

4.1.2 Headlight alignment

Validities

BMW PASSENGER CAR, BMW i, MINI PASSENGER CAR, ROLLS-ROYCE

Official method according to EG PTI:

Use a headlight adjustment device to determine the horizontal setting of each headlight for the low-beam headlight or use the electronic vehicle interface.

Fault determination according to EG PTI:

a)	Headlight adjustment not within the prescribed limits.
b)	System outputs an error via the electronic vehicle interface.

Methods according to vehicle manufacturer:

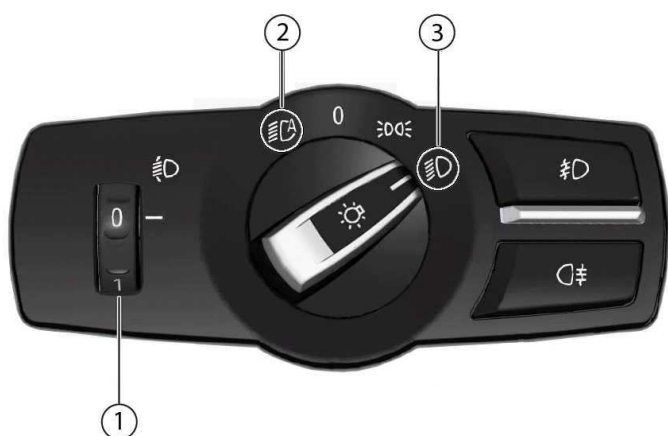
Refer to document 4.1.3 for a description on how to activate the headlights.

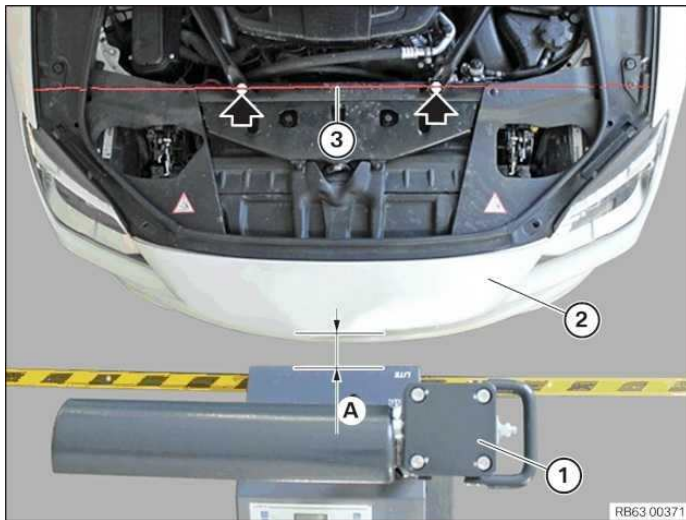
Test specifications:

- Park the vehicle on an even surface with the wheels in straight-ahead position.
- Faulty lenses and mirrors as well as light bulbs that have been tinted black are not permitted.
- Check tyre pressure and correct if necessary.
- Subject the driver's seat to the load of one person (approx. 75 kg).
- Vehicle with full fuel tank or appropriate additional weight in luggage compartment.

Carry out the test as instructed:

- Switch the ignition on.
- Manual headlight beam throw adjustment: Move handwheel to neutral position (1).
- The light switch must be in the low-beam headlight or driving light position (3).
- Do not run headlight adjustment in 'automatic driving lights control' (2) light switch position.
- Version with Xenon or LED (automatic headlight beam throw adjustment): Wait 80 s after having switched on the light. During this time, do not move the vehicle and avoid vibrations.





i

TECHNICAL INFORMATION

- Correct measurement/adjustment requires exact positioning of the headlight adjustment device (1)!
- The headlight adjusting device (1) must stand vertically to the vehicle longitudinal axis!
- This applies to all headlights!

i

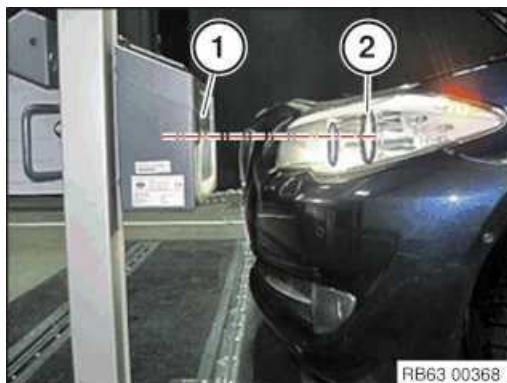
TECHNICAL INFORMATION

- Points must be vehicle proof!
- Points must be separated as wide as possible!
- Trim panels are not suitable!

Position the headlight adjustment device (1) in the centre in front of the motor vehicle (2) at a distance (A) = 10 cm .

Align the headlight adjustment device (1) with the laser beam (3). The laser beam (3) must meet two suitable spots, e.g. highlighted by arrows.

If the headlight adjusting device (1) does not have a laser beam (3), complete the alignment analogous with the line in the mirror.

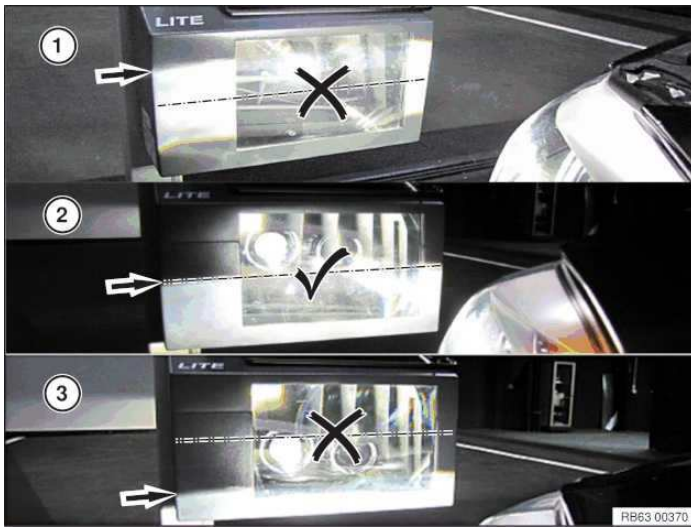


i

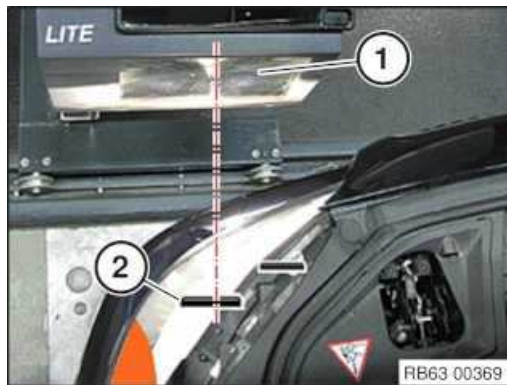
TECHNICAL INFORMATION

Always perform positioning of the headlight adjusting device (1) at the outer headlight (2)!

The centre of the collecting lens (1) must match the centre of headlight (2) horizontally. Corrections are made by raising or lowering the headlight adjusting device.



When positioned correctly, the light/dark boundary of the headlight (marked with arrow) must hit the collecting lens of the adjusting device in the centre: 1. Headlight adjustment device too far down. 2. Headlight adjustment device positioned correctly. 3. Headlight adjustment device too far at the top.



The centre of the collecting lens (1) must match the centre of headlight (2) vertically. Corrections are made by sliding the side of the headlight adjusting device to the left or right.

Light/dark boundary of headlights in headlight adjusting device

Setting dimension, headlights:

The value is indicated in % on the headlight housing.



The following value applies to saloons **1.0 %**: 1.0 % = -10 cm/10 m = - 1.0 % at the headlight adjustment device



The following value applies to Sports Utility Vehicles **1.1 %**: 1.1 % = -11 cm/10 m = - 1.1 % at the headlight adjustment device

4.1.1 Headlamps status and function

Validities

BMW PASSENGER CAR, BMW i, MINI PASSENGER CAR, ROLLS-ROYCE

Official method according to EG PTI:

Visual inspection and operation

Fault determination according to EG PTI:

a)	Headlight/light source faulty or missing (multiple headlight/multiple light sources; for LED up to 1/3 not operational). Individual headlights/light sources; for LED visibility severely impaired.
b)	Projection system (reflector and lens and/or headlight lens or end lens) with minor damage, projection system (reflector and lens and/or headlight lens or end lens) severely damaged or not available.
c)	Light not attached safely.

Methods according to vehicle manufacturer:

In general, four different lighting systems are installed at BMW, which may vary based on the vehicle equipment.

The front headlight consist of two headlights with a low-beam headlight and high beam each. All installed bulbs and/or LEDs of this system must be fully functional.

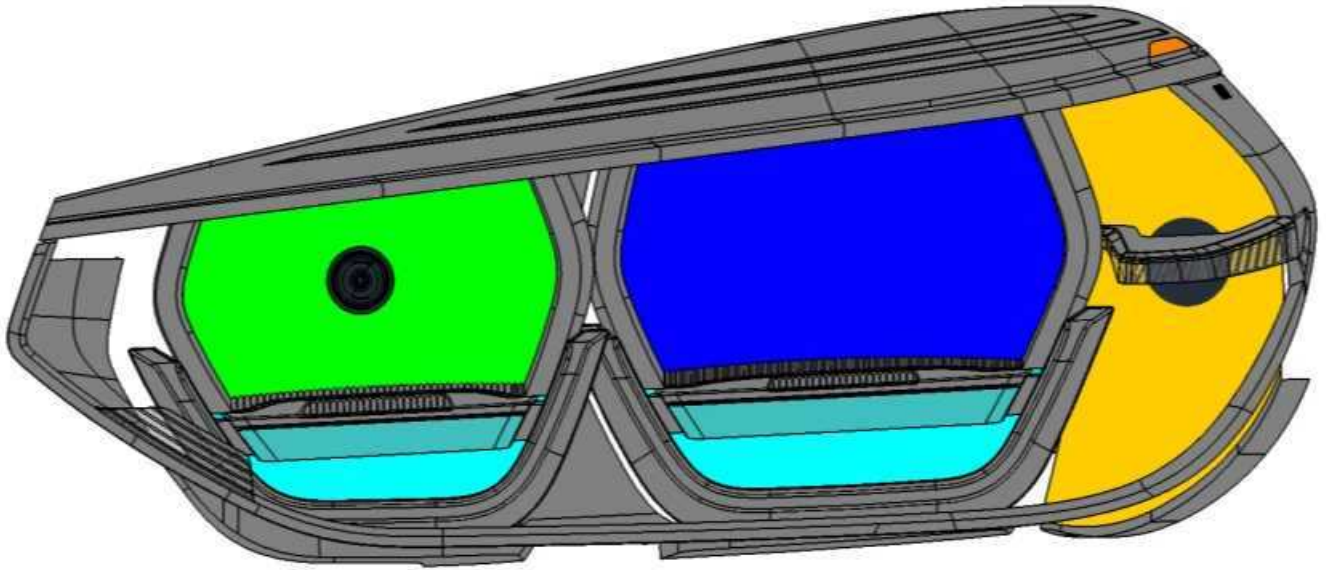
Following systems are installed:

The following descriptions come from examples of different models and may deviate in individual cases.

Halogen (H7) headlights

Manual headlight beam throw adjustment





	- The low-beam headlight (1) has been illustrated in dark blue.	1
	- The high beam (2) has been illustrated in green.	2
	- The daytime driving light (3) has been illustrated in light blue.	3
	- The turn indicator (4) has been illustrated in yellow/orange.	4

Xenon headlights

Automatic headlight beam throw adjustment (legally prescribed as per regulation by the ECE).



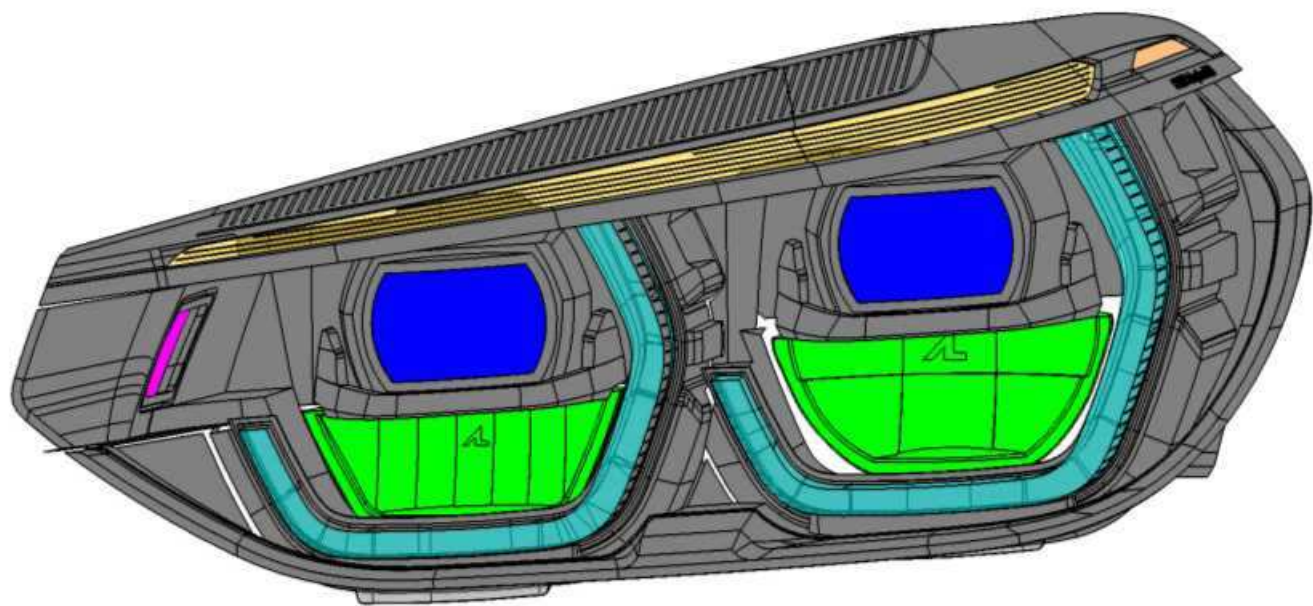
LED headlight

Low-beam headlight, high beam, daytime driving lights, front parking light.

Automatic driving light (automatic driving lights control).

Automatic headlight beam throw adjustment (legally prescribed as per regulation by the ECE).





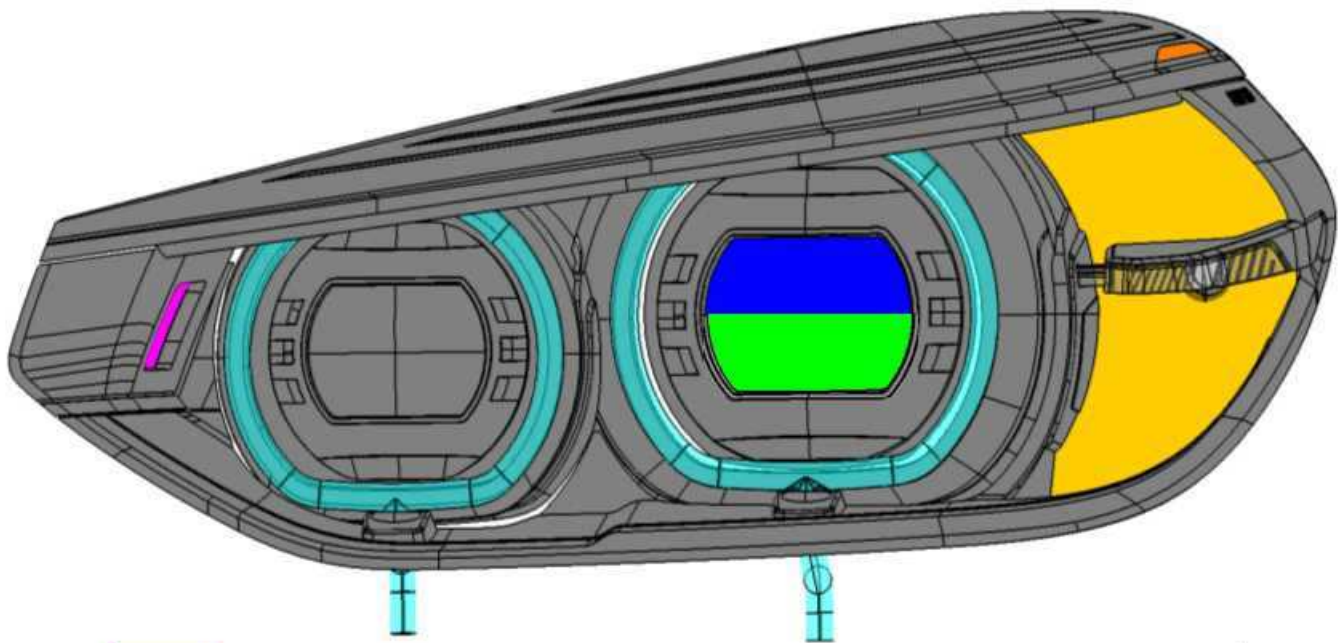
	- The cornering light (1) has been illustrated in purple.	1
	- The turn indicator (2) has been illustrated in orange or yellow.	2
	- The low-beam headlight (3) has been illustrated in dark blue.	3
	- The high beam (4) has been illustrated in green.	4
	- The daytime driving light (5) has been illustrated in light blue.	5

Laser light

Automatically switches on and irrelevant for the statutory vehicle inspection.



Example G01 - front light combination (optional equipment
5A4)BiLED AHL



	- The cornering light (1) has been illustrated in purple.	1
	- The low-beam headlight (2) has been illustrated in dark blue.	2
	- The high beam (3) has been illustrated in green.	3
	- The daytime driving light (4) has been illustrated in light blue.	4
	- The turn indicator (5) has been illustrated in yellow.	5

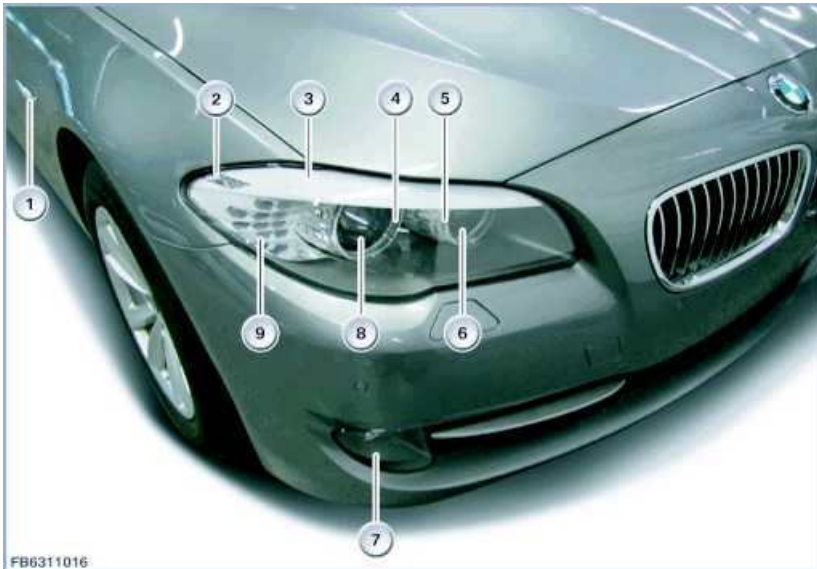
Operations

See Chapter 4.1.3.



Headlight overview

Front headlights



- 1 Side panel turn indicator
- 2 Side marker light
- 3 Accent light
- 4 Lighting ring for side lights and daytime driving lights in the low-beam headlight
- 5 Lighting ring for side lights and daytime driving lights in the high-beam headlight
- 6 High beam headlights
- 7 Fog lights
- 8 Bi-xenon headlight for low-beam headlight
- 9 LED turn indicator light

Headlight condensation



NOTICE

Certain weather conditions can lead to fogging on the inside of the headlight lens.
This is not necessarily a fault that requires replacement of the headlight.



Top row (A): Permissible fogging. **Headlight need not be replaced!**

Bottom row (B): Impermissible fogging. Replace the headlight.

4.1.6 Headlight cleaning system (if required)

Validities

BMW PASSENGER CAR, BMW i, MINI PASSENGER CAR, ROLLS-ROYCE

Official method according to EG PTI:

Visual inspection and operation (if possible).

Fault determination according to EG PTI:

Device not working with gas discharge bulb (xenon headlights) and LED headlight.

Methods according to vehicle manufacturer:

As legally prescribed, BMW installs a headlight cleaning system for xenon and LED headlights as well as laser light. With halogen headlights it depends on the equipment specification of the corresponding vehicle type.

The position of the operating levers for the corresponding vehicle type has been described in Chapter '6.2.7 Activation units' of the EG PTI documentation!



The headlight cleaning system is always linked to the window washer system at BMW.

Upon having operated the window washer system five times the headlight cleaning system is automatically started once.

4.1.5 Self-levelling suspension devices (if required)

Validities

BMW PASSENGER CAR, BMW i, MINI PASSENGER CAR, ROLLS-ROYCE

Official method according to EG PTI:

Visual inspection and operation (if possible) or use of electronic vehicle interface.

Fault determination according to EG PTI:

a)	Device inoperative.
b)	Manual device cannot be operated from the driver's seat.
c)	System outputs an error via the electronic vehicle interface.

Methods according to vehicle manufacturer:

The overview graphic illustrates the operation of manual self-levelling suspension. There is no knurled wheel (6) available if the vehicle features automatic self-levelling suspension.



TECHNICAL INFORMATION

Note:

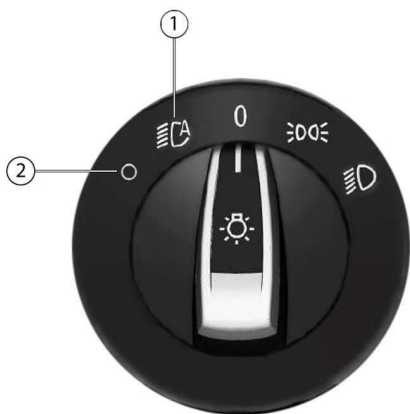
There is no way of switching the control through the electronic interface.

Self-levelling suspension equipment

Light operating unit



- 1 Button for rear fog lamp
- 2 Fog light button
- 3 Rotary switch for side lights and low-beam headlights
- 4 Knurled wheel for manual headlight beam throw adjustment
- 5 Knurled wheel for instrument lighting



Rotary switch for side light and low-beam headlight:

Index	Explanation
1	Switch position 'A' for Adaptive Headlight and automatic driving lights control
2	Indicator light (green LED) for the Adaptive Headlight and automatic driving lights control

Adaptive headlight beam throw adjustment:



The following graphic shows the light cone's primary motion patterns during operation of the automatic headlight beam throw adjustment.

The adaptive headlight beam throw adjustment is employed when driving through dips and over crests. In accordance with a request from the footwell module (FRM), the headlight driver module activates the swivel module via the stepper motors and in this way adjusts the headlight beam throw. When the vehicle passes through a dip, the headlight beam throw is increased. The swivel module is moved up slightly. The roadway is illuminated a greater distance ahead.

	Index	Explanation
	1	Vehicle without adaptive headlight beam throw adjustment
	2	Vehicle with adaptive headlight beam throw adjustment

When the vehicle passes over a crest, the headlight beam throw is reduced somewhat. The swivel module is moved down slightly. This reduces dazzling effect of an oncoming vehicle.

	Index	Explanation
	1	Vehicle without adaptive headlight beam throw adjustment
	2	Vehicle with adaptive headlight beam throw adjustment

4.2.1 Rear lights status and function

Validities

BMW PASSENGER CAR, BMW i, MINI PASSENGER CAR, ROLLS-ROYCE

Official method according to EG PTI:

Visual inspection and operation

Fault determination according to EG PTI:

a)	Light source faulty.
b)	Headlight lens/end lens faulty.
c)	Light not attached safely. Very high risk of falling.

Methods according to vehicle manufacturer:

All vehicles are equipped with daytime running lights in the in headlights as standard. Daytime running lights in the rear lights are nevertheless only fitted in certain countries.

There are 2 - 4 rear lights on a vehicle depending on the model.

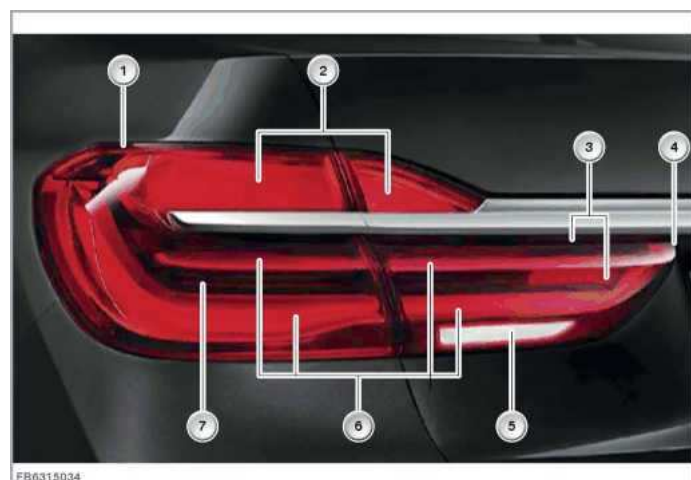
The rear lights have been integrated in pairs into the rear outer vehicle wall on the left and right.

At BMW both rear lights must be the same as a result of the design. The following lighting functions are integrated irrespective of the series:

- Brake light and tail light.
- Turn indicator.
- Side marker light, integrated into the rear light assembly at the outside of the vehicle.
- Reversing light.
- Rear fog light.

Damaged glass panes can be easily identified as part of a visual inspection. It is considerably harder to detect a failure of individual LEDs as part of a visual inspection, however the OBD interface outputs this as an error.

The following section illustrates examples of rear lights for BMW passenger cars, BMW i, MINI passenger cars and ROLLS-ROYCE passenger cars.

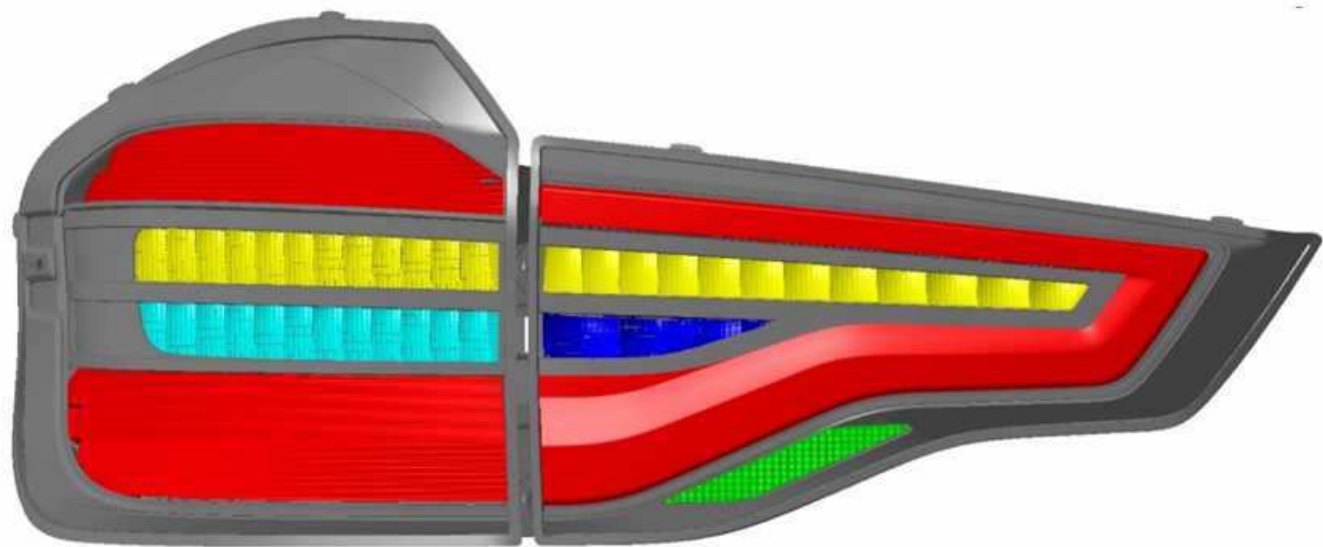


BMW passenger cars:

The graphic below shows a simplified representation of the outer left rear light and the inner left rear light using the G12 as an example.

Index	Explanation	Index	Explanation
1	Rear light, outer left	2	Direction indicator
3	Rear fog light	4	Rear light, inner left
5	Reversing lights	6	Tail light
7	Brake light		

Example of the G01 rear light cluster (OE 552)



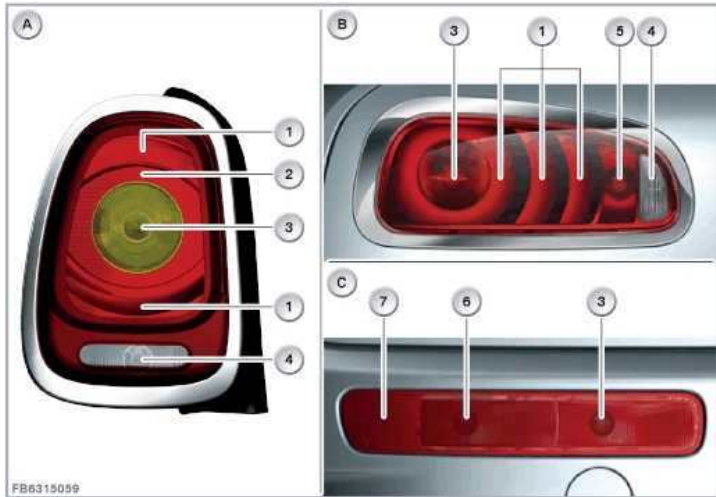
	- The tail light (1) has been highlighted in red.	1
	- The turn indicator (2) has been illustrated in yellow.	2
	- The brake light (3) has been illustrated in light blue.	3
	- The reversing light (4) has been illustrated in green.	4
	- The fog light (5) has been illustrated in dark blue.	5



BMW i:

The following graphic shows the rear lights using the example of I12.

Index	Explanation	Index	Explanation
1	Rear right turn indicator	2	Top right rear light (tail light and brake light)
3	Bottom right rear light (reversing light and rear fog light)	4	Number plate light, right
5	Number plate light, left	6	Bottom left rear light (reversing light and rear fog light)
7	Top left rear light (tail light and brake light)	8	Rear left turn indicator



MINI passenger cars:

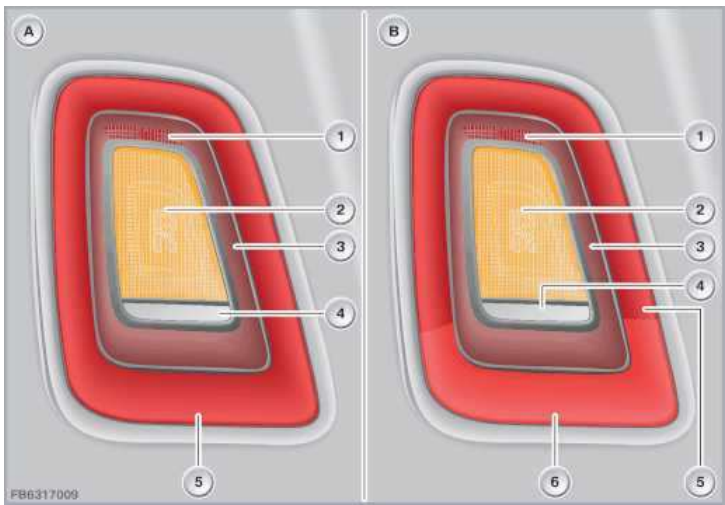
The following graphic shows a simplified representation of the left rear light in combination with LED headlights.

Index	Explanation	Index	Explanation
A	Rear light, outer left	B	Rear light, top left
C	Rear light, bottom left	1	Tail light
2	Brake light	3	Indicator light (turn indicator)
4	Reversing lights	5	Rear fog light
6	Brake light and tail light	7	Reflector

ROLLS-ROYCE passenger cars:

The lighting functions of the rear lights are produced by LEDs.

The following graphic shows a simplified representation of the rear light using the RR12 as an example.



Index	Explanation	Index	Explanation
A	Rear light, shown here: Rear fog light is not activated	B	Rear light, shown here: Rear fog light is activated
1	Rear fog light	2	Indicator light (turn indicator)
3	Reflector	4	Reversing lights
5	Tail light and brake light (light area runs all around when rear fog light is inactive)	6	Tail light (limited light surface when rear fog light is active)
7	Brake light (limited light surface when rear fog light is active)		

The hot monitoring is based on current measurement of the individual bulb outputs. A faulty bulb is detected within approximately 2 s.

4.3.2 Brake lights switch

Validities

BMW PASSENGER CAR, BMW i, MINI PASSENGER CAR, ROLLS-ROYCE

Official method according to EG PTI:

Visual inspection and operation or use of electronic vehicle interface.

Fault determination according to EG PTI:

a)	Switch cluster function not as per regulations. Delayed operation. No function.
b)	Impaired activation unit function.
c)	System outputs a CC message via the electronic vehicle interface.
d)	Emergency brake light not operating or not operating correctly.

Methods according to vehicle manufacturer

For electronic testing via the diagnostic interface (OBD socket), the read-out routines necessary for the EU testing organisation will be provided.

4.1.3 Headlamp switch

Validities

BMW PASSENGER CAR, BMW i, MINI PASSENGER CAR, ROLLS-ROYCE

Official method according to EG PTI:

Visual inspection and operation or use of electronic vehicle interface.

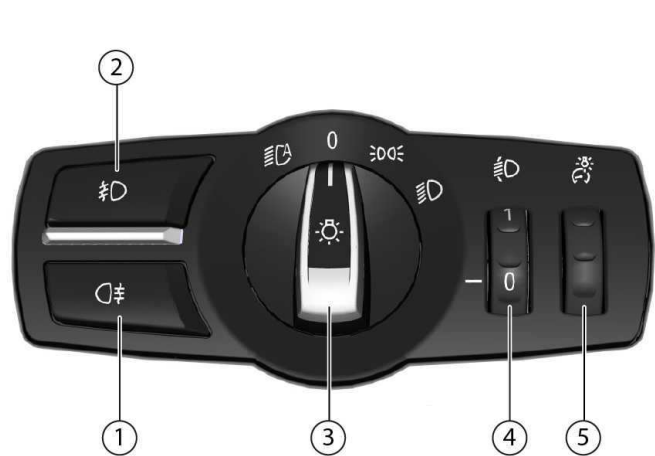
Fault determination according to EG PTI:

a)	Switch cluster function not as per regulations (number of simultaneously activated headlights). Maximum permissible light intensity exceeded towards the front.
b)	Impaired activation unit function.
c)	System outputs an error via the electronic vehicle interface.

Methods according to vehicle manufacturer:

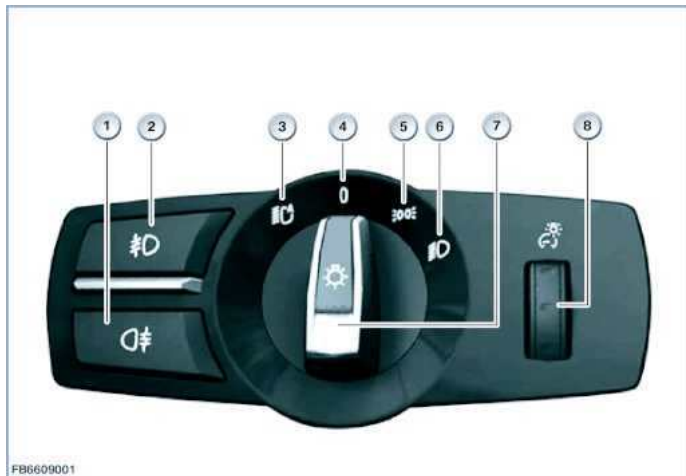
The front headlights are switched on using the standard light switch.

The figures of the light operating units shown here are merely examples and they may deviate in respective vehicle types and vehicle models.



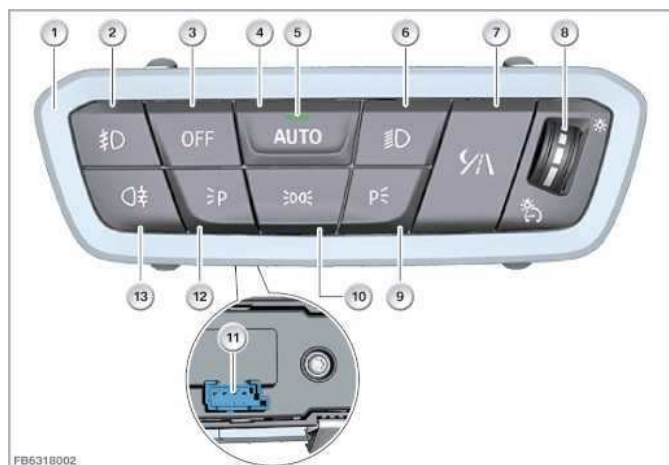
Standard light switch (3) for vehicles with halogen headlights and manual headlight beam throw adjustment.

Index	Explanation
1	Front fog light switch
2	Rear fog light switch
3	Light switch (see next graphic for details)
4	Knurled wheel for manual headlight beam throw adjustment
5	Dimmer for instrument lighting



Standard light switch (7) for vehicles with bi-xenon and automatic headlight beam throw adjustment.

Index	Explanation
1	Rear fog light switch
2	Front fog light switch
3	Position A for automatic driving lights control (optional equipment)
4	Position 0 for daytime driving lights
5	Position 1 for side lights
6	Position 2 for driving lights
7	Light switch
8	Dimmer for instrument lighting



Standard light switch (5) as example X5

Index	Explanation
1	Light operating unit
2	Fog light button
3	OFF button
4	Automatic driving lights control button (AUTO button)
5	Function indicator light for automatic driving lights control
6	Low-beam headlight button
7	Night Vision camera button
8	Knurled wheel for the dimmable instrument lighting
9	Right parking light button
10	Side light button
11	4-pin plug connection
12	Left parking light button
13	Rear fog light button



The turn signal/high beam switch signal is controlled by the steering column switch cluster (SZL).

Index	Explanation	Index	Explanation
1	FLA button	5	Continuous flashing, right
2	On-board computer button	6	Headlight flasher
3	High-beam headlight	7	One-touch flashing, left
4	One-touch flashing, right	8	Continuous flashing, left

i

TECHNICAL INFORMATION

Note:

The automatic driving lights control is also active in switch position 0 of the light switch.

For all models with series launch from 02/2015 and depending on the national-market version, automatic driving lights control is also active when the light switch is in switch position 0.

i

TECHNICAL INFORMATION

A fault check can also be performed using the vehicle's OBD interface.

The location of the OBD interface is described in chapter '**6.2.7 Operating devices**' of the EG PTI documentation.

4.13 Battery (batteries) 7 series, 8 series

Validities

BMW PASSENGER CAR

Official method according to EG PTI:

Visual inspection

Fault determination according to EG PTI:

a)	Unsafe, incorrectly secured; risk of short circuit
b)	Leakage, escaping hazardous substances
c)	Switch (if required) faulty
d)	Fuses (if required) faulty
e)	Insufficient ventilation (if required)

Methods according to vehicle manufacturer:

For the voltage supply of the low-voltage vehicle electrical system, up to 4 different 12 V batteries (colour in illustration: yellow) are used depending on the vehicle equipment::

- AGM battery
- Auxiliary battery in the engine compartment
- Auxiliary battery in the boot
- Lithium ion battery

For the vehicle electrical system support, an auxiliary battery is used in the engine compartment. For a vehicle with electrical ARS, the two actuators of the anti-roll bars are also supplied by it.

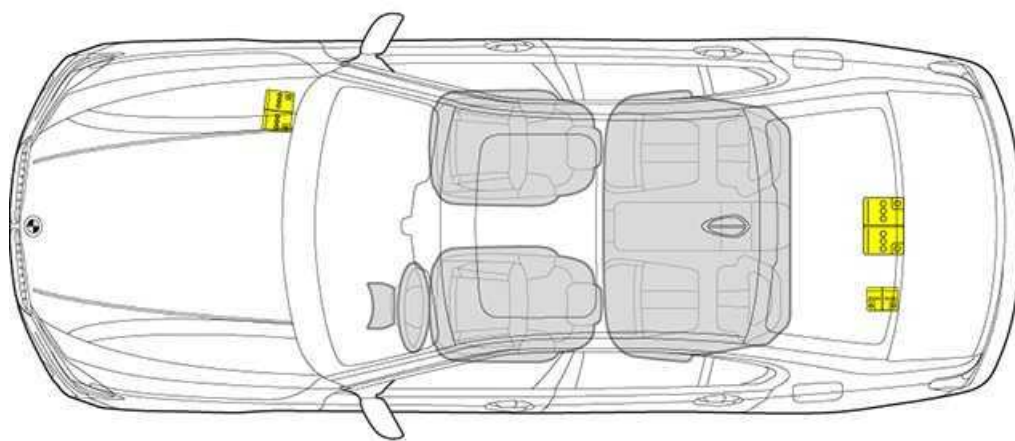
For the voltage supply of the high-voltage on-board power supply the following high-voltage batteries (shown in orange in the representation) are used:

- High-voltage battery

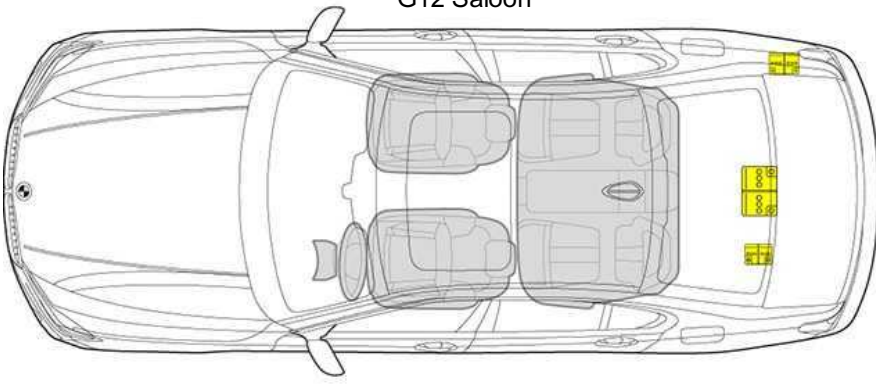
Number of batteries

Up to 5 batteries can be used in one vehicle. Due to optional equipment, the number of batteries is variable. A fault is displayed via the corresponding warning light in the instrument cluster.

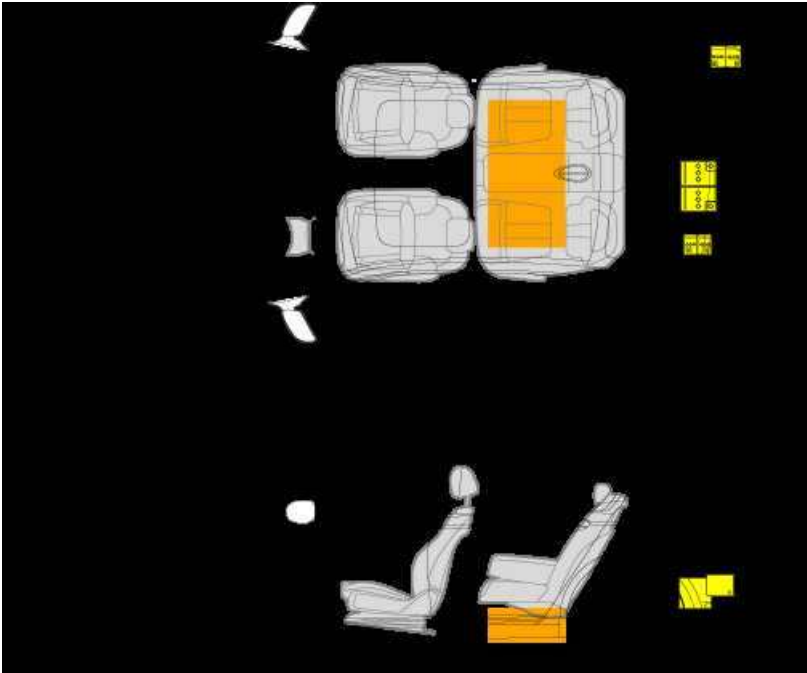
G11 Saloon



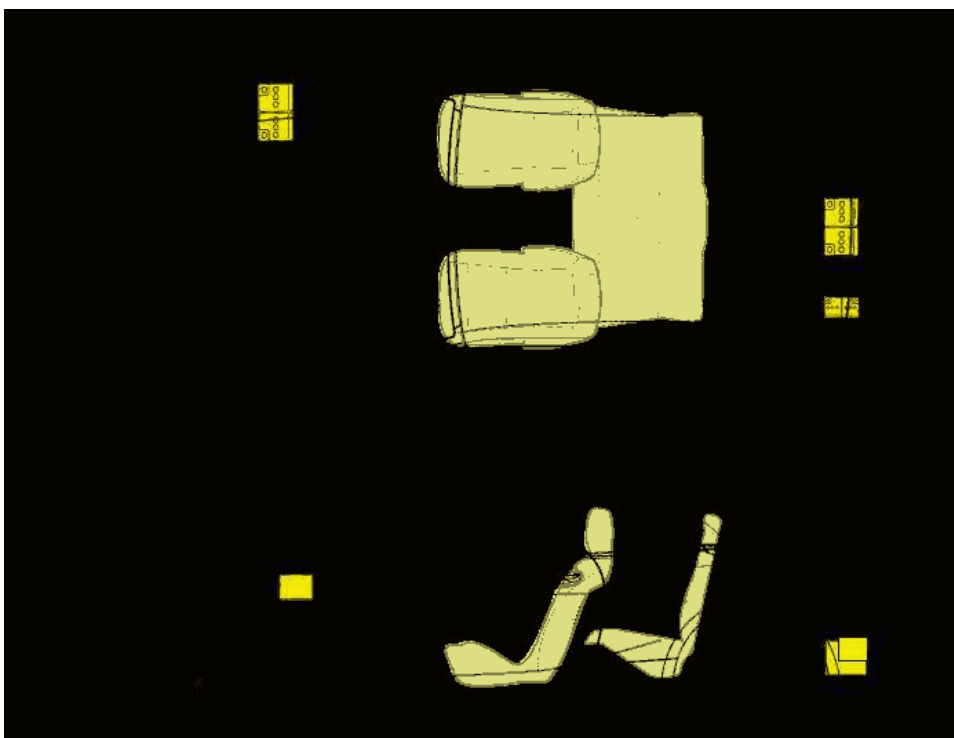
G12 Saloon

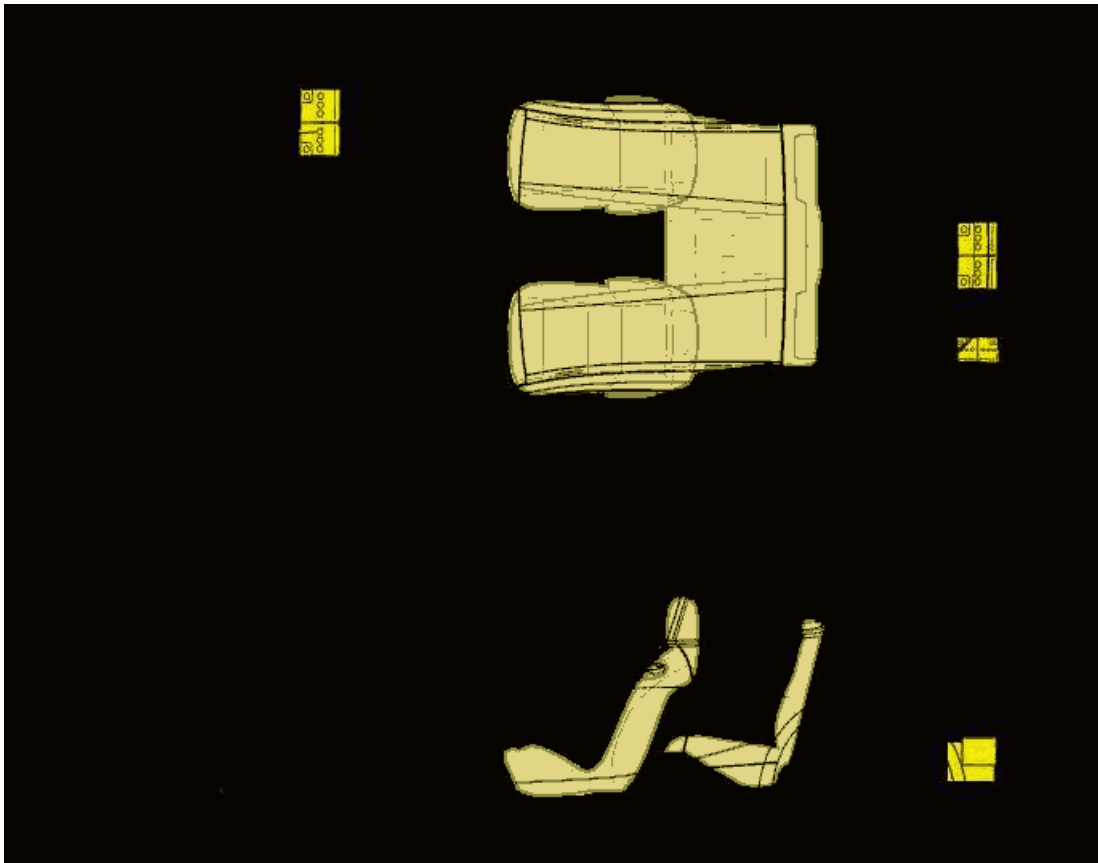


G11, G12 Limousine, Plug-in Hybrid Electric Vehicle



G14 Saloon





Special design for high-voltage batteries

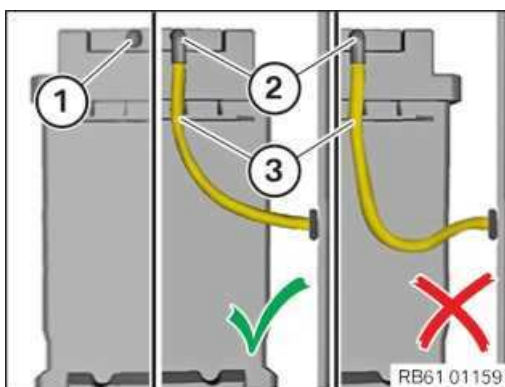
There are no special BMW devices with respect to the high-voltage batteries. There are only standard parts.

Vehicle identification number specific information related to the battery switch [Yes/No]

There is no specific information on the battery switches.

Vehicle identification number specific information related to the battery fuse [Yes/No]

There is no specific information on the battery fuse.



Vehicle identification number specific information related to the battery vent [Yes/No]

A battery has two vent holes (1, 2). One vent hole (1) must be closed correctly with a dummy plug. The vent hose (3) must be connected correctly at the other vent hole (2) .

Vehicle identification number specific information related to the operating principle.

There is no specific information related to the operating principle.