

Technical training.
Product information.

G15 Body



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BMW Service

Edited for the U.S. market by:
BMW Group University
Technical Training

ST1833

10/1/2018

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Contains important safety information and information that needs to be observed strictly in order to guarantee the smooth operation of the system.

Information status: June 2018

BMW Group vehicles meet the requirements of the highest safety and quality standards. Changes in requirements for environmental protection, customer benefits and design render necessary continuous development of systems and components. Consequently, there may be discrepancies between the contents of this document and the vehicles available in the training course.

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Additional sources of information

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

- Owner's Handbook
- Integrated Service Technical Application
- Aftersales Information Research (AIR)

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G15 Body

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G15 Body

1. Introduction

1.1. Overview



BMW 8 Series Coupé

The new BMW 8 Series Coupé with development code G15 is completely new model for BMW.

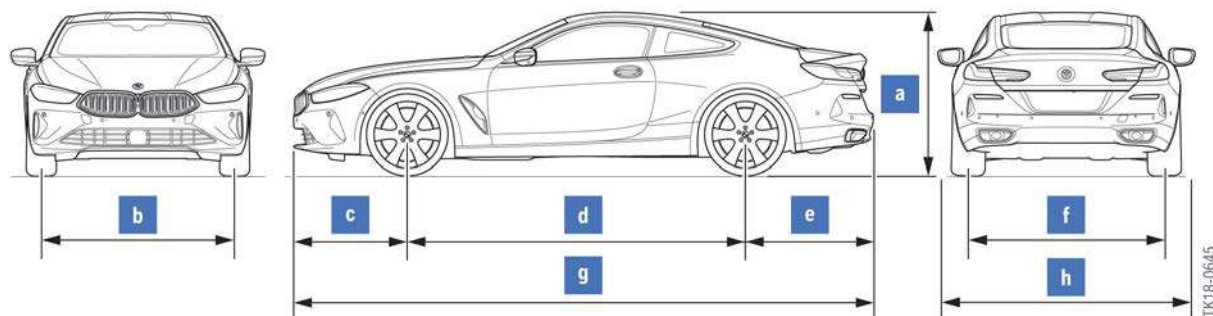
- BMW M850i xDrive.

The M850i xDrive comes standard with an 8-speed automatic transmission, Integral Active Steering, Electric Roll Stabilization, Adaptive M Suspension Professional, M Sport Brakes, M Sport Differential and the xDrive all-wheel drive which is already familiar from the G12.

Compared to the F13, its proportions are considerably more sporty. Despite the low vehicle height, the headroom at the front is on a par with its predecessor. To achieve the extremely flat outline, neither a roof aerial nor a tilt and slide or panoramic glass sunroof is available.

1.2. Dimensions and comparison of outlines

The exterior dimensions of the G15 in the European version are shown below.

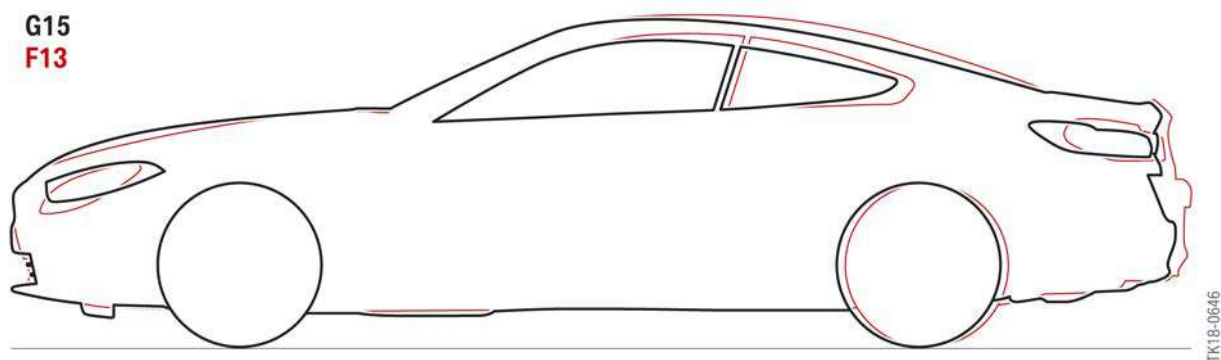


G15 outer dimensions

G15 Body

1. Introduction

| Index | Explanation | Unit | BMW M850i xDrive |
|-------|--|------|------------------|
| a | Vehicle height | [mm] | 1346 |
| b | Front track width, basic wheels | [mm] | 1627 |
| c | Front overhang | [mm] | 958 |
| d | Wheelbase | [mm] | 2822 |
| e | Rear overhang | [mm] | 1076 |
| f | Rear track width, basic wheels | [mm] | 1642 |
| g | Vehicle length | [mm] | 4856 |
| h | Vehicle width excluding/including exterior mirrors | [mm] | 1902/2137 |



Silhouette comparison of G15/F13

The following table shows the most important data of the G15 and compares this directly with the F13.

| Explanation | Unit | BMW M850i xDrive | BMW 650i xDrive | Difference |
|--|------|------------------|-----------------|------------|
| Vehicle height | [mm] | 1346 | 1369 | -23 |
| Front track width, basic wheels | [mm] | 1627 | 1600 | +27 |
| Front overhang | [mm] | 958 | 941 | +16 |
| Wheelbase | [mm] | 2822 | 2855 | -33 |
| Rear overhang | [mm] | 1076 | 1098 | -22 |
| Rear track width, basic wheels | [mm] | 1642 | 1665 | -23 |
| Vehicle length | [mm] | 4856 | 4894 | -38 |
| Vehicle width including exterior mirrors | [mm] | 2137 | - | — |
| Shoulder room, front | [mm] | 1454 | 1445 | +9 |
| Shoulder room, rear | [mm] | 1192 | 1263 | -71 |
| Elbow room, front | [mm] | 1534 | 1531 | +3 |

G15 Body

1. Introduction

| Explanation | Unit | BMW M850i xDrive | BMW 650i xDrive | Difference |
|------------------------------|------|------------------|-----------------|------------|
| Elbow room, rear | [mm] | 1185 | 1338 | -180 |
| Maximum headroom, front | [mm] | 987 | 1017 | -30 |
| Luggage compartment capacity | [l] | 420 | 460 | -40 |

1.3. Weights and payload

The vehicle curb weights as per DIN and the payloads of the G15 in the European version are set out in the following table.

| Model | Unit | Vehicle curb weight | Payload |
|------------------|------|---------------------|---------|
| BMW M850i xDrive | lbs | 4478 | 772 |

1.4. Models

The G15 will be available at market introduction with the following models.

| Model | Engine | Displacement [cc] | Power output [kW (HP)] | Torque [Nm (lb-ft)] |
|------------------|-------------------|-------------------|------------------------|---------------------|
| BMW M850i xDrive | 8-cylinder engine | 4395 | 390 (523) | 750 (553) |

1.4.1. BMW M Performance

BMW M Performance model is the only one available for the US market.

G15 Body

1. Introduction

Exterior equipment



M PERFORMANCE

TK18-0647

BMW M850i xDrive exterior trim

Equipment range, exterior trim:

- Larger air inlets
- Front spoiler (spoiler edge)
- Components in the color "Cerium Grey":
 - Frame and longitudinal bars of the kidney grille
 - Exterior mirror caps
 - Model identification on rear
 - Air breather
 - Tailpipe trims
- Tailpipe trims with exclusive geometry
- Exclusive light-alloy wheel in "Cerium Grey metallic"
- M Sport braking system (19")
- M identification on front side panel
- M rear spoiler in vehicle color

G15 Body

1. Introduction

Interior equipment



M PERFORMANCE

BMW M850i xDrive interior equipment

Equipment ranges, interior equipment:

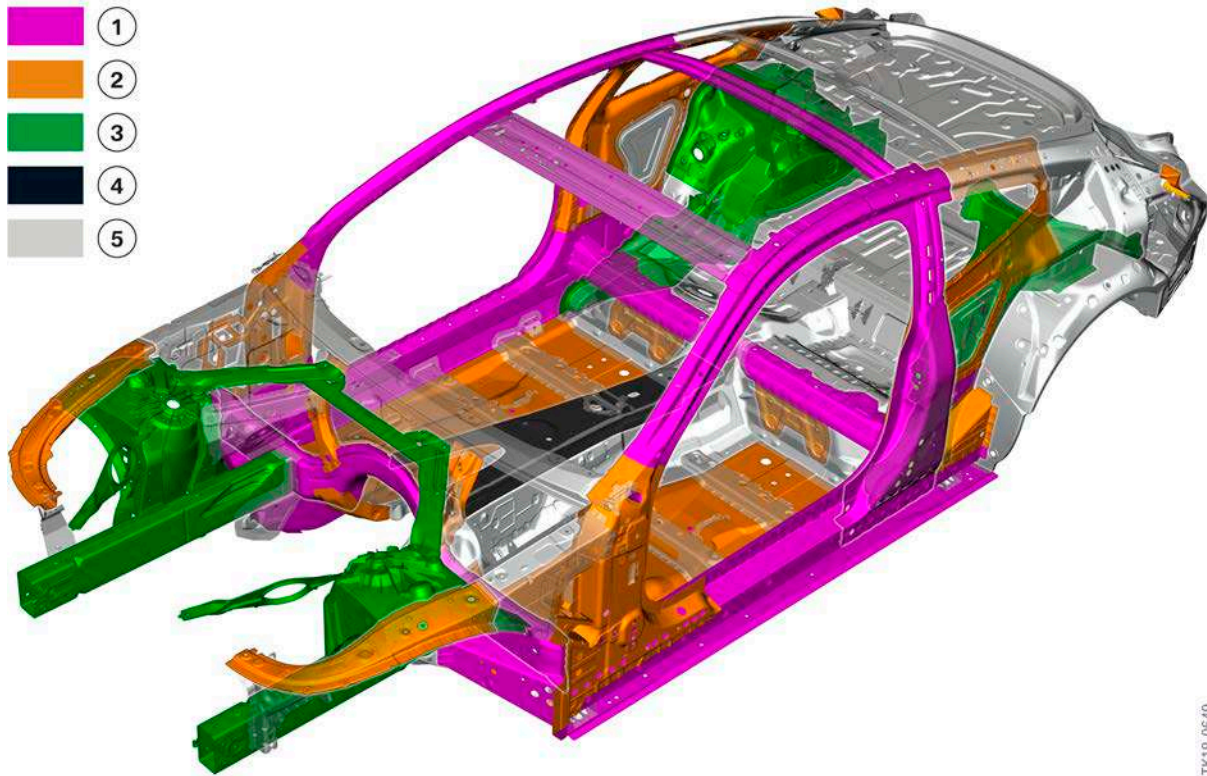
- Illuminated door sill cover strip with model identification
- Instrument cluster with digital model identification
- M Sport package:
 - Multifunction seats, front
 - M footrest and M pedals
 - Exclusive interior trim finishers
 - Headliner in anthracite
 - M leather steering wheel
 - ID transmitter with M stripe
 - Specific floor mats with edge stitching

TK18-0648

G15 Body

2. Bodyshell

2.1. Body structure



G15 material overview, body structure

| Index | Explanation |
|-------|---|
| 1 | Ultra-high strength hot-formed steel (> 900 N/mm ²) |
| 2 | Multiphase steel (> 300 N/mm ²) |
| 3 | Aluminium |
| 4 | Carbon |
| 5 | Other steel |

The lightweight body concept of the G15 envisages components made of high-strength hot-formed steel, aluminium and carbon. Thanks to the material mix, the materials are able to contribute their specific strengths to the vehicle in the best possible way.

The number of aluminium components (die-cast and extruded profiles) has increased considerably. In contrast with the F13, the engine supports, rear side members and spring strut domes are now made of aluminium. In addition to the G12 and the G30, the G15 now belongs to the 3rd series in which structural components made of aluminium are used in the rear end.

G15 Body

3. Exterior Equipment

3.1. Overview



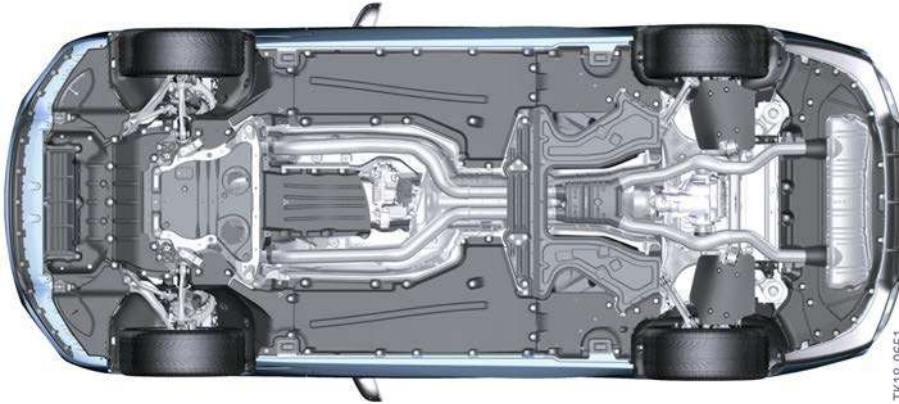
G15 exterior equipment

| Index | Explanation |
|-------|--|
| 1 | Air flaps (in the radiator grille) |
| 2 | Headlights (do not extend as far as the radiator grill, currently the most slender headlight in the BMW portfolio) |
| 3 | Air breather |
| 4 | Exterior mirror (integrated into the window recess finisher strip) |
| 5 | Additional brake light (top, behind the rear window) |
| 6 | Full LED rear lights |

G15 Body

3. Exterior Equipment

3.2. Vehicle underbody



G15 Underbody

Compared to the F13, the undercarriage in the area of the rear has once again been closed further. This plays a significant role in the aerodynamics and CO₂ reduction. The use of textile material improves the external acoustics and at the same time reduces weight.

3.3. Carbon components

Various carbon components for the G15 can be ordered with the optional equipment M Carbon exterior package (SA 71C):

- Air guide element for air curtain
- Trims at the front ornamental grille (omitted in vehicles with front radar sensor)
- Exterior mirror covers
- Rear spoiler
- Diffuser insert.

An M carbon roof can also be ordered with the optional equipment SA 40C.

G15 Body

3. Exterior Equipment

3.4. Air damper control



G15 Active air-flap control

| Index | Explanation |
|-------|----------------------------------|
| 1 | Air flaps at top |
| 2 | Actuator for air flaps at top |
| 3 | Brake air duct left |
| 4 | Air flaps at bottom |
| 5 | Actuator for air flaps at bottom |
| 6 | Brake air duct right |

The G15 also features the familiar 3rd generation air flap control which has been used since the G12. The air flaps are located inside the ornamental grille surround at the top and behind the central air inlet of the lower bumper panel.

The top and bottom air flaps are controlled by separate actuators. When a corresponding cooling request is received, the bottom air flaps always open first and then the top air flaps. The air flaps at the bottom can also have several intermediate settings.

A new feature of the G15 is that the brake air ducts can now also be closed via the flap system at the bottom.

G15 Body

4. Body Repair Level 1

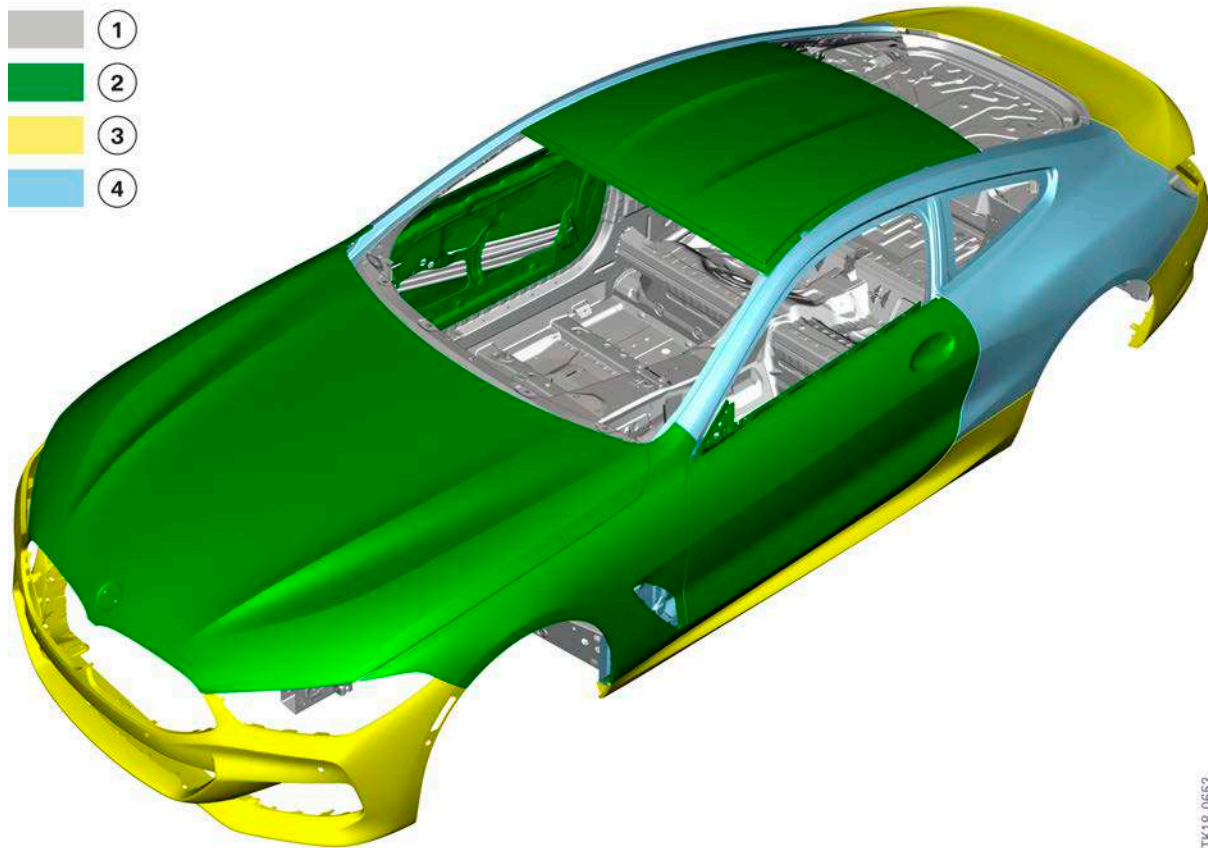
4.1. Overview

Taking into account the repair stages of the BMW workshop information system, the body repair work in the Technical Qualification is divided into 3 repair levels. Each of the 3 Body Repair Levels includes certain prerequisites in terms of the qualifications of the employees and the workshop equipment.

The special characteristics of the mounted body parts and materials used in the outer body skin are described in this chapter.

For information on the basic procedure for carrying out adjustment work on body mounted parts, refer to the "Body Repair Level 1" product information of the body standard qualification and also the workshop information system.

4.2. Outer body skin



G15 overview of materials, outer body skin

| Index | Explanation |
|-------|-------------------------|
| 1 | Other steel grades |
| 2 | Aluminium |
| 3 | Plastic (SMC, PP, EPDM) |
| 4 | Deep drawing steel |

G15 Body

4. Body Repair Level 1

The following table provides you with an overview of the components of the outer body skin where different materials have been used and/or where the materials have remained the same.

| Component | G15 | F13 |
|-------------------|------------------------------|--------------------|
| Roof | Aluminium (carbon as option) | Deep drawing steel |
| Bonnet | Aluminium | Aluminium |
| Tailgate | Plastic | Plastic |
| Front side panels | Aluminium | Plastic |
| Doors | Aluminium | Aluminium |
| Outer side frame | Deep drawing steel | Deep drawing steel |

4.3. Tailgate



G15 Tailgate components

G15 Body

4. Body Repair Level 1

| Index | Explanation |
|-------|------------------------------|
| 1 | Outer skin (plastic) |
| 2 | Hinge reinforcement (steel) |
| 3 | Inner shell (plastic) |
| 4 | Rear light housing (plastic) |
| 5 | Lock reinforcement (steel) |

BMW is using a tailgate made of plastic (SMC¹) with paintable surface for the first time. The IMC method² is being used to manufacture the tailgate. Additional lining components are not required. This provides more geometrical design freedom and reduces weight.

¹ SMC (Sheet Molding Compound): plate-shaped, doughy compounds made of thermosetting resins for production of fiber-reinforced plastics.

² IMC (in-mould coating): procedure during which the surface of the shaped part is coated while still in the mould.

G15 Body

4. Body Repair Level 1



G15 tailgate

| Index | Explanation |
|-------|-----------------------------|
| 1 | Spring support |
| 2 | Spindle drive |
| 3 | Tailgate lock |
| 4 | Automatic Soft Close system |

The G15 features an automatic tailgate operation as standard. It is driven from the right via a one-sided conventional spindle drive.

A soft-close function is used to lock the tailgate in the tailgate lock.

G15 Body

4. Body Repair Level 1

4.4. Exterior rearview mirrors



G15 exterior rearview mirror

For the first time at BMW, the exterior mirrors are integrated into the window recess finisher strips of frameless doors. This gives the appearance of a decorative strip which runs through into the mirror head.

Exterior mirror caps made of carbon are available in combination with the optional equipment M Carbon exterior package (SA 71C).

G15 Body

4. Body Repair Level 1

4.5. Doors



G15 lightweight support

| Index | Explanation |
|-------|---------------------|
| 1 | Power window motor |
| 2 | Lightweight support |

The lightweight support is mounted on the door structure by means of screws and bayonet fittings. It divides the interior of the door into a dry and wet side. The dry side is closed off to the inside by the door trim panel and the wet side is closed towards the outside by the door outer skin. Sensitive components – such as loudspeakers and airbag sensors – are located on the dry side and are thus optimally protected against moisture.

The power window mechanism is based on a cable mechanism. The electrical drive force is provided by an electric motor which – in contrast with the G11/G12 – is installed on the wet side of the lightweight support.

In contrast to the G05, instead of being activated via pulse-width modulated signals, the power window motors in the G15 are activated via relays as before.

G15 Body

5. Interior Equipment

5.1. Overview



G15 interior equipment

| Index | Explanation |
|-------|--|
| 1 | Light operating unit |
| 2 | Frameless interior mirror |
| 3 | Display (integrated automatic heating/air conditioning system) |
| 4 | Heating and air conditioning controls |
| 5 | Radio operating unit |
| 6 | Cover (wireless charging station and cup holder) |
| 7 | Selector lever |
| 8 | Controller |

To improve the spatial impression and increase the field of view, a frameless interior mirror is used in the G15.

G15 Body

5. Interior Equipment

If required, glass controls (SA 4A2) can be ordered for the following components:

- Selector lever
- Volume control button
- Controller
- START-STOP button

5.2. Ambient lighting



G15 ambient lighting

In the G15, ambient lighting is used as standard which emits indirect light and illuminates contour lines.

A "forwards-looking" lighting design is used in this case in which the center console, but not the instrument panel, is illuminated. This emphasizes the sporting character of the vehicle.

G15 Body

5. Interior Equipment

5.3. Front seats



G15 front seat

In the standard seat for the M850i xDrive is the multifunction seat, for the driver and front passenger. These are also equipped with backrest width and seat depth adjustment and a lumbar support.

The following optional equipment can also be ordered (among others):

- Front active seat ventilation (SA 453)
- Seat heating for driver and front passenger (SA 494)
The distribution of heat between seat cushions and backrests can be controlled in combination with the multifunction seats (SA 4FM).
- M seat belts (SA 4GQ).

A massage function is not available for the G15.

Visually integrated head restraints are equipped with all the functionality and comfort of a height and depth-adjustable head restraint. A head rest characteristic map control prevents a collision with the headliner.

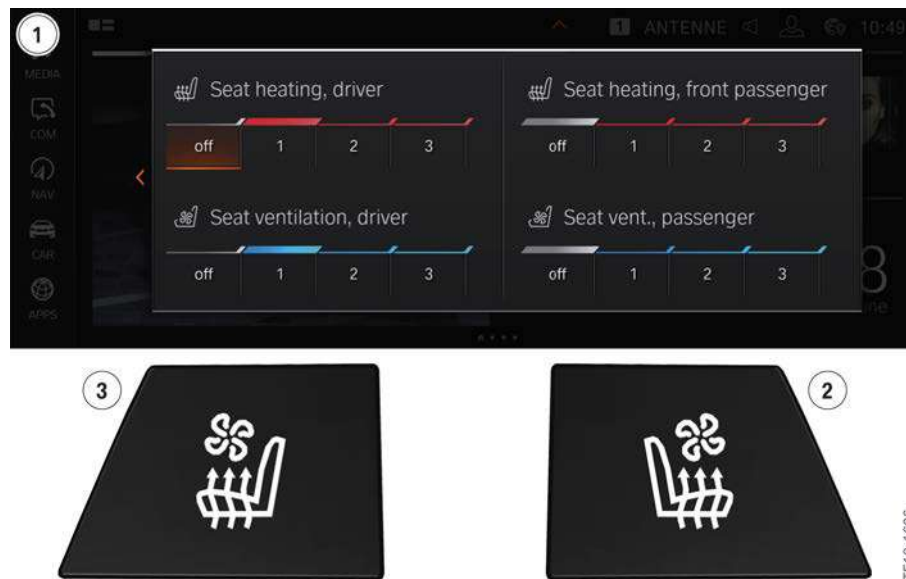
G15 Body

5. Interior Equipment

The switches for fore-and-aft seat adjustment are on the seat. So they can be easily seen and used, they are mounted tilted towards the passengers. The comfort entry is activated via a leather loop on the back of the seat in the area of the backrest upper section.

In contrast to the F13, a conventional seat belt system with belt deflector support on the B-pillars is used in the G15.

5.3.1. Active seat ventilation, seat heating



G15 active seat ventilation, seat heating

| Index | Explanation |
|-------|---|
| 1 | Display in the Central Information Display (CID) |
| 2 | Button for seat heating/seat climate control on right |
| 3 | Button for seat heating/seat climate control on left |

The buttons for seat heating and active seat ventilation are centralized in the G15. To ensure the two systems are fully functional therefore, it is necessary to make settings at the CID.

The seat heating and/or the active seat ventilation can be switched on and off by pressing the seat heating/seat and climate control button on the air conditioning control panel. Different intensity levels can be selected by pressing the button several times.

After switching on, a corresponding display appears in the CID, where further settings can be made via the touchscreen or controller.

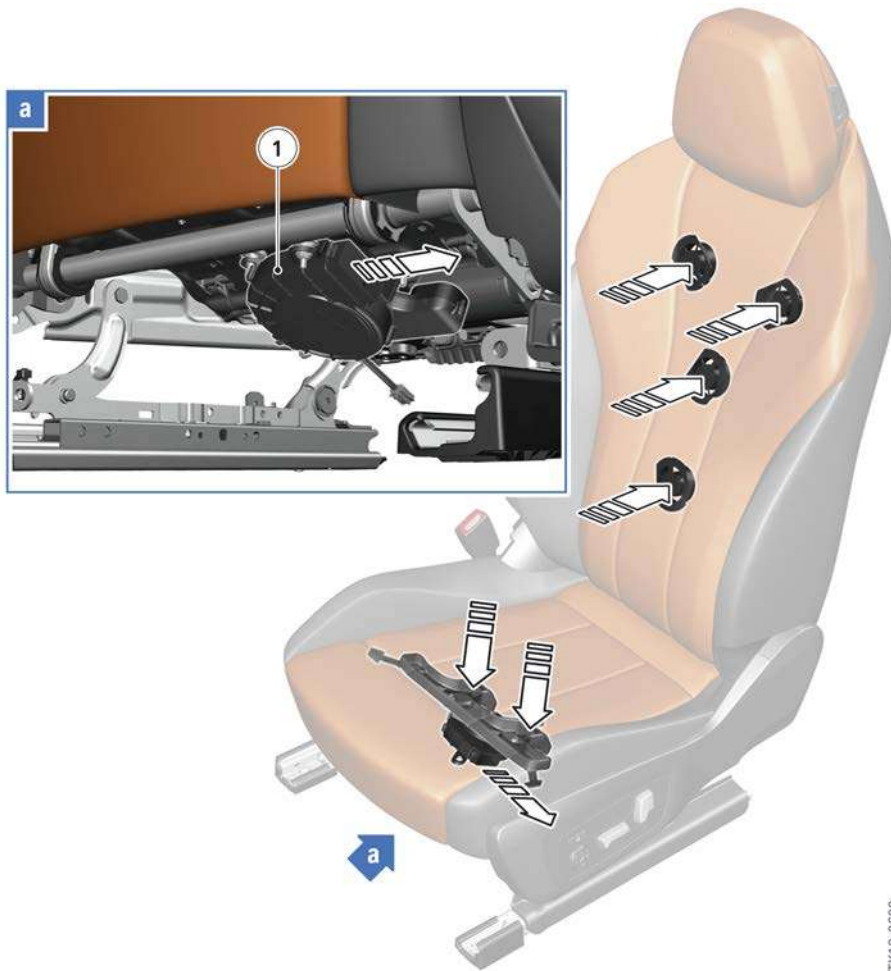
Seat climate control

The seat climate control combines the seat heating and active seat ventilation functions.

G15 Body

5. Interior Equipment

If both systems are active, one push of the button reduces the intensity of both functions by one level. The last function to be active is immediately activated when the system is switched back on. If both functions were switched off at the same time, the system automatically activates the seat heating when it is switched back on.



G15 active seat ventilation

| Index | Explanation |
|-------|-------------|
| 1 | Central fan |

A suction ventilation system is being used in the front seats for the first time at BMW. With this system, the cooler air is drawn out of the interior past the body into the seat. This improves the subjective perception of the cooling power.

Additionally, a single fan (central fan) is mounted for the first time under the structure of the front seat instead of the single fan in the seat cushion surface.

G15 Body

5. Interior Equipment

5.4. Rear seats



G15 rear seats

| Index | Explanation |
|-------|---------------------------|
| 1 | Backrest remote unlocking |

To improve the rearwards vision, headrests are not installed in the two rear seats.

Both rear seat backrests can be folded forwards separately to increase the size of the luggage compartment. They are unlocked via two mechanical remote backrest unlocking mechanisms in the luggage compartment.

5.5. Climate control



G15 Air conditioning control panel

A 2/2 zone air conditioning system is used in the G15. The first digit stands for the temperature settings which can be separately controlled. The second digit stands for the zones in which the amount of air can be controlled separately.

G15 Body

5. Interior Equipment

Additional functions of the integrated automatic heating/air conditioning system are (among others):

- Automatic program with 5 intensity levels which can be set for the driver and front passenger separately
- Stratification of temperature
- Independent ventilation
- Automatic air recirculation control
- SYNC program
- MAX-A/C.

Further optional equipment is available to order:

- Comfort seating package, (SA 4HB) includes:
heated armrests at the front in the doors and center console
as well as steering wheel and front seat heating



Technical training.
Product information.

G15 Powertrain/Chassis



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G15 Powertrain/Chassis

1. Introduction

1.1. Overview

The new BMW 8 series has the development code G15.



G15 Complete Vehicle

The BMW 8 series is scheduled for the market introduction in November 2018. The 8 series will be equipped as standard with an 8-speed automatic transmission, Integral Active Steering, Electronic Damper Control and the xDrive all-wheel drive.

The G15 features the newly developed integrated brake system with internal designation Dynamic Stability Control integrated DSCi.

See the product information DSCi for more information on the Dynamic Stability Control integrated DSCi.



Important notes on handling of the new brake system must be strictly observed.

G15 Powertrain/Chassis

1. Introduction

1.2. Models

The following model is available for the market introduction in November 2018:

| Model | Engine | Automatic transmission | Transfer box |
|--------------|------------|------------------------|---------------------------|
| M850i xDrive | N63B 44T 3 | GA8X76D | Active Torque Control -13 |

1.3. BMW M Performance



M Performance model M850i xDrive

A list of the technical highlights of the model M850i xDrive is shown below:

- TwinPower Turbo 8-cylinder gasoline engine
- M Sport braking system (19")
- M sport differential
- M light-alloy wheels (20")
- Sports exhaust system
- M leather steering wheel
- M rear spoiler
- Adaptive M suspension Professional suspension

As an option, the M850i xDrive can be equipped with an M carbon roof and M carbon exterior package.

G15 Powertrain/Chassis

1. Introduction

1.4. Engine identification

The engine designation is used to uniquely identify the various engines. The following table provides an overview of the composition of the different engine codes.

| Position | Meaning | Index | Explanation |
|----------|--|--|---|
| 1 | Engine developer | M, N, B P S W | BMW Group BMW Motorsport BMW M GmbH Bought-in engines |
| 2 | Engine type | 3 4 5 6 7 | 3-cylinder in-line engine (e.g. B38) 4-cylinder in-line engine (e.g. B48) 6-cylinder in-line engine (e.g. B58) V8 engine (e.g. N63) V12 engine (e.g. N74) |
| 3 | Change to the basic engine concept | 0 1 – 9 | Basic engine Changes, e.g. combustion process |
| 4 | Method of operation or fuel and mounting orientation if applicable | A B C D H K | Petrol, transverse mounted Petrol, longitudinally mounted Diesel, transverse mounted Diesel, longitudinally mounted Hydrogen Petrol, horizontal mounting |
| 5+6 | Displacement in 1/10 liter | 12 15 20 30 40 44 60 | 1.2 l 1.5 L 2.0 L 3.0 L 4.0 L 4.4 L 6.0 L |
| 7 | Performance class | K U M O T S | Lowest Lower Middle Upper Top Super |
| 8 | Redesign relevant to approval | 0 1 – 9 | New development Redesign |

G15 Powertrain/Chassis

2. Engine

2.1. Gasoline engine N63B44T3



N63B44T3 engine

| M850i xDrive | |
|-----------------------|--------------------|
| Engine identification | N63B44T3 |
| Power output | 390 kW (523 hp) |
| Torque | 750 Nm (553 lb-ft) |

2.1.1. Technical data

| Parameters | Unit | N63B44T3 |
|---------------------|-----------------|-----------------|
| Displacement | cm ³ | 4395 |
| Cylinder layout | — | V |
| Number of cylinders | — | 8 |
| Firing order | — | 1-5-4-8-6-3-7-2 |
| Hole | mm | 89 |
| Stroke | mm | 88.3 |

G15 Powertrain/Chassis

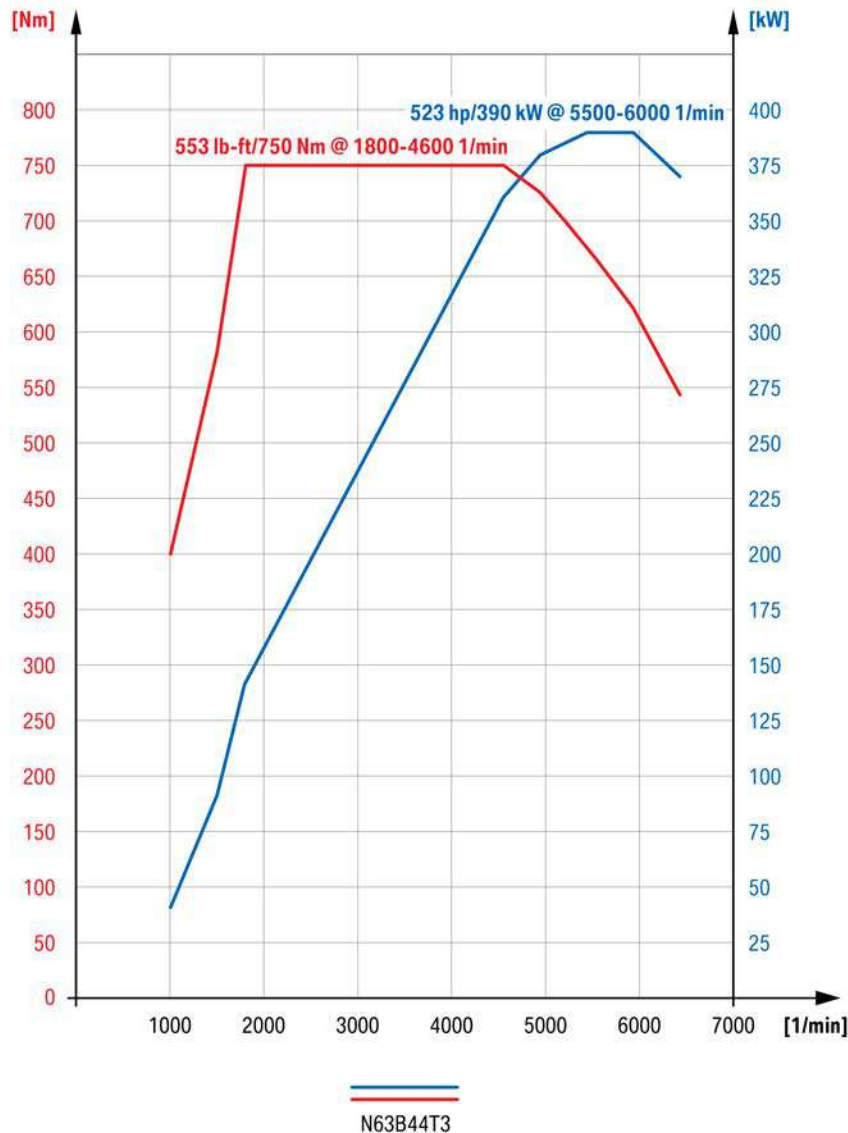
2. Engine

| Parameters | Unit | N63B44T3 |
|------------------------------------|-----------|---------------------------------------|
| Compression ratio | | 10.5:1 |
| Combustion process | — | Turbo-Valvetronic direct injection |
| Max. output at rotational speed | kW rpm | 390 (523 hp) 5500 – 6000 |
| Max. torque at rotational speed | Nm rpm | 750 (553 lb-ft) 1800 – 4600 |
| Oil quantity | l | 10.5 |

G15 Powertrain/Chassis

2. Engine

2.1.2. Full load diagram



Full load diagram N63B44T3 engine

2.1.3. Special features

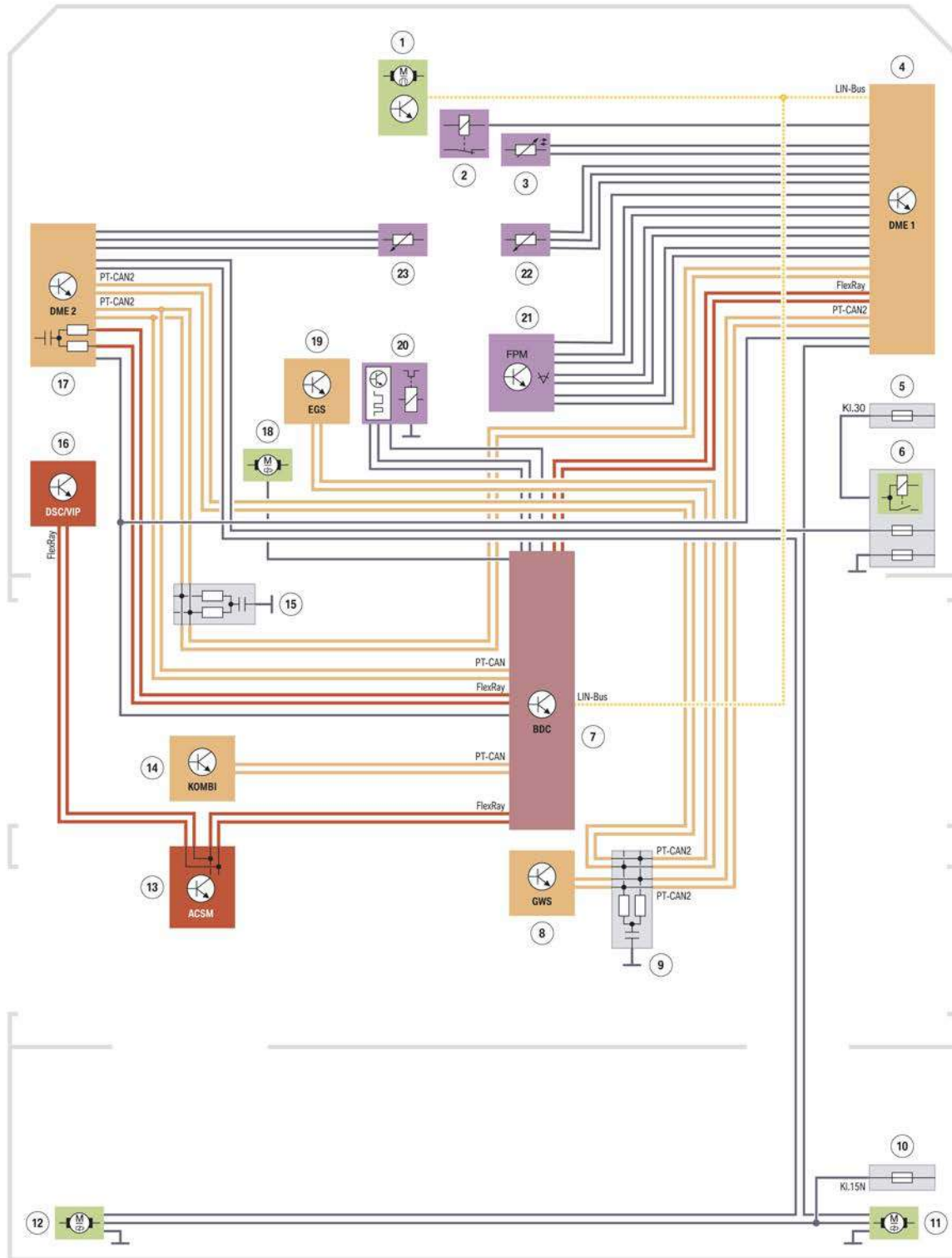
- Exhaust turbocharger with blow-off valves
- Indirect charge air cooler with bypass pipe
- Electric arc wire sprayed cylinder barrels
- Digital Motor Electronics DME 8.8T.0
- High-pressure injection up to 350 bar.

For more information on the N63B44T3 engine, refer to the product information N63TU3 engine.

G15 Powertrain/Chassis

2. Engine

2.1.4. System wiring diagram



System wiring diagram for the N63B44T 3 engine

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G15 Powertrain/Chassis

2. Engine

| Index | Explanation |
|-------|---|
| 1 | Electric fan |
| 2 | Relay for electric fan |
| 3 | Coolant temperature sensor |
| 4 | Digital Motor Electronics (DME 1) |
| 5 | Fuse, terminal 30 |
| 6 | Power distribution box, front |
| 7 | Body Domain Controller (BDC) |
| 8 | Gear selector switch (GWS) |
| 9 | CAN terminator 5 |
| 10 | Power distribution box, rear right |
| 11 | E-motor exhaust flap rear right |
| 12 | E-motor exhaust flap rear left |
| 13 | Crash Safety Module (ACSM) |
| 14 | Instrument cluster (KOMBI) |
| 15 | CAN terminator 5 |
| 16 | Dynamic Stability Control/virtual integration platform (DSCi) |
| 17 | Digital Motor Electronics (DME 2) |
| 18 | Starter motor |
| 19 | Electronic transmission control (EGS) |
| 20 | Air conditioning compressor |
| 21 | Accelerator pedal module |
| 22 | Differential pressure sensor cylinder bank 2 |
| 23 | Differential pressure sensor cylinder bank 1 |

2.1.5. Vacuum supply

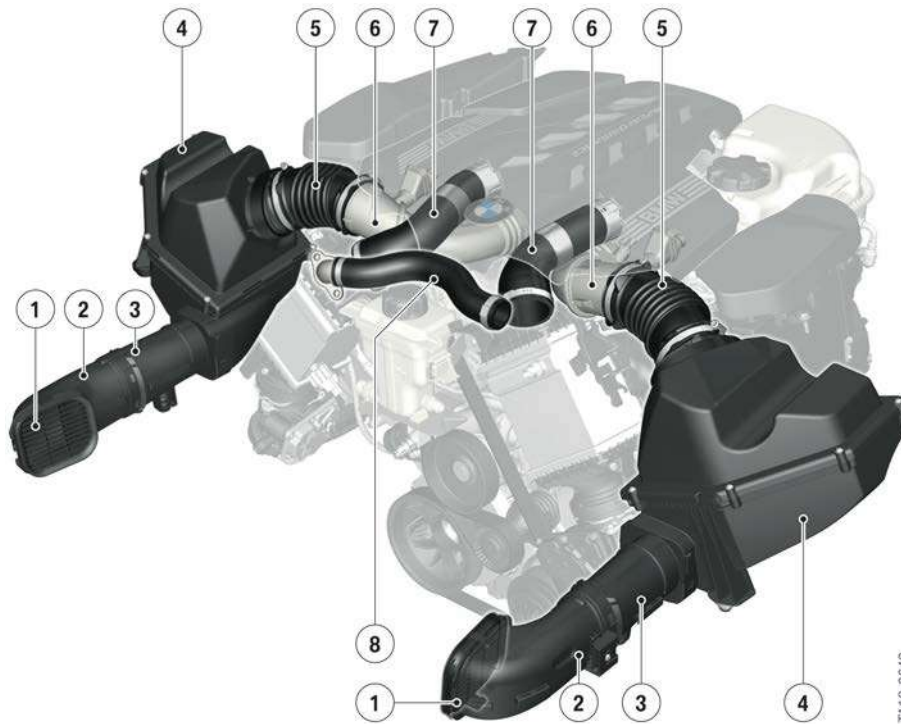
Vehicles equipped with a gasoline engine and conventional brake system require a vacuum pump to boost the pedal force. In vehicles equipped with a gasoline engine and DSCi brake system, a vacuum booster is not required as the pedal force is generated hydraulically in the DSCi brake system. A vacuum pump is therefore omitted with the M850i xDrive.

G15 Powertrain/Chassis

2. Engine

2.1.6. Air intake system

Air intake duct



G15 air intake duct in N63B44T3 engine

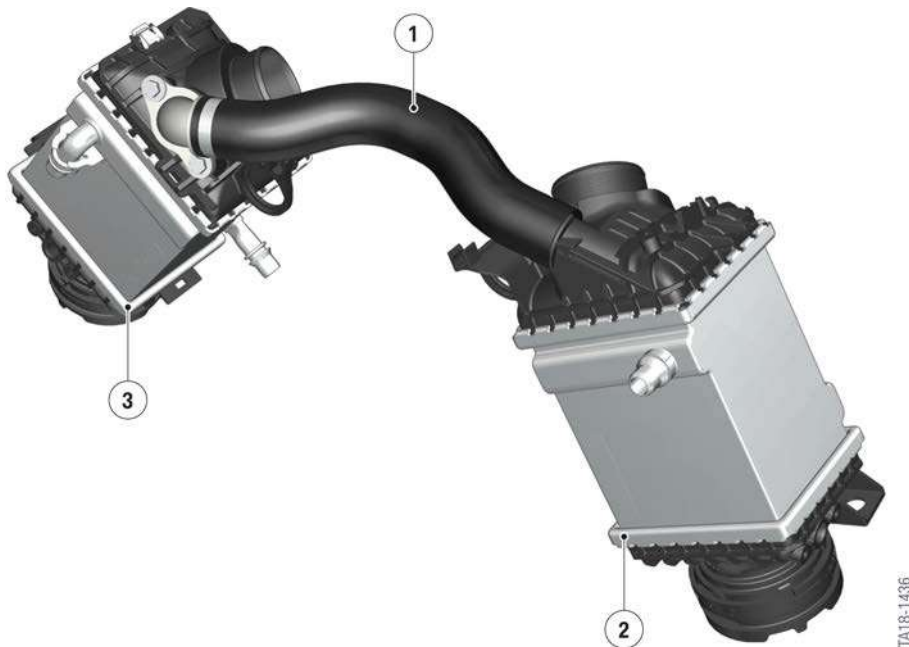
| Index | Explanation |
|-------|--|
| 1 | Unfiltered air intake with grille |
| 2 | Unfiltered-air bypass |
| 3 | Unfiltered-air duct |
| 4 | Intake silencer |
| 5 | Clean air gaiter |
| 6 | Clean air manifold incl. temperature sensor and non-return valve |
| 7 | Charge air hose from compressor for indirect charge air cooling |
| 8 | Bypass pipe |

Charge air cooling

A bypass pipe is installed between the two charge air coolers of cylinder bank 1 and cylinder bank 2 to effect pressure compensation between the two cylinder banks.

G15 Powertrain/Chassis

2. Engine



G15 charge air cooling N63B44T3 engine

| Index | Explanation |
|-------|--------------------------------|
| 1 | Bypass pipe, charge air cooler |
| 2 | Charge air cooler, bank 1 |
| 3 | Charge air cooler, bank 2 |

The pressure compensation results in the following advantages:

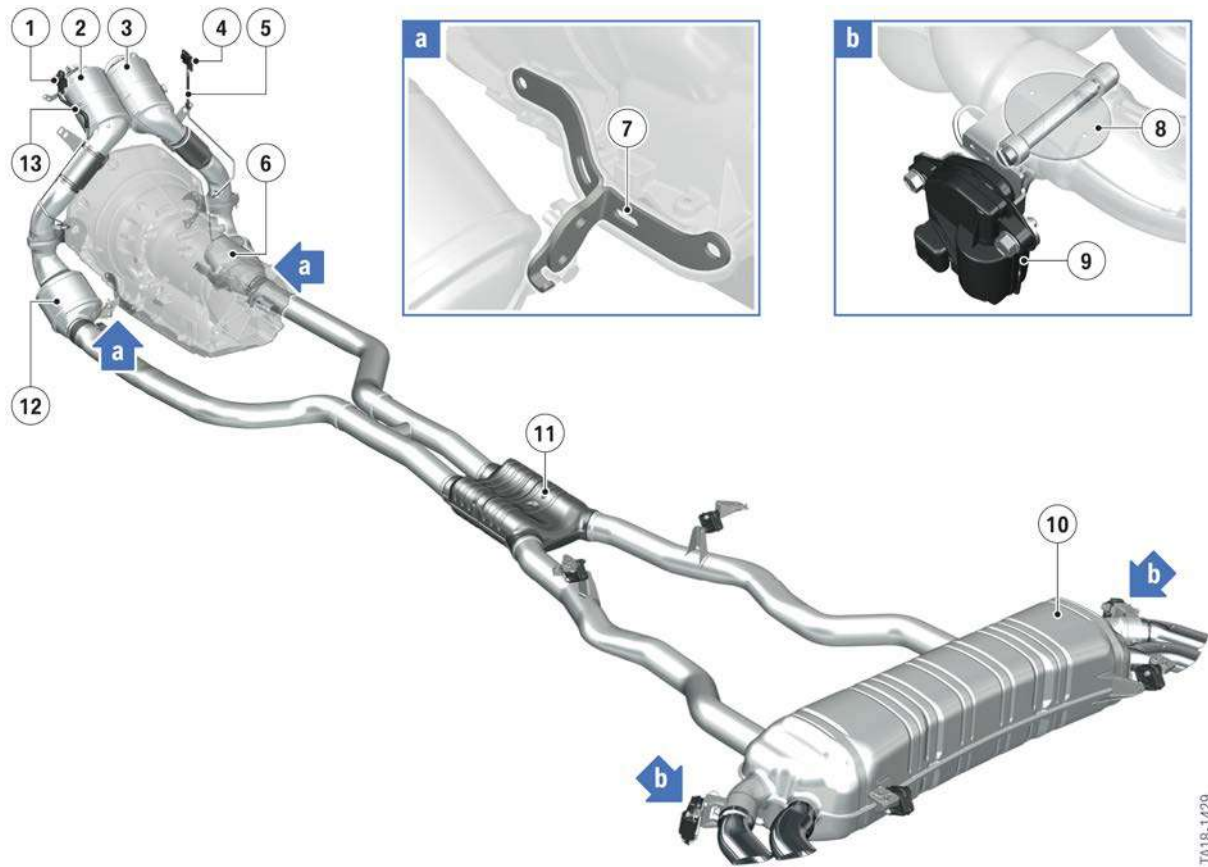
- Improved acoustics
- No pressure peaks in the charge air duct
- Optimum utilisation of characteristic maps by the engine control.

2.1.7. Exhaust emission system

A sports exhaust system is used in the M850i xDrive model.

G15 Powertrain/Chassis

2. Engine



G15 exhaust emission system for N63TU3 engine

| Index | Explanation |
|-------|---|
| 1 | Differential pressure sensor, cylinder bank 2 |
| 2 | Catalytic converter, cylinder bank 2 |
| 3 | Catalytic converter, cylinder bank 1 |
| 4 | Differential pressure sensor, cylinder bank 1 |
| 5 | Differential pressure sensor line, cylinder bank 1 |
| 6 | Petrol particulate filter, cylinder bank 1 (Not for the US) |
| 7 | Holder for gasoline particulate filter (Not for the US) |
| 8 | Exhaust flap |
| 9 | E-motor exhaust flap |
| 10 | Rear silencer |
| 11 | Center silencer |
| 12 | Petrol particulate filter, cylinder bank 2 (Not for the US) |
| 13 | Differential pressure sensor line, cylinder bank 2 |

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G15 Powertrain/Chassis

2. Engine

Electrical exhaust flaps

The 2 exhaust flaps, which are installed downstream of the rear silencer on the outer exhaust tailpipes can be adjusted with the assistance of an e-motor.

The e-motor is activated by the Digital Motor Electronics through pulse-width modulation. The following input variables are taken into account for this:

- Engine speed
- Engine load
- Driving speed

The various driving modes also influence the exhaust flap control.

The electrical exhaust flaps are always open in the SPORT and SPORT PLUS driving modes. In the ECO PRO and COMFORT driving modes, they are only open up to a speed of 15 km/h (10 mph) or an engine speed higher than 4000 rpm.

| Conditions | ECO PRO | COMFORT | SPORT | SPORT+ |
|--------------------|---------|---------|-------|--------|
| < 15 km/h (10 mph) | | | | |
| > 15 km/h (10 mph) | | | | |
| <4000 rpm | | | | |
| >4000 rpm | | | | |

= exhaust flaps open

An intermediate setting of the exhaust flaps is not possible. They are either fully open or closed. If faults are detected or the actuation stops, or after the engine has been stopped, the preferred position is the closed position.



The e-motor of the exhaust flap can be replaced separately. The exhaust flaps can be placed in an installation position with the help of the workshop diagnosis system ISTA.



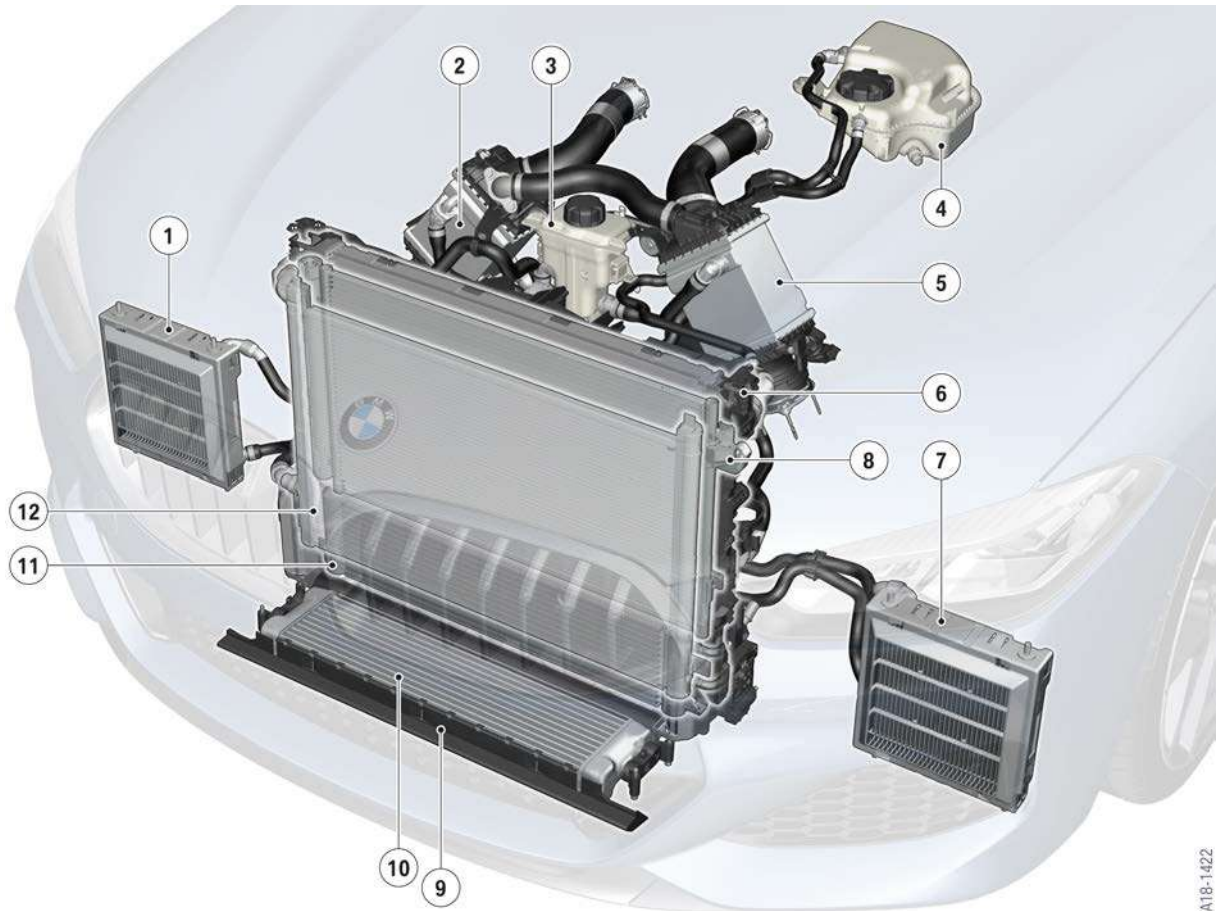
Note that the exhaust flaps may be closed when the vehicle is idling. As such, no emission measurement can be performed at these exhaust tailpipes.

2.1.8. Cooling

An additional cooling package is used for optimum cooling. This consists of an additional upstream coolant radiator including front spoiler lip.

G15 Powertrain/Chassis

2. Engine



TA18-1422

Cooling N63TU3 engine

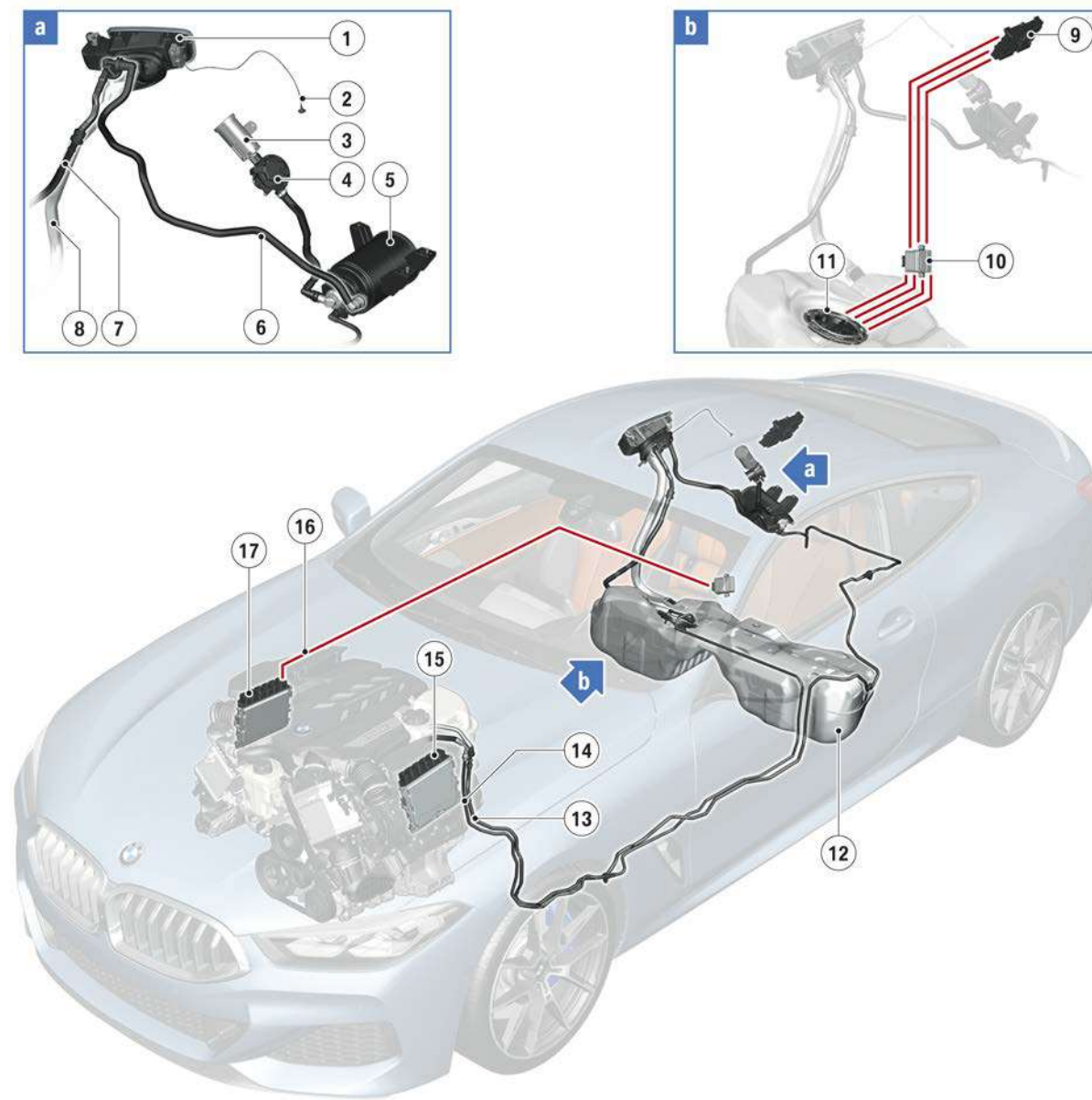
| Index | Explanation |
|-------|--|
| 1 | Auxiliary radiator, engine |
| 2 | Indirect charge air cooler |
| 3 | Expansion tank, low- temperature circuit |
| 4 | Expansion tank, high-temperature circuit |
| 5 | Indirect charge air cooler |
| 6 | High-temperature radiator |
| 7 | Auxiliary radiator, engine |
| 8 | A/C condenser |
| 9 | Front spoiler lip |
| 10 | Upstream radiator |
| 11 | Transmission oil air cooler |
| 12 | Low-temperature radiator |

G15 Powertrain/Chassis

2. Engine

2.2. Fuel supply

2.2.1. Engine



G15 system overview for the engine fuel supply

TA1B-1423

| Index | Explanation |
|-------|------------------------------------|
| 1 | Fuel filler cap |
| 2 | Emergency release, fuel filler cap |
| 3 | Fresh-air filter |
| 4 | Tank leak diagnosis |

G15 Powertrain/Chassis

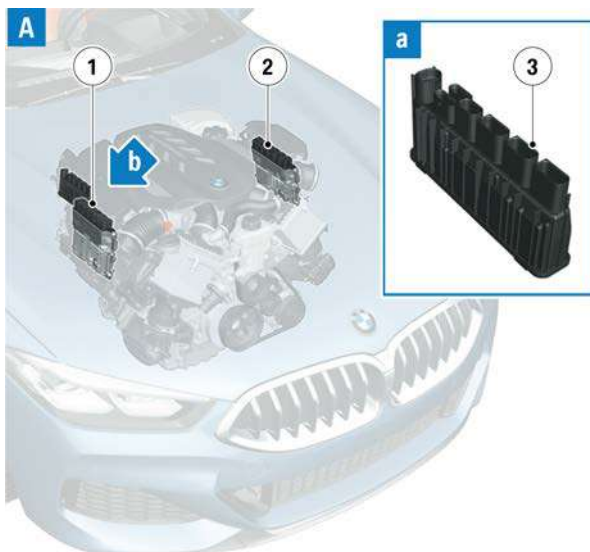
2. Engine

| Index | Explanation |
|-------|---|
| 5 | Carbon canister |
| 6 | Ventilation line, carbon canister |
| 7 | Tank ventilation line |
| 8 | Fuel filler neck |
| 9 | Power distribution box, rear right |
| 10 | Fuel pump control (FPC) |
| 11 | Delivery unit |
| 12 | Fuel tank |
| 13 | Purge air line, carbon canister |
| 14 | Fuel feed (from the fuel tank) |
| 15 | Digital Motor Electronics (DME 2) |
| 16 | Data line to fuel pump control module |
| 17 | Digital Motor Electronics DME1 (primary control unit) |

2.3. Engine electrical system

2.3.1. Engine control unit

The 8th generation engine electronics (DME) is used in the G15. Its appearance is characterized by a uniform housing and a uniform connector strip. However, the hardware inside has been adapted to the various applications.



G15 integrated supply module

G15 Powertrain/Chassis

2. Engine

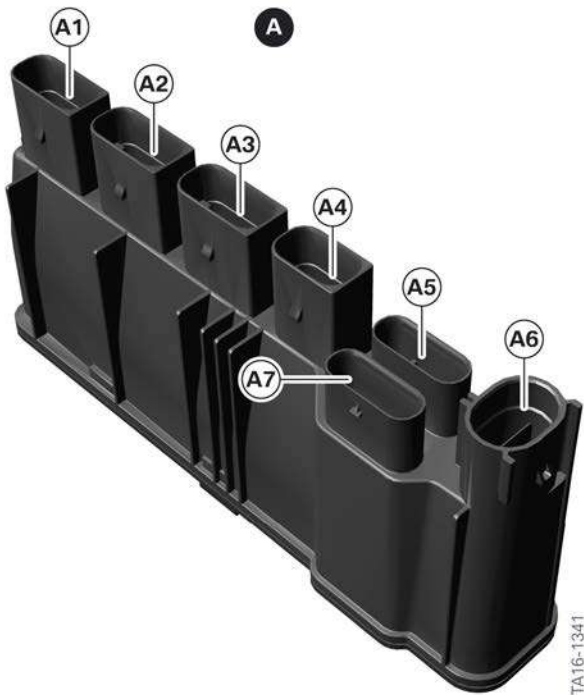
| Index | Explanation |
|-------|--|
| A | M850i xDrive |
| a | Integrated supply module |
| 1 | Digital Motor Electronics 1 (DME 8.8T.O) |
| 2 | Digital Motor Electronics 2 (DME 8.8T.O) |
| 3 | Integrated supply module |

Engine control unit N63B44T3

One control unit is used per cylinder bank in the 8-cylinder engine. The actuators and sensors of cylinder bank 1 are assigned to the DME -1 control unit. Accordingly the DME -2 control unit is responsible for the functions of cylinder bank 2. The DME -1 is the main control unit and also accepts any information relevant to the entire engine, e.g. the crankshaft sensor signal. The DME -1 makes this information available to the DME -2 control unit directly via the bus system. Due to the variety of sensors and actuators it was deemed necessary to use 2 control units.

The integrated supply module is also on the engine control unit. It supplies the engine control units and various sensors and actuators with the required supply voltage.

Integrated supply module



Integrated supply module in the G15

G15 Powertrain/Chassis

2. Engine

| Index | |
|-------|---|
| A | Integrated supply module |
| A1 | Voltage supply for actuators and sensors |
| A2 | Voltage supply for actuators and sensors |
| A3 | Actuation of relay for integrated supply module |
| A4 | – |
| A5 | DME voltage supply |
| A6 | Voltage supply for power distribution box in engine compartment |
| A7 | – |

2.3.2. MSAconnected 1.0


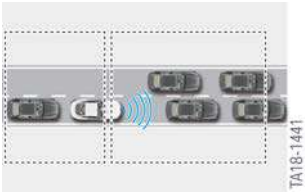
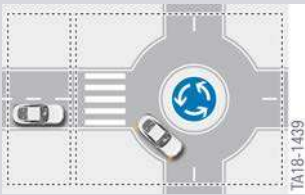
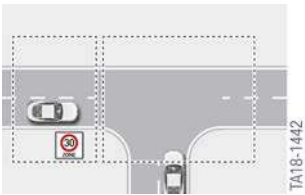
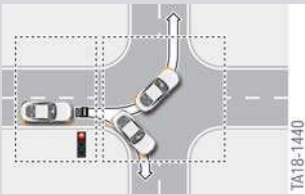
The MSAconnected 1.0 already used in other vehicles is also used in the G15. A new features of this system is that it can also respond to a traffic light situation.

G15 Powertrain/Chassis

2. Engine

Situations

The following table shows examples of how the G15 with MSAconnected 1.0 responds to different traffic situations:

| Situation | | Action |
|---|------------------------------------|---|
|  | Traffic light situation | If a green traffic light is detected, the engine is not switched off. If the traffic light changes from red to green when the engine is switched off, the engine starts. |
|  | Response to a vehicle in front | If the vehicle detects that the vehicle in front is moving, the engine is not stopped. If the vehicle detects that the vehicle in front is driving off when the engine is switched off, the engine is then started. |
|  | Roundabout/traffic circle | The engine is not stopped when the vehicle is approaching, is on or has just left a roundabout. Exception: the vehicle in front is stationary on the approach to a roundabout. |
|  | Road junctions in residential area | The engine is not switched off if the vehicle is right in front of, in or just beyond a road junction in a residential area. Exception: the vehicle in front is stationary on the approach to a road junction in a residential area. |
|  | Turn-off request | The engine is not switched off if the vehicle is at a crossroads and the system detects that driver is about to turn (turn indicator switched on). |

G15 Powertrain/Chassis

2. Engine

Sensors

The following sensors and systems are required to detect the MSA connected 1.0 traffic situations.

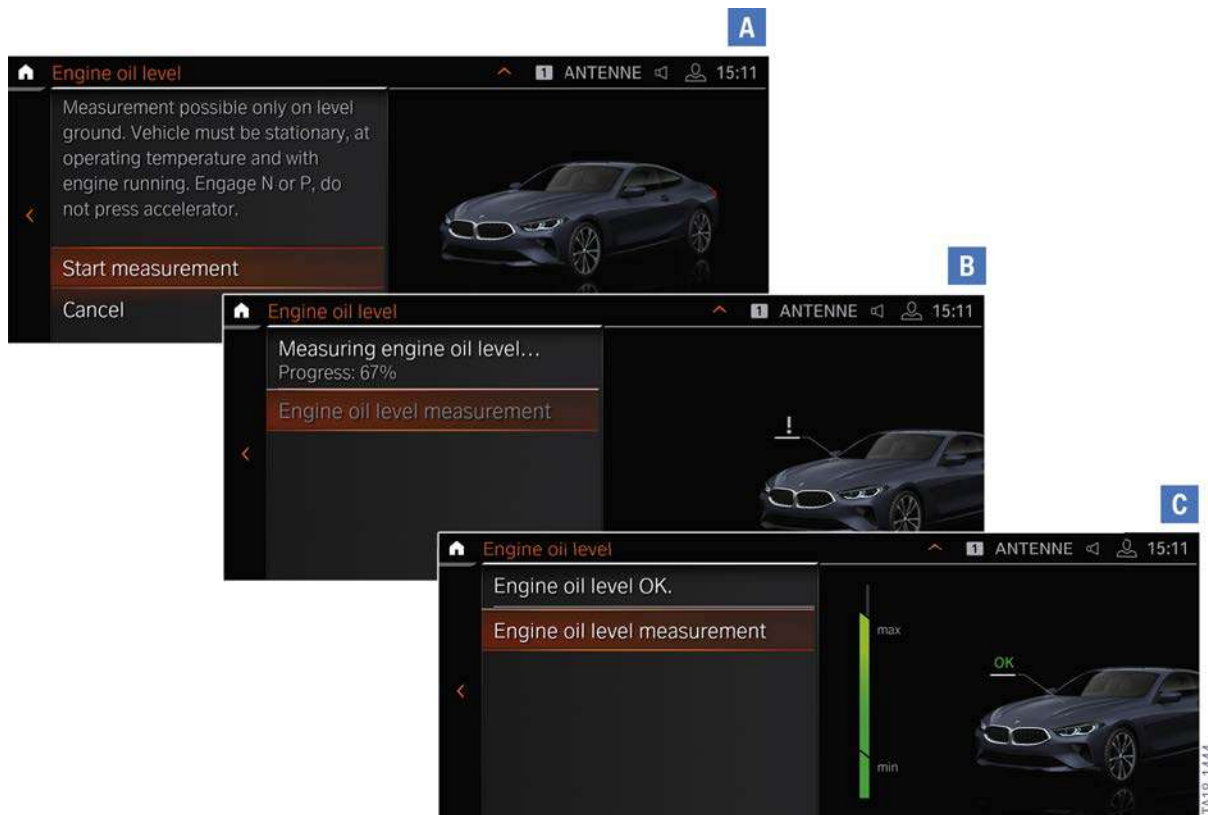
| Situation | Navigation/head unit | Camera/KAFAS | Radar/ACC |
|---------------------------|--|--|-----------------------------------|
| Traffic light situation | Mandatory, prerequisite for enabling | KAFAS 4 High essential, prerequisite for enabling | Optional |
| Leading vehicle | Not mandatory, increases the reliability by plausibility check, e.g. crossing traffic at junctions | Mandatory, prerequisite for enabling | Not mandatory, increases accuracy |
| Roundabout/traffic circle | Mandatory, prerequisite for enabling | Not mandatory, increases the reliability by plausibility check, e.g. for deactivation in the case of tail-back | Optional |
| Residential area | Mandatory, prerequisite for enabling | Not mandatory, increases the reliability by plausibility check, e.g. for deactivation in the case of tail-back | Optional |
| Turn-off request | Mandatory, prerequisite for enabling | Not mandatory, increases the reliability by plausibility check, e.g. for deactivation in the case of tail-back | Optional |

G15 Powertrain/Chassis

2. Engine

2.3.3. Oil level measurement

The operating concept of the oil level measurement display has been reworked. The simplified display of prevention reasons and the forecast time increases the customer's understanding of measurement inhibitors and the measurement procedure.



Oil level measurement in the G15

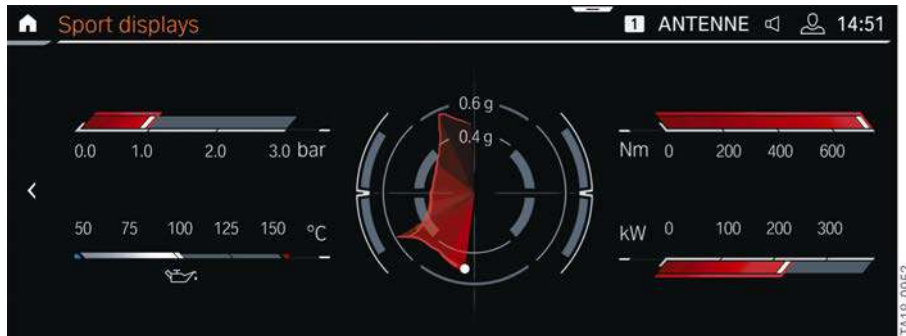
| Index | Explanation |
|-------|-------------------------------------|
| A | Start screen, oil level measurement |
| B | Oil level measurement |
| C | Final screen, oil level measurement |

G15 Powertrain/Chassis

2. Engine

2.3.4. Sport displays

The sport displays in the Central Information Display have been reworked.



Sport displays

The following information is displayed:

- Charging pressure
- Engine torque
- Engine performance
- Engine oil temperature
- G forces

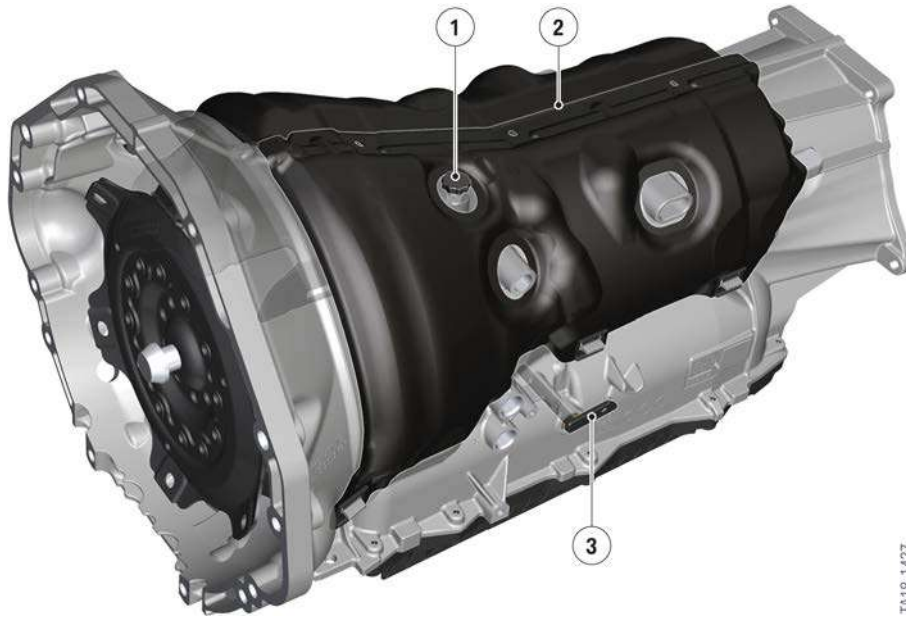
G15 Powertrain/Chassis

3. Gearbox

3.1. Automatic transmission

3.1.1. Overview

In the G15 the 8HPTU2 automatic transmission is used. The 8HPTU2 supersedes the familiar 8HPTU automatic transmission.



8HPTU2 automatic transmission

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| Index | Explanation |
|-------|---------------------------------|
| 1 | Transmission breather |
| 2 | Acoustic capsule |
| 3 | Mechanism for emergency release |

The following changes have been made to the 8HPTU2 compared to its predecessor:

- Newly developed control unit: electronic transmission control EGS
- Mechatronics with sliding pressure controller
- Increased range
- Optimized mechanical torsional vibration damper.

This brings about the following improvements:

- Better driving and shifting comfort
- Increased gearshift dynamic
- Increased gear transitions
- Increased efficiency

G15 Powertrain/Chassis

3. Gearbox

The acoustic capsules in the N63B44T 3 engine are manufactured in two parts.

3.1.2. Designation

The designation for the 8HPTU2 automatic transmission has been changed. The designation for the 8HP and the 8HPTU remains the same. The following table provides an overview of the composition of the official transmission designations for the 8HPTU2 automatic transmission.

Transmission designation of 8HPTU2 automatic transmission

| Position | Meaning | Index | Explanation |
|----------|---------------------------|----------|--------------------------------------|
| 1 | Designation | G | Transmission |
| 2 | Type of transmission | A | Automatic transmission |
| 3 | Number of gears | 8 | 8 forward gears |
| 4 | Drive type | L X | Rear-wheel drive Four-wheel drive |
| 5 + 6 | Transferable torque | 51 76 | 500 Nm 750 Nm |
| 7 | Steering axis inclination | C D | 8.2 8.6 |
| 8 | Manufacturer | Z | Zahnradfabrik Friedrichshafen |

3.1.3. Technical data

The following table shows a comparison between the new 8HPTU2 (transmission variant GA8X76D) automatic transmission and the predecessor automatic transmission 8HPTU (transmission variant GA8HP75).

| Technical data | Unit | 8X76D (new) | 8HP75 (old) |
|--------------------------------|------|------------------|-------------|
| Maximum input power, gasoline | [kw] | 390 (523 hp) | 350 |
| Maximum input torque, gasoline | [Nm] | 750 (552 lb.-ft) | 700 |
| Transmission ratio 1st gear | | 5.50 | 5.00 |
| Transmission ratio 2nd gear | | 3.52 | 3.20 |
| Transmission ratio 3rd gear | | 2.20 | 2.14 |
| Transmission ratio 4th gear | | 1.72 | 1.72 |
| Transmission ratio 5th gear | | 1.317 | 1.31 |
| Transmission ratio 6th gear | | 1.00 | 1.00 |
| Ratio, 7th gear | | 0.82 | 0.82 |

G15 Powertrain/Chassis

3. Gearbox

| Technical data | Unit | 8X76D (new) | 8HP75 (old) |
|---------------------------------|------|-------------|-------------|
| Transmission ratio 8th gear | | 0.64 | 0.64 |
| Transmission ratio reverse gear | | 3.93 | 3.47 |
| Steering axis inclination | | 8.59 | 7.81 |

3.1.4. Sports automatic transmission

In the G15, the sports automatic transmission variant GA8X76D with Steptronic is used. The customer has 2 shift paddles on the steering wheel and additional functions such as:

- Launch Control
- Manual start "coasting in idle"
- Driving into the speed limiter.

3.1.5. Functional enhancements

The function "driving into the speed limiter" have been expanded.

Driving into the speed limiter

Driving into the speed limiter irrespective of the driving mode is now possible for BMW M850i xDrive. To do so, as is the case with other vehicles, the manual shift mode and Dynamic Traction Control (DTC) must be activated (briefly press the DSC button).

3.1.6. Transmission emergency release

In the event of a breakdown, emergency release of the automatic transmission is possible in 2 different ways.

- Mechanical transmission emergency release
- Electronic transmission emergency release.

The procedures to be followed for mechanical and electronic transmission emergency release are along the same lines as those for 8HPTU automatic transmission.



Before performing a mechanical or electronic transmission emergency release, the vehicle must be secured to prevent it from rolling away.

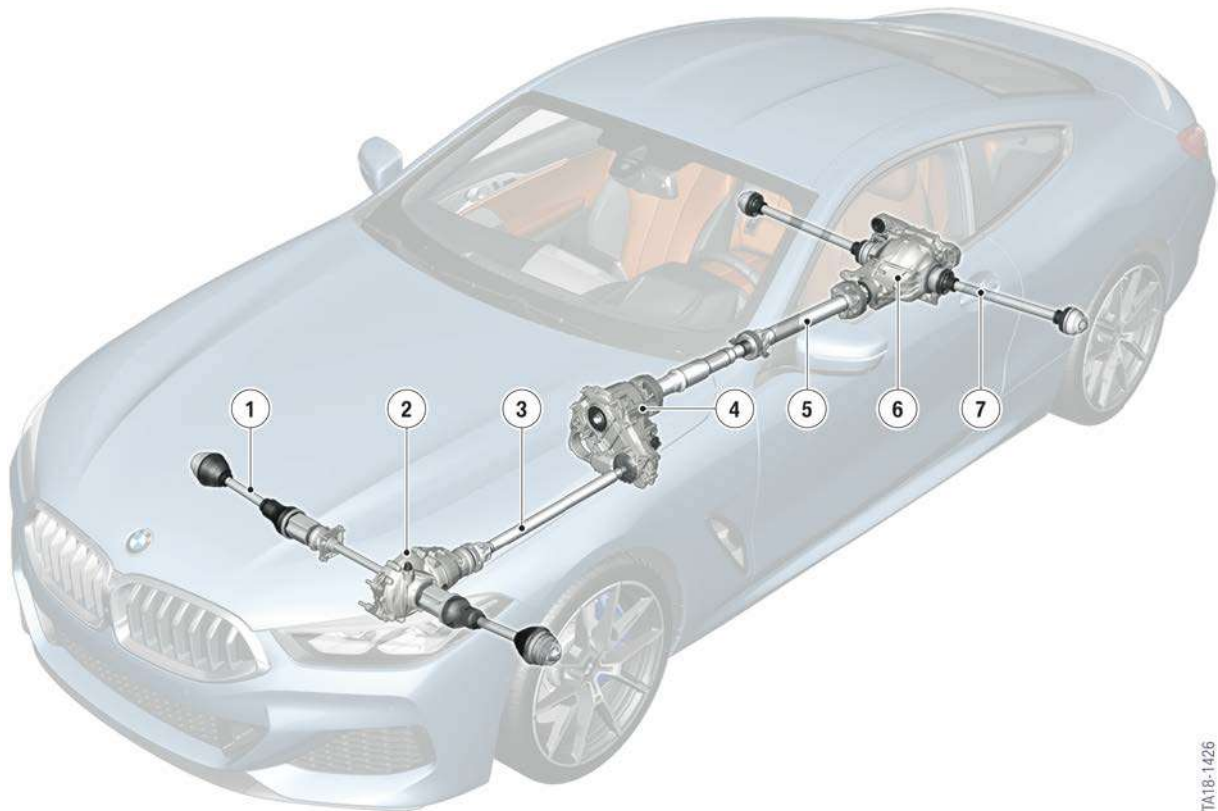
Detailed information on the electronic transmission emergency release is provided in the corresponding repair instructions and in the Owner's Handbook.

G15 Powertrain/Chassis

3. Gearbox

3.2. Four-wheel drive

3.2.1. Overview



G15 overview of four-wheel drive

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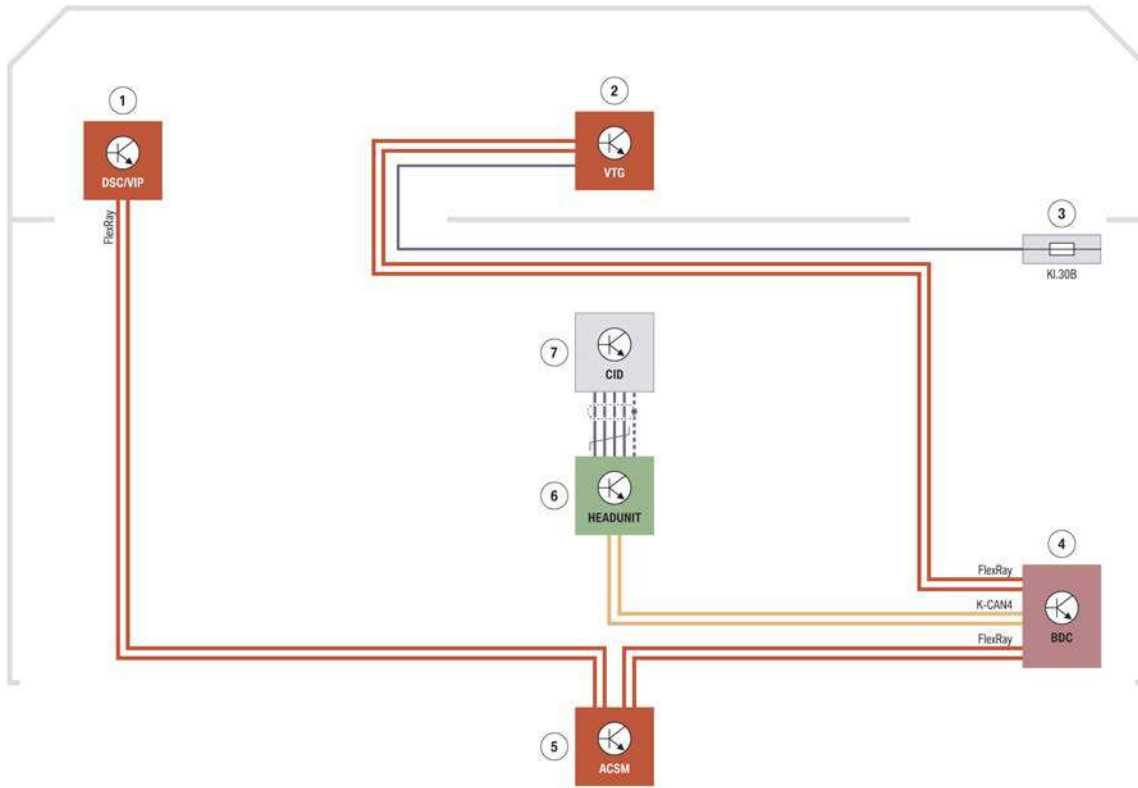
| Index | Explanation |
|-------|--|
| 1 | Output shaft, front |
| 2 | Front axle differential |
| 3 | Front propeller shaft |
| 4 | Transfer box |
| 5 | Rear propeller shaft |
| 6 | Rear axle differential with regulated lock |
| 7 | Output shaft, rear |

The designation of the transfer box is ATC13-1. It is a standard transfer box and was first used in the G12. One special feature of this transfer box is the Efficiency Mode, which leads to a reduction of the splash losses and thus increases fuel economy.

G15 Powertrain/Chassis

3. Gearbox

3.2.2. System wiring diagram



G15 system wiring diagram xDrive

| Index | Explanation |
|-------|--|
| 1 | Dynamic S tability Control/virtual integration platform (DSCi) |
| 2 | VTG control unit |
| 3 | Power distribution box, front right |
| 4 | Body Domain Controller (BDC) |
| 5 | Advanced Crash Safety Module (ACSM) |
| 6 | Head unit |
| 7 | Central Information Display (CID) |

3.3. Regulated rear axle differential lock

3.3.1. Introduction

The rear axle differential with regulated lock is included as standard in the M850i xDrive.

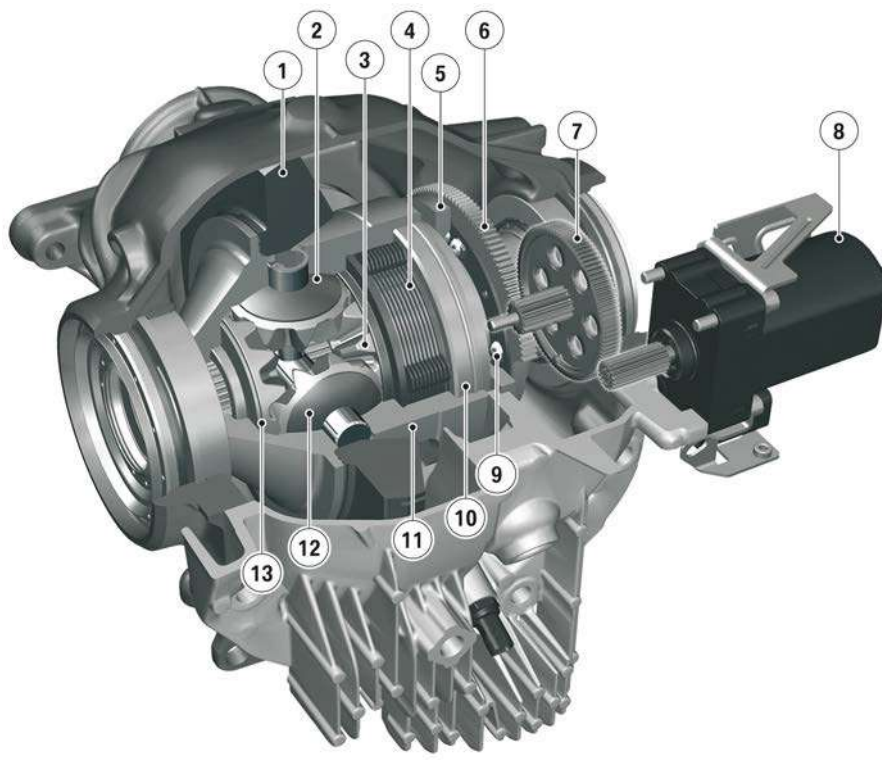
G15 Powertrain/Chassis

3. Gearbox

In the G15, the rear axle differential 225ALS is used. In the G01, G02 and G05, the HAG 215LWS used is different to the above in terms of materials and housing design as well as housing cover. The ring gear is also bigger than the one in the HAG 215LWS.

| Model | Engine | Automatic transmission | Rear axle final drive | Gear ratio i |
|--------------|---------|------------------------|-----------------------|--------------|
| M850i xDrive | N63B44T | GA8X76D Sport | HAG 225ALS | 2.81:1 |

The sales designation of the system is M Sport differential. In the following chapters the rear axle differential with regulated lock is called regulated rear axle differential lock.



Regulated rear axle differential lock

| Index | Explanation |
|-------|--|
| 1 | Ring Gear |
| 2 | Differential bevel gear |
| 3 | Output bevel gear |
| 4 | Multidisc clutch |
| 5 | Fixed pressure disc with second half of ball ramp |
| 6 | Ball ramp consisting of geared mobile adjusting disc and first half of ball ramp |
| 7 | Intermediate gear |
| 8 | Electric motor |

G15 Powertrain/Chassis

3. Gearbox

| Index | Explanation |
|-------|---|
| 9 | Ball and spherical washer |
| 10 | Differential lid (connected to differential housing, cannot rotate) |
| 11 | Differential housing (connected to outer discs) |
| 12 | Differential bevel gear |
| 13 | Output bevel gear |




The regulated rear axle differential lock makes possible the reduction of the slip between right and left rear wheel by joining both wheels via a multidisc clutch. If required, the clutch package can be closed via an e-motor. A lock-up torque of up to 1500 Nm can be made available irrespective of the requested drive torque of the engine.

The advantages of the controlled rear axle differential lock are:

- Improved handling
- Improved traction
- Greater driving stability.

The regulated rear axle differential lock is based on the active M differential of BMW M GmbH.

The following table provides you with an overview of the various rear axle differentials with locks.

| | Unit | HAG 225M | HAG 225ALS | HAG 215LWS |
|------------------------------------|------|---|--|---|
| Used in series | | F90 | G15 | G01, G02, G05 |
| Structure | |  |  |  |
| Maximum lock-up torque | [Nm] | 2000 | 1500 | 1500 |
| Ring gear diameter | [mm] | 225 | 225 | 215 |
| Housing material | | Aluminum | Aluminum | Grey cast iron |
| Material of housing cover | | Aluminum | Aluminum | Aluminum |
| Disc type | | Disc set with carbon lining | Disc set with carbon lining | Disc set with carbon lining |
| Attachment of housing cover | | bottom | Rear | Rear |

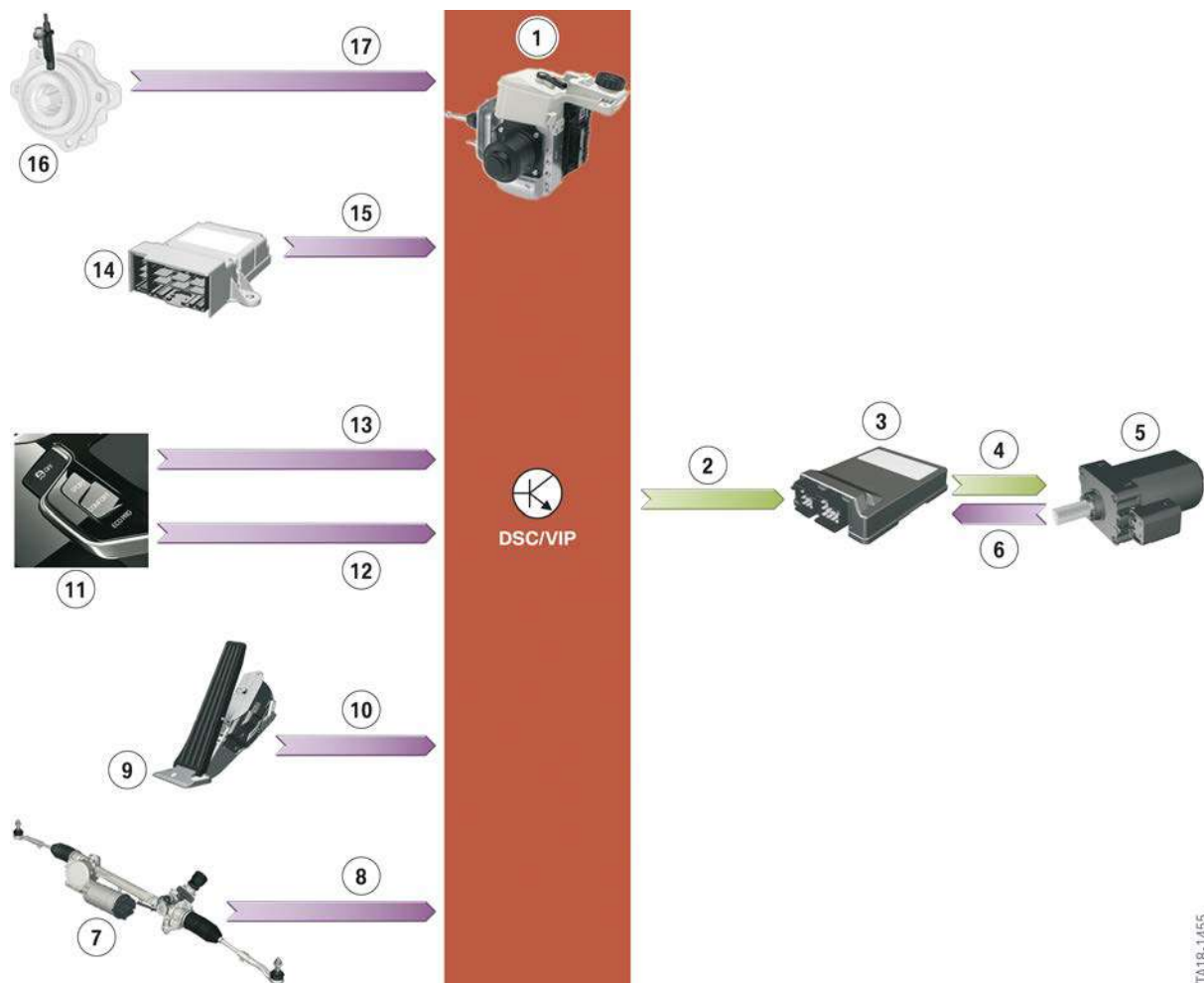
G15 Powertrain/Chassis

3. Gearbox

3.3.2. System overview

The central system for controlling the regulated rear axle differential lock is the Dynamic Stability Control integrated DSCi. It evaluates the driving dynamic parameters provided by other sensors and control units and forwards the calculated lock-up torque to be set to the control unit for the regulated rear axle differential lock (GHAS).

The DSCi can also request separate and higher-level locking interventions to stabilise and enhance the agility of the vehicle when the DSC control system is activated and also deactivated. The following diagram shows the information required for the functioning of the regulated rear axle differential lock:



System overview of regulated rear axle differential lock

| Index | Explanation |
|-------|--|
| 1 | Dynamic S tability Control/virtual integration platform (DSCi) |
| 2 | Lock-up torque request |
| 3 | Control unit for regulated rear axle differential lock (GHAS) |
| 4 | Electric motor actuation |
| 5 | Electric motor, multidisc clutch |

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G15 Powertrain/Chassis

3. Gearbox

| Index | Explanation |
|-------|--|
| 6 | Position and temperature of electric motor |
| 7 | Electromechanical power steering (EPS) control unit |
| 8 | Steering angle |
| 9 | Accelerator pedal module (FPM) control unit |
| 10 | Accelerator pedal angle |
| 11 | DSC/DTC switch, driving experience switch |
| 12 | Active driving mode (SPORT, COMFORT, ECO PRO) |
| 13 | DSC/DTC status (DSC/DTC activated/deactivated) |
| 14 | Advanced Crash Safety Module (ACSM) control unit |
| 15 | Yaw rate, longitudinal acceleration and lateral acceleration |
| 16 | Wheel speed sensor |
| 17 | Vehicle speed |

3.3.3. Design

The regulated rear axle differential lock consists of the following components:

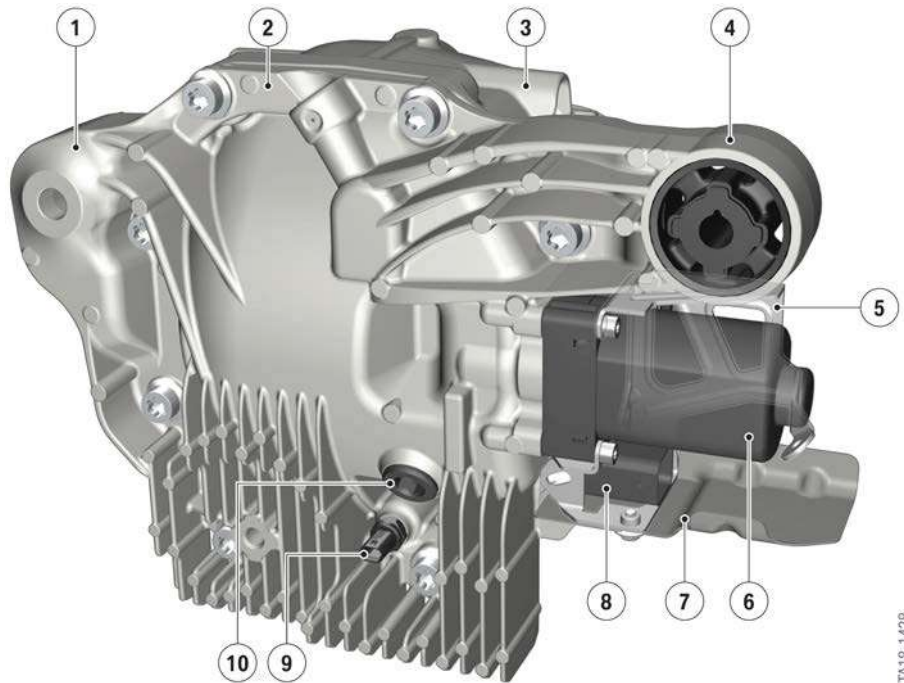
- Rear axle differential with multidisc clutch and ball ramp
- Electric motor with transfer box
- Control unit for regulated rear axle differential lock (GHAS).

External structure

The rear axle differential can be recognized by an aluminum housing cover mounted from the rear and an electric motor which is visible from the outside. The housing of the G15 is made of aluminum.

G15 Powertrain/Chassis

3. Gearbox



Structure of regulated rear axle differential lock

| Index | Explanation |
|-------|---------------------------------------|
| 1 | Connection to rear axle support |
| 2 | Housing cover |
| 3 | Housing |
| 4 | Connection to rear axle support |
| 5 | Holder for heat shield |
| 6 | Electric motor |
| 7 | Heat shield |
| 8 | Electrical connection, electric motor |
| 9 | Transmission oil temperature sensor |
| 10 | Oil filler plug |

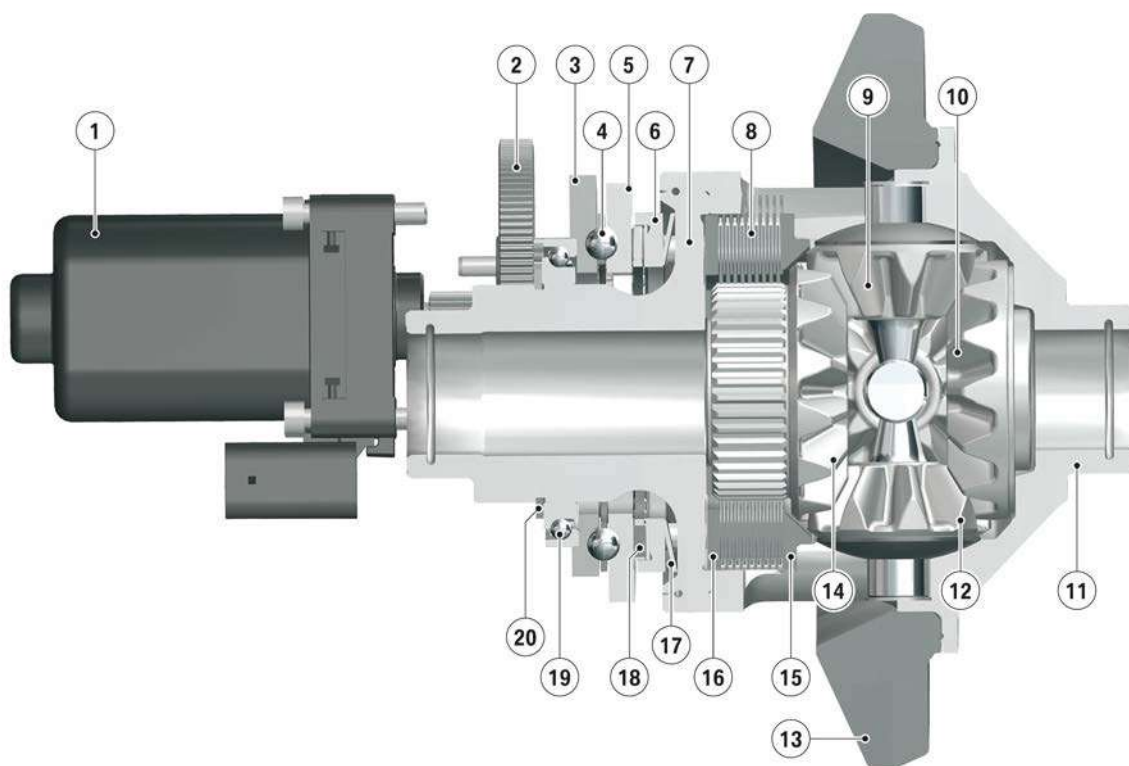
Inner structure

The rear axle differential consists of the following main components on the inside:

- Differential gear
- Multidisc clutch
- Ball ramp
- Transfer box, electric motor.

G15 Powertrain/Chassis

3. Gearbox



TA18-0808

Regulated rear axle differential lock: Internal structure (viewing direction: opposite to direction of travel)

| Index | Explanation |
|-------|--|
| 1 | Electric motor |
| 2 | Transfer box |
| 3 | Ball ramp consisting of geared mobile adjusting disc and first half of ball ramp |
| 4 | Balls/Spherical washer |
| 5 | Fixed pressure disc with second half of ball ramp |
| 6 | Disc spring pressure ring |
| 7 | Differential lid (connected to differential housing, cannot rotate) |
| 8 | Disc set |
| 9 | Differential bevel gear |
| 10 | Output bevel gear |
| 11 | Differential housing (connected to outer discs) |
| 12 | Differential bevel gear |
| 13 | Crown wheel |
| 14 | Output bevel gear |
| 15 | Counter pressure plate |
| 16 | Pressure plate |

G15 Powertrain/Chassis

3. Gearbox

| Index | Explanation |
|-------|--|
| 17 | Disc spring |
| 18 | Axial needle bearing with axial needle bearing thrust washer |
| 19 | Ball bearing between inner output hub and differential housing |
| 20 | Circlip (ball bearing fixing) |

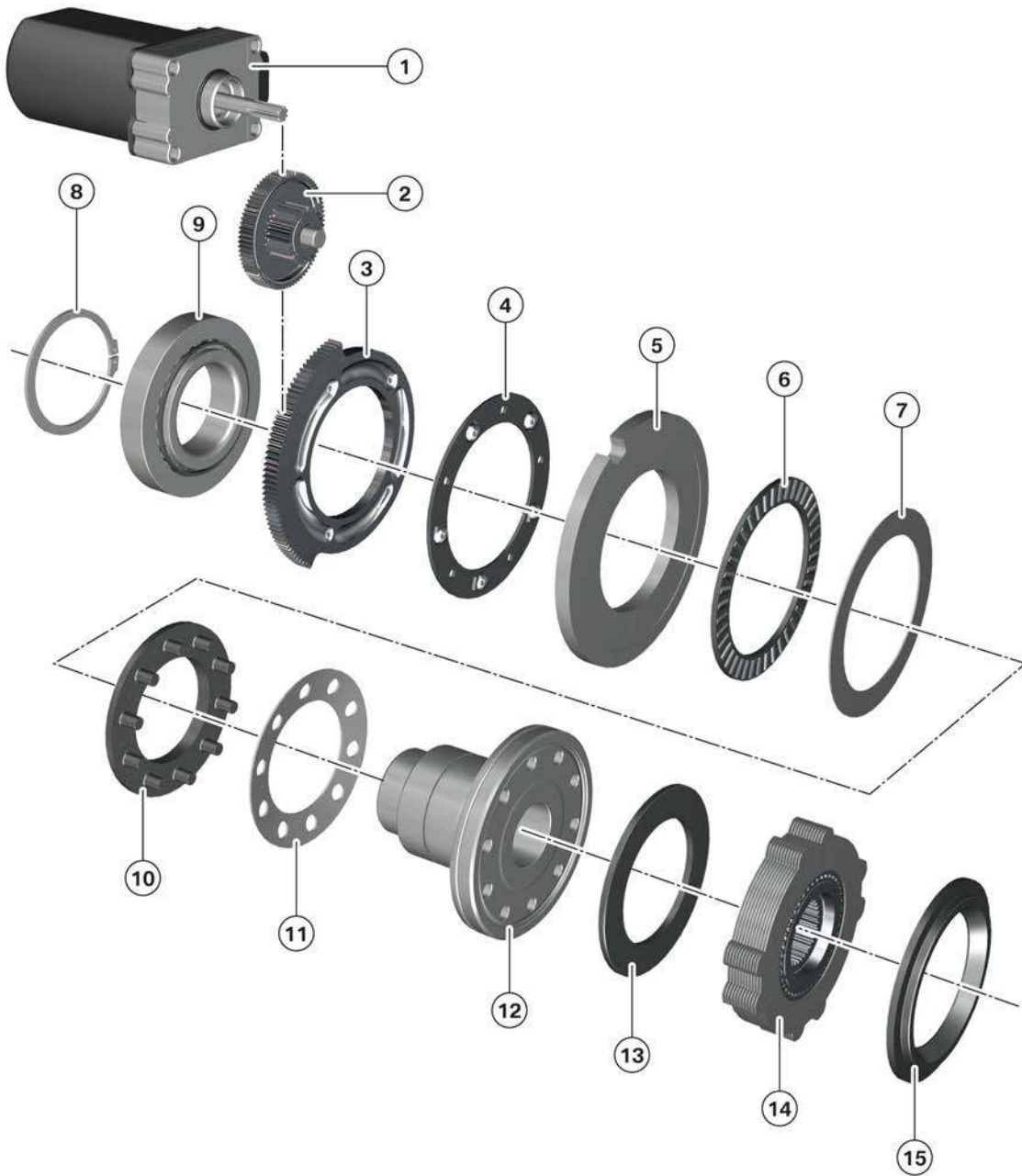
The electric motor (1) with transfer box (2) is screwed on at the housing. The pressure disc with the second ball ramp half (5) is fixed in the housing. The mobile components of the ball ramp (3 and 4) generate the necessary axial displacement of the fixed pressure disc (5) with the aid of the transfer box (2). These components are not subject to the differential transmission rotation and are disconnected from the rotating components by an axial needle bearing (18).

The components with the index 6 to 20 belong to the differential gear.

The lock is effected between the right output (14) and the differential housing (11) and counteracts a difference in speed between the output bevel gears (9 and 13). The disc spring (17) opens the lock when current is not supplied to the e-motor.

G15 Powertrain/Chassis

3. Gearbox



TA17-0454

Regulated rear axle differential lock: structure of lock

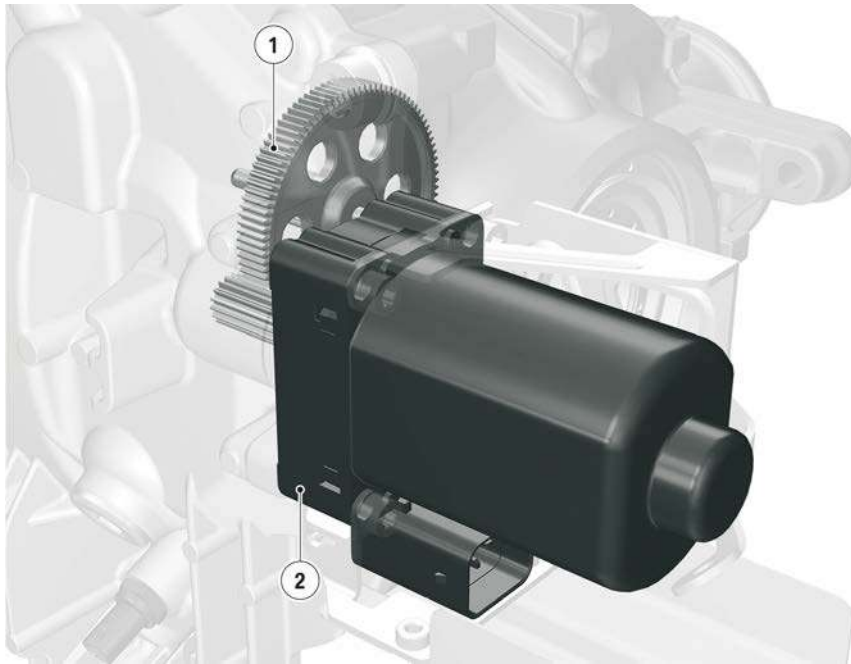
| Index | Explanation |
|-------|--|
| 1 | Electric motor |
| 2 | Transfer box |
| 3 | Ball ramp consisting of geared mobile adjusting disc and first half of ball ramp |
| 4 | Balls/Spherical washer |
| 5 | Fixed pressure disc with second half of ball ramp |
| 6 | Axial needle bearing |

3. Gearbox

| Index | Explanation |
|-------|---|
| 7 | Axial bearing thrust washer |
| 8 | Circlip (ball bearing fixing) |
| 9 | Ball bearing between inner output hub and differential housing |
| 10 | Disc spring pressure ring |
| 11 | Disc spring |
| 12 | Differential lid (connected to differential housing, cannot rotate) |
| 13 | Pressure plate |
| 14 | Disc set |
| 15 | Counter pressure plate |

Electric motor

An e-motor controls the lock-up torque to be set via the multidisc clutch.



Regulated rear axle differential lock, electric motor

| Index | Explanation |
|-------|-----------------|
| 1 | Transfer box |
| 2 | E lectric motor |

The rotational movement of the e-motor is transmitted via the transfer box with ball ramp. This produces an axial force which compresses the multidisc clutch. Depending on this contact pressure the multidisc clutch transmits more or less lock-up torque. The control is effected via the angle of rotation of the e-motor. This is determined with the assistance of engine-internal hall effect sensors.

G15 Powertrain/Chassis

3. Gearbox

The electric motor consists of:

- Engine
- Temperature sensor
- 2 hall effect sensors.

A temperature sensor, also installed in the electric motor, is used to protect the electric motor against overheating. To determine the position of the electric motor, 2 hall effect sensors in the engine are used.

A recalibration of the characteristic curve of the lock-up torque via the engine position is regularly performed to compensate the wear in the clutch. To be able to assign a certain position of the electric motor a corresponding coupling lock-up torque and to take the wear influences into account while doing so, a reference run is performed after the combustion engine is switched off. During this reference run the engine is subjected to a defined current level. The lock-up torque of 0 Nm is assigned to the resulting position.

Temperature monitoring

Three temperature sensors in total are used to protect the components against overheating. The temperature of the control unit GHAS (driver output stage), temperature of the e-motor and transmission oil temperature are monitored.

Control unit for regulated rear axle differential lock (GHAS)

In the G15, the control unit of the regulated rear axle differential lock (GHAS) is in the rear area of the vehicle and is screwed to the support of the rear trim panel.



G15 mounting orientation of GHAS

3.3.4. Operating principle

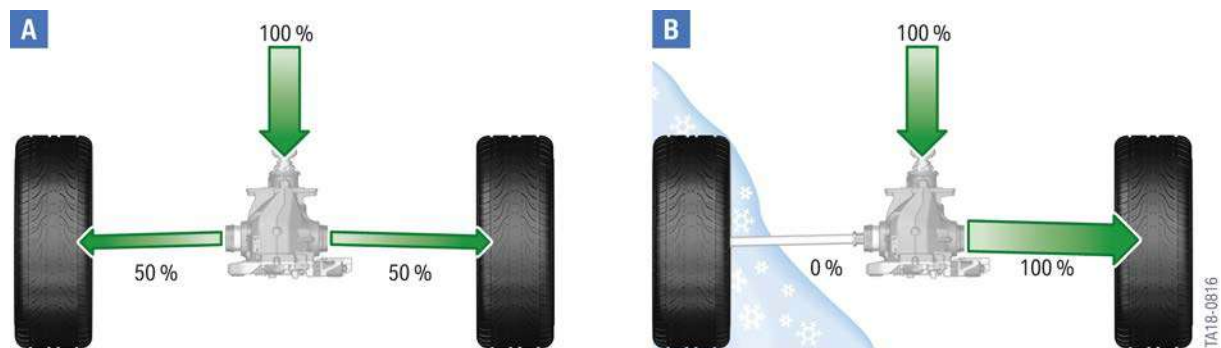
The drive torque to be transmitted at the wheels of the rear axle is calculated in the DSCi and is forwarded to the regulated rear axle differential lock (GHAS) control unit via the FlexRay bus. The GHAS calculates the adjusting torque to be set at the toothed mobile adjusting disc from the requested drive torque.

G15 Powertrain/Chassis

3. Gearbox

The adjusting torque required for control is generated by the electric motor. The rotational movement of the electric motor is converted to an axial movement by a ball ramp mechanism and the clutch package of the multidisc clutch is closed or open.

If the multidisc clutch is opened, the drive torque is distributed evenly between the right and left wheel. This means that 50% of the drive torque is applied to both wheels on the rear axle.



Regulated rear axle differential lock, drive torque distribution

| Index | Explanation |
|-------|--|
| A | Drive torque distribution with multidisc clutch open |
| B | Maximum drive torque distribution with closed multidisc clutch and lock-up torque up to 1500 Nm (left wheel in snow) |

In the event of a driving situation where it is necessary to shift the drive torque from one wheel to the other, the multidisc clutch is closed with the aid of the e-motor until the desired drive torque distribution is set.

The maximum lock-up torque of the regulated rear axle differential lock is 1500 Nm. This means that the entire drive torque can be applied to only one rear wheel if required. This corresponds to a 100 % locking effect. If the required lock-up torque is higher than the maximum achievable torque of 1500 Nm, the controlled rear axle differential lock will no longer be able to lock 100%.

3.3.5. Operating strategy

The regulated rear axle differential lock system is a proactive system that adapts the drive torque at the rear axle to the current driving situation using a variety of sensors. By evaluating all driving data in the DSC control unit a driving situation where a shift of the drive torque at the rear axle is useful can be detected in advance. An optimum drive torque distribution for the vehicle can be generated through interaction with the xDrive all-wheel system.

An adapted e-motor control in the SPORT and SPORT PLUS driving modes leads to more agile and manoeuvrable drivability. The traction of the vehicle is also increased in the SPORT driving mode with e-motor control.

The DSC status (DSC activated/deactivated, DTC activated/deactivated) also influences the characteristics of the functions. With Dynamic Traction Control (DTC) and deactivated DSC (DSC off), an adapted e-motor control also leads to more agile and manoeuvrable drivability. The agile drivability is most pronounced with deactivated DSC.

G15 Powertrain/Chassis

3. Gearbox

The following table provides an overview of the driving situations in which the regulated rear axle differential lock is active:

| Driving situation | Regulated rear axle differential lock action |
|---|---|
| Driving off | Generation of lock-up torque. |
| Road with different coefficient of friction on right and left | In the case of an emerging difference in speed at the rear axle, the drive torque is transmitted to the wheel that can transmit more driving power. |
| Accelerated cornering | Additional drive torque is transmitted to the outer cornering wheel via the wheel slip of the inner cornering wheel. |
| Load reversal upon cornering or lane change | A stabilizing torque is generated from the yaw-rate signal if oversteering is detected. |
| Oversteering | The lock is closed in the event of deliberately induced oversteering. The yaw-rate signal and accelerator pedal position are used to detect this kind of situation. |

The regulation and the operating principle of the regulated rear axle differential lock are explained below using examples of driving situations:

Driving off with similar coefficient of friction on right and left

When driving off the clutch is closed in order to achieve the maximum traction. If the maximum lock-up value is no longer required when driving off, the clutch is opened further again.

Cornering

When steering into a corner, drive torque is transmitted from the inner cornering wheel to the outer cornering wheel. This increases the steerability of the vehicle. If the vehicle changes direction, the drive torque is shifted so that the vehicle remains stable. When accelerating out of a bend/corner, the drive torque is then shifted back again to the outer cornering wheel.

Stabilization upon cornering or lane change

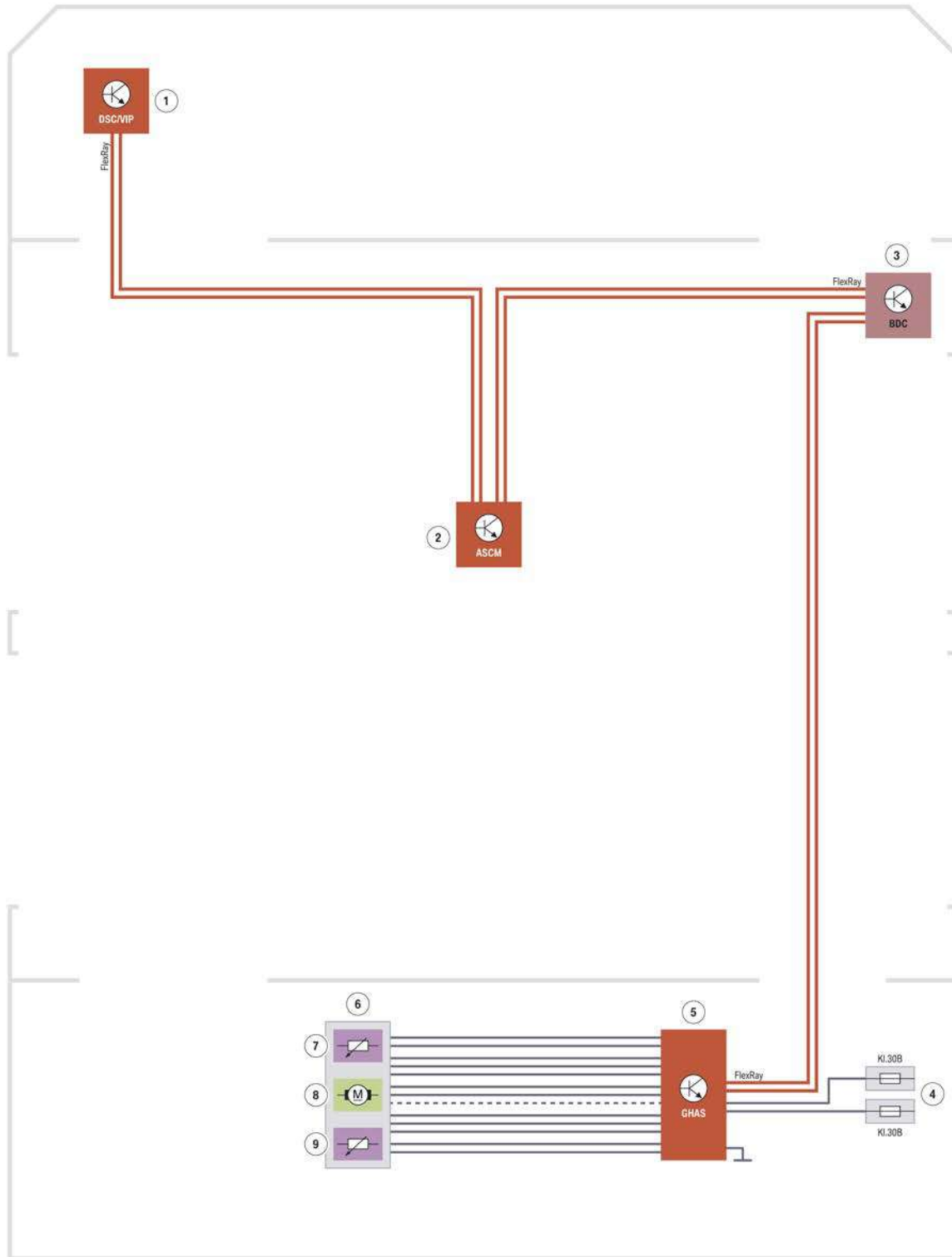
In the case of fast lane changes or upon cornering, all vehicles are prone to significant yaw responses and the vehicle may end up oversteering, for example. If the Dynamic Stability Control integrated DSCi system detects a deviation between the driver's choice and the vehicle response, the vehicle is stabilized by means of xDrive control and the regulated rear axle differential lock.

In this situation the regulated rear axle differential lock distributes the drive torque to both sides as needed in order to prevent oversteering. It is possible to largely do without decelerating brake interventions. The vehicle handling is more stable as a result and the driving dynamics is increased. As a result, the driver can accelerate very quickly out of a bend/corner, for example.

G15 Powertrain/Chassis

3. Gearbox

3.3.6. System wiring diagram



Regulated rear axle differential lock, system wiring diagram in G15

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G15 Powertrain/Chassis

3. Gearbox

| Index | Explanation |
|-------|--|
| 1 | Dynamic S tability Control/virtual integration platform (DSCi) |
| 2 | Crash Safety Module (ACSM) |
| 3 | Body Domain Controller (BDC) |
| 4 | Power distribution box, rear right |
| 5 | Regulated rear axle differential lock (GHAS) |
| 6 | Housing e-motor GHAS |
| 7 | Electric motor temperature sensor |
| 8 | Electric motor |
| 9 | Transmission oil temperature sensor |

3.3.7. Notes for Service

Oil change

The oil filling of the rear axle differential lock is designed for the entire service life of the assembly.



BMW AG vehicles with regulated rear axle differential lock are not designed for use on racing tracks. In the case of use on racing tracks very high temperatures may arise in the rear axle differential which may lead to premature wear of the rear axle differential oil. In the case of a customer complaint "Noises from the rear axle differential", before replacing the entire component it may be worth changing the oil first to see if this resolves the problem.

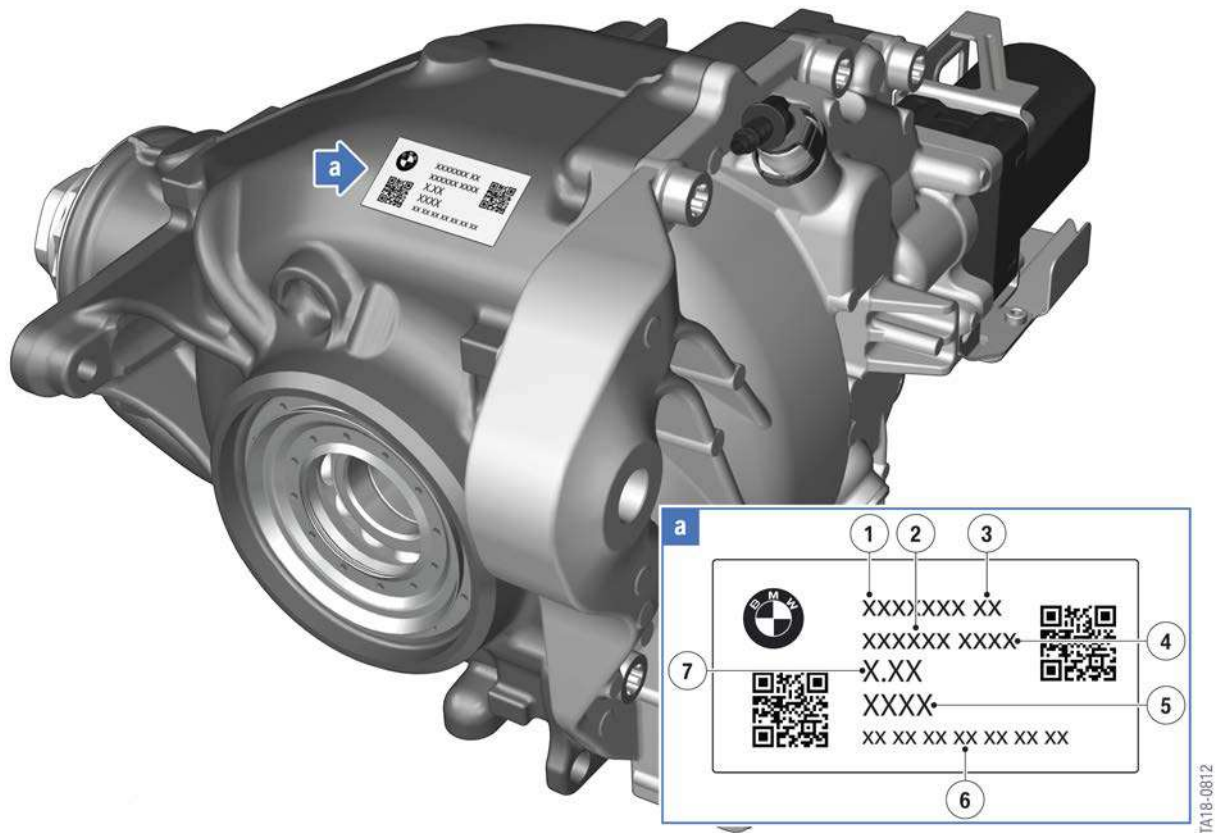
Classification

Due to the component tolerances of the different components of the regulated rear axle differential lock, the stroke of the ball ramp for closing the multidisc clutch may differ in each case. However, these tolerances can be compensated by adapted control of the electric motor for closing the multidisc clutch.

The respective tolerance or classification code is determined during production and printed on the type plate of the regulated rear axle differential lock. This type plate is located on the top of the regulated rear axle differential lock.

G15 Powertrain/Chassis

3. Gearbox



Classification of regulated rear axle differential lock

| Index | Explanation |
|-------|----------------------|
| 1 | BMW part number |
| 2 | Production date |
| 3 | Revision index |
| 4 | Production counter |
| 5 | Route identification |
| 6 | Classification code |
| 7 | Ratio |

The tolerance can be determined as follows in Service:

- Read out of the classification code via the workshop diagnosis system ISTA.
- Read off the classification code on the type plate of the rear axle differential (rear axle differential may need to be lowered).

The 16-digit classification code can be entered in the control unit for the regulated rear axle differential lock (GHAS) using the service function "Correction value of characteristic curve" in the workshop diagnosis system ISTA.

G15 Powertrain/Chassis

3. Gearbox

After the following servicing work has been carried out, the classification code must be manually entered in the GHAS control unit:

- Rear axle differential was renewed
- If the data of the old GHAS control unit can no longer be read out when renewing the GHAS control unit
- For fault elimination, if invalid or missing correction values were identified in the control unit.



Only the data printed on the type plate can be entered. Incorrectly entered data lead to a decline of the traction or increased wear.

Service functions

At the time this product information was created, three service functions were available for the regulated rear axle differential lock:

- Delete wear data: This service function must be carried out after the renewal of the electric motor or the entire rear axle differential.
- Renew GHAS control unit: This service function must be carried out after the renewal of the GHAS control unit. This service function is also performed automatically as a post-programming follow-up operation.
- Correction values of characteristic curve: This service function must be carried out after the renewal of the rear axle differential or if the individual data recovery for the GHAS control unit failed. In this case, the classification code on the type plate of the rear axle differential must be read off.

G15 Powertrain/Chassis

4. Brakes

4.1. Service brake

4.1.1. Variants

Depending on the motorization and vehicle equipment, various brake calipers are used at the front and rear axle. The M Sport braking system in 19" is available as standard equipment with the BMW M850i xDrive. With the BMW 840d xDrive, an 18" Sport brake can be ordered in combination with the M Sport package (SA 337) and a 19" Sport brake can be ordered in combination with the M Technic Sport package.

Front axle

A two-part fixed caliper brake made of aluminum with 4 pistons is used on the front axle. The brake pad backplate is glued.



Brake caliper for front axle in the G15

| Index | Explanation | Manufacturer | Variable | Brake disc |
|-------|----------------------|--------------|----------|------------|
| A | Sport brake, painted | Brembo® | 19" | 395 x 36 |

Rear axle

A floating brake caliper made of cast iron with one piston is used on the rear axle. It includes the electromechanical parking brake actuator. The brake pad backplate is greased.



Brake caliper for rear axle in the G15

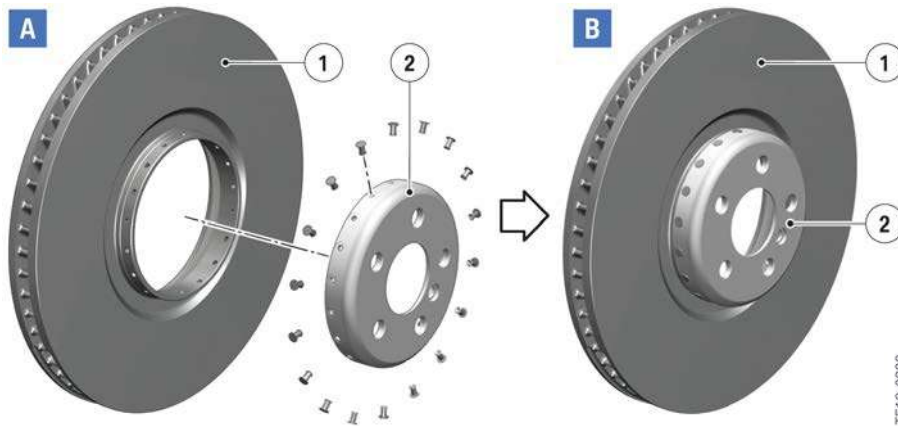
| Index | Explanation | Manufacturer | Variable | Brake disc |
|-------|----------------------|--------------|----------|------------|
| A | Sport brake, painted | TRW® | 19" | 398 x 28 |

G15 Powertrain/Chassis

4. Brakes

4.1.2. Brake discs

The G15 uses riveted lightweight construction brake discs. The weight reduction is achieved by using a brake disc chamber made of aluminum.



Brake disc in the G15

| Index | Explanation |
|-------|---|
| A | Two-part lightweight construction brake disc, dismantled view (cannot be dismantled in service) |
| B | Two-part lightweight construction brake disc, assembled view |
| 1 | Brake disc chamber |
| 2 | Friction surface |

Only the complete brake disc can be renewed in service. Separation of the rivets is not permitted.

4.2. Parking brake

The parking brake is realized by means of a combined brake caliper on the rear axle. The parking brake functions are integrated into the Dynamic Stability Control DSCi integrated.

The parking brake has a roller mode in order to permit determination of the brake forces on a brake test stand. This mode is detected automatically on the basis of a plausibility check (wheel speed comparison).

G15 Powertrain/Chassis

5. Wheels/Tires

5.1. Tires

Just like the vehicle, the tires of the G15 have been designed for sporting character and driving dynamics. The vehicle is delivered as standard with mixed tires. The tires used on the rear axle are therefore wider than those on the front axle. This meant that it was possible to base the chassis and suspension design on the significantly higher cornering potential of wide rear axle tires.

The following tires are used as standard for the M840i xDrive model:

- Front: 8 x 20, 245/35 R20
- Rear: 9 x 20, 275/30 R20

5.2. Integrated RDCi tire pressure monitor

The G15 contains the familiar RDCi tire pressure monitor. The following immobilization periods are required to teach-in new wheel electronics.

| Vehicle condition | 5 minutes | 17 minutes |
|--|-----------|------------|
| Parking | | |
| Residing | | |
| PAD mode (testing-analysis-diagnosis) | | |
| Driving | | |

The TPM wheel electronics of the RDCi in the G15 are provided by Sensata®.

For more information on the RDCi system, refer to the product information G01 and G30 chassis and suspension.

5.3. Electronic tire pressures plate

The G15 is equipped with the electronic tire pressure specification introduced in the G30. The adhesive tire pressure label is supplemented here by an additional user menu in the Central Information Display CID.

G15 Powertrain/Chassis

5. Wheels/Tires



G15 overview of electronic tire pressure specification

| Index | Explanation |
|-------|--|
| A | Electronic tire pressures label in the CID |
| B | Tire pressures information label |

Unlike the tire pressures plate sticker, the electronic tire pressures plate permanently monitors the nominal pressures taking into consideration the current temperatures. This means that it determines and displays the optimum tire pressure at any temperature. For the valid tire inflation pressures, check the Central Information Display (CID).



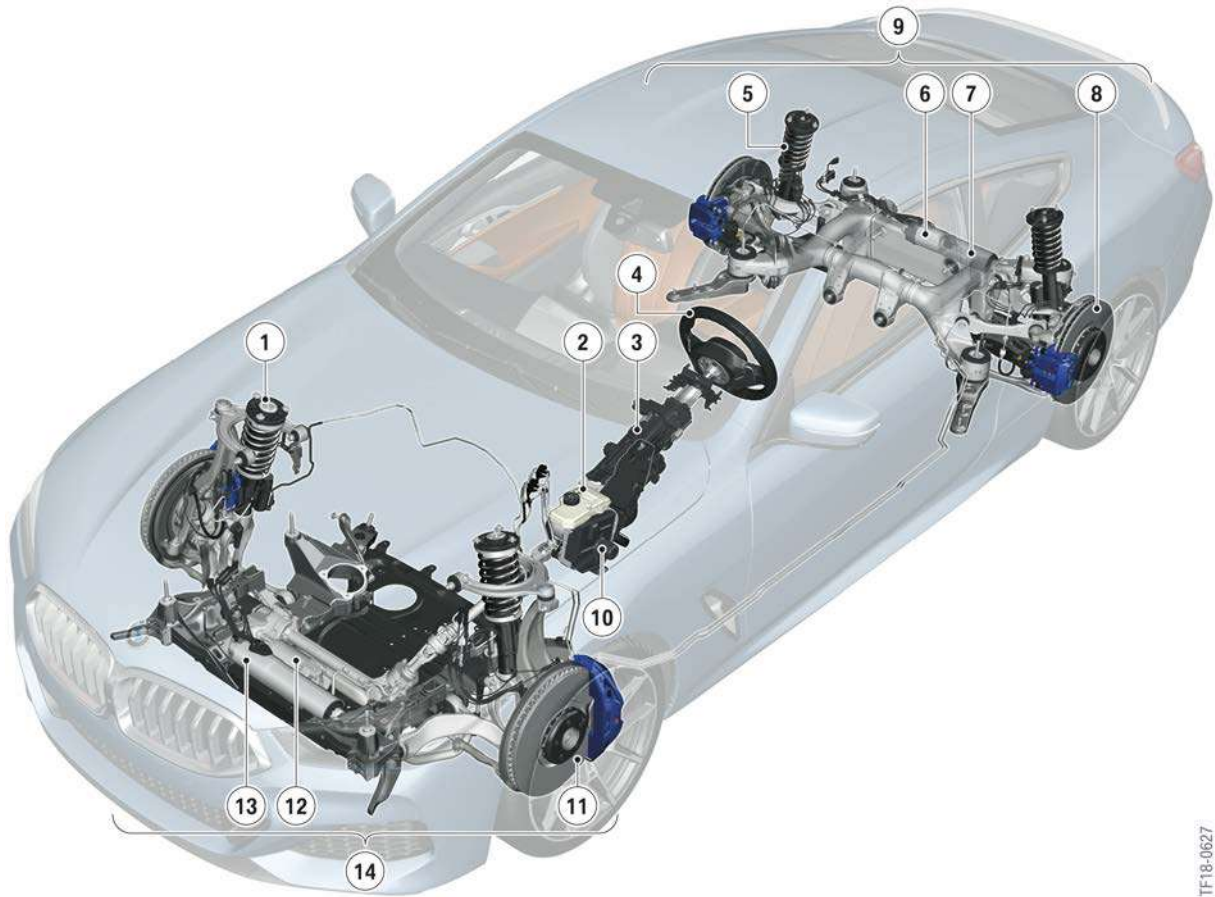
The RDC reset is omitted following adjustment of the tire inflation pressures in vehicles with activated electronic tire pressure specification.

For more information on the electronic tire pressure specification, refer to the product information G30 chassis and suspension.

G15 Powertrain/Chassis

6. Chassis and Suspension

6.1. Overview



Overview of chassis and suspension G15

| Index | Explanation |
|-------|--|
| 1 | Front spring strut |
| 2 | Brake fluid expansion tank |
| 3 | Steering column |
| 4 | Steering wheel |
| 5 | Spring strut, rear |
| 6 | Rear axle slip angle control (HSR) |
| 7 | Electric active roll stabilization rear (EARSH) |
| 8 | Disc brake with parking brake on the rear axle |
| 9 | Five-link rear suspension |
| 10 | Dynamic Stability Control integrated (DSCi) |

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G15 Powertrain/Chassis

6. Chassis and Suspension

| Index | Explanation |
|-------|--|
| 11 | Disc brake for front axle |
| 12 | Electronic Power Steering (electromechanical power steering) EPS |
| 13 | Electric active roll stabilization at the front (EARSV) |
| 14 | Double-wishbone front axle |

6.1.1. Comparison

The following table provides you with an overview of the chassis and suspension systems used in the G15 in comparison with the BMW 6 series (the F13):

| Component | F13 | G15 |
|-----------------------------|---|--|
| Front axle | Double-wishbone | Double-wishbone |
| Front suspension | Steel | Steel |
| Front damping | Conventional or Electronic Damper Control (EDC) | Electronic Damper Control (EDC) |
| Anti-roll bar, front | Conventional or Hydraulic active roll stabilization (ARS) | Conventional or Electric active roll stabilization front (EARSV) |
| Rear axle | Integral rear axle V | Five-link rear suspension |
| Rear suspension | Steel | Steel |
| Rear damping | Conventional or Electronic Damper Control (EDC) | Electronic Damper Control (EDC) |
| Rear anti-roll bar | Conventional or Hydraulic active roll stabilization (ARS) | Conventional or Electric active roll stabilization rear (EARSH) |
| Front brake | Brake discs up to dia. 374 mm | Brake discs up to dia. 395 mm |
| Rear brakes | Brake discs up to dia. 345 mm | Brake discs up to dia. 398 mm |
| Parking brake | Electromechanical holding brake | Electromechanical holding brake |
| Tire pressure | RDC | RDCi |
| Front steering | Electronic Power Steering (EPS) | Electronic Power Steering (EPS) |
| Rear steering | Rear axle slip angle control (HSR) | Rear axle slip angle control (HSR) |

An "Adaptive M suspension Professional" (SA 2VW) can be ordered as optional equipment in the M850i xDrive model. This contains the electric active roll stabilization (EARS) system instead of a conventional stabilizer. The optional equipment "Adaptive M suspension Professional" can only be ordered with the M850i xDrive model.

G15 Powertrain/Chassis

6. Chassis and Suspension

6.1.2. Overview of system descriptions

The systems already familiar from other vehicle models will not be examined in any further detail in this document. If required, refer to the detailed system descriptions in the product information documents listed below:

| Topic | Product information |
|---|----------------------------|
| Electronic Damper Control EDC High | G12 Chassis and Suspension |
| Electric active roll stabilization (EARS) | G12 Chassis and Suspension |
| Integral Active Steering | G12 Chassis and Suspension |

6.2. Stiffening measures

The vehicle is designed to ensure a high basic rigidity. This was achieved by installing the following components:

- Front-end struts
- Torsion struts on front axle
- Stiffening plate on front and rear axle.

6.2.1. Front-end struts

To increase the rigidity of the vehicle, front-end struts were installed in the engine compartment. The front-end struts are fastened to the die-cast aluminum spring strut dome and cross-connection support plate of the engine compartment.



Overview of front-end struts G15

G15 Powertrain/Chassis

6. Chassis and Suspension

| Index | Explanation |
|-------|---|
| A | Engine compartment |
| 1 | Die-cast aluminum spring strut dome front right |
| 2 | Die-cast aluminum spring strut dome front left |
| 3 | Front-end strut left |
| 4 | Front-end strut right |

Special front-end struts are installed in the M850i xDrive. The front-end struts must be removed in order to remove the air filter insert.



The screw cycles on the aluminum pressure cast spring strut dome must be noted. It may be necessary to rework the threads on the aluminum pressure cast spring strut dome using threaded inserts to ensure their strength after multiple screw cycles.

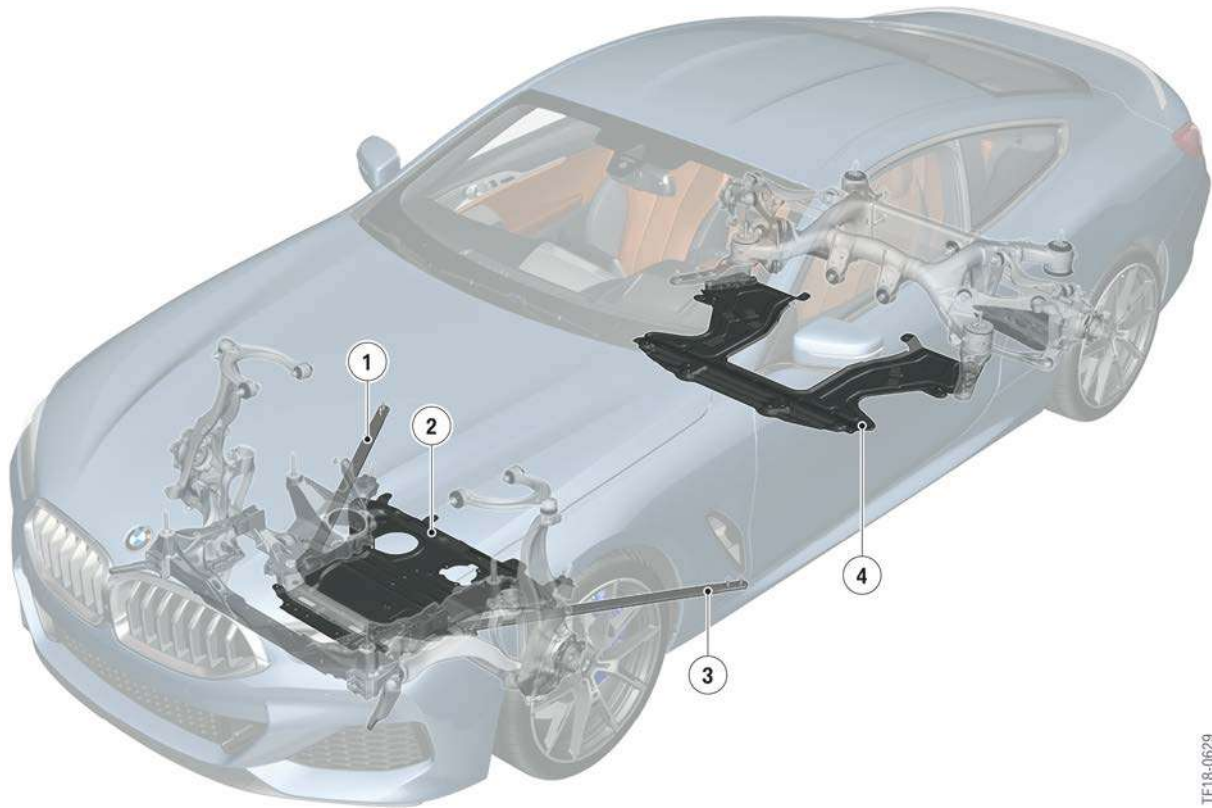
To perform the necessary servicing, observe the information and specifications of the documents in ISTA in each case which are updated on a daily basis.

6.2.2. Measures for front and rear axle

In addition to the stiffening plate on the front axle, a new stiffening plate is used on the rear axle of the G15. Torsion struts are used on the front axle. These measures increase the rigidity of the vehicle and allow a more sporty chassis and suspension setting.

G15 Powertrain/Chassis

6. Chassis and Suspension



TF18-0629

Stiffening measures, front and rear axle G15

| Index | Explanation |
|-------|------------------------------|
| 1 | Torsion struts, front right |
| 2 | Stiffening plate, front axle |
| 3 | Torsion strut, front left |
| 4 | Stiffening plate, rear axle |

6.3. Suspension systems

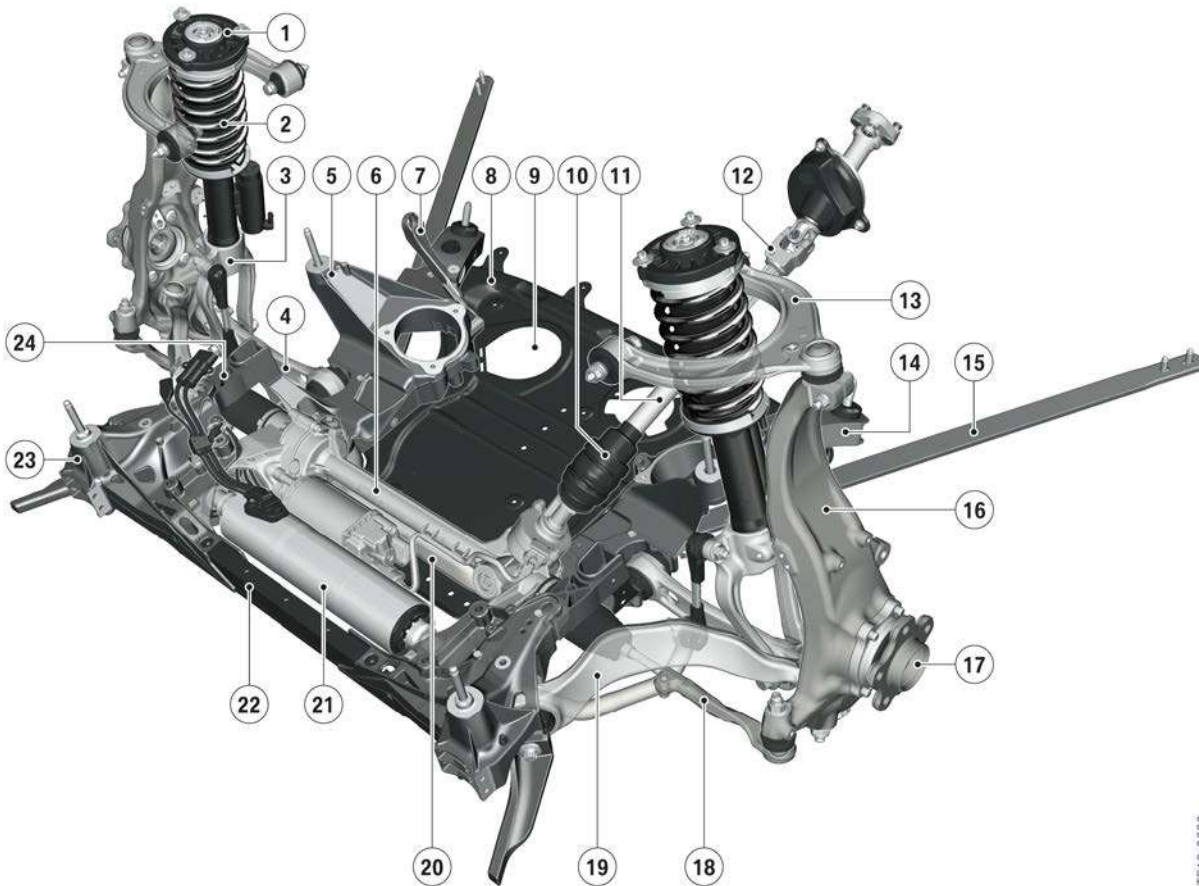
The axles of the G15 are designed, as is the entire vehicle, for sporting character and driving dynamics. The wheel guidance has been optimized by increasing the negative camber on the front and rear axle (compared to the G30).

6.3.1. Front axle

A double-wishbone front axle is used in the G15. The bearings of the front axle wishbone were specially developed for the vehicle and are harder, e.g. than those in the G30. A rubber mount originating from the F90 is used on the upper wishbone.

G15 Powertrain/Chassis

6. Chassis and Suspension



TF18-0630

Double-wishbone front axle in the G15

| Index | Explanation |
|-------|--|
| 1 | Support bearing |
| 2 | Spring strut |
| 3 | Spring strut holder |
| 4 | Wishbone, bottom |
| 5 | Cast side section |
| 6 | Steering box |
| 7 | Strut |
| 8 | Rear stiffening plate |
| 9 | Service opening |
| 10 | Universal joint of steering shaft to steering gear |
| 11 | Steering shaft |
| 12 | Universal joint of steering shaft to steering column |
| 13 | Triangle wishbone, top |
| 14 | Side member |

G15 Powertrain/Chassis

6. Chassis and Suspension

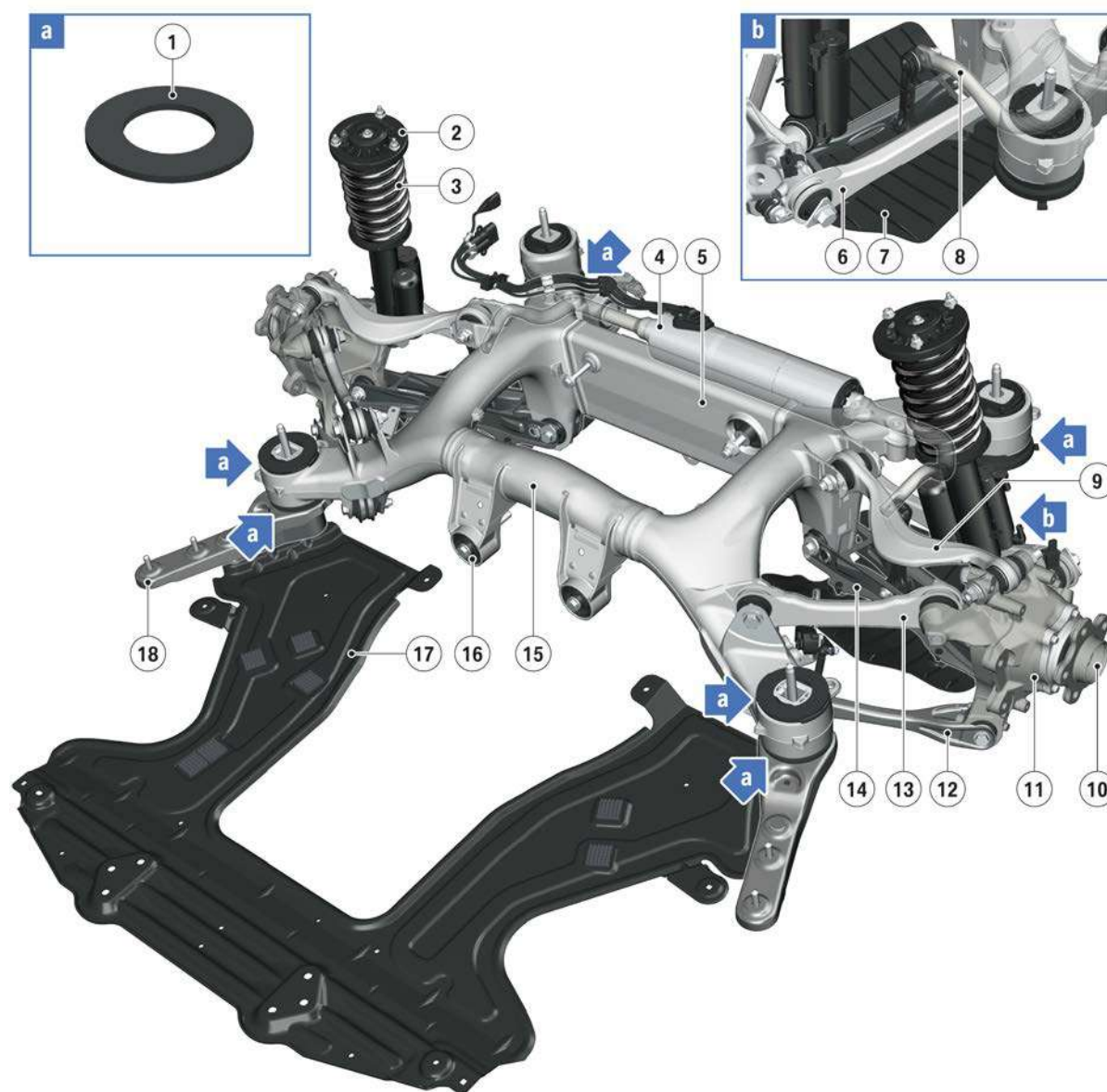
| Index | Explanation |
|-------|--|
| 15 | Torsion strut |
| 16 | Swivel bearing |
| 17 | Wheel bearing unit |
| 18 | Track rod end |
| 19 | Trailing link |
| 20 | Cross member |
| 21 | Electric active roll stabilization at the front (EARSV) (optional equipment) |
| 22 | Transverse tube |
| 23 | Cast corner |
| 24 | Cast corner connection |

6.3.2. Rear axle

A five-link rear axle is used on the rear axle. The newly developed stiffening plate increases the rigidity of the vehicle. It is screwed to the mountings on the compression struts and the body of the vehicle. Damping discs made of Cellasto are used on the rear axle to increase the driving dynamics.

G15 Powertrain/Chassis

6. Chassis and Suspension



TF18-0631

Five-link rear axle in the G15

| Index | Explanation |
|-------|---|
| 1 | Damping discs |
| 2 | Support bearing |
| 3 | Spring strut |
| 4 | Rear axle slip angle control (HSR) |
| 5 | Connection of rear axle support to rear axle differential |
| 6 | Camber link |
| 7 | Air deflector |
| 8 | Anti-roll bar |

G15 Powertrain/Chassis

6. Chassis and Suspension

| Index | Explanation |
|-------|---|
| 9 | Wishbone |
| 10 | Wheel bearing unit |
| 11 | Wheel carrier |
| 12 | Trailing arm |
| 13 | Control arm |
| 14 | Camber control arm |
| 15 | Rear axle support |
| 16 | Rubber mount of the rear axle support on the rear axle differential |
| 17 | Stiffening plate |
| 18 | Compression strut |

6.4. Dynamic Stability Control integrated (DSCi)

6.4.1. Overview

The G15 features the newly developed integrated brake system with the internal designation Dynamic Stability Control integrated (DSCi).

The DSCi combines the functions brake actuation, braking force assistance and the braking control system (DSC) into a compact, weight-saving braking module.

G15 Powertrain/Chassis

6. Chassis and Suspension



Dynamic Stability Control integrated DSCi

| Index | Explanation |
|-------|---|
| 1 | Brake control linkage with adjustable ball head |
| 2 | Expansion tank |
| 3 | Brake fluid level sensor |
| 4 | Plug connection, power supply (DC) |
| 5 | Plug connection, electrical system |
| 6 | Control unit |

G15 Powertrain/Chassis

6. Chassis and Suspension

| Index | Explanation |
|-------|-----------------------------|
| 7 | Hydraulic unit |
| 8 | Brake pedal force simulator |
| 9 | 3-phase e-motor (AC) |
| 10 | DSCi unit |

The brake system has the following driving characteristics:

- Outstanding driving dynamics and vehicle control due to the dynamics and precision of the vehicle stabilization
- More sporting character and feeling of safety due to a brake pedal feel short travel and effective modulation
- Increased active safety due to shorter stopping distances combined with assistance systems
- Due to the fast pressure build-up, much faster and more precise interventions can be achieved compared to previous brake systems.

6.4.2. Special features

The DSCi brake system is characterized by the following technical features:

- Electro-hydraulic brake-by-wire braking function
- Changeover from front/back to diagonal brake force distribution
- Changeover from a brake fluid level switch to a brake fluid level sensor
- Vacuum supply omitted
- Vacuum brake servo omitted
- Integration of the tandem brake master cylinder
- Integrated brake pedal travel sensor.

G15 Powertrain/Chassis

6. Chassis and Suspension

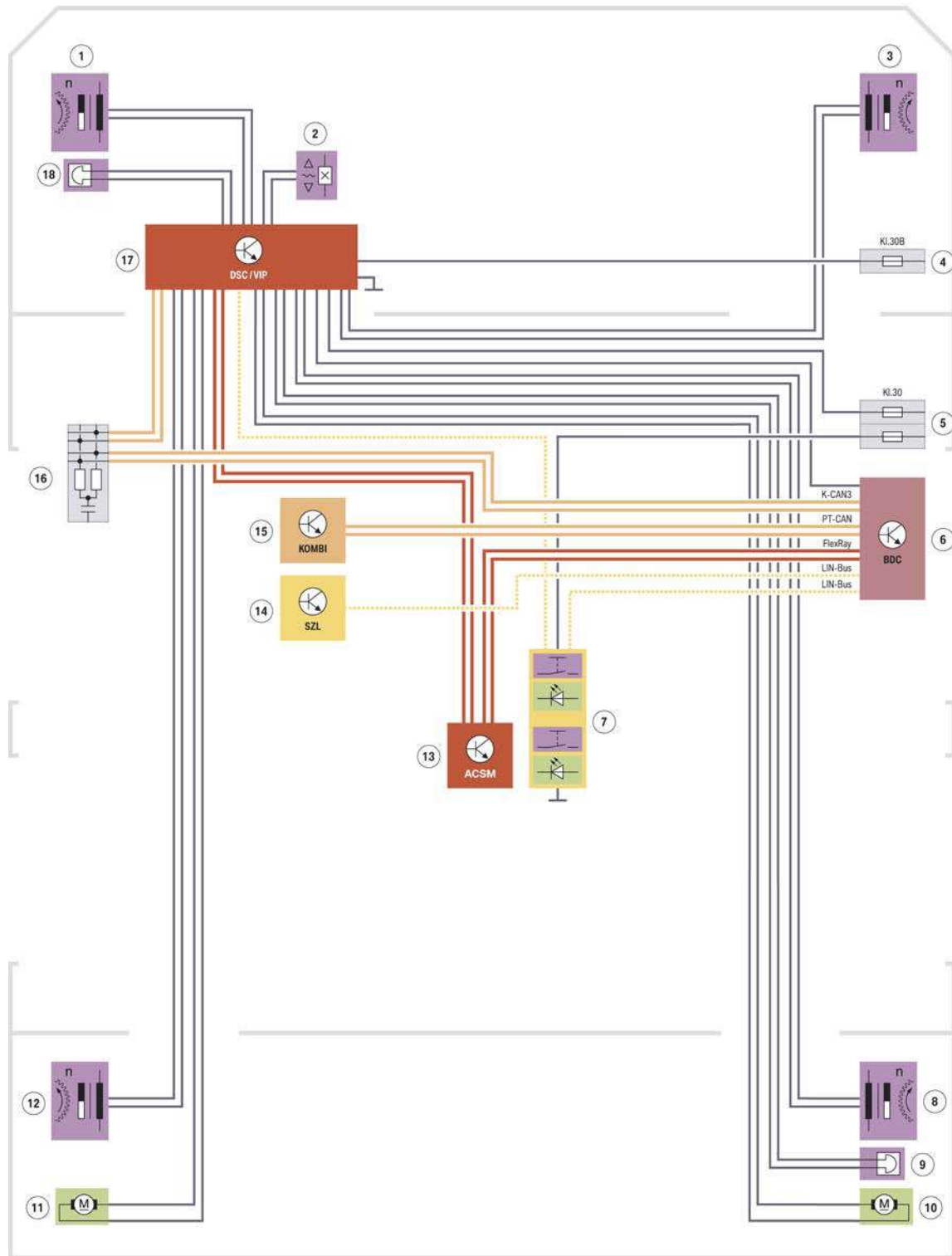
6.4.3. Brake functions

| Function | Explanation |
|--------------------------------------|---|
| Antilock Brake System (ABS) | Prevents blocking of individual wheels when braking by means of targeted modulation of brake pressures. Vehicle steerability is maintained. |
| Cornering Brake Control (CBC) | Prevents the vehicle from turning in when braking gently and when subjected to a high degree of lateral acceleration by adjusting the control of the brake pressures. The cornering stability is improved. |
| Automatic Stability Control (ASC) | Prevents the drive wheels from spinning by targeted braking of these wheels and adaptation of the drive torque delivered by the engine. Vehicle propulsion is optimized as a result and driving stability is maintained. |
| Dynamic Brake Control (DBC) | In the event of panic braking initiated by the driver, the system supports the driver by automatically immediately applying the maximum brake pressure to ensure the best possible deceleration. |
| Dynamic Stability Control (DSC) | If the vehicle starts to understeer or oversteer, it is stabilized by targeted brake interventions at individual wheels. |
| Automatic Differential Brake (ADB-X) | Simulates the function of the differential lock. If a wheel displays a tendency to spin, this wheel is automatically braked so that propulsion can still be achieved via the other wheel of the driven axle. |
| Dynamic Traction Control (DTC) | In cooperation with ASC and DSC, the intervention thresholds on normal road surfaces are widened, for example, to enable an even sportier driving style without intervention. On loose surfaces, such as snow, sand or gravel, maximum forward momentum is achieved. |
| Brake standby | Builds up a moderate brake pressure in the system when the driver takes his foot off the accelerator pedal quickly. The braking effect then acts more quickly if the driver then performs panic braking. |
| Dry by applying brake | Depending on operation of the wiper, applies the brake pads gently at intervals in order to clean (dry) the brake discs. The braking effect is significantly improved by this when the vehicle is braked. |
| Drive-off assistant | Holds the vehicle on inclines for roughly 1.5 seconds as soon as the driver releases the brake pedal in order to drive off. This means that the driver can drive off comfortably, without the vehicle rolling back down the hill unintentionally. |
| Automatic Hold | Automatically holds the vehicle after it has come to a standstill without it being necessary to still press the brake when the drive position is selected. The brake is automatically released when the accelerator pedal is pressed and the vehicle drives off normally. The function can be switched on and off by means of a button. |

G15 Powertrain/Chassis

6. Chassis and Suspension

6.4.4. System wiring diagram



System wiring diagram DSCi

TF18-1043

G15 Powertrain/Chassis

6. Chassis and Suspension

| Index | Explanation |
|-------|---|
| 1 | Wheel-speed sensor, front left |
| 2 | Brake fluid level sensor |
| 3 | Wheel-speed sensor, front right |
| 4 | Power distribution box, engine compartment |
| 5 | Power distribution box, front |
| 6 | Body Domain Controller (BDC) |
| 7 | center Operation Unit |
| 8 | Wheel speed sensor, rear right |
| 9 | Brake pad wear indicator, rear right |
| 10 | Parking brake actuator, right |
| 11 | Parking brake actuator, left |
| 12 | Wheel speed sensor, rear left |
| 13 | Advanced Crash Safety Module (ACSM) |
| 14 | Steering column switch cluster (SZL) |
| 15 | Instrument cluster (KOMBI) |
| 16 | CAN terminator |
| 17 | Dynamic Stability Control/virtual integration platform (DSCi) |
| 18 | Brake pad wear indicator, front left |

For more information on the integrated brake, refer to the product information DSCi.

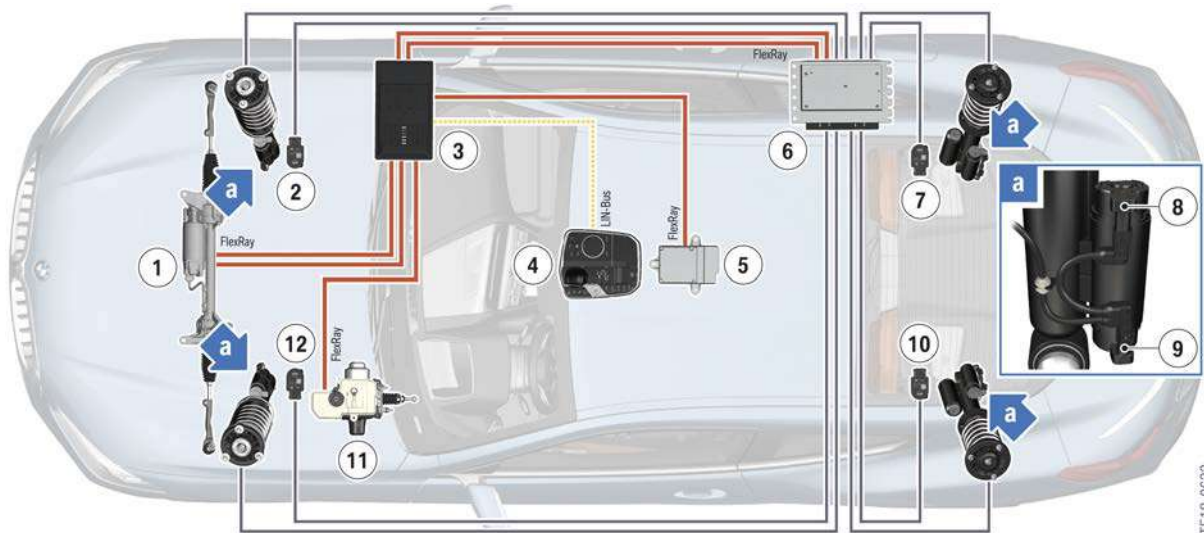
6.5. Electronic Damper Control EDC High

6.5.1. Overview

The Electronic Damper Control (EDC) with compression and rebound stage control is used as standard in the G15 and is a variable, electronically-controlled shock absorber adjustment system for controlling the vertical dynamics. The vertical dynamics platform VDP control unit uses various data such as body movement, transverse and longitudinal acceleration, steering angle and the road condition to calculate wheel-individual control commands for the electrical control valves in the shock absorbers.

G15 Powertrain/Chassis

6. Chassis and Suspension



Electronic Damper Control (EDC) in the G15

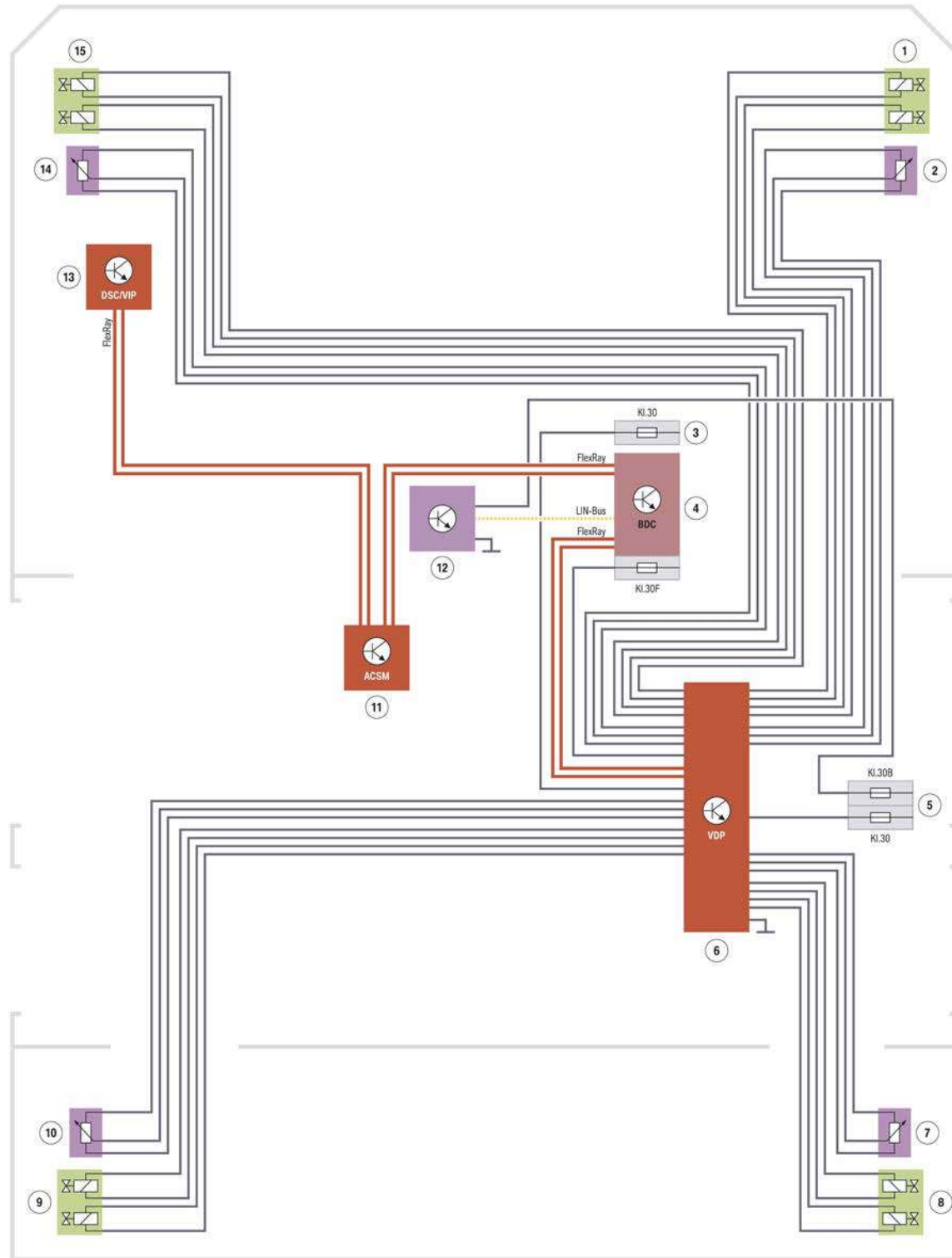
| Index | Explanation |
|-------|--|
| 1 | Electronic Power Steering (electromechanical power steering) (EPS) |
| 2 | Ride height sensor, front right |
| 3 | Body Domain Controller (BDC) |
| 4 | Driving Experience Control (FES) |
| 5 | Crash Safety Module (ACSM) |
| 6 | Vertical Dynamic Platform (VDP) |
| 7 | Ride height sensor, rear right |
| 8 | Control valve, compression stage |
| 9 | Control valve, rebound stage |
| 10 | Ride-height sensor, rear left |
| 11 | Dynamic Stability Control integrated (DSCi) |
| 12 | Ride height sensor, front left |

The electronically regulated shock absorbers form a unit in combination with the respective spring strut. There are 2 electric control valves on each shock absorber which allow the compression and rebound stages of the regulated shock absorbers to be adjusted separately. This improves the tire comfort of the vehicle while at the same time increasing the driving dynamics. The retraction and extension speeds of the shock absorbers are determined by means of the ride height sensors. The driver can use the Driving Experience Control to select a comfortable, soft or sporty taut chassis and suspension setting.

G15 Powertrain/Chassis

6. Chassis and Suspension

6.5.2. System wiring diagram



TF18-1445

System wiring diagram for Electronic Damper Control (EDC) G15

G15 Powertrain/Chassis

6. Chassis and Suspension

| Index | Explanation |
|-------|---|
| 1 | Control valves for shock absorber adjustment, front right |
| 2 | Ride height sensor, front right |
| 3 | Power distribution box, front right |
| 4 | Body Domain Controller (BDC) |
| 5 | Power distribution box, rear right |
| 6 | Vertical Dynamic Platform (VDP) |
| 7 | Ride height sensor, rear right |
| 8 | Control valves for shock absorber adjustment, rear right |
| 9 | Control valves for shock absorber adjustment, rear left |
| 10 | Ride-height sensor, rear left |
| 11 | Advanced Crash Safety Module (ACSM) |
| 12 | Driving experience switch |
| 13 | Dynamic Stability Control/virtual integration platform (DSCi) |
| 14 | Ride height sensor, front left |
| 15 | Control valves for shock absorber adjustment, front left |

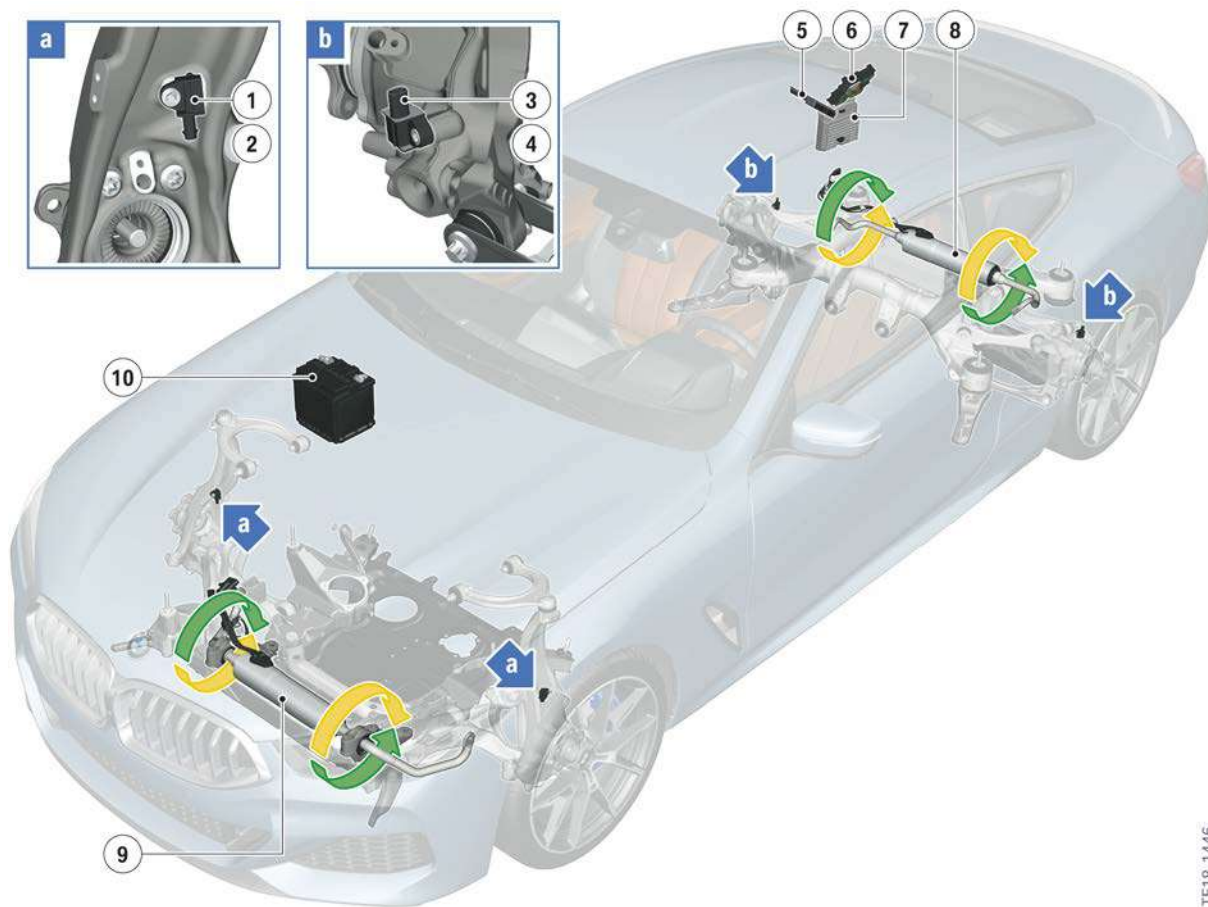
6.6. Electric active roll stabilization (EARS)

6.6.1. Overview

The electric active roll stabilization (EARS) reduces the roll tendency of the body when cornering by systematically applying mechanical torques to the stabilizer halves assisted by an e-motor.

G15 Powertrain/Chassis

6. Chassis and Suspension



TF18-1446

System overview of electric active roll stabilization (EARS) in the G15

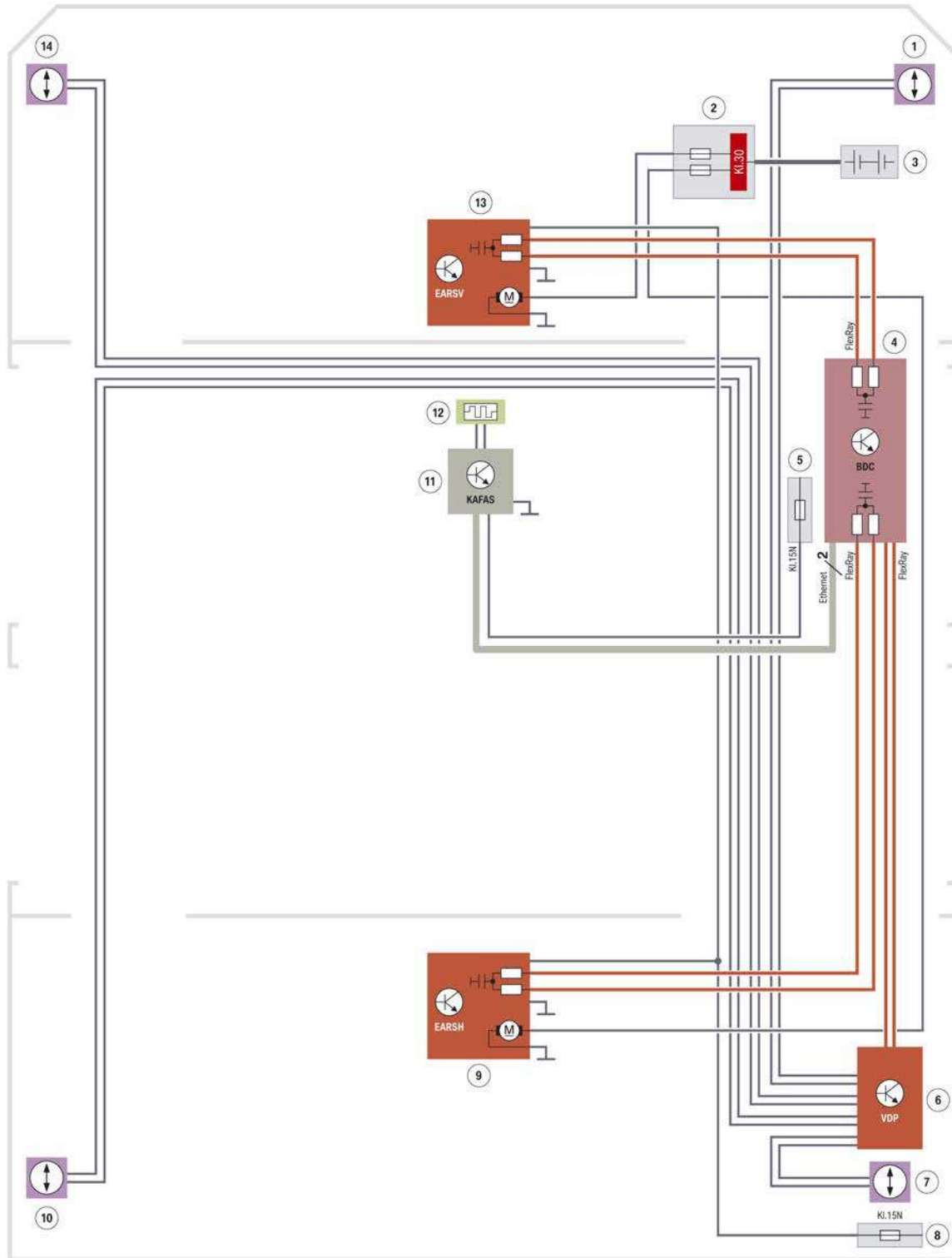
| Index | Explanation |
|-------|--|
| 1 | Front right vertical acceleration sensor |
| 2 | Vertical acceleration sensor, front left |
| 3 | Rear left vertical acceleration sensor |
| 4 | Rear right vertical acceleration sensor |
| 5 | Vertical Dynamic Platform (VDP) |
| 6 | Power distribution box, rear right |
| 7 | Power Control Unit (PCU) 500 W |
| 8 | Electric active roll stabilization rear (EARSH) |
| 9 | Electric active roll stabilization front (EARSV) |
| 10 | Auxiliary battery in the engine compartment |

The electric active roll stabilization (EARS) system is available at the market launch in the M850i xDrive as standard equipment "Adaptive M suspension Professional".

G15 Powertrain/Chassis

6. Chassis and Suspension

6.6.2. System wiring diagram



System wiring diagram for electric active roll stabilization (EARS) G15

TF18-1447

G15 Powertrain/Chassis

6. Chassis and Suspension

| Index | Explanation |
|-------|--|
| 1 | Vertical acceleration sensor, front left |
| 2 | Power distribution box, engine compartment |
| 3 | Auxiliary battery in the engine compartment |
| 4 | Body Domain Controller (BDC) |
| 5 | Power distribution box, front right |
| 6 | Vertical Dynamic Platform (VDP) |
| 7 | Rear right vertical acceleration sensor |
| 8 | Power distribution box, rear right |
| 9 | Rear electric active stabilizer (EARSH) |
| 10 | Rear left vertical acceleration sensor |
| 11 | Camera-based driver assistance systems (KAFAS) |
| 12 | Heating for camera-based assistance system |
| 13 | Front electric active stabilizer (EARSV) |
| 14 | Front right vertical acceleration sensor |

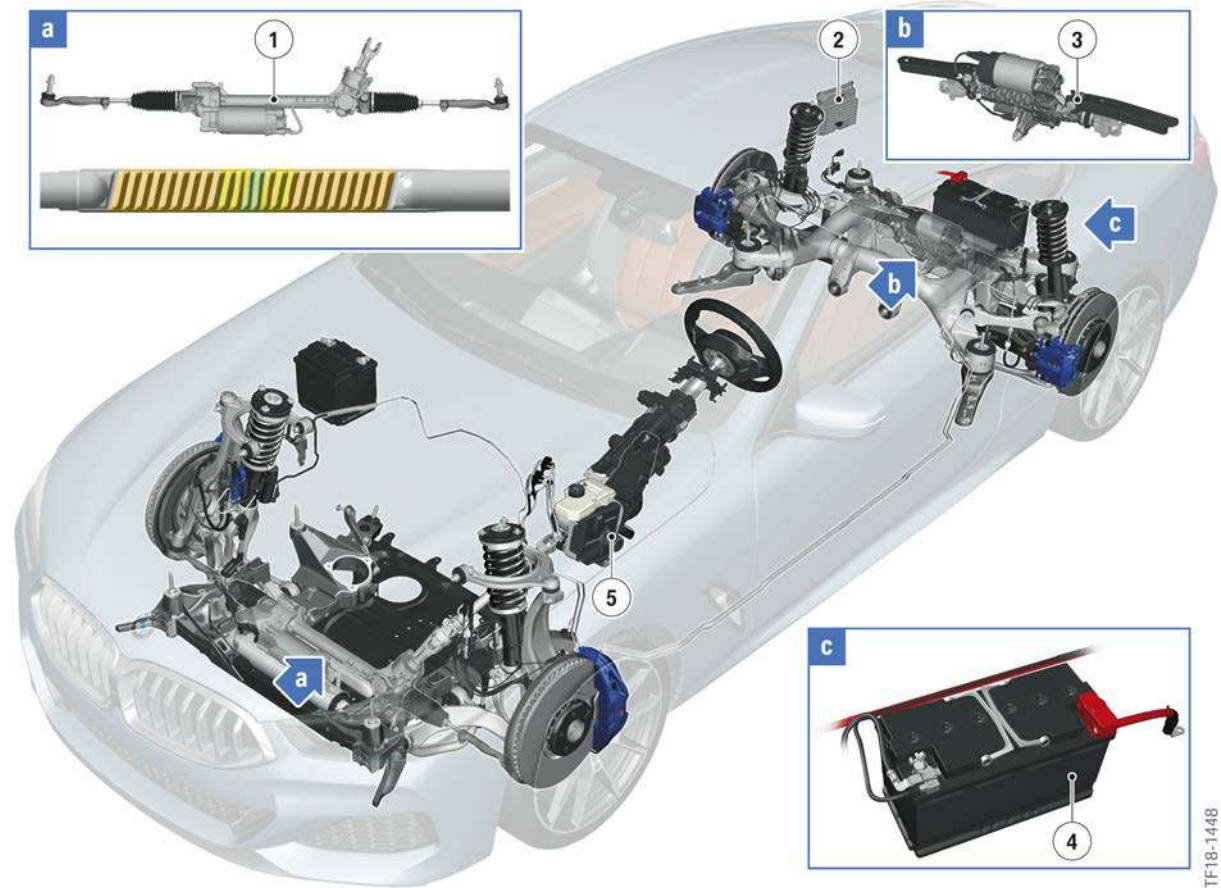
G15 Powertrain/Chassis

6. Chassis and Suspension

6.7. Steering

6.7.1. Overview

The familiar Integral Active Steering with 12 V is installed as standard in the G15. The following graphic shows the installation locations of the Integral Active Steering system components.



Overview of Integral Active Steering in the G15

| Index | Explanation |
|-------|---|
| 1 | Electronic Power Steering with variable rack geometry |
| 2 | Power Control Unit (PCU) 500 W |
| 3 | Rear axle slip angle control (HSR) |
| 4 | 12 V battery |
| 6 | Dynamic Stability Control integrated (DSCi) |

G15 Powertrain/Chassis

6. Chassis and Suspension

6.7.2. Steering wheel

The M850i xDrive, are equipped with a Steptronic sport transmission with shift paddles on the steering wheel.

- Leather sports steering wheel
- M leather steering wheel

The steering wheels can be optionally equipped with the following additional functions:

- Heated steering wheel rim
- Steering wheel vibration with assistance systems such as Lane Departure or Lane Change Warning
- Touch detection for the Traffic jam assistant function.

6.7.3. Steering column adjustment

The steering column adjustment is electrical.



Electric steering column adjustment in the G15



Technical training.
Product information.

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Technical Training

ST1833

10/1/2018

General information

Symbols used

The following symbol is used in this document to facilitate better comprehension or to draw attention to very important information:



Contains important safety information and information that needs to be observed strictly in order to guarantee the smooth operation of the system.

Information status: June 2018

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Additional sources of information

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

- Owner's Handbook
- Integrated Service Technical Application
- Aftersales Information Research (AIR)

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G15 General Vehicle Electronics

1. Introduction

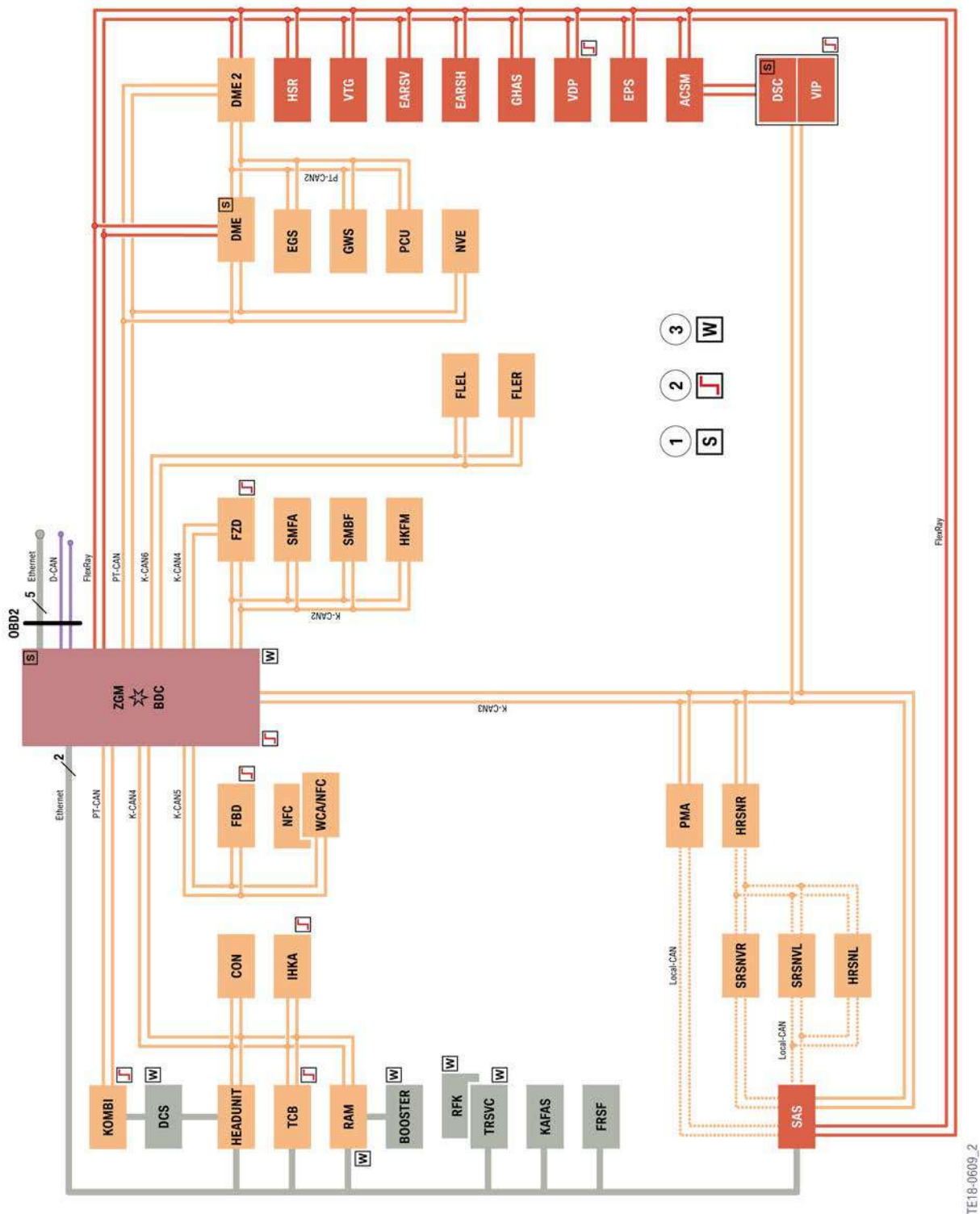
1.1. Further information

This Product Information presents the new features of and changes to the general vehicle electrical system in the G15. The focus is directed in particular at the **vehicle-specific** particularities. Basic **system-specific** descriptions of the general vehicle electrical system and further innovations for the year 2018 can be found in the Product Information **General Vehicle Electronics 2018**.

G15 General Vehicle Electronics

2. Bus Systems

2.1. Bus overview



G15 bus overview

G15 General Vehicle Electronics

2. Bus Systems

| Index | Explanation |
|---------|---|
| ACSM | Advanced Crash Safety Module |
| BDC | Body Domain Controller |
| BOOSTER | Hi-fi amplifier |
| CON | Controllers |
| DME | Digital Motor Electronics |
| DME2 | Digital Engine Electronics 2 |
| DSC | Dynamic Stability Control |
| DCS | Driver Camera System |
| EARSH | Electric active roll stabilization rear |
| EARSV | Electric active roll stabilization front |
| EGS | Electronic transmission control |
| EPS | Electronic Power Steering |
| FBD | Remote control receiver |
| FLEL | Frontal Light Electronics Left |
| FLER | Frontal Light Electronics Right |
| FRSF | Front radar sensor long range |
| FZD | Roof function center |
| GWS | Gear selector switch |
| GHAS | Regulated rear axle differential lock |
| HKFM | Tailgate function module |
| HRSNL | Rear radar sensor short range left |
| HRSNR | Rear radar sensor short range right |
| HSR | Rear axle slip angle control |
| HU-H | Head Unit High |
| IHKA | Integrated automatic heating / air conditioning |
| KAFAS | Camera-based driver assistance systems |
| KOMBI | Instrument cluster |
| NFC | Near Field Communication |
| NVE | Night Vision Electronics |
| PCU | Power Control Unit |
| PMA | Parking Manoeuvring Assistant |
| RAM | Receiver Audio Module |
| RFK | Rear view camera |
| SAS | Optional equipment system |
| SMBF | Front passenger seat module |

G15 General Vehicle Electronics

2. Bus Systems

| Index | Explanation |
|--------|---|
| SMFA | Driver's seat module |
| SRSNVL | Side radar sensor short range front left |
| SRSNVR | Side radar sensor short range front right |
| TCB | Telematic Communication Box |
| TRSVC | Top rear side view camera |
| VDP | Vertical Dynamic Platform |
| VIP | Virtual Integration Platform |
| VTG | Transfer box |
| WCA | Wireless charging station |
| ZGM | Central Gateway Module |
| 1 | Start-up node control units for starting and synchronizing the FlexRay bus system |
| 2 | Control units authorized to perform wake-up function |
| 3 | Control units also connected to wake-up line. |

2.2. Main bus systems

2.2.1. K-CAN

In the G15 the following K-CAN are used:

- K-CAN2
- K-CAN3
- K-CAN4
- K-CAN5
- K-CAN6.

The control units on the K-CAN5 are not displayed during diagnosis by the BMW diagnosis system ISTA. Diagnosis is performed via the Body Domain Controller (BDC). The following control units are affected here:

- Remote control receiver (FBD)
- Wireless charging station (WCA)
- Near Field Communication (NFC).

All K-CAN bus systems have a data transfer rate of 500 kBit/s.

G15 General Vehicle Electronics

2. Bus Systems

2.2.2. PT-CAN

In the G15 the following PT-CAN are used:

- PT-CAN
- PT-CAN2.

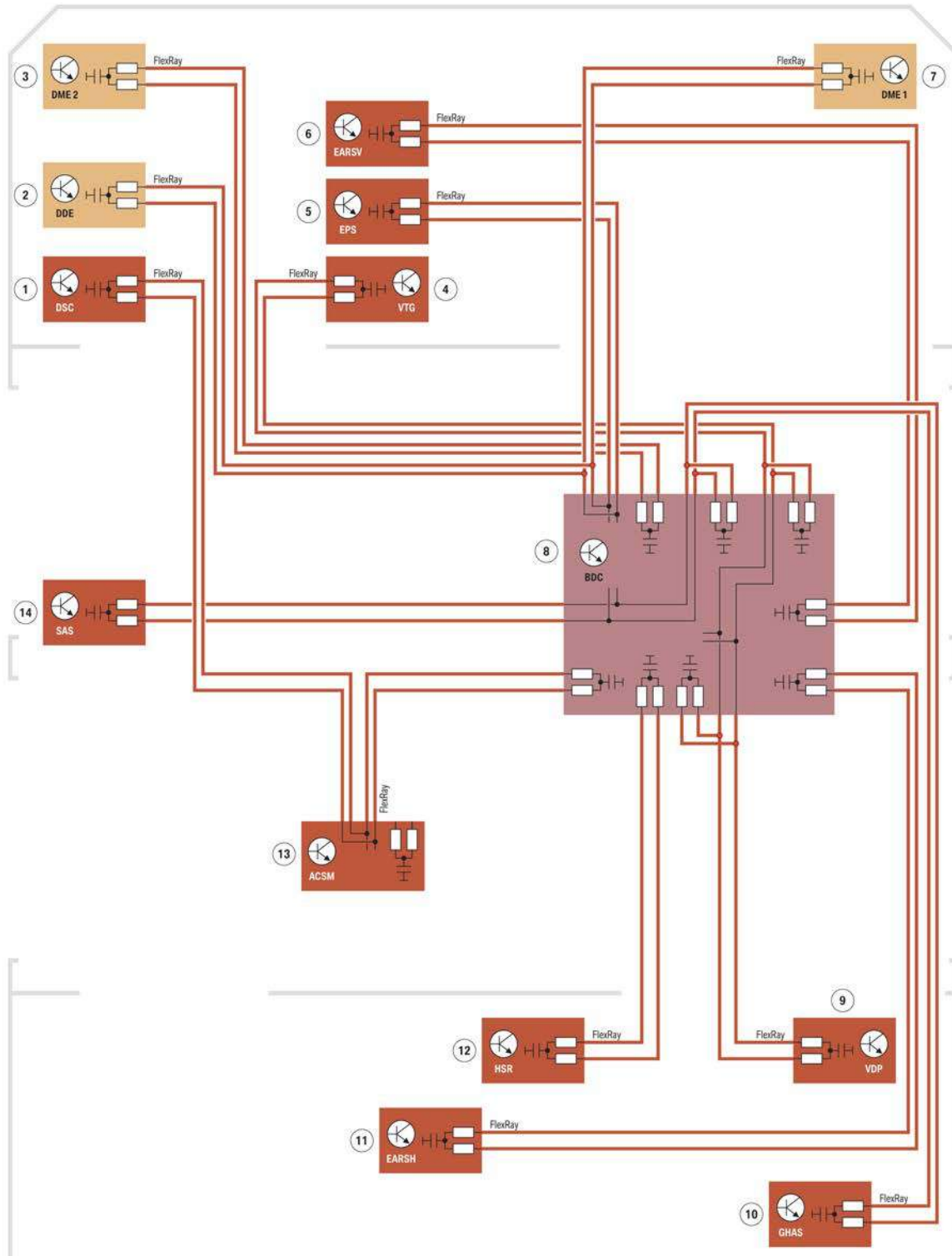
The gateway for the PT-CAN2 is located in the DME.

Both PT-CAN bus systems have a data transfer rate of 500 kBit/s.

G15 General Vehicle Electronics

2. Bus Systems

2.2.3. FlexRay



TE18-1103

G15 FlexRay

G15 General Vehicle Electronics

2. Bus Systems

| Index | Explanation |
|-------|--|
| 1 | Dynamic Stability Control (DSC) |
| 2 | Digital Diesel Electronics (DDE) (Not for US) |
| 3 | Digital Engine Electronics 2 (DME2) |
| 4 | Transfer box (VTG) |
| 5 | Electronic Power Steering (EPS) |
| 6 | Electric active roll stabilization front (EARSV) |
| 7 | Digital Motor Electronics (DME) |
| 8 | Body Domain Controller (BDC) |
| 9 | Vertical Dynamic Platform (VDP) |
| 10 | Regulated rear axle differential lock (GHAS) |
| 11 | Electric active roll stabilization rear (EARSH) |
| 12 | Rear axle slip angle control (HSR) |
| 13 | Advanced Crash Safety Module (ACSM) |
| 14 | Optional equipment system (SAS) |

FlexRay has a data transfer rate of 10 MBit/s.

2.2.4. Ethernet

2 Ethernet variants are used in the G15. The Ethernet variant with 5 lines (4 data lines and 1 activation line) is still used on the G15 by the OBD2 interface to the BDC.

OABR Ethernet (2 data lines) is also used in the G15.

OABR Ethernet application

The following control units are connected to the vehicle electrical system via OABR Ethernet:

- Driver Camera System (DCS)
- Top Rear Side View Camera (TRSVC)
- Rear view camera (RFK)
- Camera-based driver support systems (KAFAS)
- Front radar sensor long range (FRSF).

The following control units are, aside from a further bus system, connected to the vehicle electrical system via OABR Ethernet:

- Head Unit High (HU-H)
- Telematic Communication Box (TCB)
- Receiver Audio Module (RAM)
- Optional equipment system (SAS).

G15 General Vehicle Electronics

2. Bus Systems

Wake-up line

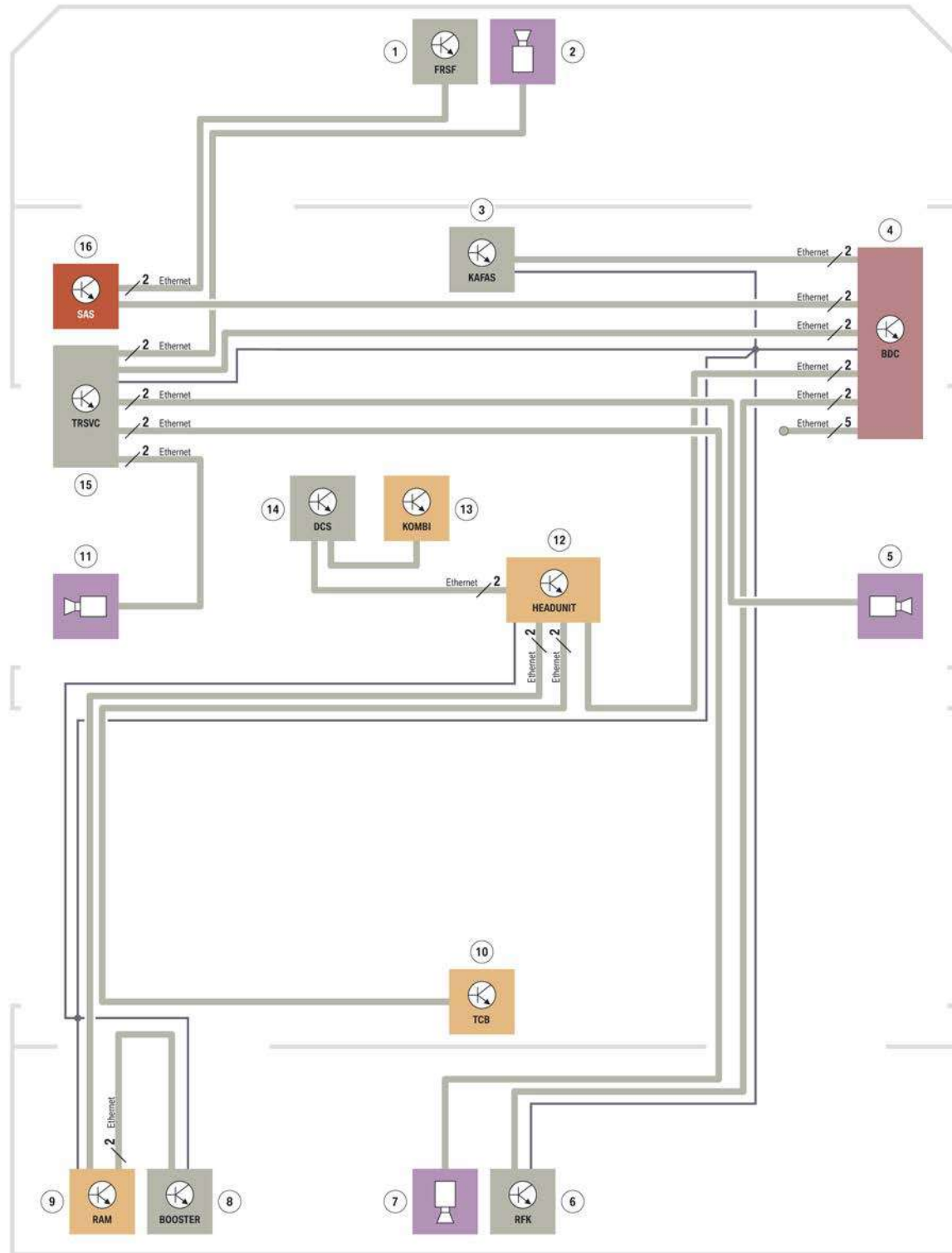
Certain control units require a separate wake-up line for wake-up. The following control units on the Ethernet have a wake-up line:

- Driver Camera System (DCS)
- Booster
- Rear view camera (RFK)
- Top Rear Side View Camera (TR SVC).

G15 General Vehicle Electronics

2. Bus Systems

System wiring diagram



G15 Ethernet

TE18-0615

G15 General Vehicle Electronics

2. Bus Systems

| Index | Explanation |
|-------|---|
| 1 | Front radar sensor long range (FRSF) |
| 2 | Top view camera (only in conjunction with TRSVC) |
| 3 | Camera-based driver support systems (KAFAS) |
| 4 | Body Domain Controller (BDC) |
| 5 | Side view camera right (only in conjunction with TRSVC) |
| 6 | Rear view camera (RFK) |
| 7 | Rear view camera (only in conjunction with TRSVC) |
| 8 | Audio amplifier (Booster) |
| 9 | Receiver Audio Module (RAM) |
| 10 | Telematic Communication Box (TCB) |
| 11 | Side view camera left (only in conjunction with TRSVC) |
| 12 | Head Unit High 3 (HU-H3) |
| 13 | Instrument cluster (KOMBI) |
| 14 | Driver Camera System (DCS) |
| 15 | Top Rear Side View Camera (TRSVC) |
| 16 | Optional equipment system (SAS) |

2.2.5. D-CAN

The D-CAN is installed between the BDC and the diagnostic socket.

The D-CAN has a data transfer rate of 500 kBit/s.

2.3. Local CAN

Depending on the equipment specification, the following local CAN bus system are provided in the G15:

- Between optional equipment system (SAS), Parking Manoeuvring Assistant (PMA) and Top Rear Side View Camera (TRSVC).
- Between optional equipment system (SAS), rear radar sensor short range right (HRSNR), side radar sensor short range front left (SRSNVL) and side radar sensor short range front right (SRSNVR).
- Between rear radar sensor short range right (HRSNR), rear radar sensor short range left (HRSNL), side radar sensor short range front left (SRSNVL) and side radar sensor short range front right (SRSNVR).
- Between Digital Motor Electronics 1 (DME1) and Digital Motor Electronics 2 (DME2).
- Between reversible electromotive reel left (REMA LI), Advanced Crash Safety Module (ACSM) and reversible electromotive reel right (REMARE).

G15 General Vehicle Electronics

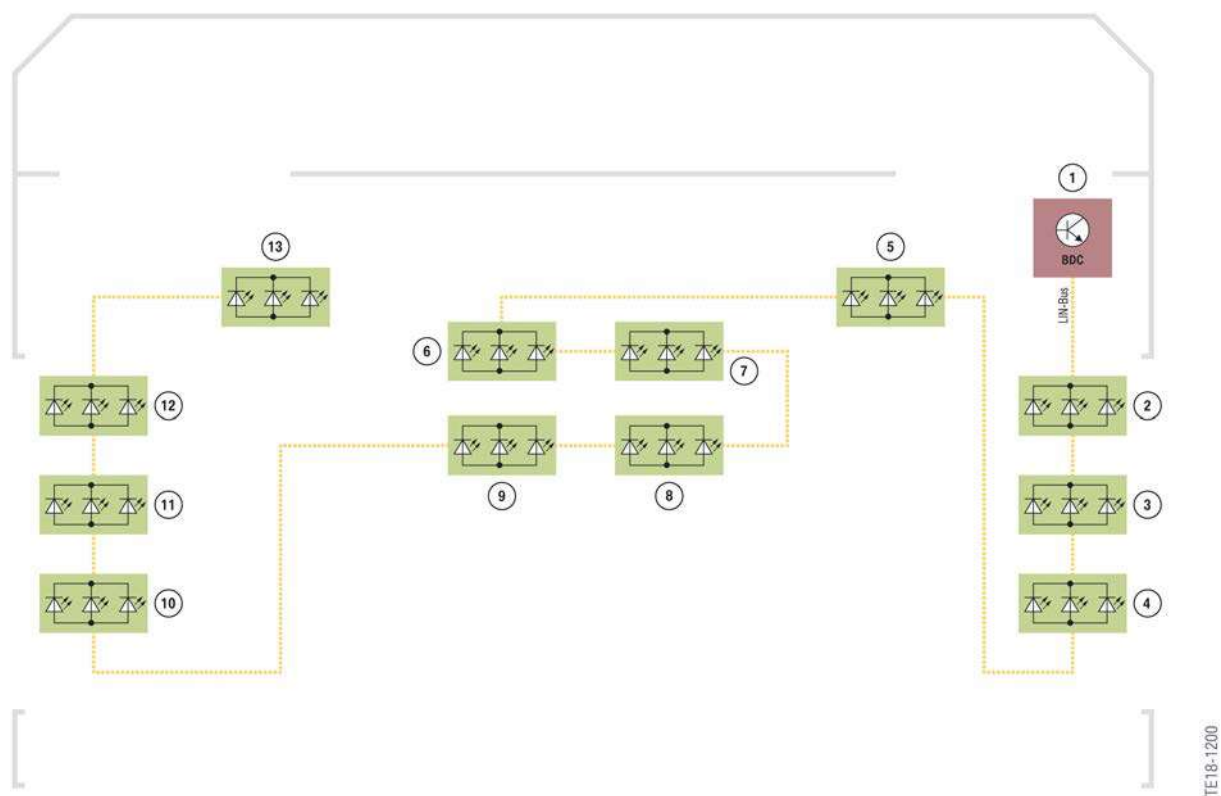
2. Bus Systems

The local CAN bus systems are not all shown in the overview during a diagnosis.

2.4. LIN bus

A multitude of LIN buses are used in the G15. 2 particular LIN buses are the LIN bus for the integrated automatic heating/air conditioning system and the LIN bus for the ambient lighting. Both LIN buses are arranged in series. If the LIN bus is interrupted at a particular point, no communication with subsequent components is possible from this point.

A simplified system wiring diagram is shown below for the ambient lighting.



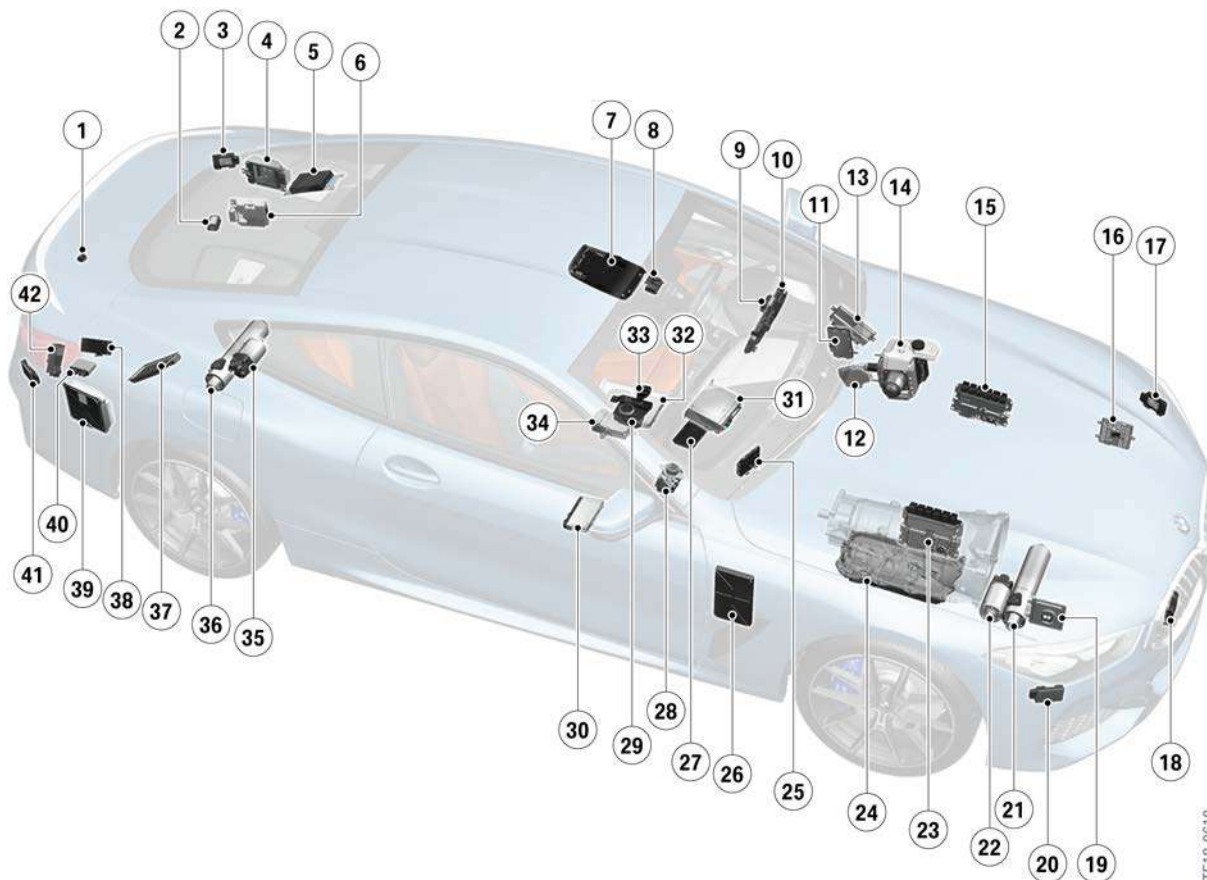
G15 LIN bus, ambient lighting

| Index | Explanation |
|-------|---|
| 1 | Body Domain Controller (BDC) |
| 2 | LED modules, front passenger door |
| 3 | LED module, footwell light, front passenger |
| 4 | LED modules, center stack, left |
| 5 | LED modules, center stack, right |
| 6 | LED modules, driver's door |
| 7 | LED module, footwell light, driver |

G15 General Vehicle Electronics

3. Control Units

3.1. Installation location



G15 installation location of control units

| Index | Explanation |
|-------|---|
| 1 | Rear view camera (RFK) |
| 2 | Remote control receiver (FBD) |
| 3 | Rear radar sensor short range left (HRSNL) |
| 4 | Receiver Audio Module (RAM) |
| 5 | Telematic Communication Box 2 (TCB2) |
| 6 | Booster |
| 7 | Roof function center (FZD) |
| 8 | Camera-based driver support systems (KAFAS) |
| 9 | Driver Camera System (DCS) |
| 10 | Instrument cluster (KOMBI) |
| 11 | Optional equipment system (SAS) |
| 12 | Night Vision Electronics (NVE) |
| 13 | Top Rear Side View Camera (TRSVC) |

G15 General Vehicle Electronics

3. Control Units

| Index | Explanation |
|-------|--|
| 14 | Dynamic Stability Control (DSC) |
| 15 | Digital Motor Electronics (DME) |
| 16 | Frontal Light Electronics Left (FLEL) |
| 17 | Side radar sensor short range front left (SRSNVL) |
| 18 | Front radar sensor long range (FRSF) |
| 19 | Frontal Light Electronics Right (FLER) |
| 20 | Side radar sensor short range front right (SRSNVR) |
| 21 | Electric active roll stabilization front (EARSV) |
| 22 | Electronic Power Steering (EPS) |
| 23 | Digital Engine Electronics 2 (DME2) |
| 24 | Electronic transmission control (EGS) |
| 25 | Integrated automatic heating / air conditioning (IHKA) |
| 26 | Body Domain Controller (BDC) |
| 27 | Wireless charging station (WCA) |
| 28 | Transfer box (VTG) |
| 29 | Controller (CON) |
| 30 | Front passenger seat module (SMBF) |
| 31 | Head Unit High 3 (HU-H3) |
| 32 | Driver's seat module (SMFA) |
| 33 | Gear selector switch (GWS) |
| 34 | Advanced Crash Safety Module (ACSM) |
| 35 | Rear axle slip angle control (HSR) |
| 36 | Electric active roll stabilization rear (EARSH) |
| 37 | Vertical Dynamic Platform (VDP) |
| 38 | Tailgate function module (HKFM) |
| 39 | Power Control Unit (PCU) |
| 40 | Parking Manoeuvring Assistant (PMA) |
| 41 | Rear radar sensor short range right (HRSNR) |
| 42 | Regulated rear axle differential lock (GHAS) |

G15 General Vehicle Electronics

3. Control Units

3.2. Gateway

3.2.1. Body Domain Controller



Body Domain Controller

Functions

The Body Domain Controller is responsible for the following functions:

- Gateway
- Electronic immobilizer
- Terminal control
- Central locking system
- Power windows
- Horn
- Interior light
- Exterior lights
- Wash/wipe system
- Vehicle data storage
- Data transfer, Conditioned Based Service.

Fuses

The following components are protected by fuses in the Body Domain Controller:

- Horn
- Head Unit High
- Light operating unit
- Intelligent Safety button

G15 General Vehicle Electronics

3. Control Units

- Audio operating unit
- Steering column switch cluster
- Diagnostic socket
- Vertical Dynamic Platform (electronics)
- Integrated automatic heating / air conditioning
- Rain-light-solar-condensation sensor
- Tailgate function module
- Telematic Communication Box
- Outside door handle electronics
- Control unit, contactless tailgate activation
- Power Control Unit
- Central locking system.

Relays

The following relays are located in the Body Domain Controller:

- Terminal 30F
- Horn
- Central locking system
- Headlight cleaning system.

Gateway

The central gateway module (ZGM) is integrated in the new Body Domain Controller (BDC). It is viewed as a control unit within a control unit, in that the ZGM in the BDC behaves like an autarkic control unit. The purpose of the ZGM is to connect all the bus systems to each other. By connecting them in this way, it is possible to use information from the individual bus systems on a generalized level. The central gateway module is able to implement different protocols and speeds on other bus systems. The programming data for the control units is transmitted by Ethernet to the vehicle via the ZGM.

LIN controller

The BDC is the gateway for the following components at the local interconnect network bus:

- Switch block, driver's/front passenger door
- Control unit, contactless tailgate activation
- Exterior rearview mirrors
- Audio operating unit
- Light switch
- Intelligent Safety button

G15 General Vehicle Electronics

3. Control Units

- Steering column switch cluster (SZL)
- Seat heating
- Operating facility, center console
- Wiper
- Steering column adjustment
- Interior mirror
- Roof function center (FZD) (interior lighting)
- Rain-light-solar-condensation sensor (RLSBS)
- Rear right power distribution box.

The following control units are connected via a LIN bus to the BDC, but the BDC has only one wake-up function:

- Auxiliary battery charging unit
- Intelligent battery sensor
- Electric fan
- Active air flap control
- Digital Motor Electronics.

3.3. Control units on the K-CAN2

The following control units are connected to the K-CAN2:

- Roof function center (FZD)
- Driver's seat module (SMFA)
- Front passenger seat module (SMBF)
- Tailgate function module (HKFM).

G15 General Vehicle Electronics

3. Control Units

3.3.1. Roof function center

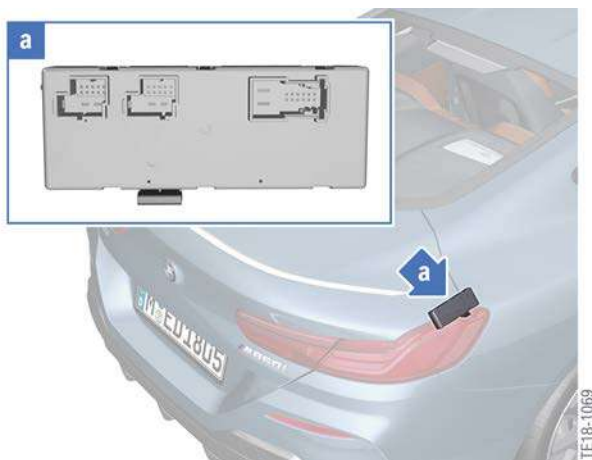


Roof function center

Depending on the equipment specification, the roof function center (FZD) contains the following functions:

- Alarm system
- Gesture recognition camera
- Emergency call button
- Interior lighting.

3.3.2. Tailgate function module



Tailgate function module

G15 General Vehicle Electronics

3. Control Units

3.3.3. Seat modules



Seat modules

Sports seats with electrical adjustment and memory function are installed as standard equipment.

3.4. Control units on the K-CAN3

The following control units are connected to the K-CAN3:

- Parking Manoeuvring Assistant (PMA)
- Rear radar sensor short range right (HRSNR).

Further information on the two control units can be found in the Product Information **Driver Assistance Systems 2018**.

3.4.1. Parking Manoeuvring Assistant



Parking Manoeuvring Assistant

G15 General Vehicle Electronics

3. Control Units

3.4.2. Rear radar sensors short range



Rear radar sensors short range

The rear radar sensors short range are a further development of the lane change warning (SWW) radar sensors. Both rear radar sensors have diagnostic capability.

The rear radar sensor short range left is connected via a local CAN to the rear radar sensor short range right.

3.5. Control units on the K-CAN4

The following control units are connected to the K-CAN4:

- Controller (CON)
- Integrated automatic heating / air conditioning (IHKA)
- Telematic Communication Box 2 (TCB2)
- Head Unit High 3 (HU-H3)
- Receiver Audio Module (RAM).

Further information on the following control units can be found at:

| Control unit | Product information |
|-----------------------------|----------------------------|
| Controller (CON) | Displays and Controls 2018 |
| Head Unit High 3 (HU-H3) | Infotainment 2018 |
| Receiver Audio Module (RAM) | |

G15 General Vehicle Electronics

3. Control Units

3.5.1. Controllers



Controllers

3.5.2. Integrated automatic heating / air conditioning



Integrated automatic heating / air conditioning

G15 General Vehicle Electronics

3. Control Units

3.5.3. Telematic Communication Box 2



Telematic Communication Box

The Telematic Communication Box 2 (TCB2) is installed in the luggage compartment.

3.5.4. Head Unit High 3



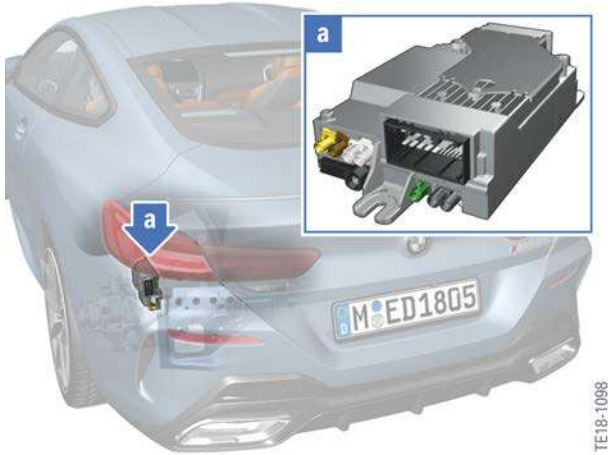
Head Unit High

The Head Unit High 3 (HU-H3) is installed in the G15. The HU-H3 does not have an integrated CD or DVD drive. The tuners for the radio are integrated in the Receiver Audio Module (RAM).

G15 General Vehicle Electronics

3. Control Units

3.5.5. Receiver Audio Module



Receiver Audio Module

The Receiver Audio Module (RAM) contains the following functions:

- Antenna tuner
- Antenna amplifier
- Audio amplifier.

3.6. Control units on the K-CAN5

The following control units are connected to the K-CAN5:

- Remote control receiver (FBD)
- Wireless charging station (WCA).

Further information on the wireless charging station (WCA) can be found in the Product Information **General Vehicle Electronics 2018**.

G15 General Vehicle Electronics

3. Control Units

3.6.1. Remote control receiver



Remote control receiver

3.6.2. Wireless charging station



Wireless charging station

The wireless charging station (WCA) contains an NFC antenna and electronics for simple mobile phone connection and for communication with the BMW Digital Key.

3.7. Control units on the K-CAN6

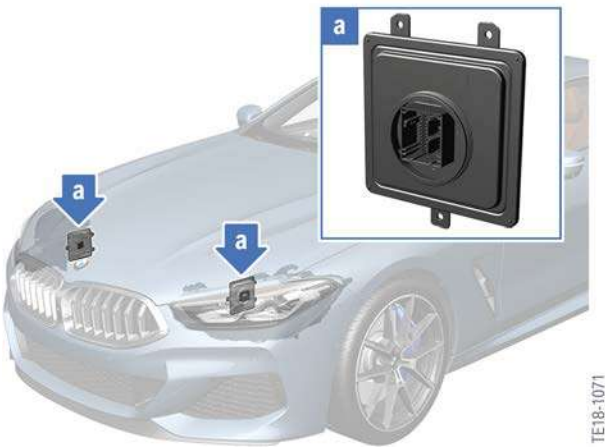
The following control units are connected to the K-CAN6:

- Frontal Light Electronics Left (FLEL)
- Frontal Light Electronics Right (FLER)

G15 General Vehicle Electronics

3. Control Units

3.7.1. Frontal Light Electronics



Frontal Light Electronics left/right

3.8. Control units on the Ethernet

The following control units are connected to the Ethernet:

- Front radar sensor long range (FRSF)
- Rear view camera (RFK)
- Top Rear Side View Camera (TR SVC)
- Camera-based driver support systems (KAFAS)
- Driver Camera System (DCS)
- Booster.

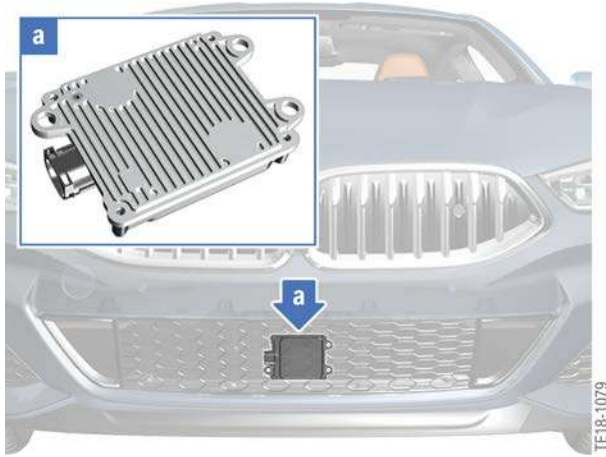
Further information on the following control units can be found at:

| Control unit | Product information |
|---|--------------------------------|
| Front radar sensor long range (FRSF) Camera-based driver support systems (KAFAS) Driver Camera System (DCS) | Driver Assistance Systems 2018 |
| Booster | Infotainment 2018 |

G15 General Vehicle Electronics

3. Control Units

3.8.1. Front radar sensor long range



Front radar sensor long range

The front radar sensor long range (FRSF) is a further development of the ACC radar sensor.

3.8.2. Rear view camera

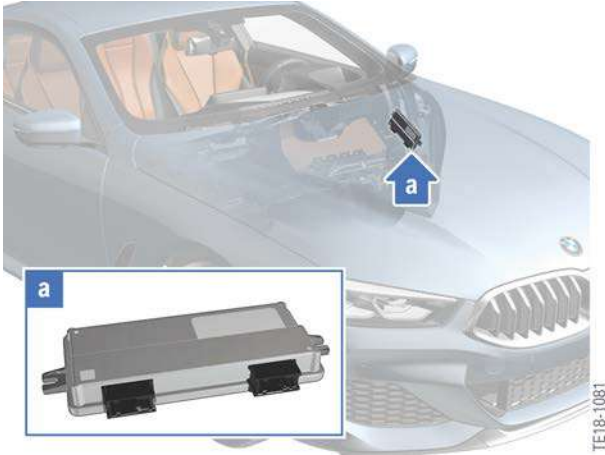


Rear view camera

G15 General Vehicle Electronics

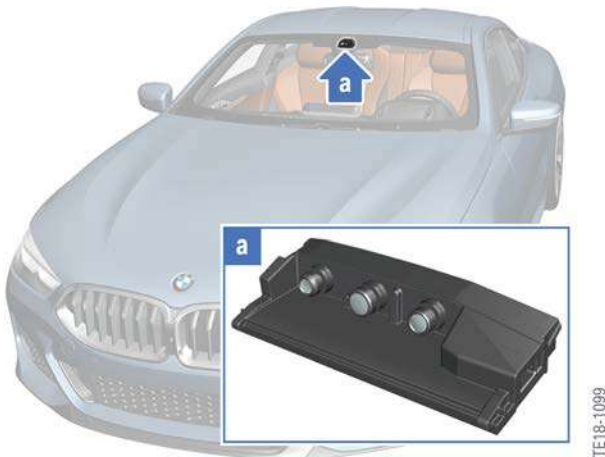
3. Control Units

3.8.3. Top rear side view camera



Top rear side view camera

3.8.4. Camera-based driver assistance systems



Camera-based driver assistance systems

The KAFAS camera is installed in 2 variants, depending on the equipment specification:

- Camera with 1 lens
- Camera with 3 lenses.

G15 General Vehicle Electronics

3. Control Units

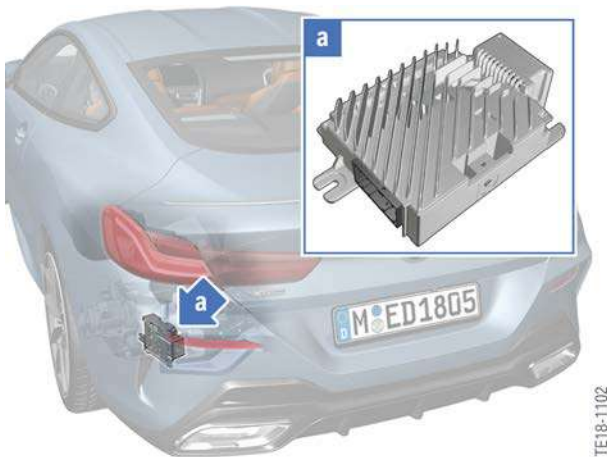
3.8.5. Driver Camera System



Driver Camera System

The Driver Camera System (DCS) contains a camera on the instrument cluster to observe the opening of the driver's eyes.

3.8.6. Booster



Booster

The Booster is the successor to the previous AMP-T audio amplifier.

G15 General Vehicle Electronics

3. Control Units

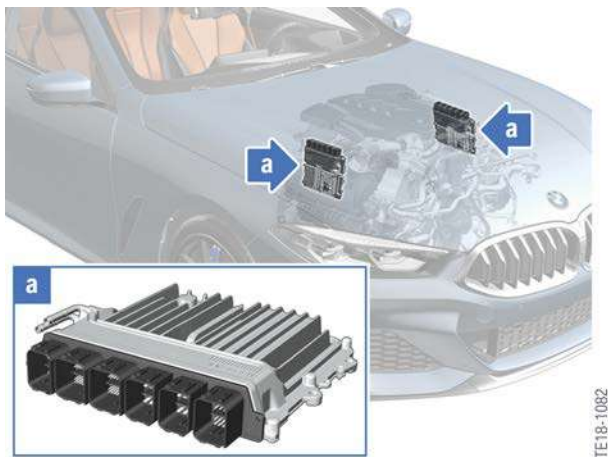
3.9. Control units on the PT-CAN

The following control units are connected to the PT-CAN:

- Digital Motor Electronics (DME)
- Instrument cluster (KOMBI)
- Night Vision Electronics (NVE).

Further information on the instrument cluster can be found in the Product Information **Displays and Controls 2018**.

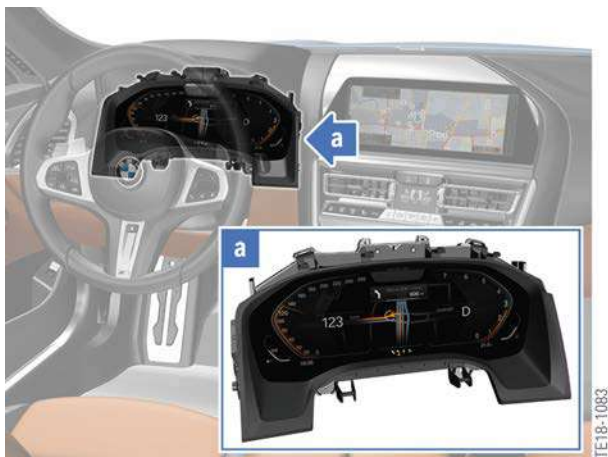
3.9.1. Digital Motor Electronics



Digital Motor Electronics

2 control units (DME1 and DME2) are installed in the M850i xDrive.

3.9.2. Instrument cluster

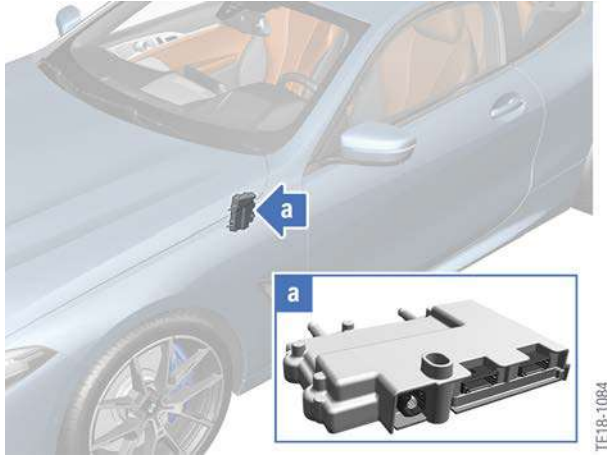


Instrument cluster

G15 General Vehicle Electronics

3. Control Units

3.9.3. Night Vision Electronics



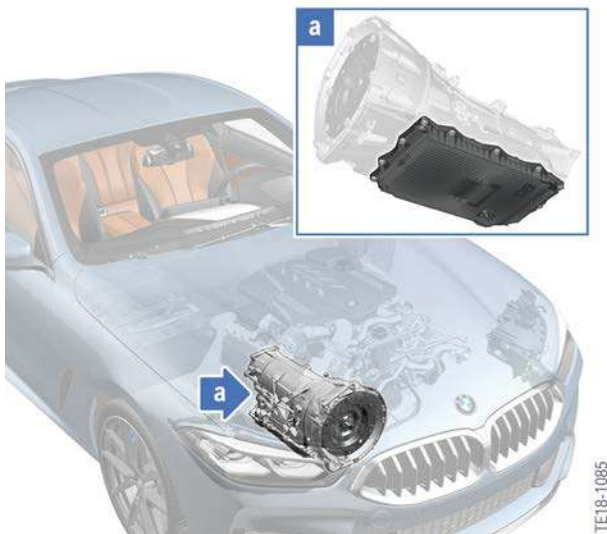
Night Vision Electronics

3.10. Control units on the PT-CAN2

The following control units are connected to the PT-CAN2:

- Electronic transmission control EGS
- Gear selector switch GWS
- Power Control Unit PCU

3.10.1. Electronic transmission control



Electronic transmission control

G15 General Vehicle Electronics

3. Control Units

3.10.2. Gear selector switch



Gear selector switch

3.10.3. Power Control Unit



Power Control Unit

3.11. Control units on the FlexRay

The following control units are connected to the FlexRay:

- Advanced Crash Safety Module (ACSM)
- Dynamic Stability Control (DSC)
- Electric active roll stabilization front (EARSV)
- Electric active roll stabilization rear (EARSH)
- Electronic Power Steering (EPS)
- Rear axle slip angle control HSR

G15 General Vehicle Electronics

3. Control Units

- Optional equipment system (SAS)
- Transfer box (VTG)
- Vertical Dynamic Platform (VDP)
- Regulated rear axle differential lock.

Further information on Dynamic Stability Control (DSC) can be found in the Product Information **G15 Drivetrain**.

3.11.1. Advanced Crash Safety Module



Advanced Crash Safety Module

3.11.2. Dynamic Stability Control



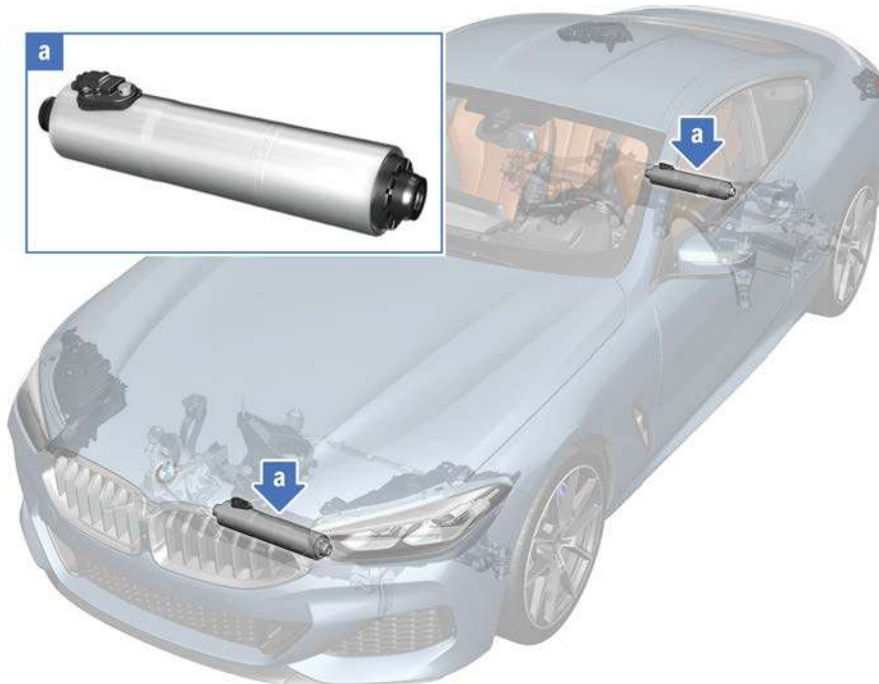
Dynamic Stability Control

DSC consists of 2 integrated control units, Dynamic Stability Control and the Virtual Integration Platform.

G15 General Vehicle Electronics

3. Control Units

3.11.3. Electric active roll stabilization



TE18-1091

Electric active roll stabilization

3.11.4. Electronic Power Steering



TE18-1092

Electronic Power Steering

G15 General Vehicle Electronics

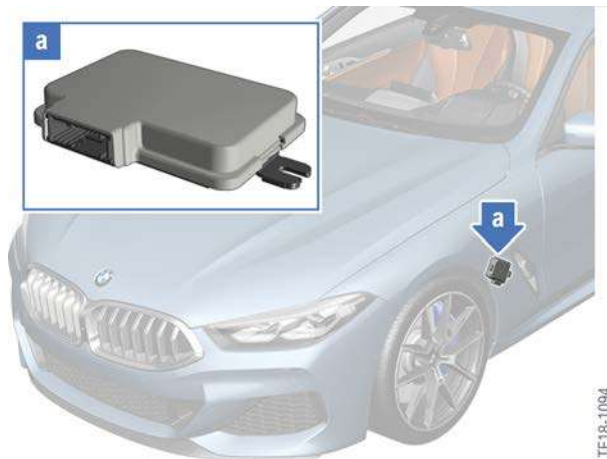
3. Control Units

3.11.5. Rear axle slip angle control



Rear axle slip angle control

3.11.6. Optional equipment system



Optional equipment system

TE18-1094

G15 General Vehicle Electronics

3. Control Units

3.11.7. Transfer box



Transfer box

TE18-1095

3.11.8. Vertical dynamic platform



Vertical dynamic platform

TE18-1096

G15 General Vehicle Electronics

3. Control Units

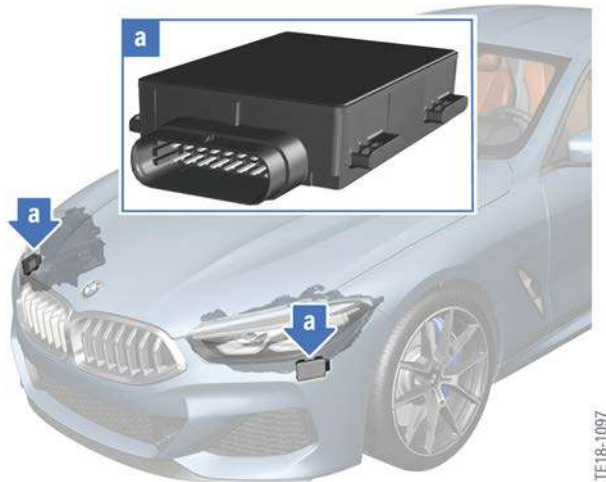
3.11.9. Regulated rear axle differential lock



Regulated rear axle differential lock

3.12. Control units on the local CAN

3.12.1. Side radar sensors short range front



Side radar sensors short range front

The two side radar sensors are a further development of the radar sensors left and right. Both radar sensors are displayed in the diagnosis.

G15 General Vehicle Electronics

4. Voltage Supply

4.1. Overview

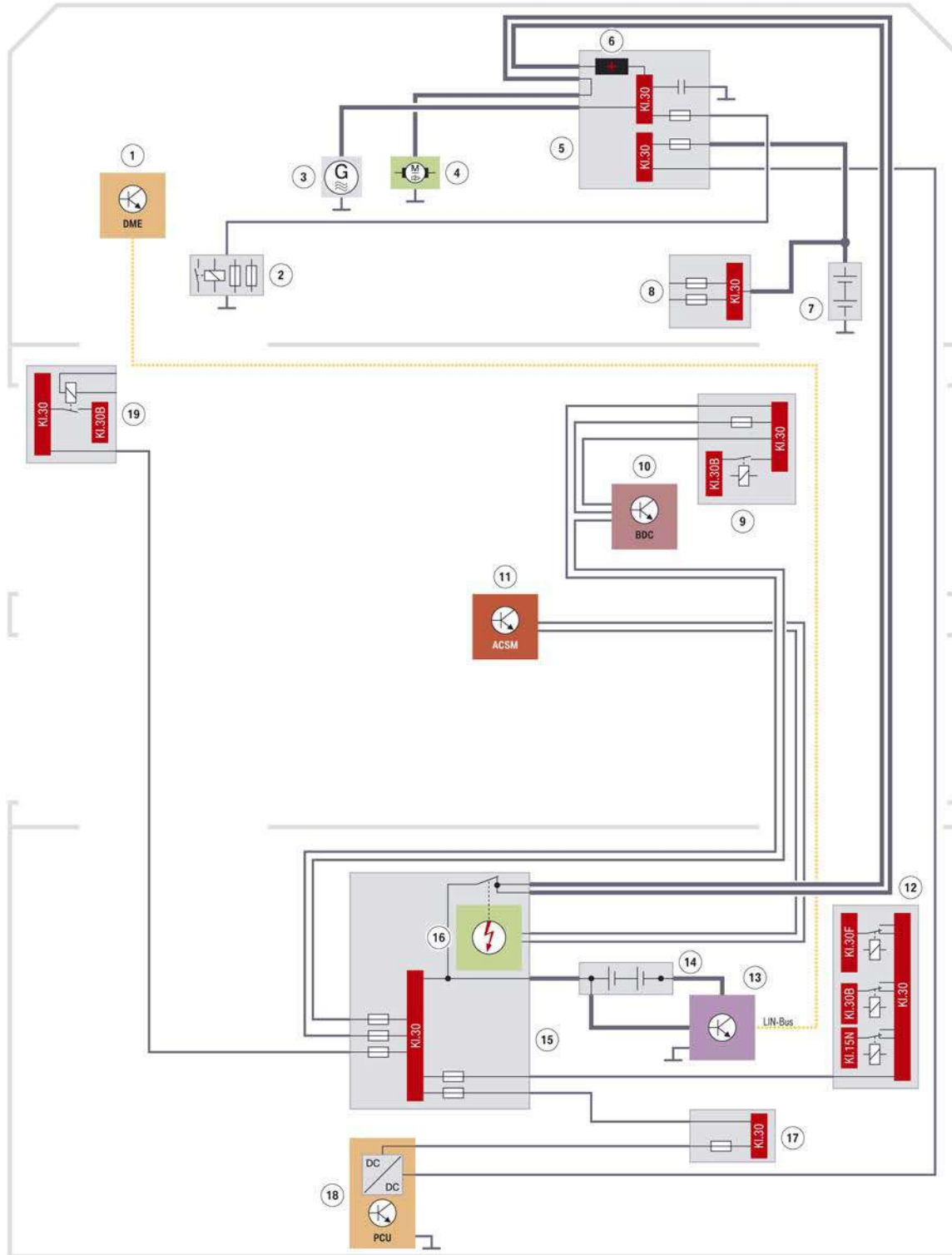
A vehicle electrical system support with an auxiliary battery and a Power Control Unit is installed.

Further information on the dual storage system can be found in the Product Information **General Vehicle Electronics 2018**.

G15 General Vehicle Electronics

4. Voltage Supply

4.1.1. System wiring diagram, vehicle electrical system support



Voltage supply

TE18-1104

G15 General Vehicle Electronics

4. Voltage Supply

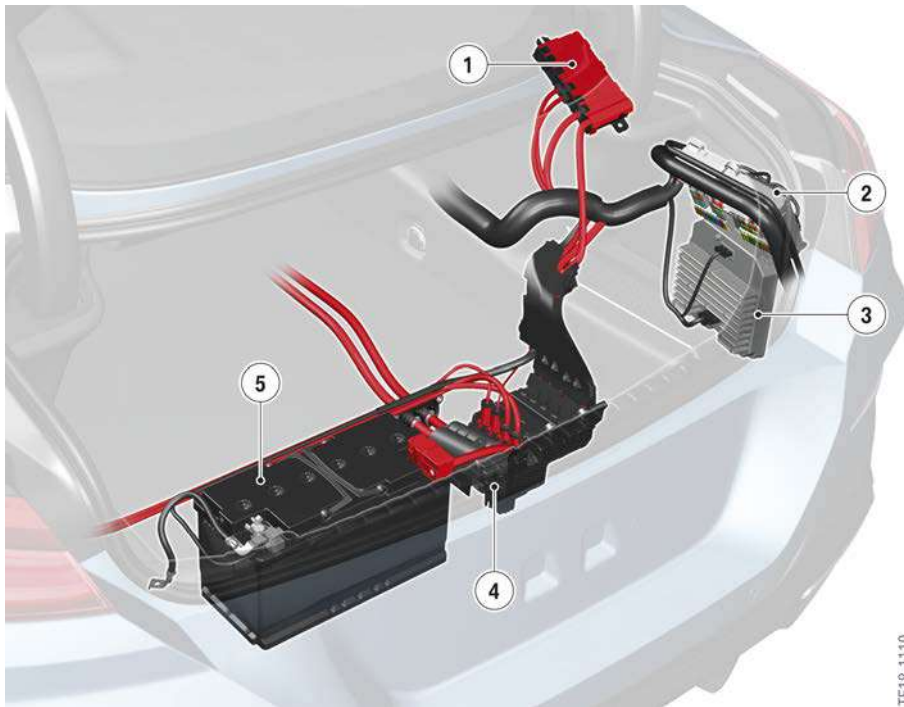
| Index | Explanation |
|-------|---|
| 1 | Digital Motor Electronics (DME) |
| 2 | Power supply module |
| 3 | Alternator |
| 4 | Starter motor |
| 5 | Power distribution box, engine compartment |
| 6 | Positive battery connection point |
| 7 | Auxiliary battery |
| 8 | Power distribution box, auxiliary battery, engine compartment |
| 9 | Power distribution box, front right |
| 10 | Body Domain Controller (BDC) |
| 11 | Advanced Crash Safety Module (ACSM) |
| 12 | Power distribution box, luggage compartment |
| 13 | Intelligent Battery Sensor (IBS) |
| 14 | Battery |
| 15 | Battery power distribution box |
| 16 | Safety battery terminal (SBK) |
| 17 | Power distribution box, battery, right |
| 18 | Power Control Unit (PCU) |
| 19 | Power distribution box, front left |

G15 General Vehicle Electronics

4. Voltage Supply

4.2. Components

4.2.1. Overview of luggage compartment



G15 overview of luggage compartment

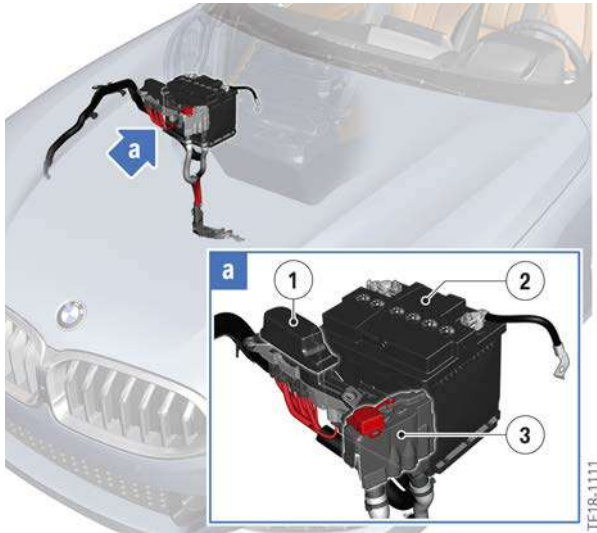
| Index | Explanation |
|-------|---|
| 1 | Power distribution box, battery, right |
| 2 | Power distribution box, luggage compartment |
| 3 | Power Control Unit PCU 500 W |
| 4 | Power distribution box with safety battery terminal |
| 5 | Battery |

G15 General Vehicle Electronics

4. Voltage Supply

4.2.2. Overview of engine compartment

The following graphic shows the vehicle electrical system support.



G15 overview of engine compartment

| Index | Explanation |
|-------|--|
| a | Vehicle electrical system support with AGM auxiliary battery |
| 1 | Power distribution box, engine compartment |
| 2 | Auxiliary battery, vehicle electrical system support |
| 3 | Jump start terminal point |

4.2.3. Battery

AGM batteries are to supply the G15 with electric power. The vehicle battery is installed in the luggage compartment. Depending on the equipment specification, an auxiliary battery is installed in the engine compartment.

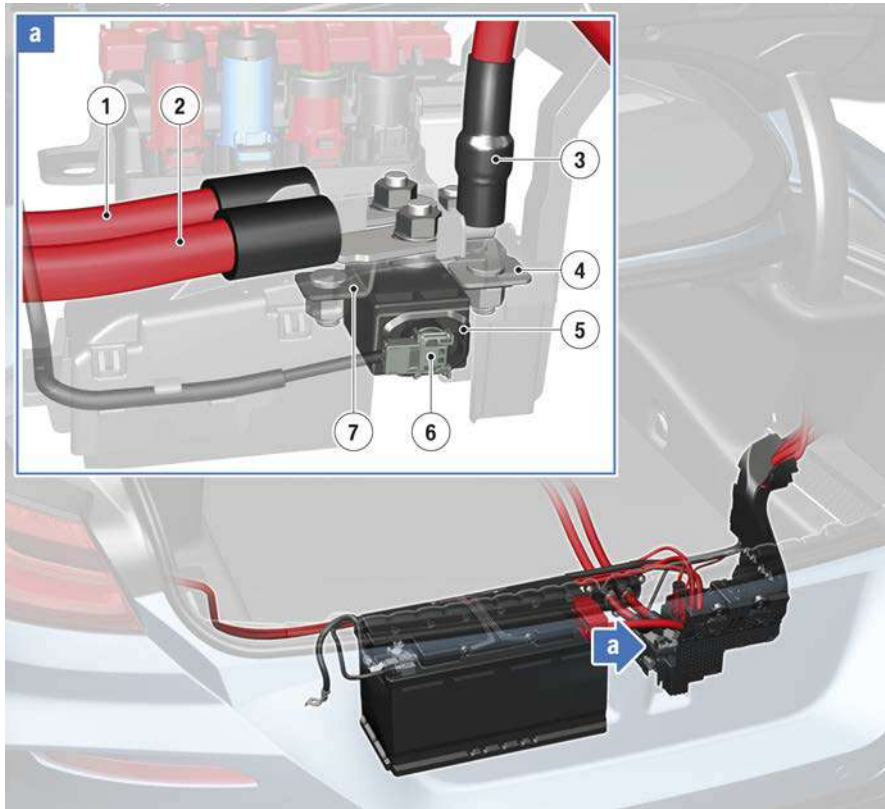
Depending on the equipment specification, either a 90 Ah or a 105 Ah vehicle battery can be installed.

The auxiliary battery in the engine compartment is installed with vehicle electrical system support. This is a 60 Ah AGM battery.

G15 General Vehicle Electronics

4. Voltage Supply

Safety battery terminal



G15 safety battery terminal

| Index | Explanation |
|-------|--|
| 1 | B+ cable to the starter motor and alternator |
| 2 | B+ cable to the jump start terminal point |
| 3 | Positive wire in the power distribution box |
| 4 | Busbar |
| 5 | Safety battery terminal (SBK) |
| 6 | Connector, safety battery terminal |
| 7 | Busbar |

G15 General Vehicle Electronics

4. Voltage Supply

4.2.4. Integrated supply module

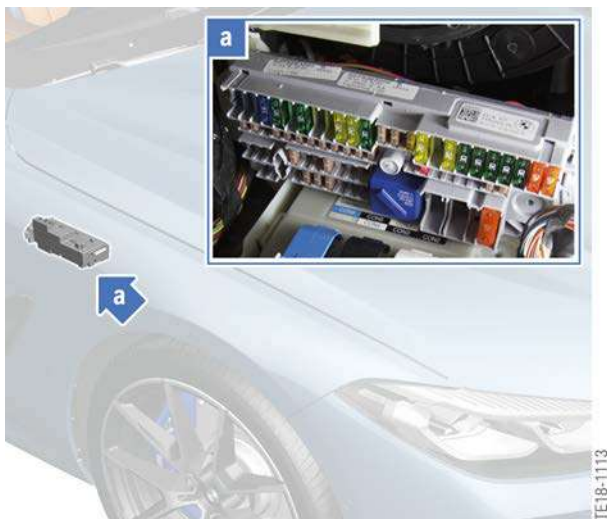


G15 integrated supply module

The engine control and its components are supplied with voltage via the integrated supply module.

4.2.5. Power distribution box

Front right



G15 power distribution box, front right

G15 General Vehicle Electronics

4. Voltage Supply

A relay for terminal 30B is installed in the front right power distribution box.

The connected consumers are supplied with terminal 30, terminal 30B and terminal 15N. Terminal 15N is controlled by the luggage compartment power distribution box.

Front left



G15 power distribution box, front left

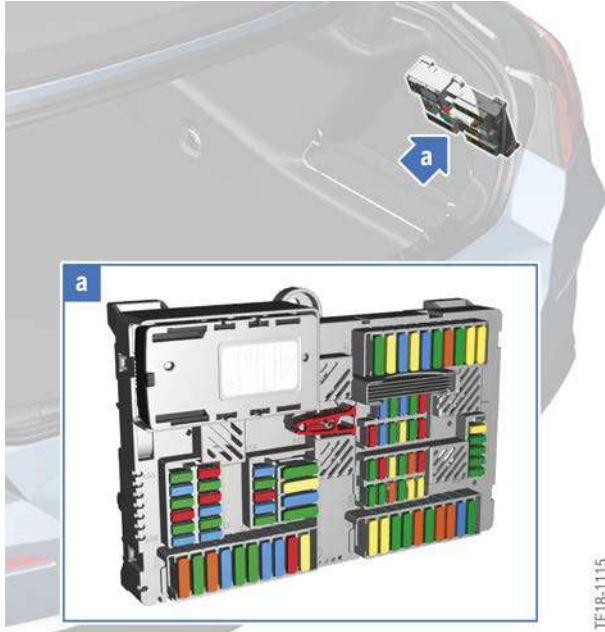
A relay for terminal 30B is installed in the front left power distribution box.

The connected consumers are supplied with terminal 30 and terminal 30B.

G15 General Vehicle Electronics

4. Voltage Supply

Luggage compartment



G15 power distribution box, luggage compartment

The following relays are installed in the luggage compartment power distribution box:

- 1 relay, terminal 15N
- 2 relays, terminal 30B
- 2 relays, terminal 30F
- 1 relay, rear window heating.

All the relays are bi-stable. The relays are activated by the Body Domain Controller via a LIN bus. The luggage compartment power distribution box controls the terminal 30B relays of the two front power distribution boxes.

Body Domain Controller

A terminal 30F relay is installed in the Body Domain Controller (BDC).

A number of consumers are supplied via the BDC with terminal 30 and terminal 30F.

4.2.6. Power Control Unit with vehicle electrical system support

Present-day vehicles have a high energy consumption due to the many electrical consumers. As a result, there is a high demand on the vehicle battery particularly in phases in which the combustion engine is not running and the alternator is not supplying any power (e.g. engine start-stop phases).

In order to protect the vehicle battery, the G15 is fitted with DC/DC converter in the Power Control Unit (PCU) and an auxiliary battery.

G15 General Vehicle Electronics

4. Voltage Supply

The preconditions for the direction of the energy management are calculated from the use of the vehicle. When the engine is running the auxiliary battery is charged from the conventional vehicle electrical system. During the phases in which the combustion engine is not running, the energy is supplied from the auxiliary battery to the conventional vehicle electrical system.

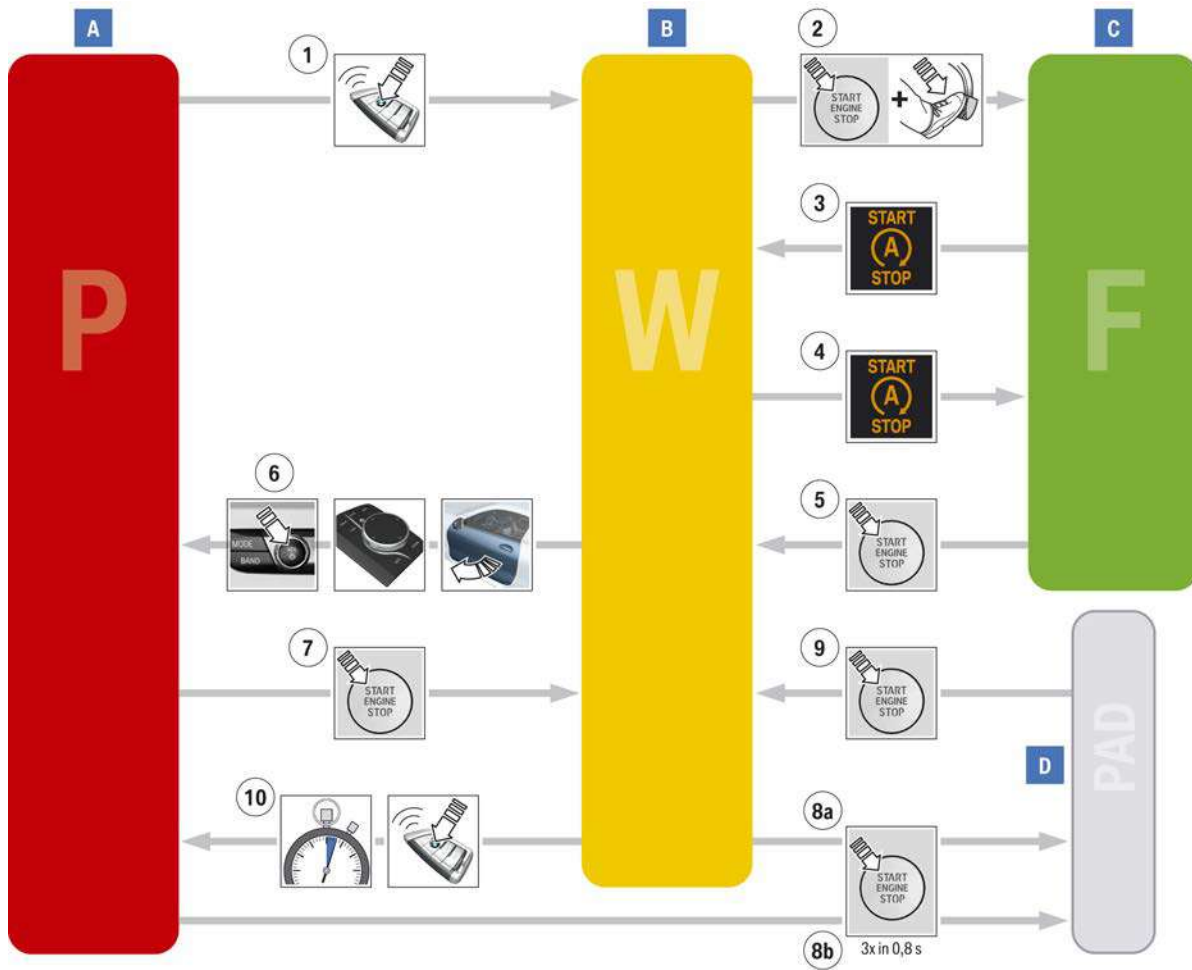
A control unit which is connected to the PT-CAN2 is integrated in the PCU. A DC/DC converter with an output of 500 W is also integrated.

G15 General Vehicle Electronics

5. Terminal Control

5.1. Introduction

The G15 is provided with the terminal control **P**arking **R**esiding **D**riving known since the G12.



G15 terminal control

| Index | Explanation |
|-------|---|
| A | Parking |
| B | Residing |
| C | Driving |
| D | Testing-analysis-diagnosis (PAD) mode |
| 1 | Change from parking to residing by waking up the vehicle (e.g. vehicle unlocking) |
| 2 | Change from residing to driving by pressing the start/stop button and the brake pedal at the same time (combustion engine is started) |
| 3 | Automatic engine start-stop function stop |
| 4 | Automatic engine start-stop function start |

G15 General Vehicle Electronics

5. Terminal Control

| Index | Explanation |
|-------|---|
| 5 | When the start/stop button is pressed, the terminal status changes from driving to residing (combustion engine is switched off). |
| 6 | Change from residing to driving (activate the head unit media button for more than 3 s, confirm change via controller, change by leaving the vehicle) |
| 7 | When the start/stop button is pressed, the terminal status changes from parking to residing. |
| 8a | When the start/stop button is pressed (3 times in 0.8 s), the terminal status changes from residing to testing-analysis-diagnosis (PAD). |
| 8b | When the start/stop button is pressed (3 times in 0.8 s), the terminal status changes from parking to testing-analysis-diagnosis (PAD). |
| 9 | When the start/stop button is pressed, the terminal status changes from testing-analysis-diagnosis (PAD) to residing. |
| 10 | Change from residing to driving (locking vehicle, no customer interaction for 10 minutes.) |

Further information on terminal control can be found in the Product Information **G12 General Vehicle Electronics**.

5.2. Partial network operation

Present-day vehicles contain up to 70 control units with well over 100 microcontrollers which are networked with each other. Depending on the current vehicle condition, not all comfort and assistance systems are always required.

Through the targeted cutting out and cutting in of control units that are not required, it is possible to save energy and thus relieve the strain on the battery.

5.2.1. Control units

Different transceivers are used in the control units in order to realize partial network operation. These transceivers are able to evaluate and interpret messages. This control unit remains switched off as long as any bus communication takes place without a valid wake-up event for the control unit being present. If a wake-up event is transmitted on the corresponding bus, the transceiver can activate the microcontroller's voltage regulator and the control unit starts up.

Certain control units on the Ethernet require a separate wake-up via the terminal 15 wake-up line for starting up.

5.2.2. Residing

If e.g. the radio is being listened to in the vehicle condition, only the bus system to which the radio function is connected is active. The other bus systems are woken up only when a further function, such as e.g. seat heating, is required.

G15 General Vehicle Electronics

5. Terminal Control

5.2.3. Driving

If during the drive functions are not used or required, e.g. seat adjustment, the corresponding control units can be switched off.

G15 General Vehicle Electronics

6. Exterior Lights

6.1. Headlights

6.1.1. Variants

The G15 is fitted exclusively with BMW laser lights.

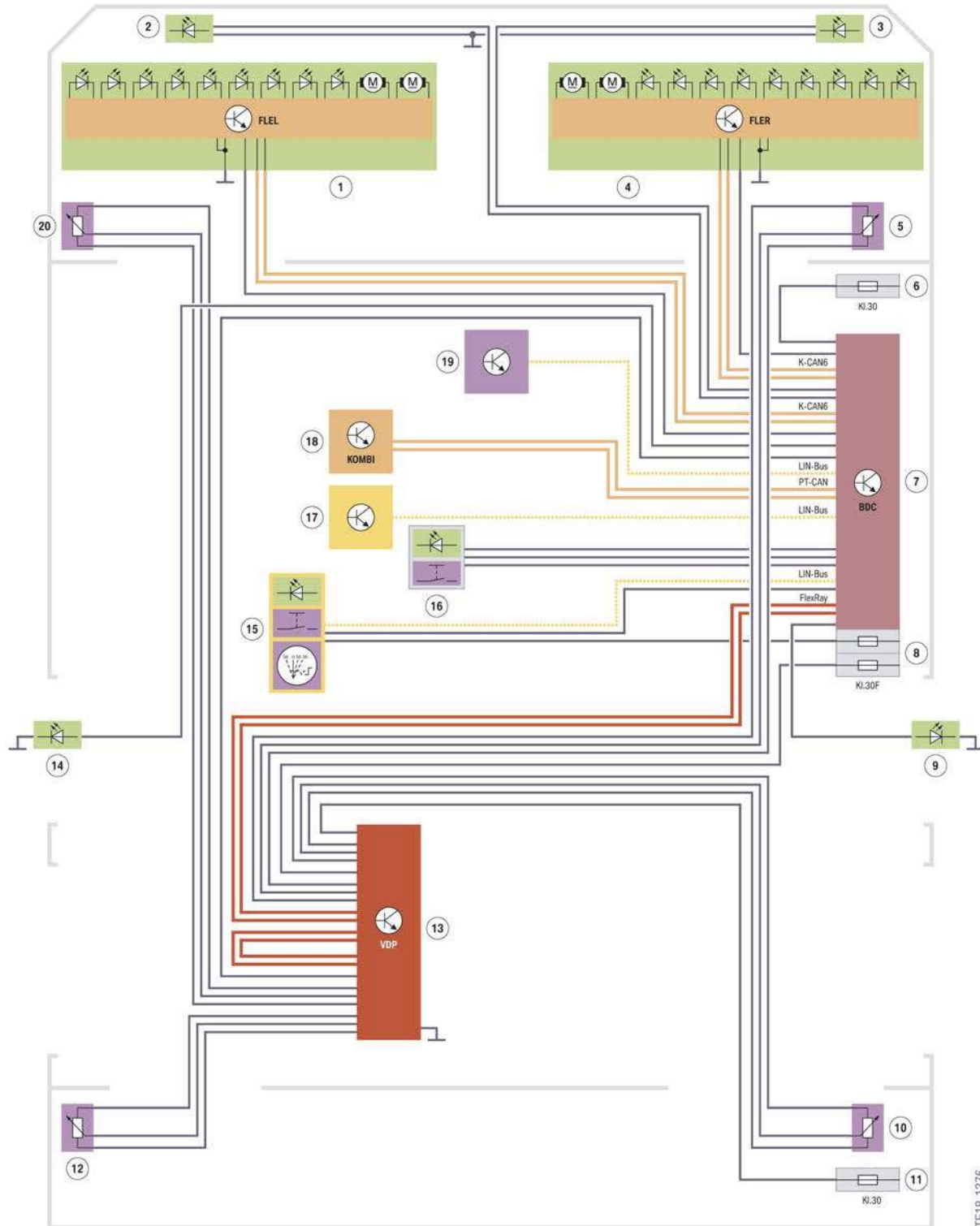
- BMW laser light (SA 5AZ).

A headlight cleaning system is not offered.

G15 General Vehicle Electronics

6. Exterior Lights

6.1.2. System wiring diagram



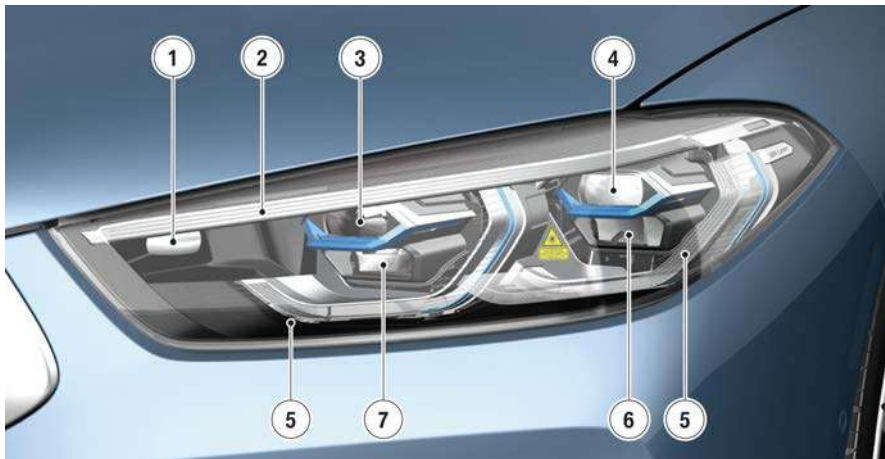
G15 lighting, front

G15 General Vehicle Electronics

6. Exterior Lights

| Index | Explanation |
|-------|---|
| 1 | Frontal Light Electronics Left (FLEL) |
| 2 | Left fog light |
| 3 | Right fog light |
| 4 | Frontal Light Electronics Right (FLER) |
| 5 | Ride height sensor, front right |
| 6 | Fuses in the power distribution box, front right |
| 7 | Body Domain Controller (BDC) |
| 8 | Fuse in the Body Domain Controller |
| 9 | Turn indicator in exterior rearview mirror, right |
| 10 | Ride height sensor, rear right |
| 11 | Fuse for rear right power distribution box |
| 12 | Ride-height sensor, rear left |
| 13 | Vertical Dynamic Platform (VDP) |
| 14 | Turn indicator in exterior rearview mirror, left |
| 15 | Light operating unit |
| 16 | Hazard warning switch/Intelligent Safety button |
| 17 | Steering column switch cluster (SZL) |
| 18 | Instrument cluster (KOMBI) |
| 19 | Rain-light-solar-condensation sensor (RLSBS) |
| 20 | Ride height sensor, front right |

6.1.3. BMW laser light



G15 BMW laser light

G15 General Vehicle Electronics

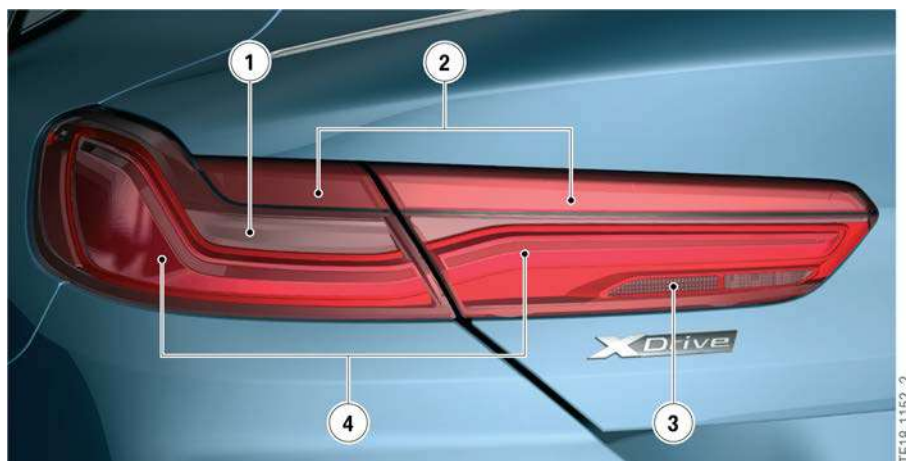
6. Exterior Lights

| Index | Explanation |
|-------|----------------------------------|
| 1 | Cornering light |
| 2 | Turn indicator |
| 3 | Low-beam headlight |
| 4 | Low-beam headlight and high beam |
| 5 | Side light/daytime driving light |
| 6 | High beam laser and high beam |
| 7 | High beam |

A warning sticker in the headlight is required by law in some countries.

6.2. Lighting, rear

6.2.1. Rear light



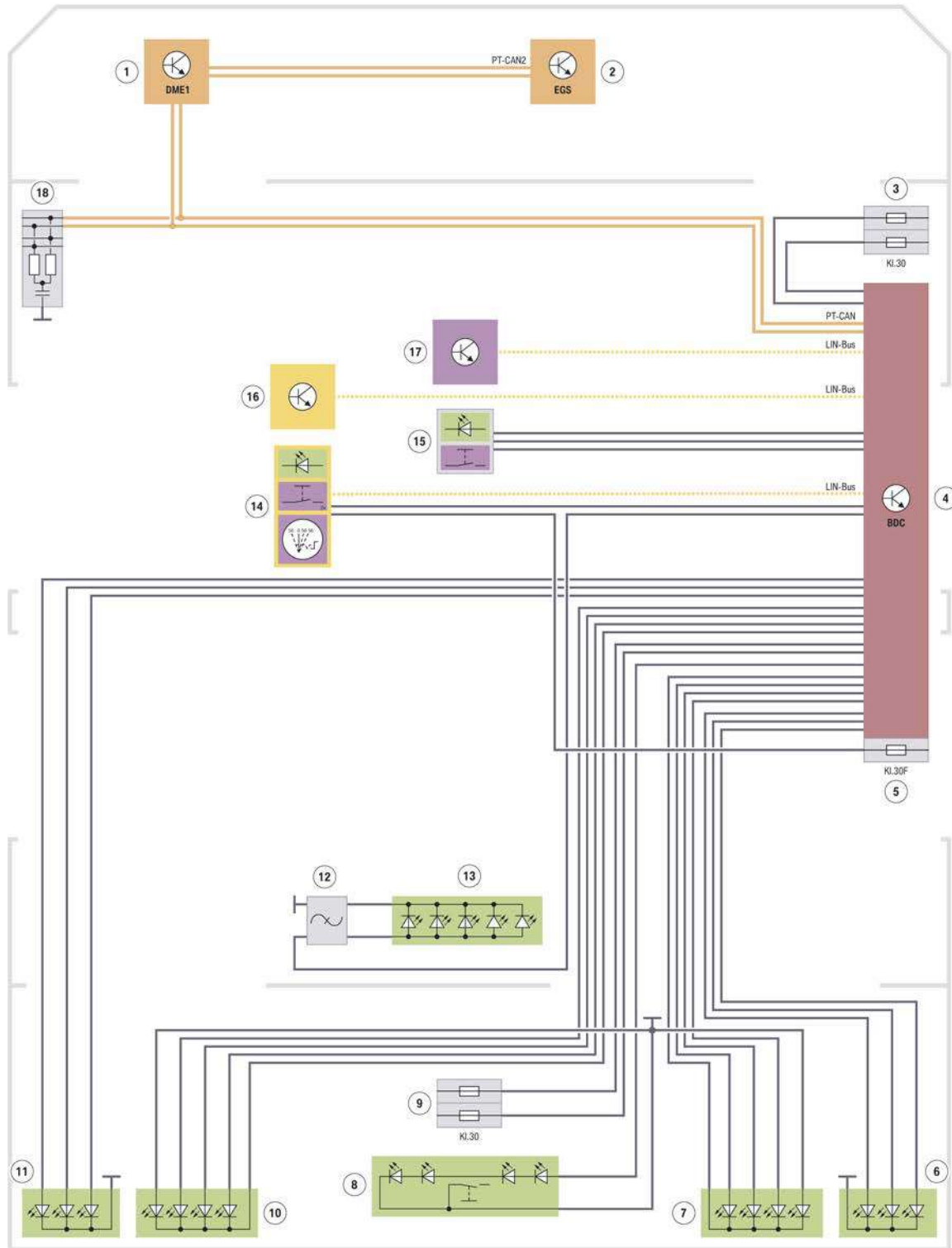
G15 rear light

| Index | Explanation |
|-------|-----------------|
| 1 | Brake light |
| 2 | Turn indicator |
| 3 | Reversing light |
| 4 | Tail light |

G15 General Vehicle Electronics

6. Exterior Lights

6.2.2. System wiring diagram



G15 lighting, rear

TE18-0616

G15 General Vehicle Electronics

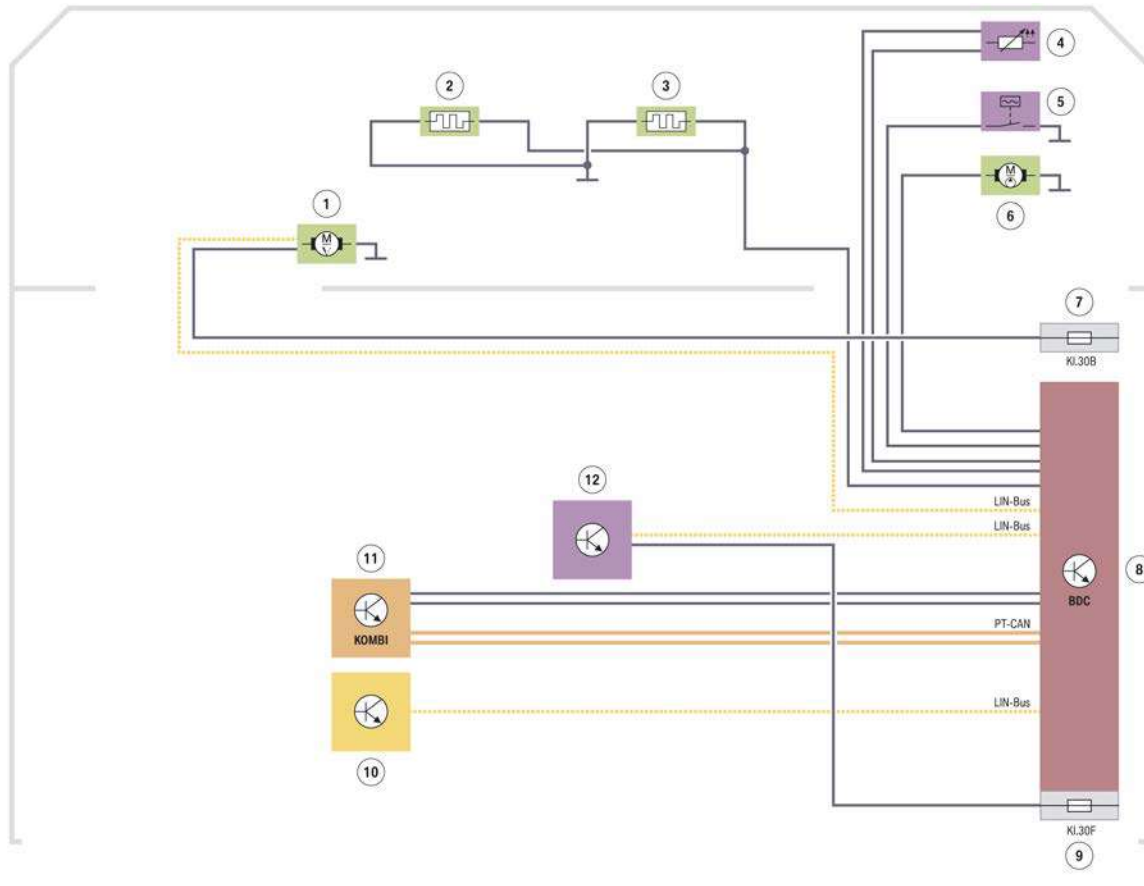
6. Exterior Lights

| Index | Explanation |
|-------|--|
| 1 | Digital Motor Electronics 1 (DME1) |
| 2 | Electronic transmission control (EGS) |
| 3 | Fuses in power distribution box, front right |
| 4 | Body Domain Controller (BDC) |
| 5 | Fuse, Body Domain Controller |
| 6 | Rear light, outer right (turn indicator, brake light, tail light) |
| 7 | Rear light, inner right (turn indicator, brake light, tail light, reversing light) |
| 8 | Number plate lights/tailgate button |
| 9 | Battery power distribution box fuses |
| 10 | Rear light, inner left (turn indicator, brake light, tail light, reversing light) |
| 11 | Rear light, outer left (turn indicator, brake light, tail light) |
| 12 | Interference suppression filter |
| 13 | Additional brake light |
| 14 | Light switch |
| 15 | Hazard warning switch/Intelligent Safety button |
| 16 | Steering column switch cluster (SZL) |
| 17 | Rain-light-solar-condensation sensor (RLSBS) |
| 18 | CAN terminator |

G15 General Vehicle Electronics

7. Wash/Wipe System

7.1. System wiring diagram



G15 wash/wipe system

| Index | Explanation |
|-------|--|
| 1 | Wiper motor |
| 2 | Washer jet heating, left |
| 3 | Washer jet heating, right |
| 4 | Outside temperature sensor |
| 5 | Washer fluid level switch |
| 6 | Window washer pump |
| 7 | Fuse for front right power distribution box |
| 8 | Body Domain Controller (BDC) |
| 9 | Fuse, Body Domain Controller |
| 10 | Steering column switch cluster (SZL) |
| 11 | Instrument cluster (KOMBI) |
| 12 | Rain-light-solar-condensation sensor (RLSBS) |

G15 General Vehicle Electronics

7. Wash/Wipe System

The wiper motor is a 12 V motor with gearing. The control unit, the wiper motor and the transmission form one replaceable unit. This wiper motor unit comprises:

- A permanently excited direct current motor with attached reduction gear
- Control unit electronics with position sensor and suppressor components with attached plug connection.

The control unit in the wiper motor is able to identify the following faults:

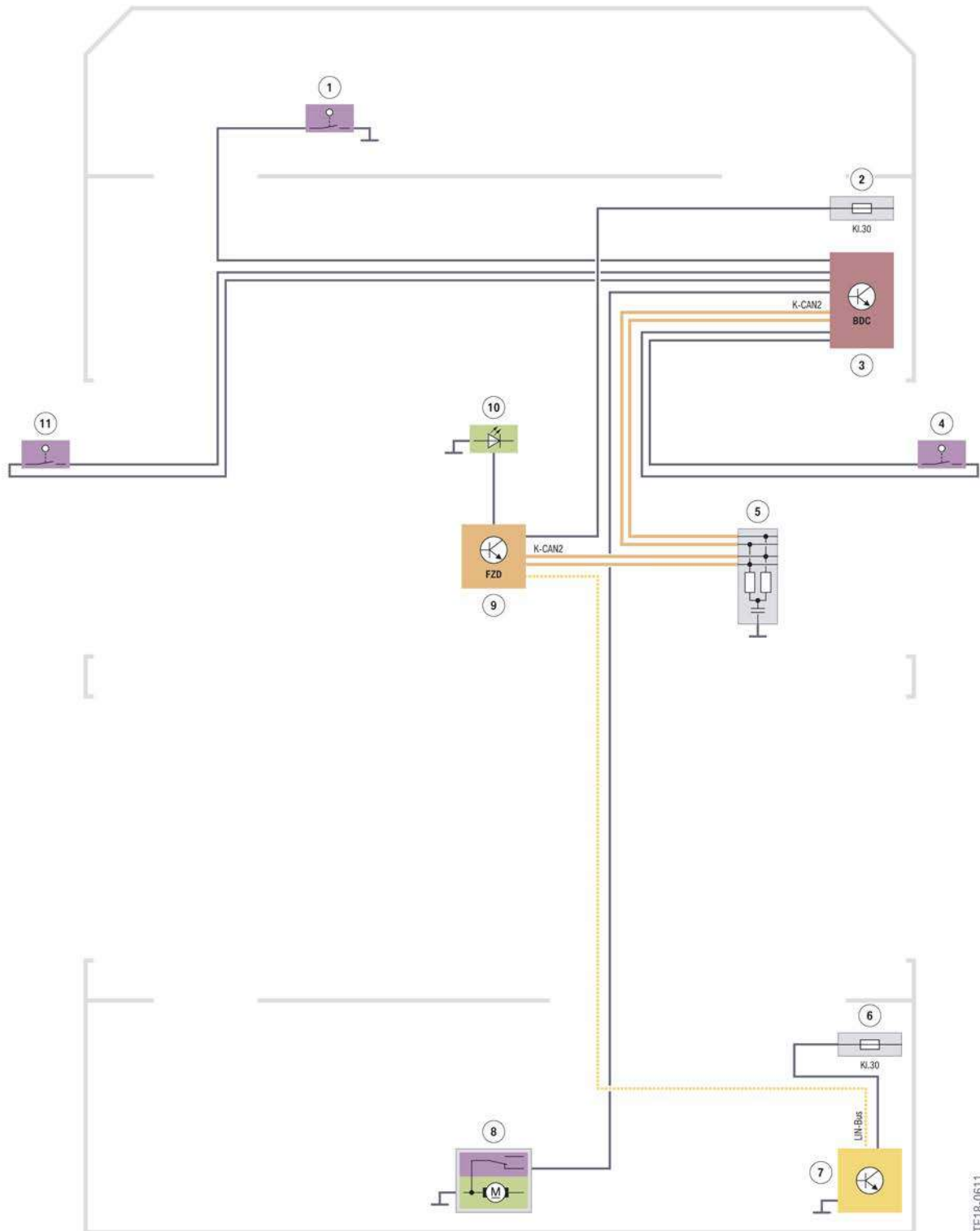
- Fault, control unit electronics
- Short circuit
- Open circuits.

The control unit in the wiper motor does not have a fault memory. The fault code entry is effected in the Body Domain Controller BDC.

G15 General Vehicle Electronics

8. Alarm System

8.1. System wiring diagram



G15 alarm system

TE18-0611

G15 General Vehicle Electronics

8. Alarm System

| Index | Explanation |
|-------|---|
| 1 | Bonnet switch |
| 2 | Fuse, power distribution box, front |
| 3 | Body Domain Controller (BDC) |
| 4 | Door lock, passenger's side |
| 5 | CAN terminator |
| 6 | Luggage compartment power distribution box fuse |
| 7 | Siren with tilt alarm sensor (SINE) |
| 8 | Tailgate lock |
| 9 | Roof function center (FZD) |
| 10 | LED interior mirror |
| 11 | Door lock, driver's side |

The alarm system is equipped with an ultrasonic interior movement detector for monitoring the passenger compartment. This is integrated in the roof function center.

The Body Domain Controller monitors the door contacts, the bonnet switches and the tailgate. As soon as a status changes, the ultrasonic interior movement detector receives this information via the K-CAN2. When the alarm system is activated, an alarm is set off by the siren with tilt alarm sensor (SINE) in the event of a break-in.

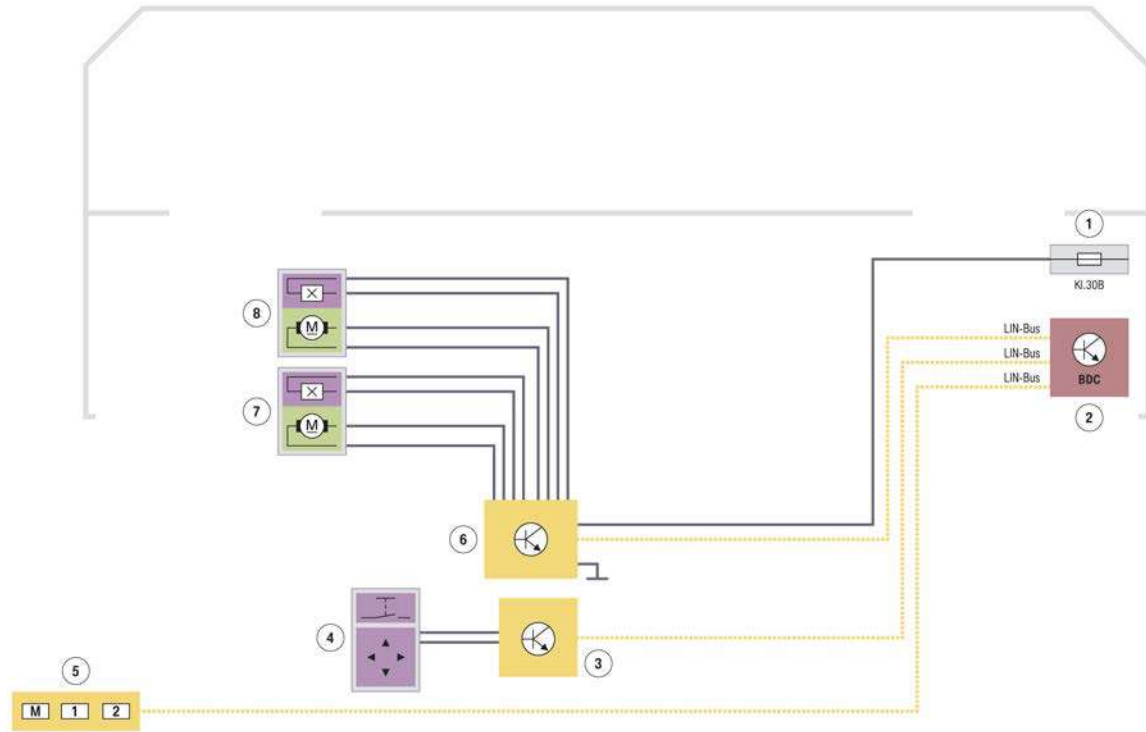
The siren with tilt alarm sensor (SINE) is connected to the roof function center via a LIN bus.

The status of the alarm system is displayed via an LED in the interior mirror.

G15 General Vehicle Electronics

9. Electr. Steering Column Adjustment

9.1. System wiring diagram



G15 electric steering column adjustment

| Index | Explanation |
|-------|---|
| 1 | Fuse for front right power distribution box |
| 2 | Body Domain Controller (BDC) |
| 3 | Steering column switch cluster (SZL) |
| 4 | Steering column adjustment switch |
| 5 | Memory switch, driver's door |
| 6 | Steering column adjustment |
| 7 | Motor, steering column adjustment |
| 8 | Motor, steering column adjustment |

G15 General Vehicle Electronics

10. Interior Lighting

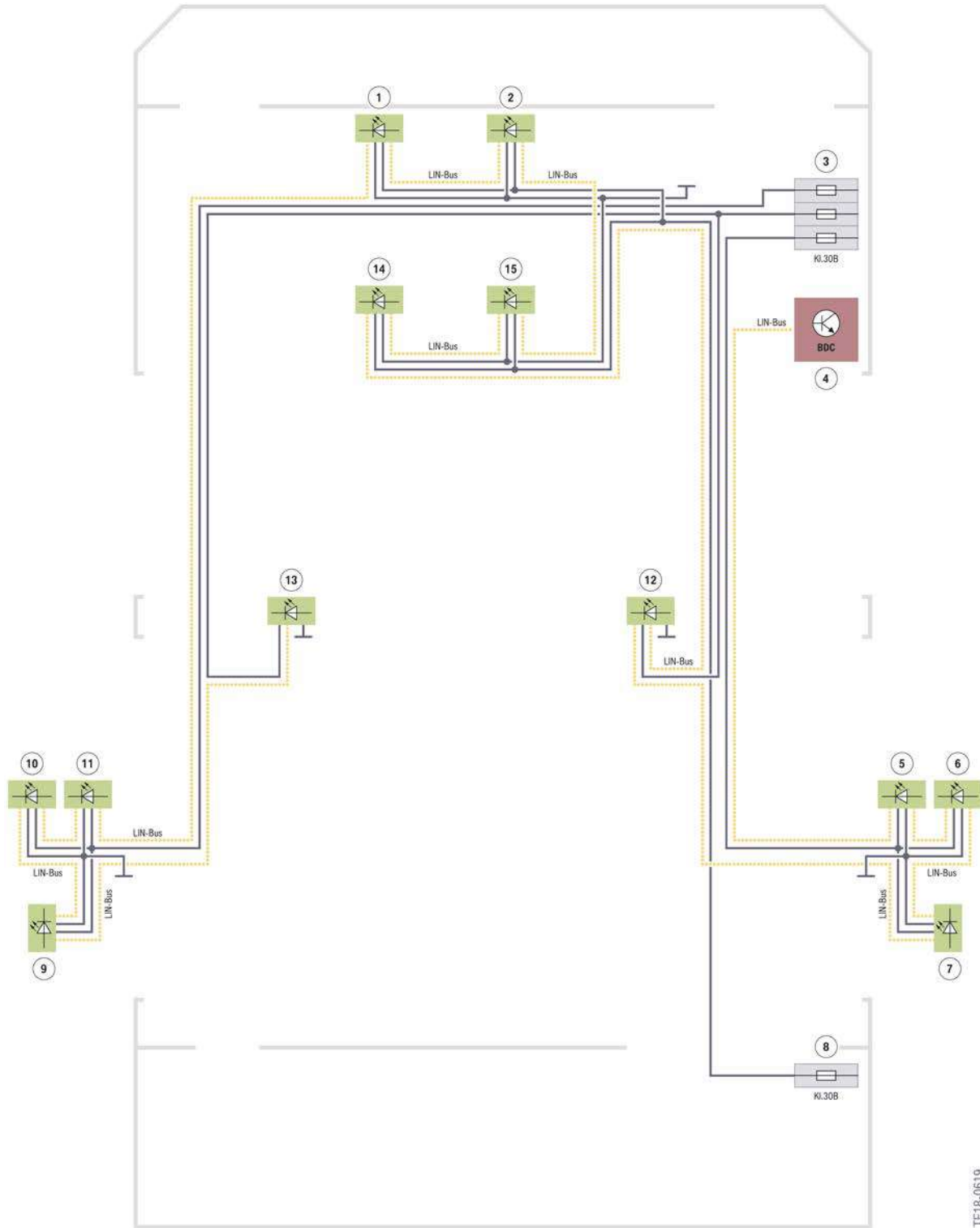
10.1. Basic

The G15 has ambient lighting as standard equipment.

G15 General Vehicle Electronics

10. Interior Lighting

10.1.1. System wiring diagram, ambient lighting



G15 ambient lighting

TE18-0619

G15 General Vehicle Electronics

10. Interior Lighting

| Index | Explanation |
|-------|---|
| 1 | RGB LED center stack, left |
| 2 | RGB LED center stack, right |
| 3 | Fuses in power distribution box, front right |
| 4 | Body Domain Controller (BDC) |
| 5 | RGB LED storage compartment, door, right |
| 6 | RGB LED door opener, right |
| 7 | RGB LED contour lines, door, right |
| 8 | Luggage compartment power distribution box fuse |
| 9 | RGB LED contour lines, door, left |
| 10 | RGB LED door opener, right |
| 11 | RGB LED storage compartment, door, left |
| 12 | RGB LED footwell, right |
| 13 | RGB LED footwell, left |
| 14 | RGB LED center stack, left |
| 15 | RGB LED center stack, right |

The ambient lighting comprises 11 predefined light designs.

During an incoming phone call the ambient lighting flashes at a specified frequency.

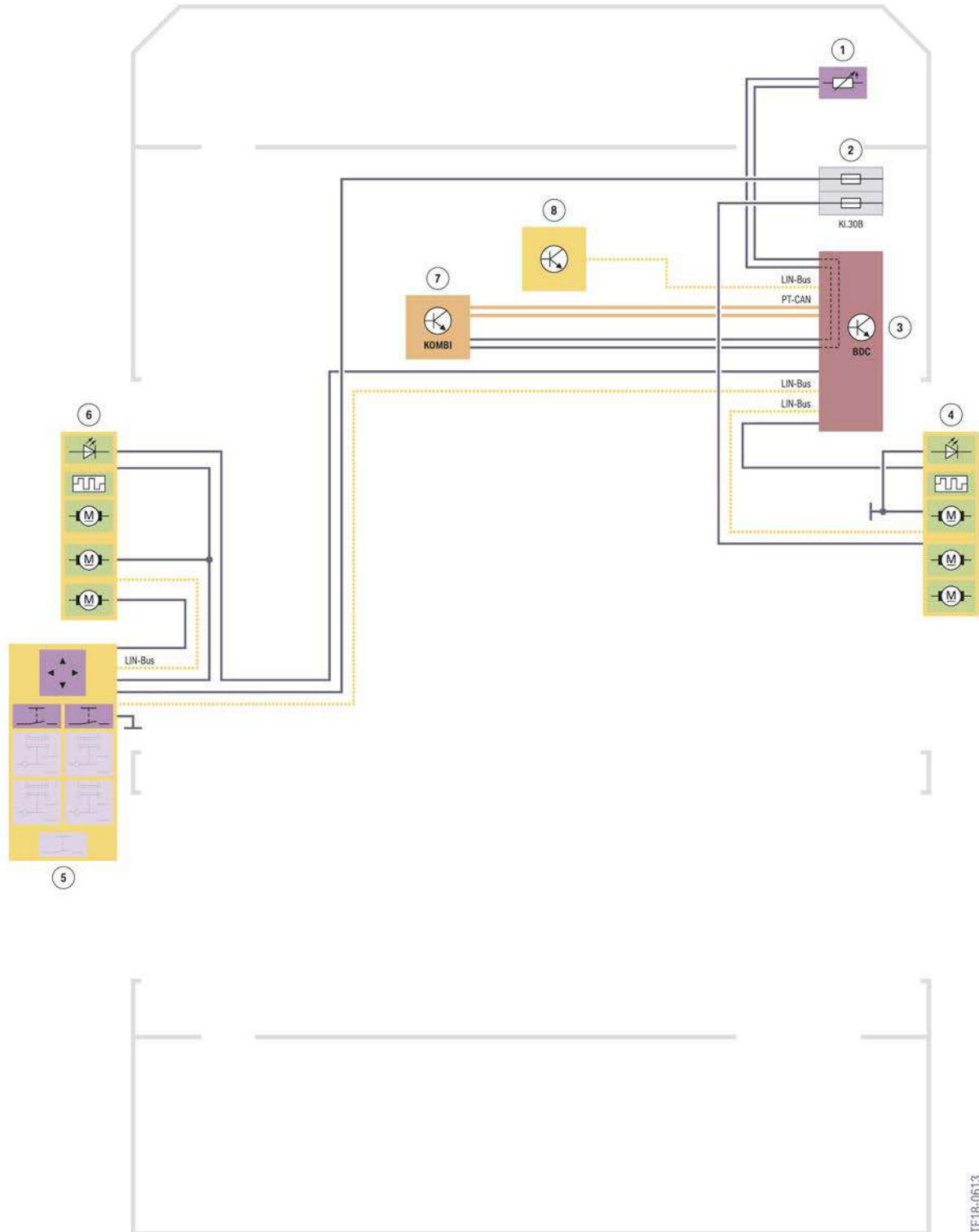
The ambient lighting is activated when the vehicle is unlocked or locked.

RGB LEDs (**R**ed, **G**reen, **B**lue) are used for the ambient lighting. The lighting is controlled via a separate LIN bus. Here the individual LED modules are connected in series. If the LIN bus is interrupted at a point, the lighting is interrupted at this point. A search for the fault must be carried out at the location where the last LED illuminates.

G15 General Vehicle Electronics

11. Exterior Rearview Mirror

11.1. System wiring diagram



G15 exterior rearview mirror

G15 General Vehicle Electronics

11. Exterior Rearview Mirror

| Index | Explanation |
|-------|--|
| 1 | Outside temperature sensor |
| 2 | Fuses in power distribution box, front right |
| 3 | Body Domain Controller (BDC) |
| 4 | Exterior rearview mirror, front passenger side |
| 5 | Switch block for driver's side |
| 6 | Exterior rearview mirror, driver's side |
| 7 | Instrument cluster (KOMBI) |
| 8 | Interior mirror |

The outside temperature sensor is connected to the instrument cluster. This makes the value available via the PT-CAN. The BDC evaluates the signal and activates the exterior mirror heating as required via the LIN bus. Control of the heater output is dependent on the outside temperature.

The exterior mirror motors are activated via the LIN bus.

G15 General Vehicle Electronics

12. Locking and Security Functions

12.1. Central locking system

12.1.1. Function

The function of the central locking system is controlled via the BDC. The function is as follows:

- The radio signal from the ID transmitter is received via the remote control receiver (FBD).
- The BDC activates the central locking system and the interior lighting.
- The BDC evaluates the status of the doors, lids and gates.
- The BDC evaluates the status of the central locking button.
- The BDC controls the Soft Close drives.
- The BDC unlocks the fuel filler flap.

12. Locking and Security Functions

12.1.2. System wiring diagram



G15 central locking system

G15 General Vehicle Electronics

12. Locking and Security Functions

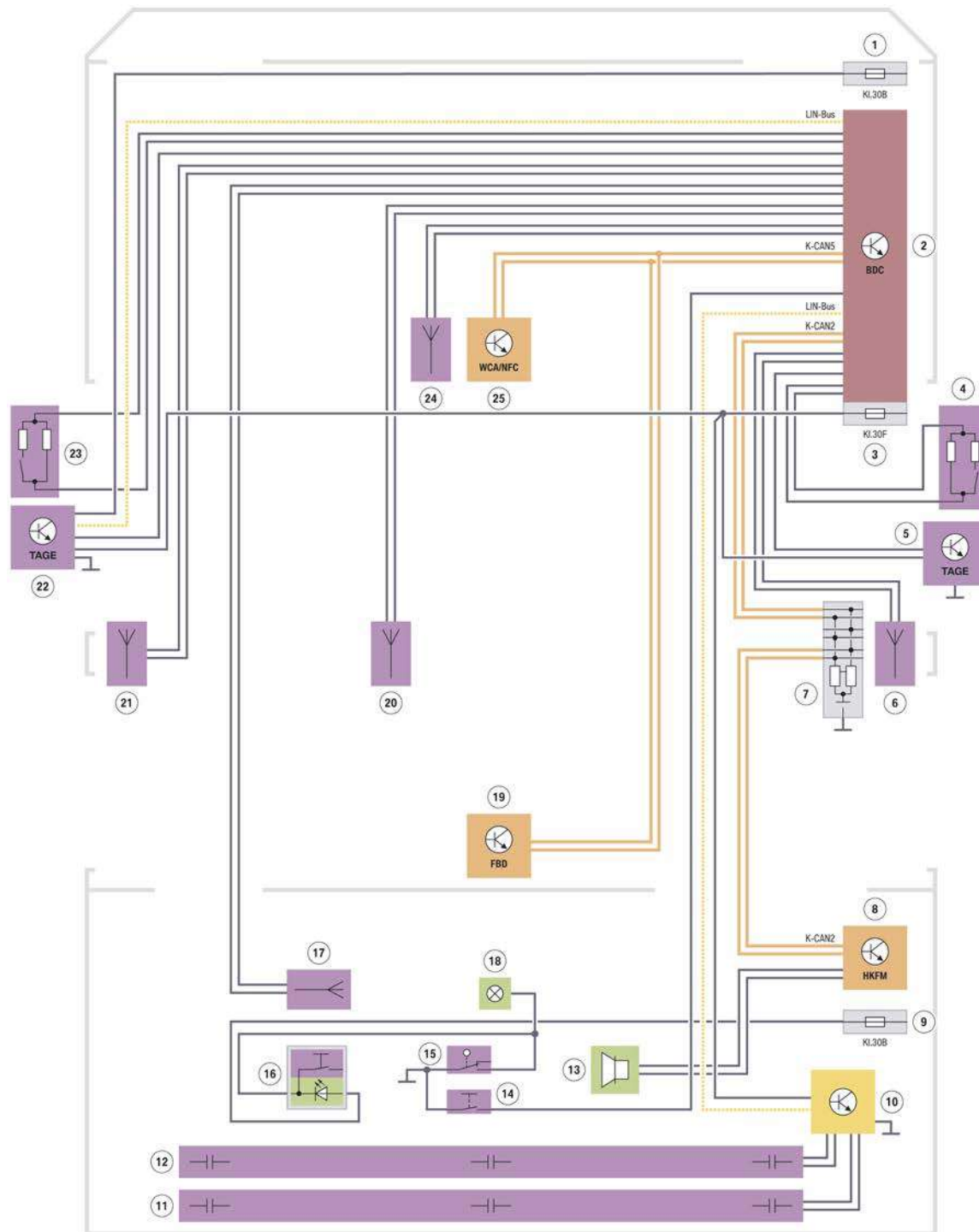
| Index | Explanation |
|-------|---|
| 1 | Fuse, power distribution box, front |
| 2 | Body Domain Controller (BDC) |
| 3 | Door lock, passenger's side |
| 4 | Central locking button on passenger's side (US version) |
| 5 | Power window regulator, passenger side |
| 6 | Motor, fuel filler flap lock |
| 7 | Luggage compartment power distribution box fuse |
| 8 | Door lock, tailgate |
| 9 | Soft-close automatic drive |
| 10 | Number plate light/tailgate button |
| 11 | Luggage compartment power distribution box fuse |
| 12 | Remote control receiver (FBD) |
| 13 | Power window regulator, driver's side |
| 14 | Door lock, driver's side |
| 15 | Central locking button, driver's side |
| 16 | Switch block for driver's side door |
| 17 | Inside tailgate button |

G15 General Vehicle Electronics

12. Locking and Security Functions

12.2. Comfort Access

12.2.1. System wiring diagram



Comfort Access

G15 General Vehicle Electronics

12. Locking and Security Functions

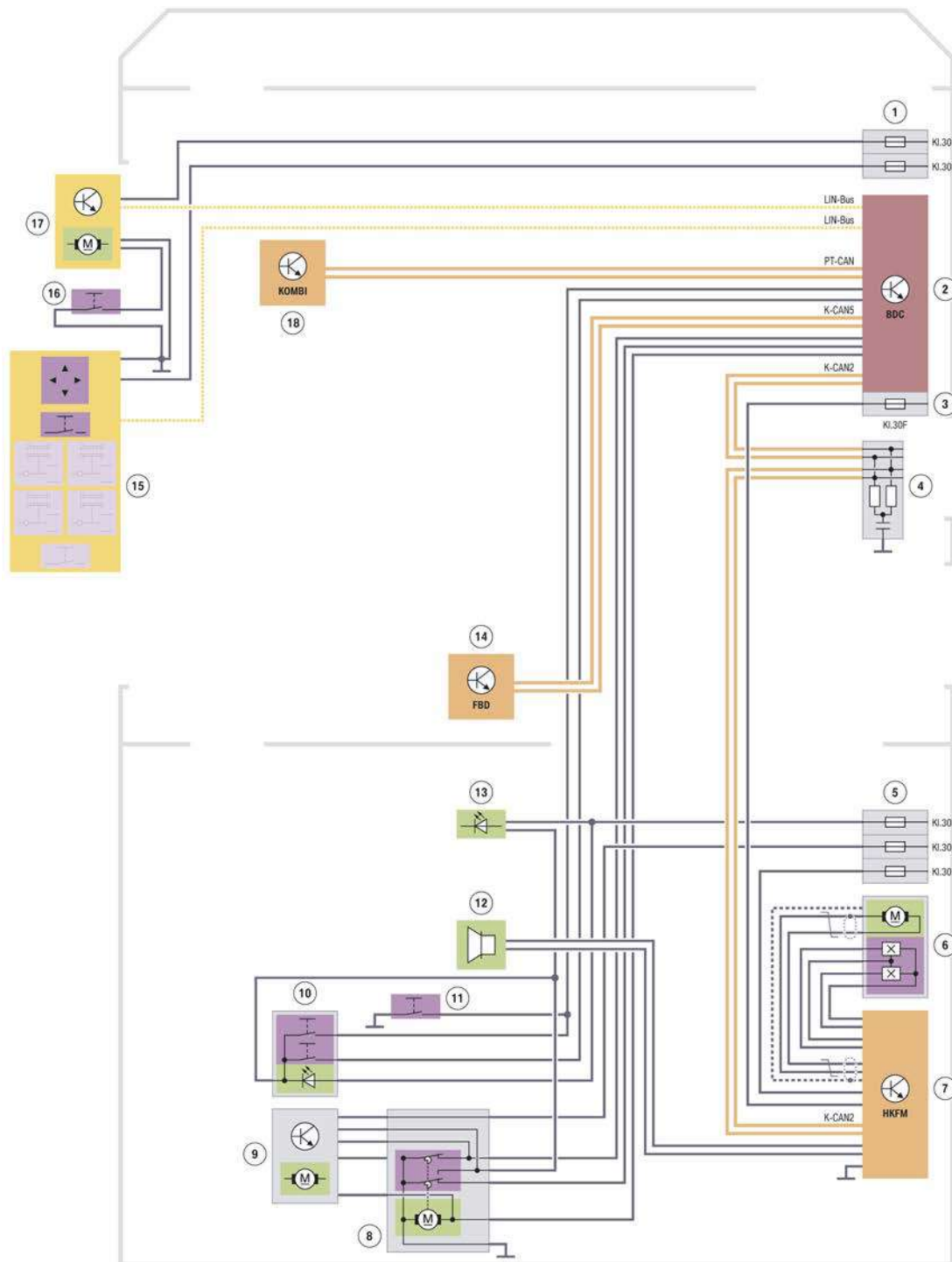
| Index | Explanation |
|-------|--|
| 1 | Fuse for front right power distribution box |
| 2 | Body Domain Controller (BDC) |
| 3 | Fuse, Body Domain Controller |
| 4 | Switch, door lock, passenger's side |
| 5 | Outside door handle electronics (TAGE) on front passenger side |
| 6 | Comfort Access antenna, passenger's side |
| 7 | CAN terminator |
| 8 | Tailgate function module (HKFM) |
| 9 | Luggage compartment power distribution box fuse |
| 10 | Control unit, contactless tailgate activation |
| 11 | Sensor at bottom for contactless tailgate activation |
| 12 | Sensor at top for contactless tailgate activation |
| 13 | Acoustic warning device |
| 14 | Outside tailgate button |
| 15 | Tailgate lock switch |
| 16 | Inside tailgate button |
| 17 | Comfort Access antenna, luggage compartment |
| 18 | Luggage compartment light |
| 19 | Remote control receiver (FBD) |
| 20 | Comfort Access antenna, passenger compartment |
| 21 | Comfort Access antenna, driver's side |
| 22 | Outside door handle electronics (TAGE) on driver's side |
| 23 | Switch, door lock, driver's side |
| 24 | Comfort Access antenna, passenger compartment |
| 25 | Wireless charging station (WCA)/Near Field Communication (NFC) |

G15 General Vehicle Electronics

12. Locking and Security Functions

12.3. Tailgate

12.3.1. System wiring diagram



Automatic operation of tailgate

G15 General Vehicle Electronics

12. Locking and Security Functions

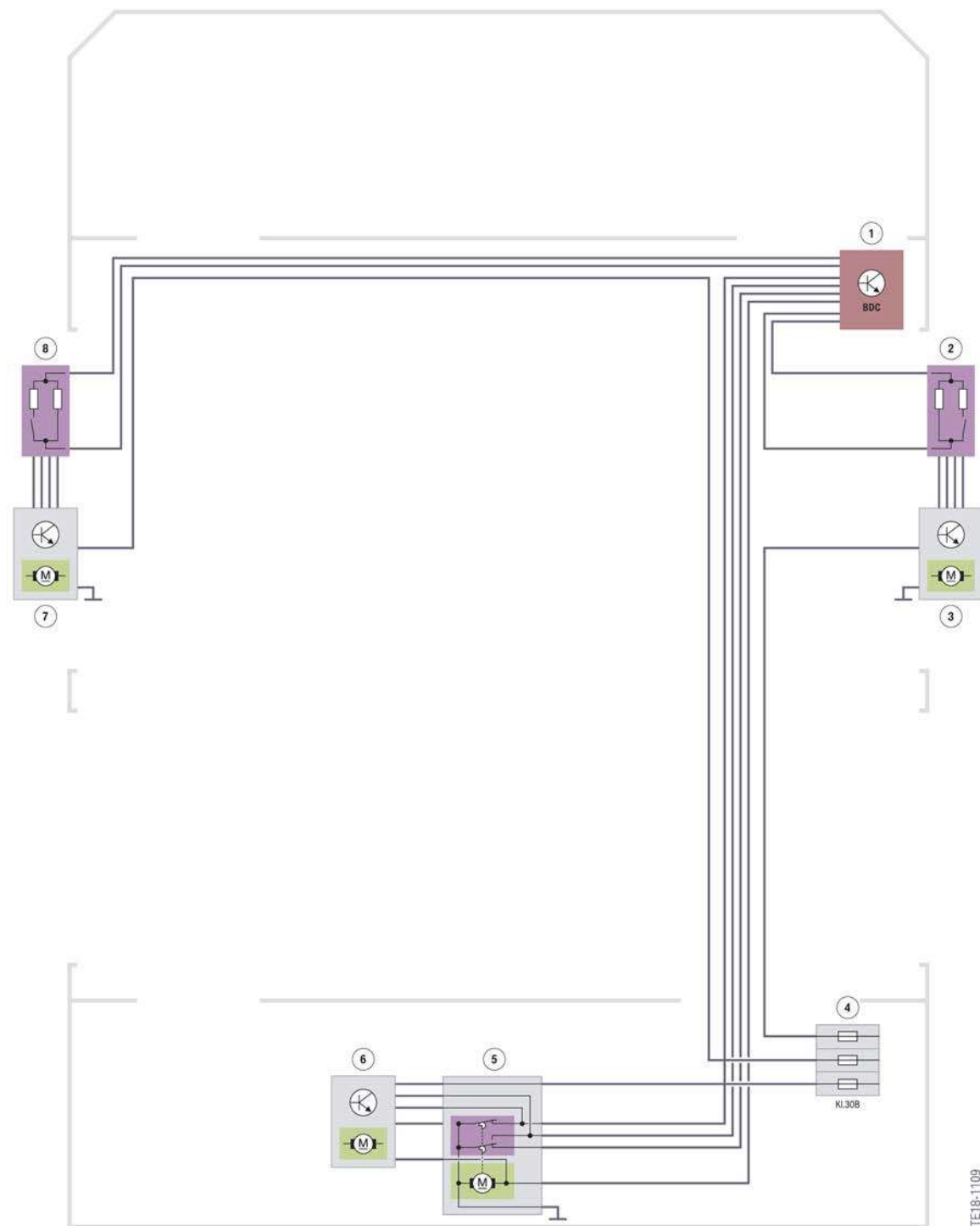
| Index | Explanation |
|-------|--|
| 1 | Fuses in power distribution box, front right |
| 2 | Body Domain Controller (BDC) |
| 3 | Fuse, Body Domain Controller |
| 4 | CAN terminator |
| 5 | Fuses, power distribution box, luggage compartment |
| 6 | Tailgate drive, right |
| 7 | Tailgate function module (HKFM) |
| 8 | Tailgate lock |
| 9 | Soft-close automatic drive |
| 10 | Tailgate buttons (close/lock) |
| 11 | Outside tailgate button |
| 12 | Acoustic warning device |
| 13 | Luggage compartment light |
| 14 | Remote control receiver (FBD) |
| 15 | Switch block for driver's side |
| 16 | Tailgate button, driver's side |
| 17 | Power window motor, driver's side |
| 18 | Instrument cluster (KOMBI) |

G15 General Vehicle Electronics

12. Locking and Security Functions

12.4. Automatic Soft Close system

12.4.1. System wiring diagram



Automatic Soft Close system

G15 General Vehicle Electronics

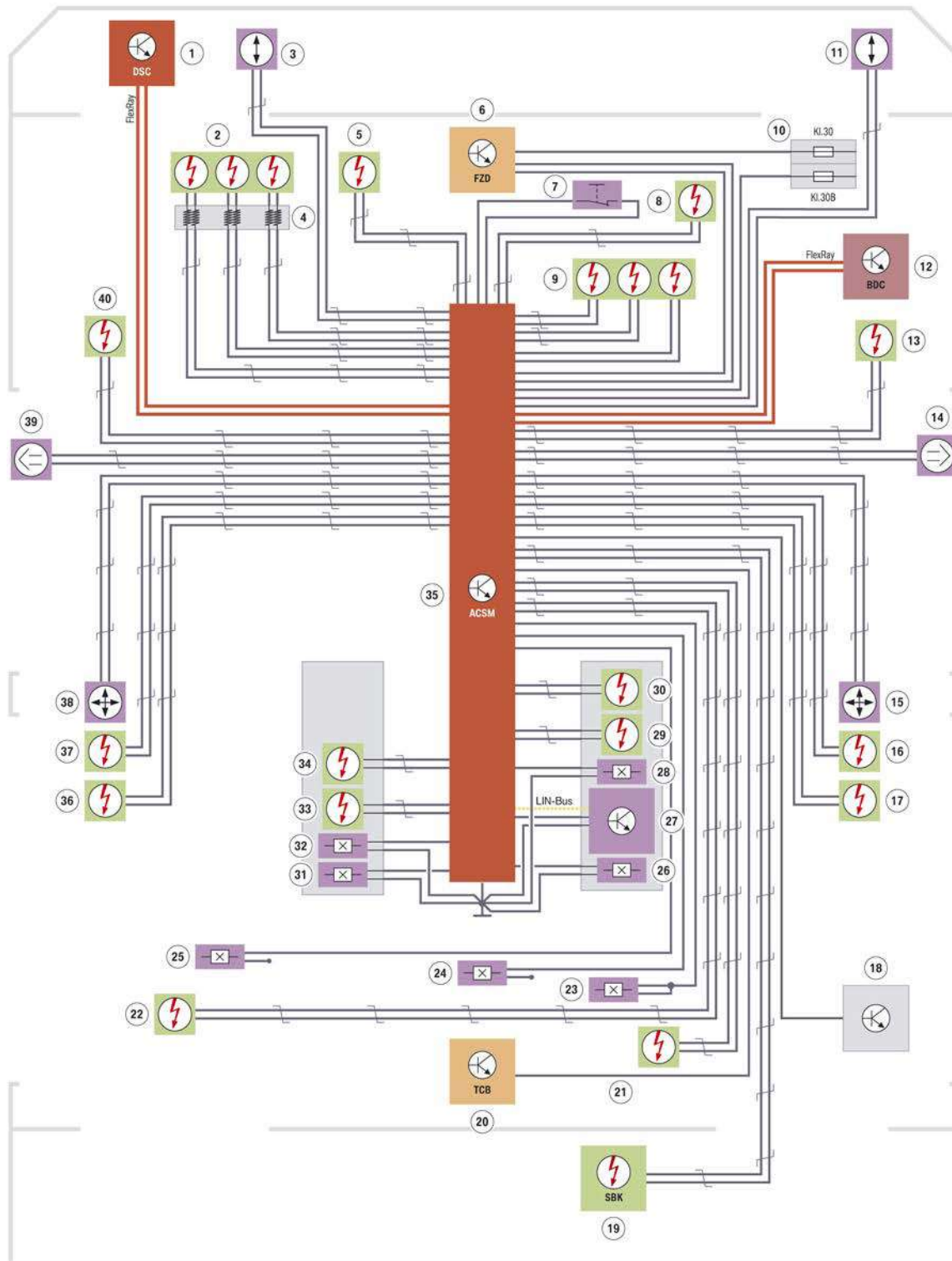
12. Locking and Security Functions

| Index | Explanation |
|-------|--|
| 1 | Body Domain Controller (BDC) |
| 2 | Door lock, right |
| 3 | Soft-close drive, right |
| 4 | Fuses, power distribution box, luggage compartment |
| 5 | Tailgate lock |
| 6 | Soft-close drive, tailgate |
| 7 | Soft-close drive, left |
| 8 | Door lock, left |

G15 General Vehicle Electronics

13. Safety Systems

13.1. System wiring diagram



TE18-1194

G15 safety systems

G15 General Vehicle Electronics

13. Safety Systems

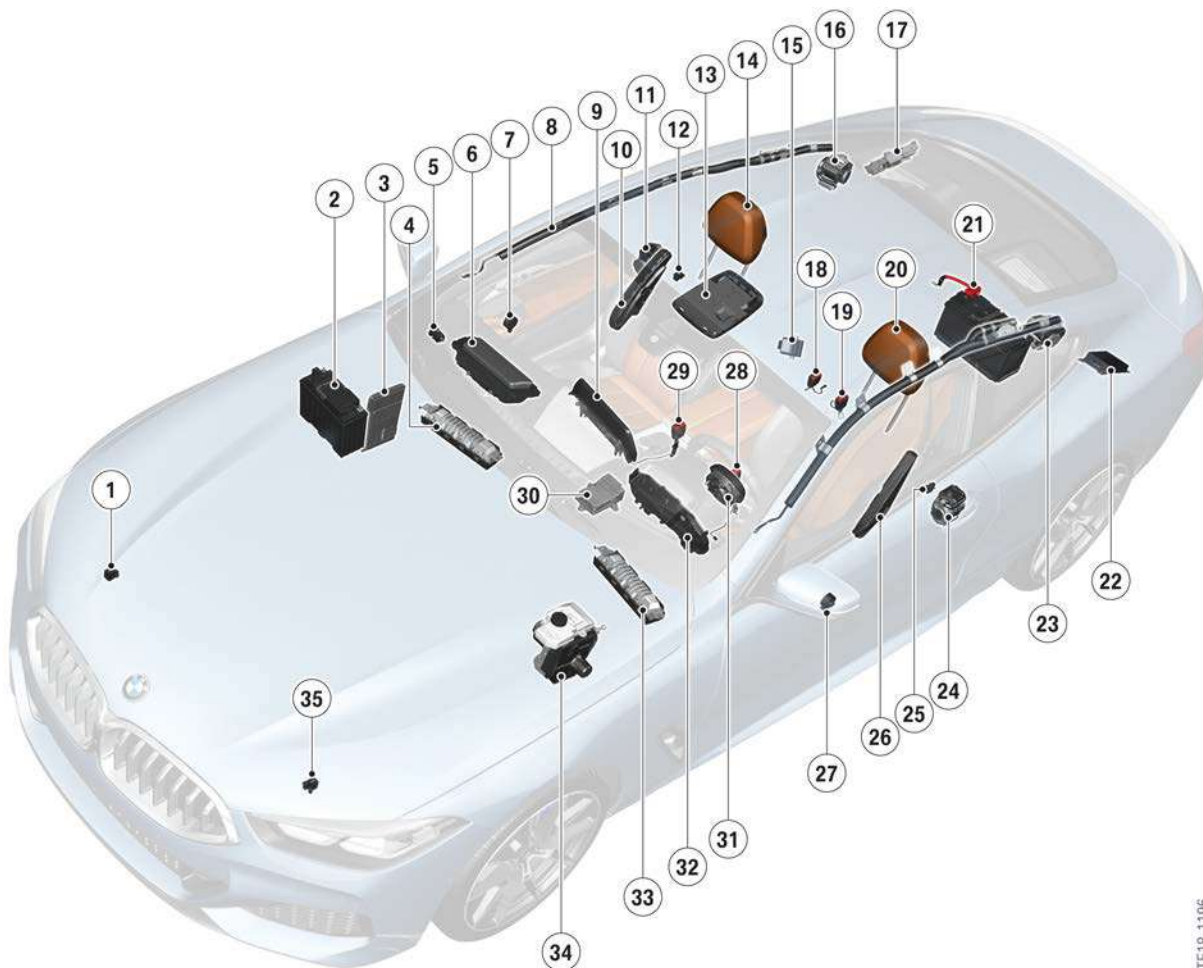
| Index | Explanation |
|-------|---|
| 1 | Dynamic Stability Control (DSC) |
| 2 | Driver's airbag |
| 3 | Airbag sensor, front left |
| 4 | Clock spring |
| 5 | Knee airbag, driver |
| 6 | Roof function center (FZD) |
| 7 | Switch for front passenger airbag deactivation (not for US) |
| 8 | Knee airbag, front passenger |
| 9 | Front passenger airbag |
| 10 | Fuses in power distribution box, front right |
| 11 | Airbag sensor, front right |
| 12 | Body Domain Controller (BDC) |
| 13 | Head airbag, right |
| 14 | Airbag sensor, door, right (pressure) |
| 15 | Acceleration sensor, B-pillar on right |
| 16 | Adaptive belt force limiter, passenger's side |
| 17 | Reel pretensioner, front passenger |
| 18 | Electric fuel pump |
| 19 | Safety battery terminal (SBK) |
| 20 | Telematic Communication Box 2 (TCB2) |
| 21 | Reel pretensioner, rear right |
| 22 | Reel pretensioner, rear left |
| 23 | Seat belt buckle switch, rear right |
| 24 | Seat belt buckle switch, rear center |
| 25 | Seat belt buckle switch, rear left |
| 26 | Seat belt buckle switch, front passenger |
| 27 | Seat occupancy mat, CIS mat |
| 28 | Seat-position sensor, front right |
| 29 | Side airbag, front passenger |
| 30 | Crash-active headrest, front passenger |
| 31 | Seat belt buckle switch, driver |
| 32 | Seat-position sensor, front left |
| 33 | Side airbag, driver's side |
| 34 | Crash-active headrest, driver |
| 35 | Advanced Crash Safety Module (ACSM) |

G15 General Vehicle Electronics

13. Safety Systems

| Index | Explanation |
|-------|--|
| 36 | Reel pretensioner, driver |
| 37 | Adaptive belt force limiter, driver's side |
| 38 | Acceleration sensor, B-pillar on left |
| 39 | Airbag sensor, door, left (pressure) |
| 40 | Head airbag, left |

13.2. System overview



G15 system overview,

TE18-1196

G15 General Vehicle Electronics

13. Safety Systems

| Index | Explanation |
|-------|---|
| 1 | Airbag front sensor, right |
| 2 | Dual storage system, lithium ion battery |
| 3 | Body Domain Controller (BDC) |
| 4 | Knee airbag, front passenger |
| 5 | Switch for front passenger airbag deactivation (not for US) |
| 6 | Front passenger airbag |
| 7 | Airbag sensor, door, right (pressure) |
| 8 | Head airbag, right |
| 9 | Central information display (CID) |
| 10 | Side airbag, front passenger |
| 11 | Automatic tensioner, front passenger |
| 12 | Acceleration sensor, B-pillar on right |
| 13 | Roof function center (FZD) |
| 14 | Crash-active headrest, front passenger |
| 15 | Electric fuel pump |
| 16 | Reel tensioner, rear right |
| 17 | Power distribution box, luggage compartment |
| 18 | Seat belt buckle switch, rear center |
| 19 | Seat belt buckle switch, rear left |
| 20 | Crash-active headrest, driver |
| 21 | Safety battery terminal (SBK) |
| 22 | Telematic Communication Box 2 (TCB2) |
| 23 | Reel tensioner, rear left |
| 24 | Automatic tensioner, driver |
| 25 | Acceleration sensor, B-pillar on left |
| 26 | Side airbag, driver's side |
| 27 | Airbag sensor, door, left (pressure) |
| 28 | Seat belt buckle switch, driver |
| 29 | Seat belt buckle switch, front passenger |
| 30 | Advanced Crash Safety Module (ACSM) |
| 31 | Driver's airbag |
| 32 | Instrument cluster (KOMBI) |
| 33 | Knee airbag, driver |
| 34 | Dynamic Stability Control (DSC) |
| 35 | Airbag front sensor, left |

G15 General Vehicle Electronics

13. Safety Systems

13.3. Functions

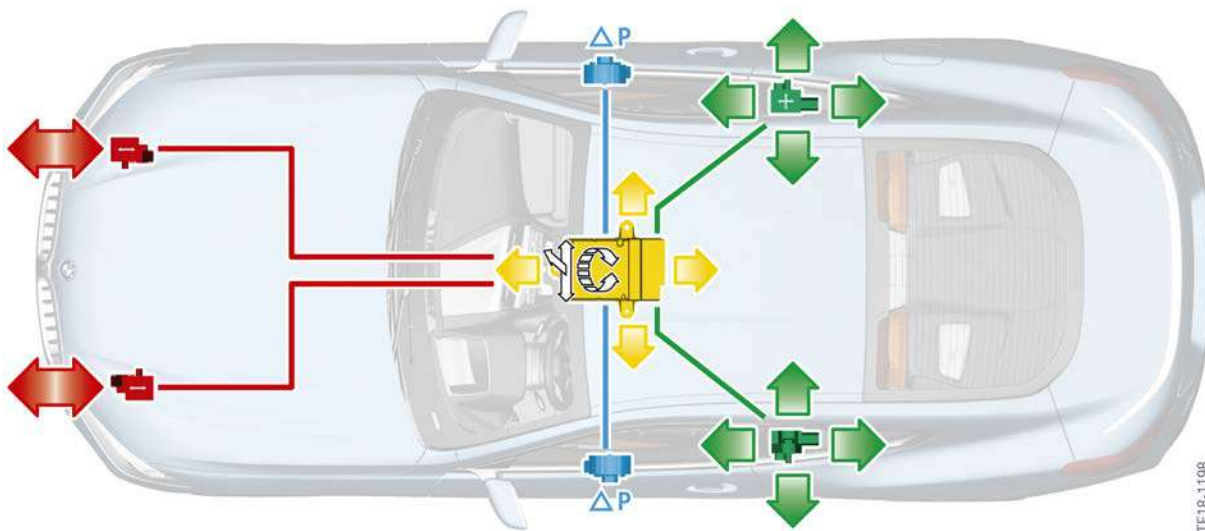
13.3.1. Impact detection

The US version of the vehicles is equipped with the following sensors:

- one lateral and one longitudinal acceleration sensor in the B-pillars (green)
- one airbag sensor to monitor the pressure in each of the front doors (blue)
- one lateral and one longitudinal acceleration sensor in the ACSM (yellow)
- one roll rate sensor in the ACSM (yellow)
- one vertical acceleration sensor in the ACSM (yellow)
- one airbag front sensor each on the engine supports (red)

The airbag sensors in the doors assist with the identification of a side-on crash.

The airbag front sensors assist with the identification of a head-on crash and its corresponding severity.



G15 impact detection, US version

TE18-1198



Technical training.
Product information.

G15 Driver Assistance Systems



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BMW Service

Edited for the U.S. market by:
BMW Group University
Technical Training

ST1833

10/1/2018

General information

Symbols used

The following symbol is used in this document to facilitate better comprehension or to draw attention to very important information:



Contains important safety information and information that needs to be observed strictly in order to guarantee the smooth operation of the system.

Information status: June 2018

BMW Group vehicles meet the requirements of the highest safety and quality standards. Changes in requirements for environmental protection, customer benefits and design render necessary continuous development of systems and components. Consequently, there may be discrepancies between the contents of this document and the vehicles available in the training course.

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For changes/additions to the technical data, repair procedures, please refer to the current information issued by BMW of North America, LLC, Technical Service Department.

This information is available by accessing TIS at www.bmwcenternet.com.

Additional sources of information

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

- Owner's Handbook
- Integrated Service Technical Application
- Aftersales Information Research (AIR)

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G15 Driver Assistance Systems

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G15 Driver Assistance Systems

1. Introduction

The most versatile range of Driver Assistance Systems ever for a BMW model was launched with the introduction of the G12. Numerous innovative systems have been introduced and have opened the way for highly automated driving. One year later, the G30 expanded the already varied range of offerings with new Driver Assistance Systems.

The new BMW 8 series with development designation G15 continues with these innovations. The Back-up Assistant has been available since the introduction of this new vehicle on the market, which makes comfortable and automatically guided reversing possible. Furthermore, many of the Driver Assistance Systems introduced in the G30 feature new functions and therefore also make it easier for the driver to continue guiding the vehicle by:

- providing the driver with information
- prompting the driver with suggestions
- automatically intervening in the driving process.

G15 Driver Assistance Systems

1. Introduction

1.1. Further information

This reference manual presents the new features and modifications to the Driver Assistance Systems in the G15. The focus is directed in particular at the **vehicle-specific** features. The following reference manual items provide basic descriptions of the new features as well as familiar Driver Assistance Systems for **specific systems**:

| Reference Manual | Information on | |
|---|--|---|
| ST1858 Driver Assistance systems 2018 (Innovations) | <ul style="list-style-type: none"> • KAFAS Mid Camera • KAFAS High Camera • Driver Camera System (DCS) • Front collision mitigation • Lane Departure Warning • Emergency Stop Assistant | <ul style="list-style-type: none"> • Intersection collision warning • Active Cruise Control with Stop&Go function • Automatic Parking • Back-up Assistant • Evasion Assistant • Automatic Lane Change |
| ST1604 G30 Driver Assistance Systems (Previously published) | <ul style="list-style-type: none"> • Collision Warning • Speed Limit Info • Intersection Warning • Lane Departure Warning • Active Blind Spot Detection • Cross-traffic Alert front/rear • BMW Night Vision | <ul style="list-style-type: none"> • Surround view • Remote 3D View • Park Distance Control (PDC) • Parking Maneuvering Assistant (PMA) • Active Lane Keeping Assistant • Evasion Aid |
| ST1701 G01 Driver Assistance Systems (Previously published) | <ul style="list-style-type: none"> • Hazard Preview | |

G15 Driver Assistance Systems

1. Introduction

1.1.1. System Terminology

The names of the Driver Assistance Systems described in this reference manual refer to the names as seen by the customer (e.g. in-vehicle menus, owner's manual, sales literature, etc.) The table below shows these systems and their corresponding names as found in technical systems:

| Name of System in Reference Manual | Name of System in Technical Systems | Name of System in previously published Reference Manuals |
|---|--|---|
| Blind Spot Collision Warning | Lane change warning with active steering intervention | Active Blind Spot Detection |
| Front collision mitigation | Front collision warning with braking function | Frontal Collision Warning with city collision mitigation |
| Daytime Pedestrian Protection | Pedestrian warning with braking function | Daytime Pedestrian Protection |
| Evasion Assistant | Avoidance assistant | Evasion Aid |
| Lane Departure Warning | Lane departure warning with active steering intervention | Lane Departure Warning |
| Side collision mitigation | Side collision warning with steering intervention | Side Collision Avoidance |
| Active Cruise Control with Stop&Go | Active Cruise Control | Active Cruise Control with Stop&Go |
| Dynamic Cruise Control | Dynamic Cruise Control | Dynamic Cruise Control |
| Steering Assistant | Steering and lane guidance assistant | Active Lane Keeping Assistant |
| Traffic Jam Assistant | Traffic jam assistant | Traffic Jam Assistant |
| Speed Limiter | Speed Limit Device | N/A |
| Speed Limit Assistant | Speedlimit Assist | N/A |
| Automatic Lane Change | Lane change assistant | N/A |
| Automatic Parking | Parking maneuvering assistant | Parking Maneuvering Assistant |
| Speed Limit Info | Road sign recognition | Road Sign Recognition |
| Intersection collision warning | Street crossing warning / Intersection collision warning | Intersection Warning |
| Cross traffic warning rear | Rear crossing traffic warning | Cross Traffic Alert Rear |
| Cross traffic warning front | Front crossing traffic warning | Cross Traffic Alert Front |
| Back-up Assistant | Reversing Assistant | N/A |
| Emergency Stop Assistant | N/A | N/A |
| Fatigue Alert | Alertness assistant | Fatigue and Focus Alert |
| Automatic High Beams | Non-glare high-beam assistant | High-beam assistant |

G15 Driver Assistance Systems

1. Introduction

1.2. Overview

1.2.1. "Driving" options structure

The following tables are intended to provide an overview of the relationships between the options structure and the Driver Assistance Systems used as well as their system components. Furthermore, they also list all Driver Assistance Systems available in the G15. This overview presents the information status at the production start of the G15.

Innovations are formatted in "**bold type**".

Standard equipment

The G15 is always equipped with the KAFAS Mid Camera and rear radar sensor short range (left and right) as standard equipment. The following table shows the Driver Assistance Systems included as standard equipment.

Active Driving Assistant (SA 5AS) (standard)

- Blind Spot Collision Warning
- Front collision mitigation
- **Daytime Pedestrian Protection**
- **Lane Departure Warning**
- Cross traffic warning rear
- Speed Limit Info



Dynamic Cruise Control (standard)

- **Speed Limiter**

G15 Driver Assistance Systems

1. Introduction

Optional equipment

In the G15, the customer has the choice of an additional optional equipment package: Active Driving Assistant Professional (SA 5AU).

Unlike the G05, Active Cruise Control with Stop&Go (SA 5DF) is not available to be ordered separately. Because of this, the front radar sensor (FRS) is not used in the G15. Instead, the front radar sensor long range (FRSF) is always used with the Active Driving Assistant Professional.

Active Driving Assistant Professional (SA 5AU)

- Steering Assistant
- Lane Departure Warning with side collision mitigation
- Active Cruise Control with Stop&Go function (up to 180 km/h)
- Cross traffic warning front
- **Speed Limit Assistant**
- **Evasion Assistant**
- **Intersection collision warning**
- **Automatic Lane Change**
- **Emergency Stop Assistant**

Driving Assistant (SA 5AS) (standard)

- Blind Spot Collision Warning
- Front collision mitigation
- **Daytime Pedestrian Protection**
- **Lane Departure Warning**
- Cross traffic warning rear
- Speed Limit Info



G15 Driver Assistance Systems

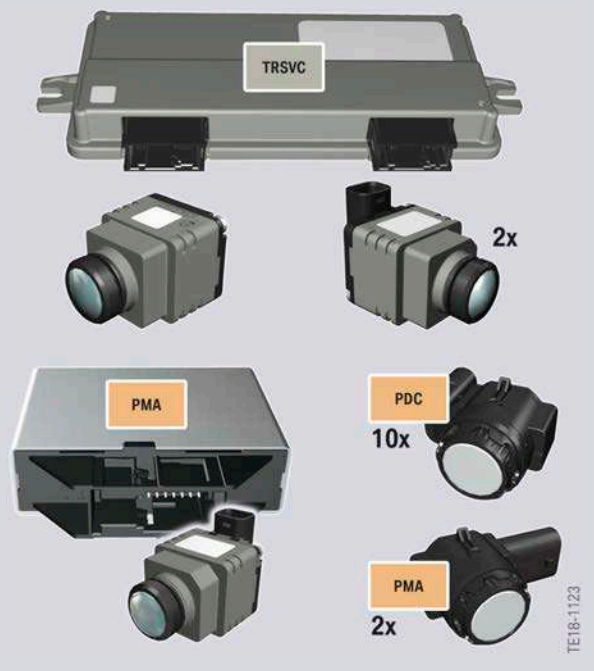
1. Introduction

1.2.2. Offer structure "Parking"

The familiar standard equipment package Parking Assistant Plus (SA 5DN) is installed in the new BMW 8 series. The offer structure of the equipment Parking Assistant Plus (SA 5DN) now includes the Back-up Assistant and a leaving parking space function. The optional equipment Remote Control Parking (SA 5DV) is not available for the G15.

Parking Assistant Plus (SA 5DN) (standard)

- Surround view w/3D view
- Panorama View (GPS-based)
- Remote 3D View
- Automatic Parking with parallel parking and **maneuvering out of parking spaces**
- **Back-up Assistant**
- Side protection
- Rear view camera
- Front and rear Park Distance Control (PDC)
- Auto PDC



G15 Driver Assistance Systems

1. Introduction

1.2.3. Innovations

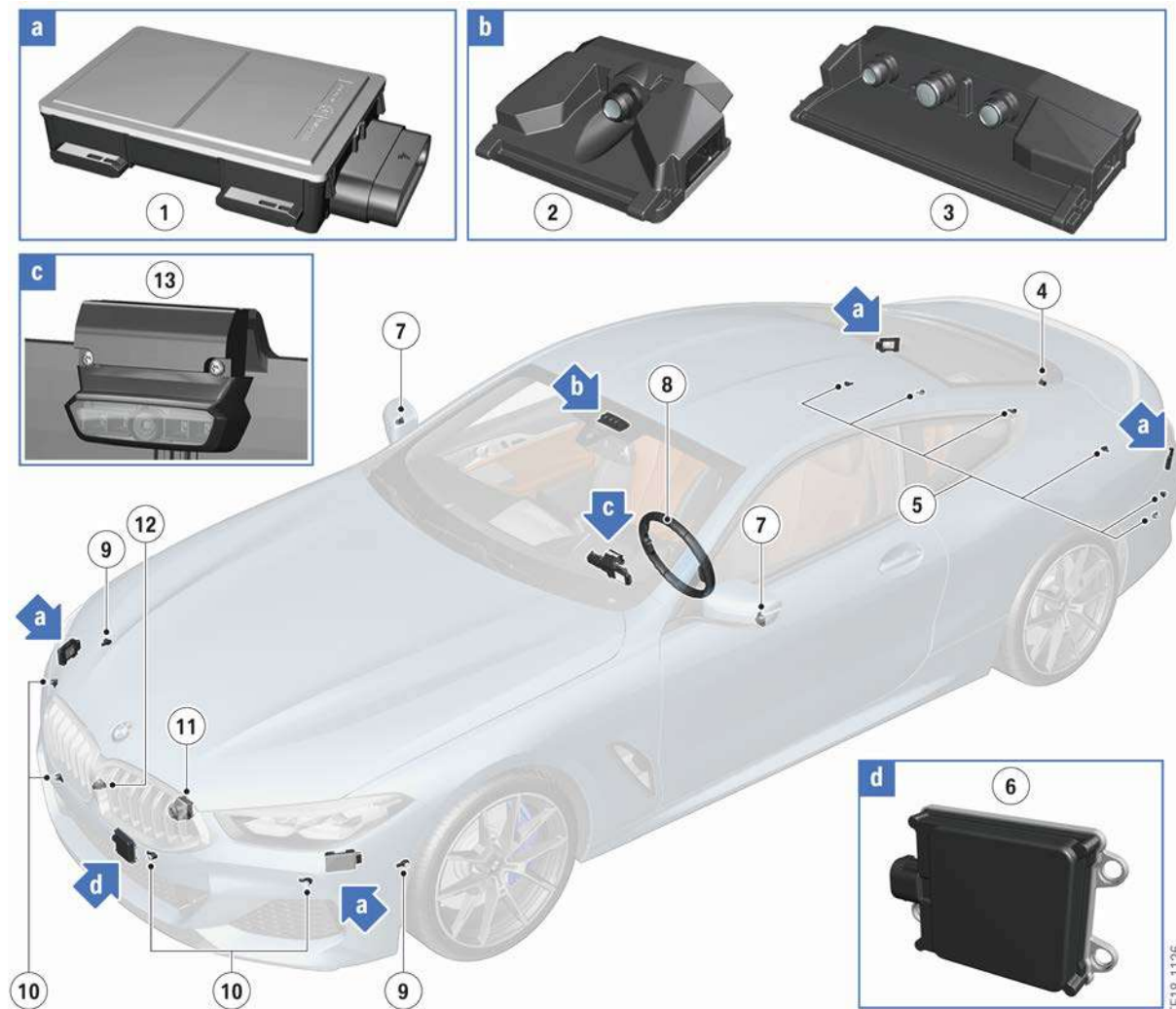
- The G15 is always equipped with a KAFAS camera and radar sensors in the rear of the vehicle.
- The G15 is only equipped with the front radar sensor long range (FRSF) if Active Driving Assistant Professional (SA 5AU) is ordered.
- The G15 does not offer the front radar sensor (FRS).
- The instrument cluster is optionally equipped with a camera (Driver Camera System (DCS)) which points at the driver.
- The optional equipment Active Driving Assistant Plus (SA 5AT) is replaced with Active Driving Assistant Professional (SA 5AU).
- A new MODE button in the Driver Assistance Systems control panel on the multifunction steering wheel.
- LED indicators on the steering wheel (only with Active Driving Assistant Professional (SA 5AU)).
- The Daytime Pedestrian Protection now also warns about cyclists.
- Speed Limiter is available for Dynamic Cruise Control (DCC).
- Speed Limit Assistant is available for the optional equipment package Active Driving Assistant Professional (SA 5AU).
- With the Speed Limit Assistant, the upcoming speed limit ahead may be manually adopted in the cruise control.
- Evasion Assistant is now also available when a pedestrian warning is issued.
- The Intersection collision warning has been enhanced to include a city braking function.
- Lane Departure Warning performs an active steering intervention towards the center of the lane with Active Driving Assistant (SA 5AS). Previously, the optional equipment Active Driving Assistant Plus (SA 5AT) was required for this.
- Automatic Parking supports maneuvering out of parallel parking spaces.
- The parking assistance button no longer needs to be pressed and held while maneuvering into a parking space when using Automatic Parking .
- The Back-up Assistant is used.

G15 Driver Assistance Systems

1. Introduction

1.2.4. Sensor installation locations

Depending on the vehicle equipment, the sensors shown are used. New or revised sensors are shown enlarged in a magnifying glass.



G15 Overview of sensors of assistance systems

| Index | Explanation |
|-------|--|
| 1 | Side radar sensor (HRSNR, HRSNL, SRSNVR, SRSNVL) |
| 2 | KAFAS Mid Camera |
| 3 | KAFAS High Camera |
| 4 | Rear view camera (RFK) |
| 5 | Ultrasonic sensors for Park Distance Control (PDC), rear |
| 6 | Front radar sensor long range (FRSF) |
| 7 | Side view camera |

G15 Driver Assistance Systems

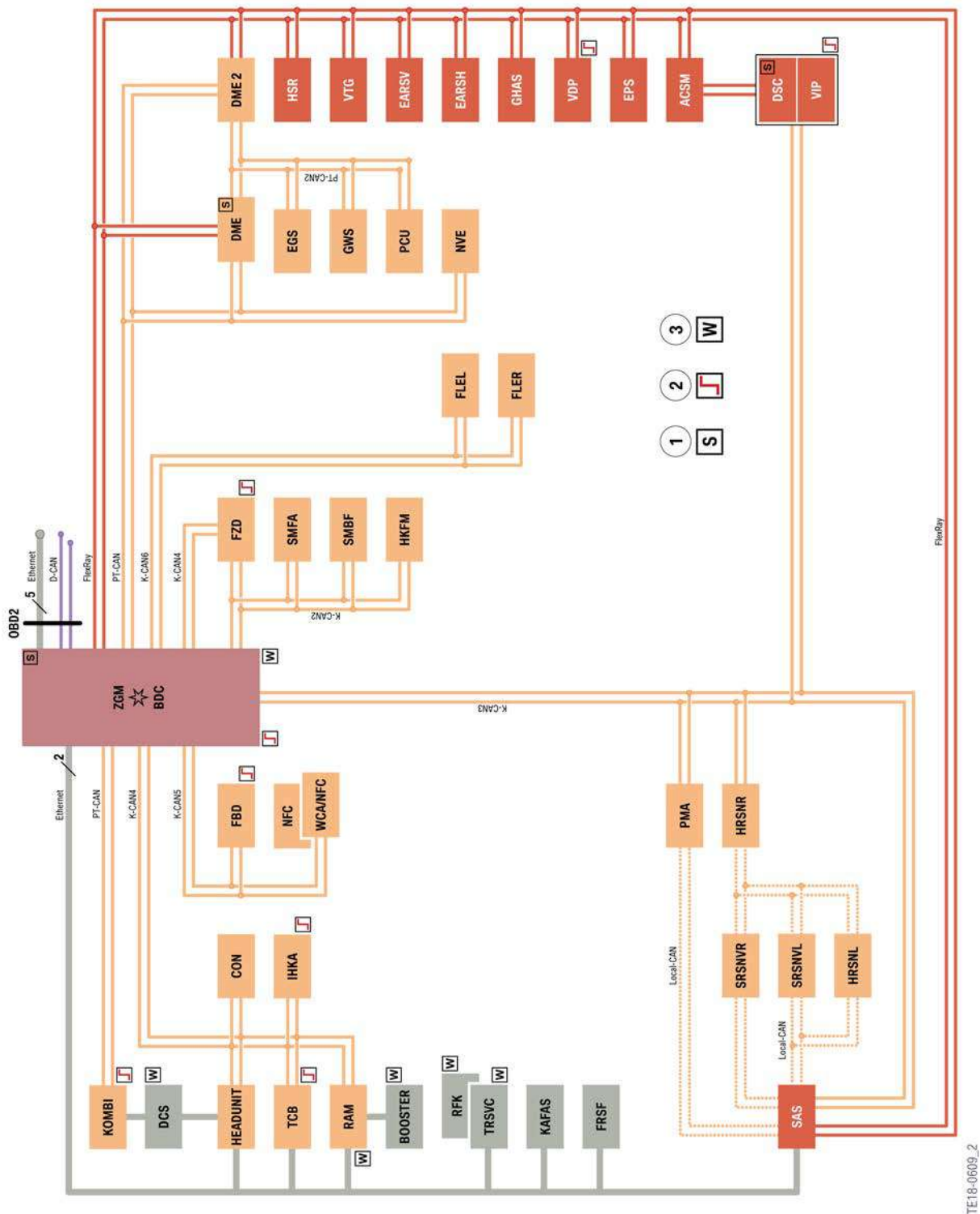
1. Introduction

| Index | Explanation |
|-------|--|
| 8 | Capacitive sensor mat on steering wheel rim |
| 9 | Ultrasonic sensors for Parking Maneuvering Assistant (PMA) |
| 10 | Ultrasonic sensors for Park Distance Control (PDC), front |
| 11 | Night Vision camera |
| 12 | Front camera |
| 13 | Driver Camera System (DCS) |

G15 Driver Assistance Systems

1. Introduction

1.3. Bus overview



G15 bus overview

G15 Driver Assistance Systems

1. Introduction

| Index | Explanation |
|----------|---|
| ACSM | Advanced Crash Safety Module |
| BDC | Body Domain Controller |
| BOOSTER | Hi-fi amplifier |
| CON | Controller |
| DME | Digital Motor Electronics |
| DME2 | Digital Engine Electronics 2 |
| DSC | Dynamic Stability Control |
| DCS | Driver Camera System |
| EARSH | Electric active roll stabilization rear |
| EARSV | Electric active roll stabilization front |
| EGS | Electronic transmission control |
| EPS | Electronic Power Steering |
| FBD | Remote control receiver |
| FLEL | Frontal Light Electronics Left |
| FLER | Frontal Light Electronics Right |
| FRSF | Front radar sensor long range |
| FZD | Roof function center |
| GWS | Gear selector switch |
| GHAS | Regulated rear axle differential lock |
| HKFM | Tailgate function module |
| HRSNL | Rear radar sensor short range left |
| HRSNR | Rear radar sensor short range right |
| HSR | Rear axle slip angle control |
| HEADUNIT | Head Unit High |
| IHKA | Integrated automatic heating / air conditioning |
| KAFAS | Camera-based Driver Assistance Systems |
| KOMBI | Instrument cluster |
| NFC | Near Field Communication |
| NVE | Night Vision Electronics |
| PCU | Power Control Unit |
| PMA | Parking Maneuvering Assistant |
| RAM | Receiver Audio Module |
| RFK | Rear view camera |
| SAS | Optional equipment system |
| SMBF | Front passenger seat module |

G15 Driver Assistance Systems

1. Introduction

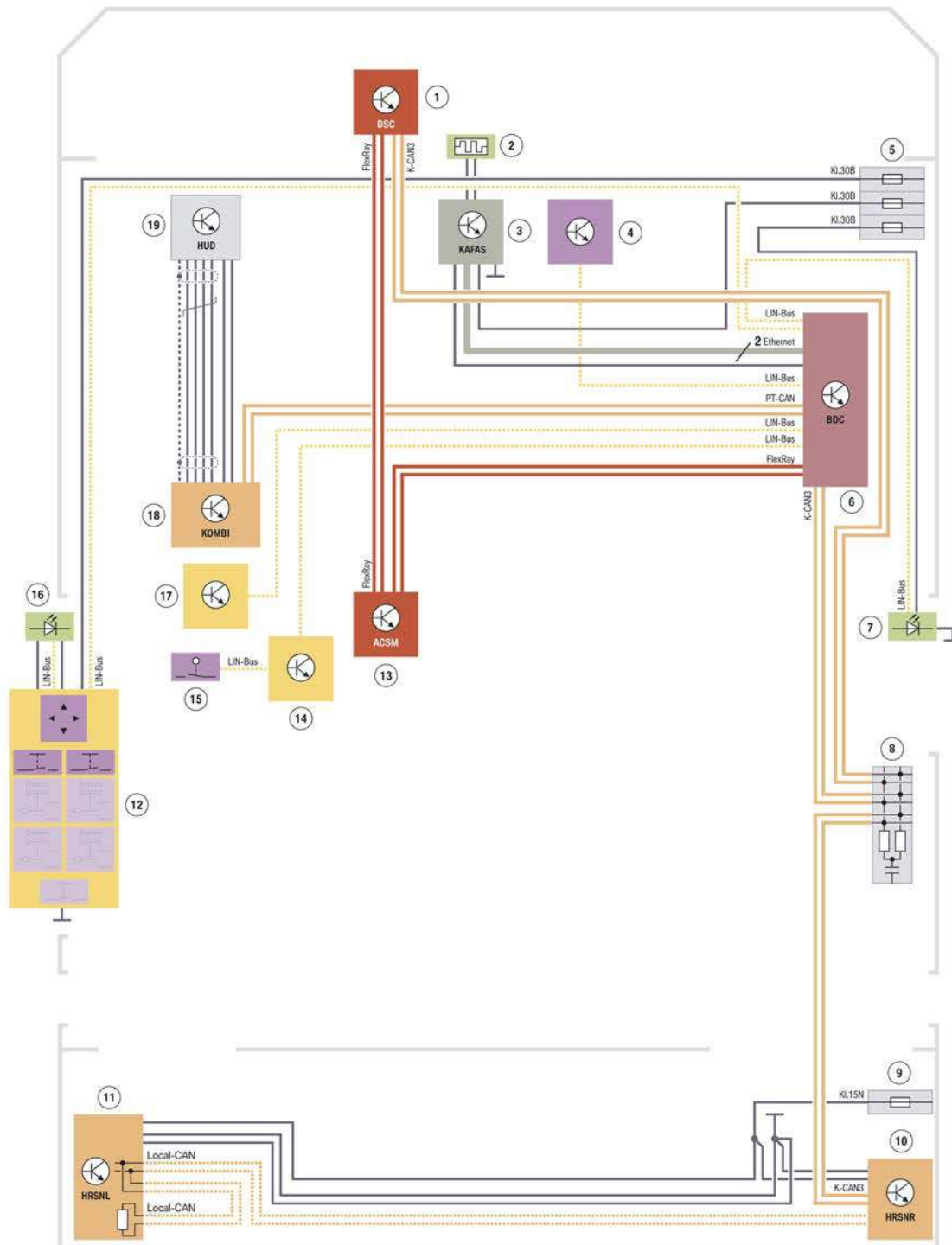
| Index | Explanation |
|---------|---|
| SMFA | Driver's seat module |
| TCB | Telematic Communication Box |
| TRSVC | Top rear side view camera |
| VDP | Vertical Dynamic Platform |
| VIP | Virtual Integration Platform |
| VTG | Transfer box |
| WCA/NFC | Wireless charging station with control electronics for Near Field Communication |
| ZGM | Central gateway module |
| 1 | Start-up node control units for starting and synchronizing the FlexRay bus system |
| 2 | Control units authorized to perform wake-up function |
| 3 | Control units also connected to wake-up line |

G15 Driver Assistance Systems

1. Introduction

1.4. System wiring diagrams

1.4.1. Active Driving Assistant (SA 5AS)



G15 with optional equipment Active Driving Assistant (SA 5AS)

TE18-1615

G15 Driver Assistance Systems

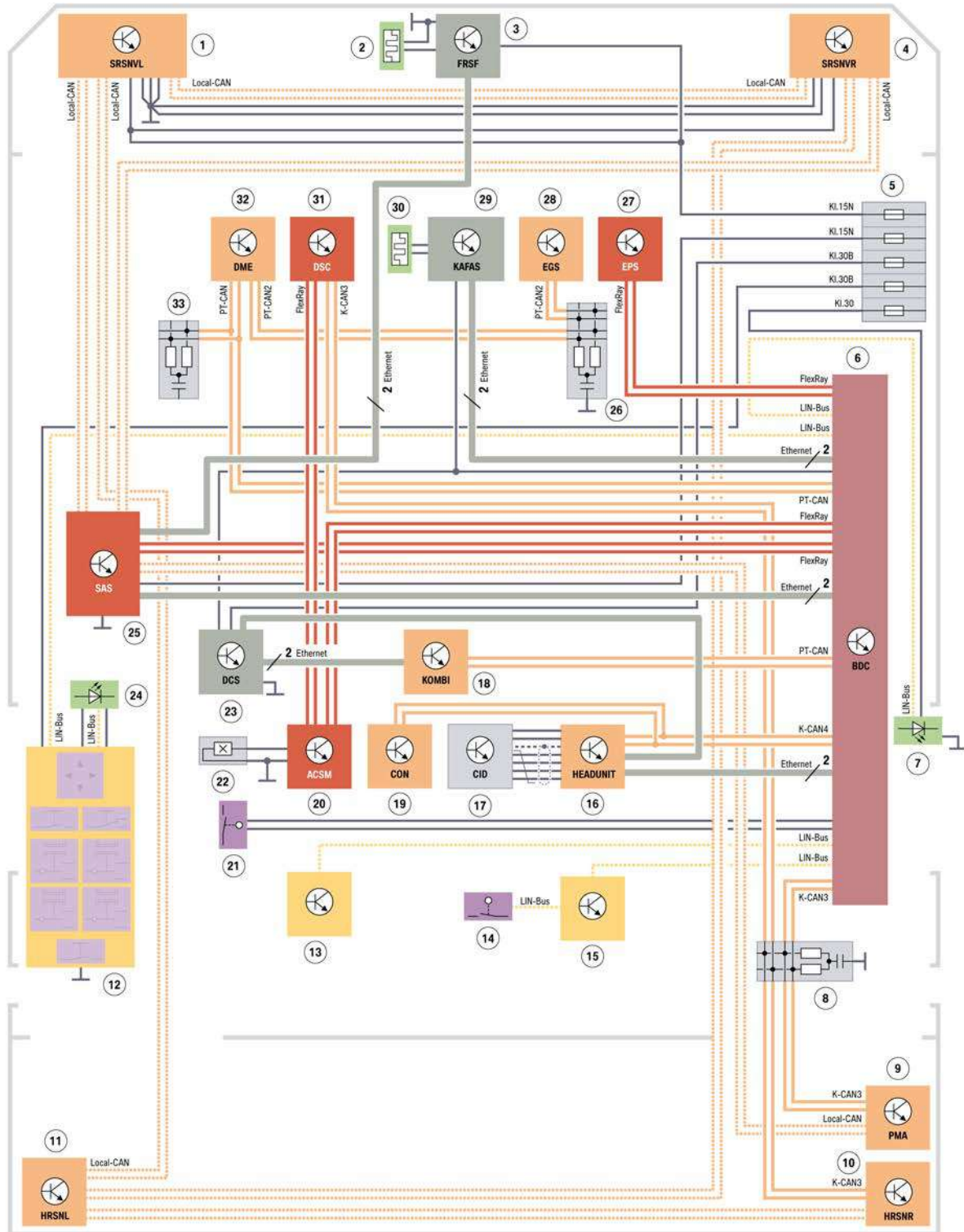
1. Introduction

| Index | Explanation |
|-------|--|
| 1 | Dynamic Stability Control (DSC) |
| 2 | Heating for KAFAS Mid Camera |
| 3 | KAFAS Mid Camera |
| 4 | Rain-light-solar-condensation sensor (RLSBS) |
| 5 | Fuse for front right power distribution box |
| 6 | Body Domain Controller (BDC) |
| 7 | Signal unit (LED) in right mirror glass |
| 8 | CAN terminator |
| 9 | Fuse for rear right power distribution box |
| 10 | Rear radar sensor short range right (HRSNR) |
| 11 | Rear radar sensor short range left (HRSNL) |
| 12 | Switch block, driver's door |
| 13 | Advanced Crash Safety Module (ACSM) |
| 14 | Audio operating unit |
| 15 | Intelligent Safety button |
| 16 | Signal unit (LED) in left mirror glass |
| 17 | Steering column switch cluster (SZL) |
| 18 | Instrument cluster (KOMBI) |
| 19 | Head-Up Display (HUD) |

G15 Driver Assistance Systems

1. Introduction

1.4.2. Active Driving Assistant Professional (SA 5AU)



G15 with optional equipment Driving Assistant Professional (SA 5AU)

TE18-1616_2

G15 Driver Assistance Systems

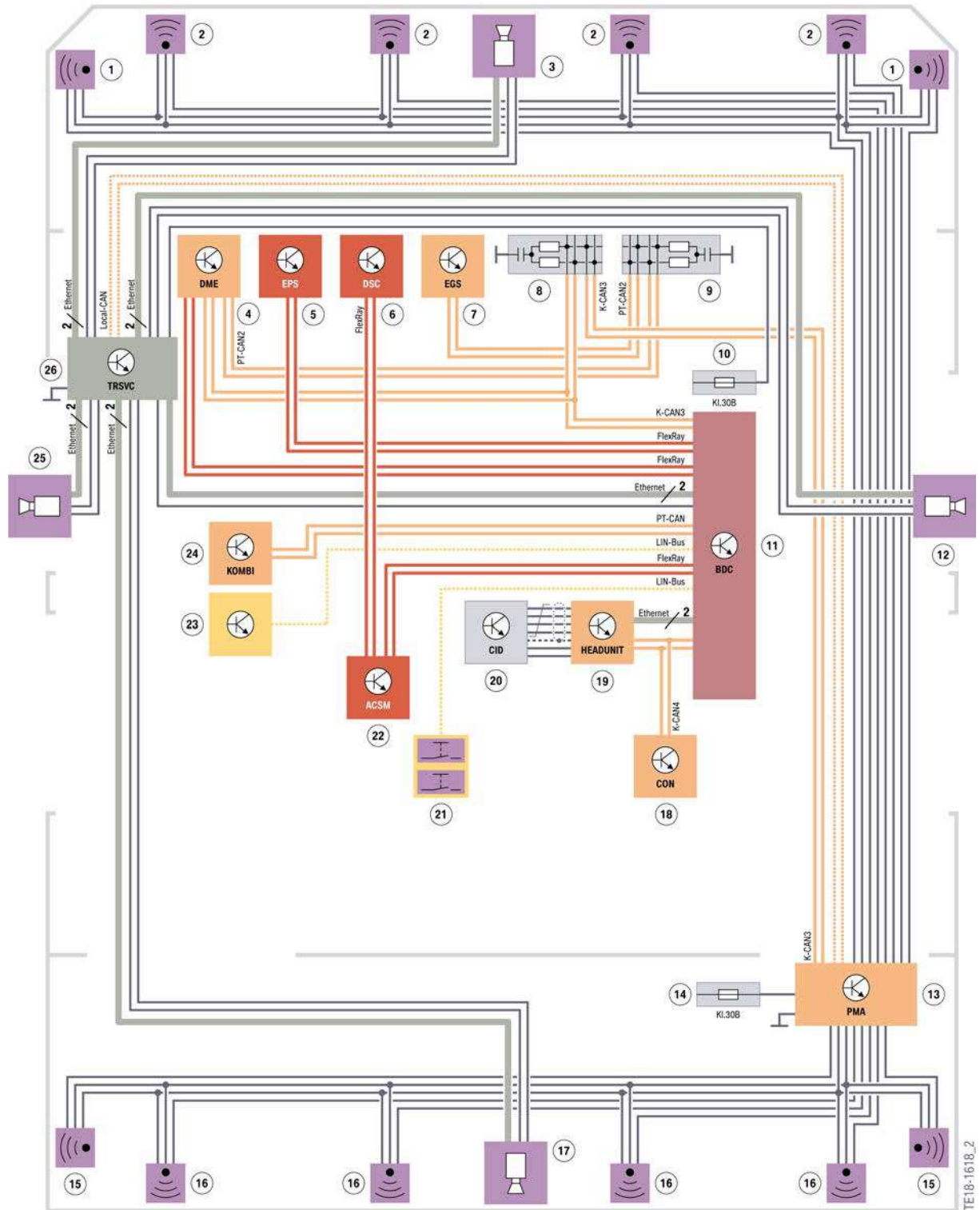
1. Introduction

| Index | Explanation |
|-------|--|
| 1 | Side radar sensor short range front left (SRSNVL) |
| 2 | Heating, front radar sensor long range (FRSF) |
| 3 | Front radar sensor long range (FRSF) |
| 4 | Side radar sensor short range front right (SRSNVR) |
| 5 | Fuse for front right power distribution box |
| 6 | Body Domain Controller (BDC) |
| 7 | Signal unit (LED) in right mirror glass |
| 8 | CAN terminator |
| 9 | Parking Maneuvering Assistant (PMA) |
| 10 | Rear radar sensor short range right (HRSNR) |
| 11 | Rear radar sensor short range left (HRSNL) |
| 12 | Switch block, driver's door |
| 13 | Steering column switch cluster (SZL) |
| 14 | Intelligent Safety button |
| 15 | Audio operating unit |
| 16 | Head Unit |
| 17 | Central Information Display (CID) |
| 18 | Instrument cluster (KOMBI) |
| 19 | Controller (CON) |
| 20 | Advanced Crash Safety Module (ACSM) |
| 21 | Door contact switch, driver's door |
| 22 | Seat belt buckle contact, driver's seat |
| 23 | Driver Camera System (DCS) |
| 24 | Signal unit (LED) in left mirror glass |
| 25 | Optional equipment system (SAS) |
| 26 | CAN terminator |
| 27 | Electronic Power Steering (EPS) |
| 28 | Electronic transmission control (EGS) |
| 29 | KAFAS High Camera |
| 30 | Heating, KAFAS High Camera |
| 31 | Dynamic Stability Control (DSC) |
| 32 | Digital Motor Electronics (DME) |
| 33 | CAN terminator |

G15 Driver Assistance Systems

1. Introduction

1.4.4. Parking Assistant Plus (SA 5DN)



G15 with optional equipment Parking Assistant Plus (SA 5DN)

G15 Driver Assistance Systems

1. Introduction

| Index | Explanation |
|-------|--|
| 1 | Ultrasonic sensor for PMA |
| 2 | Ultrasonic sensor PDC, front |
| 3 | Front camera |
| 4 | Digital Motor Electronics (DME) |
| 5 | Electronic Power Steering (EPS) |
| 6 | Dynamic Stability Control (DSC) |
| 7 | Electronic transmission control (EGS) |
| 8 | CAN terminator |
| 9 | CAN terminator |
| 10 | Fuse for front right power distribution box |
| 11 | Body Domain Controller (BDC) |
| 12 | Right side view camera |
| 13 | Parking Maneuvering Assistant (PMA) |
| 14 | Fuse for rear right power distribution box |
| 15 | Ultrasonic sensor for PDC, side rear |
| 16 | Ultrasonic sensor for PDC, rear |
| 17 | Rear view camera (RFK) |
| 18 | Controller (CON) |
| 19 | Head Unit High |
| 20 | Central Information Display (CID) |
| 21 | Parking assistance button and Panorama View button |
| 22 | Advanced Crash Safety Module (ACSM) |
| 23 | Steering column switch cluster (SZL) |
| 24 | Instrument cluster (KOMBI) |
| 25 | Left side view camera |
| 26 | Top Rear Side View Camera (TRSVC) |

G15 Driver Assistance Systems

2. Operating Elements

The Driver Assistance Systems are operated when the vehicle is in motion via 4 operating elements:

- Light operating unit
- Control panel on the multifunction steering wheel
- Intelligent Safety button
- Center console control panel.



G15 control elements for assistance systems

| Index | Explanation |
|-------|---|
| 1 | Light operating unit |
| 2 | Control panel for Driver Assistance Systems on the multifunction steering wheel |
| 3 | Intelligent Safety button |
| 4 | Parking assistance button |
| 5 | Panorama View button |

The settings within the Intelligent Safety menu are made via the Controller. Only the operating elements relevant to the Driver Assistance Systems are discussed in this chapter. You can find a full description of the display and operating elements of the G15 in the reference manual "G15 Displays and Controls".

G15 Driver Assistance Systems

2. Operating Elements

2.1. Light operating unit

The Night Vision button for activation of the thermal image screen in the Central Information Display (CID) is located in the light operating unit.



G15 Night Vision button for thermal image screen in the CID

| Index | Explanation |
|-------|---------------------|
| 1 | Night Vision button |

2.2. Multifunction steering wheel



G15 Control panel for Driver Assistance Systems on the multifunction steering wheel

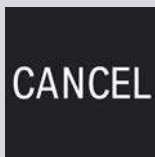
| Index | Explanation |
|-------|--|
| A | Control panel with standard equipment |
| B | Control panel with optional equipment "Active Driving Assistant Professional" (SA 5AU) installed |

G15 Driver Assistance Systems

2. Operating Elements



Resume button for resuming a set speed



Cancel button for temporarily deactivating the cruise control



Rocker switch for changing the set speed



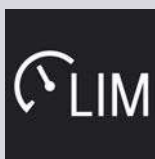
Set button for saving the current speed

Vehicles with Speed Limit Assistant:

- Speed Limit Assistant deactivated:
Adoption of the suggested speed limit
- Speed Limit Assistant activated:
Change back to the last speed set



Button for activating or deactivating the Dynamic Cruise Control (DCC)



Button for activating or deactivating the Speed Limiter function



Button for increasing the distance to the vehicle in front



Button for reducing the distance to the vehicle in front

G15 Driver Assistance Systems

2. Operating Elements



Resume/Cancel button for resuming a set speed/temporarily deactivating the cruise control



Assist button for activating/deactivating the Driver Assistance System selected using the MODE button (Assist button)



MODE Button for selecting the Driver Assistance System
Possible selection:

- **Only** ACC Stop&Go or
- ACC Stop&Go **with** Steering Assistant (including Traffic Jam Assistant)

To be able to facilitate easy operation of the ever-increasing Driver Assistance Systems without additional buttons, the operation of the Driver Assistance Systems has been changed with the optional equipment Active Driving Assistant Professional (SA 5AU). The Assist button is pressed to activate the Driver Assistance System. Then, by pressing the MODE button, the vehicle will cycle between two Driver Assistance Systems: either ACC Stop&Go or ACC Stop&Go **with** Steering Assistant (including Traffic Jam Assistant.) The chosen system is now active. Pressing the Assist button while the system is active will deactivate the system.

Note: Changing the Driver Assistance System mode is only possible when the system is active.

Example: The driver is using ACC Stop&Go and would like to engage the Steering Assistant. Pressing the MODE button would then select the Steering Assistant **with** ACC Stop&Go to be able to use both functions. If the Assist button is pressed now, Steering Assistant is deactivated together with ACC Stop&Go.

The Driver Assistance Systems that can be selected with the mode button are displayed to the driver as a selection list in the instrument cluster.

With the optional equipment Active Driving Assistant Professional (SA 5AU) there is an LED above both the left and the right control pads on the MFL. The two LEDs provide additional visual indicators to the instructions issued in the instrument cluster and the Central Information Display.

- Green: The assistance system is active and assumes lateral guidance (does not apply to the US market)
- Yellow: Interruption of the assistance system pending
- Red: The assistance system is deactivated

G15 Driver Assistance Systems

2. Operating Elements



G15 Settings menu for the LED light-emitting elements in the CID

| Index | Explanation |
|-------|---|
| 1 | "Feedback via steering wheel" menu |
| 2 | Lighting elements on the multifunction steering wheel (switch on and off) |

The LEDs can be deactivated via the iDrive menu:

- "Settings"
- "Driver Assistance"
- "Feedback via steering wheel"
- "Lighting elements"

2.3. Intelligent Safety button

The Intelligent Safety button, already familiar from other BMW models, enables the Driver Assistance Systems to be operated from a central location. The Intelligent Safety button can be used both to switch the systems on and off directly and to call up the Intelligent Safety menu to personalize the settings.

In the G15, depending on the vehicle equipment, the following Driver Assistance Systems can be personalized via the Intelligent Safety menu:

- Front collision warning
- Side collision warning
- Lane Departure Warning
- Steering intervention
- Blind Spot Collision Warning

2.4. Parking assistance button

The parking assistance button no longer has to be pressed and held while maneuvering into a parking space when using Automatic Parking. A single press of the button is sufficient.


G15 Driver Assistance Systems

3. Daytime Pedestrian Protection

The Daytime Pedestrian Protection function in the G15 is a component part of Active Driving Assistant (SA 5AS) and is effected with the aid of the KAFAS Mid camera.

For the first time, as part of the Daytime Pedestrian Protection function, the driver also receives a warning of **cyclists**. Just as with the pedestrian warning, only an **acute warning** is issued in a speed range of approximately 5-65 km/h with the cyclist warning. If the acute warning is issued, an automatic brake intervention through to maximum deceleration is initiated.

When an acute warning is issued, the same symbol is used for both the pedestrian warning and for the cyclist warning in the instrument cluster (KOMBI) and, if applicable, in the Head-Up Display (HUD).

| Symbols (HUD & KOMBI) | Explanation |
|---|---|
|  The image shows two views of the driver's display. The top view is the Head-Up Display (HUD) showing a red pedestrian symbol above a speed limit sign for 80 km/h. The bottom view is the instrument cluster (KOMBI) showing a red pedestrian symbol in the center, with a speedometer on the left and a tachometer on the right. The speedometer shows 80 km/h and the tachometer shows 0. The instrument cluster also displays 'COMFORT' and 'D' for the gear. | <p>Acute warning:</p> <ul style="list-style-type: none">• Person symbol flashes and a signal sounds• Request for intervention by braking and, if necessary, evasive action (if necessary assisted by the Evasion Assistant). |

There are no configuration possibilities in the Intelligent Safety menu for the pedestrian and cyclist warning. The only possibility is deactivation by pressing the Intelligent Safety button for a long period. The pedestrian and cyclist warning is automatically switched back on after each terminal change.

As a result of the new Evasion Assistant functions, the Evasion Assistant is also available to the driver in the event of a pedestrian and cyclist warning.

G15 Driver Assistance Systems

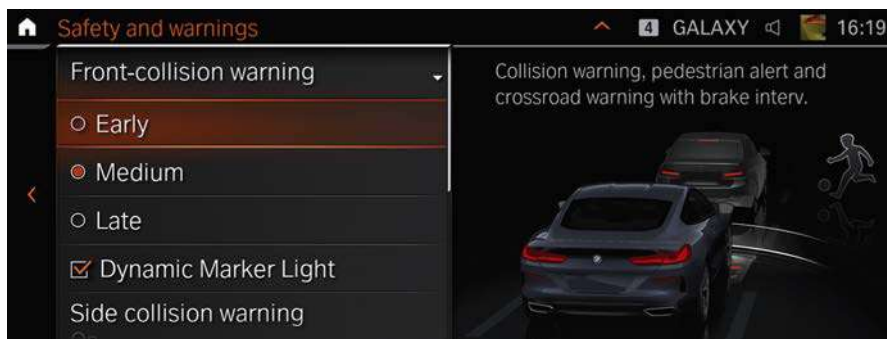
4. Intersection Collision Warning

The Intersection collision warning is also used in the G15. Since an extremely exact environment analysis must be performed in front of the vehicle for this function, the data from the KAFAS High camera, the front radar sensor long range (FRSF) and the side radar sensors short range front (SRSNVL and SRSNVR) are evaluated. Thus, the Intersection collision warning with city braking function is only available with the optional equipment Active Driving Assistant Professional (SA 5AU).

In the previous function characteristics, an acute warning is issued and a preconditioning of the brake system is performed. The responsibility for preventing an imminent collision is still the driver's alone.

With the introduction of the G15, the Intersection collision warning **with city braking function** now provides assistance in the speed range of approximately 10-80 km/h as and, when required, with a supporting brake intervention. The intensity of the brake intervention is controlled depending on the situation.

In addition, the acute warning has been supplemented by an advance warning. The warning time of the Intersection collision warning with city braking function can only be set as part of the Front collision warning in the iDrive menu.



G15 adjusting the warning time



The Intersection collision warning with city braking function does not relieve the driver of personal responsibility for correctly judging the visibility and traffic situation. The driver's driving style should be adapted to the traffic conditions. The driver should check the traffic conditions, and react accordingly if required.

G15 Driver Assistance Systems

5. Lane Departure Warning

5.1. Active steering intervention

Active steering intervention is an innovation to the Lane Departure Warning in the G15 with standard equipment Active Driving Assistant (SA 5AS). This was previously only possible with the optional equipment Active Driving Assistant Plus (SA 5AT).

Depending on the vehicle equipment, the function logic is implemented on different control units:

| Optional equipment | Control unit responsible |
|--|---|
| Active Driving Assistant (SA 5AS) | <ul style="list-style-type: none">• DSC• KAFAS Mid Camera |
| Active Driving Assistant Professional (SA 5AU) | <ul style="list-style-type: none">• Optional equipment system (SAS)• KAFAS High Camera |

G15 Driver Assistance Systems

6. Automatic Lane Change

The G15 introduces the Automatic Lane Change function to the US market. Automatic Lane Change supports the driver when changing lanes, for example when passing on highways. The system offers the driver further convenience with this and can contribute to avoiding possible collisions with another vehicle travelling in the same direction.

If the driver has activated the system and the destination lane is free, the vehicle automatically carries out a steering wheel movement and returns to lane guidance (Steering Assistant) after the lane change is completed.

The system assists the driver in the speed range from approximately 70 km/h to approximately 180 km/h.

6.1. Functional principle

Automatic Lane Change is activated if the driver operates the turn indicator (**“one-touch signalling” and holds it for approximately 1 second**) with Steering Assistant activated. This signals to the system that the driver would like to change to the adjacent lane with system support.

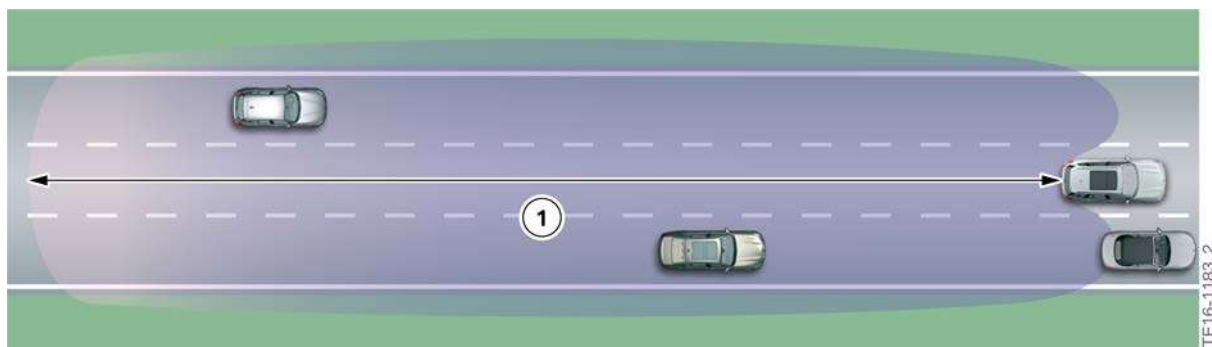
First the system analyzes whether a danger-free lane change is possible, and also whether sufficient room for the maneuver is available. The surroundings are monitored by the side radar sensors and the data from the KAFAS camera. The KAFAS camera is principally used for lane detection.

The radar sensors are not only responsible for the detection of an object, but are also able to take into consideration the speed of vehicles detected nearby.

6.1.1. Monitoring ranges

The monitoring ranges for the radar sensors are as follows:

Sensor monitoring range for vehicles behind the vehicle



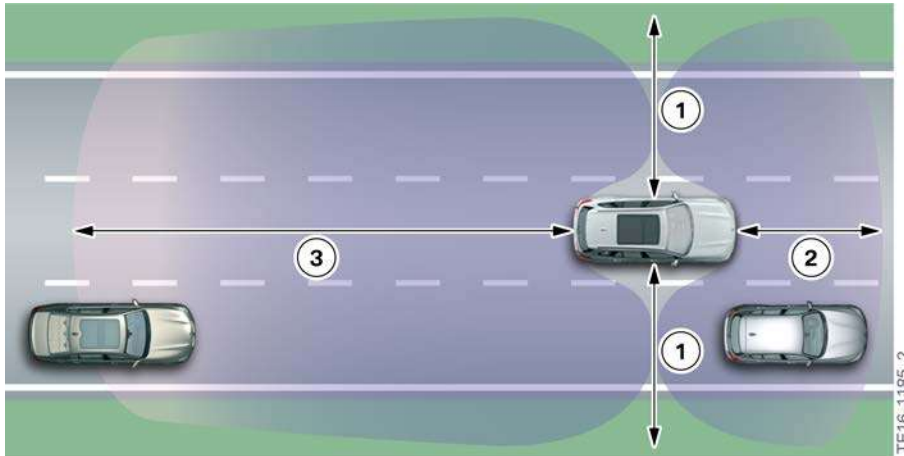
G15 sensor monitoring range for vehicles behind the vehicle

| Index | Explanation |
|-------|--------------------|
| 1 | approximately 70 m |

G15 Driver Assistance Systems

6. Automatic Lane Change

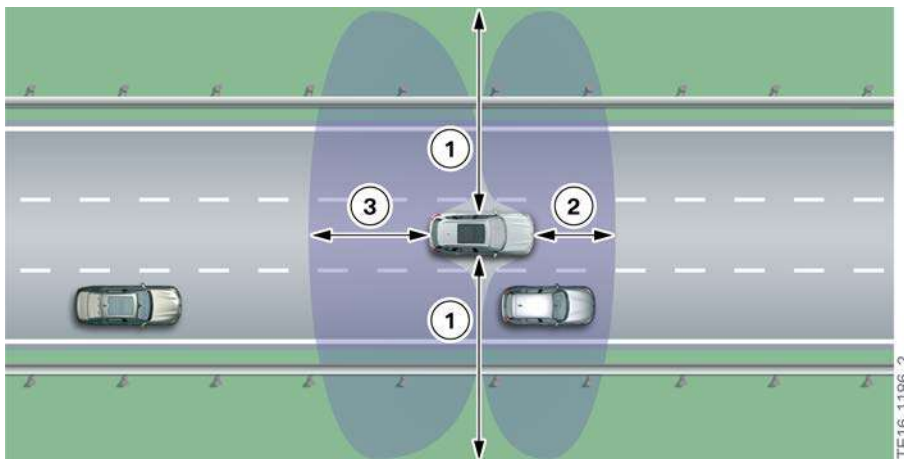
Sensor monitoring range for vehicles to the sides



G15 sensor monitoring range for vehicles to the sides

| Index | Explanation |
|-------|---|
| 1 | approximately 6 m |
| 2 | approximately 4.5 m |
| 3 | approximately 5 m to approximately 15 m (depending on the road speed) |

Sensor monitoring range for stationary objects (roadside structures) to the sides



G15 sensor monitoring range for stationary objects (roadside structures) to the sides

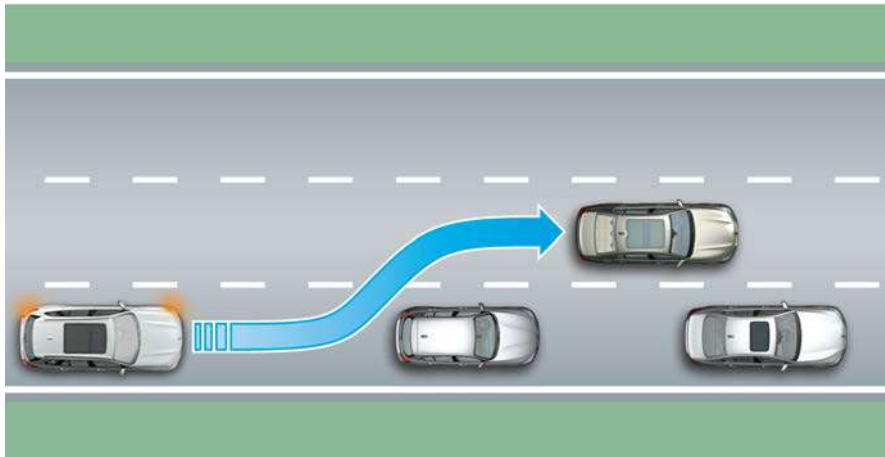
| Index | Explanation |
|-------|--------------------|
| 1 | approximately 10 m |
| 2 | approximately 4 m |
| 3 | approximately 6 m |

G15 Driver Assistance Systems

6. Automatic Lane Change

The vehicle performs the lane change automatically if the sensor system does not detect any vehicles in the relevant safety zone and if there is sufficient room for maneuvering available. It is of no importance whether the vehicle lane change is for passing purposes or whether the driver is simply wishing to change lanes.

The direction of the lane change is determined by the turn indicator which has been previously set.



G15 Automatic Lane Change

The driver merely has to monitor the lane change. This **does not**, however, mean that he is released from his duties as a driver. For instance, the driver is also obliged to check whether a lane change is permissible at all, and has to take account of passing restrictions, solid lines, etc. Automatic Lane Change does not take these circumstances into consideration.

Once the change to the adjacent lane is complete, the vehicle returns to lane guidance (Steering Assistant).

The lane change maneuver will be aborted if, once it has started, the turn indicator lever is released too soon (less than approximately 1 second), a Blind Spot Collision Warning warning is issued or an object is detected to the side of the vehicle. If the lane change maneuver is automatically cancelled before the vehicle has crossed the lane marker, the vehicle is guided back into the original lane.



The driver has full responsibility for the lane change maneuver, including checking that the destination lane is free.

The maximum steering torque has been set in such a way that it can always be overruled by the driver and therefore steering past the maximum steering torque is possible. This means that the driver has the capability at all times to abort the automatic lane change.

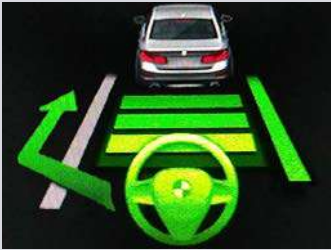
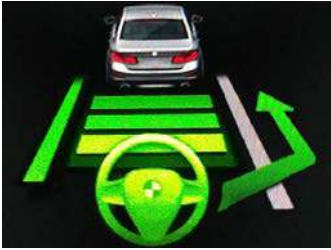
G15 Driver Assistance Systems

6. Automatic Lane Change

6.2. Operation

Automatic Lane Change is activated if the driver operates the turn indicator (**“one-touch signalling” and holds it for approximately 1 second**) with Steering Assistant activated. A special precondition or individual configuration option for the system is not provided.

Displays in the instrument cluster (KOMBI)

| Symbols | Explanation |
|--|--|
|  | <p>Steering wheel symbol and lane marker on right side is green. The left lane marker is grey. The green arrow indicates direction of Automatic Lane Change.</p> <ul style="list-style-type: none">Request to change to left lane detected. |
|  | <p>Steering wheel symbol and lane marker on left side is green. The right lane marker is grey. The green arrow indicates direction of Automatic Lane Change.</p> <ul style="list-style-type: none">Request to change to right lane detected. |



Automatic Lane Change cannot replace the driver's personal judgement of the traffic situation. Therefore, check the traffic situation around the vehicle by looking around, otherwise there may be a risk of an accident as a result of road users or objects which lie outside the detection range of the sensors. Approaching vehicles can be detected too late or not at all because of the limits inherent in the system. Automatic Lane Change does not release the driver from his own responsibilities.

G15 Driver Assistance Systems

6. Automatic Lane Change

6.3. Functional prerequisites

The following basic prerequisites must be met to use Automatic Lane Change:

- Steering Assistant is active.
- The vehicle is traveling on a divided highway.
- The turn indicator lever is held in the “one-touch signalling position” for approximately 1 second.
- The driving lane line to be crossed has been detected.
- “Hands-on” (hands on the steering wheel) must be detected at the start of the maneuver.
- Blind Spot Collision Warning is active and not issuing a warning.
- No vehicles have been detected in the maneuvering space to the side of the vehicle.
- No stationary objects (such as roadside structures, posts, etc.) have been detected in the maneuvering space to the side of the vehicle.
- The vehicle is travelling at a speed between approximately 70 km/h and approximately 180 km/h.

6.4. Deactivation criteria

Automatic Lane Change is automatically deactivated in the following situations:

- Automatic Lane Change is no longer executed if the trigger conditions are not met within approximately 10 seconds from the start of the turn indication.
- Automatic Lane Change will be aborted if, once a lane change maneuver has started, the turn indicator lever is released too soon (less than approximately 1 second), a Blind Spot Collision Warning is issued or an object is detected to the side of the vehicle.
- Automatic Lane Change is also aborted if the driver steers opposite to the steering torque applied by the system.
- If the lane marker on the other side of the destination lane is not detected in sufficient time after passing over the lane marking to be crossed.

G15 Driver Assistance Systems

7. Cruise Control

7.1. Active Cruise Control with Stop&Go function

Active Cruise Control with Stop&Go function is included in the G15 with the optional equipment Active Driving Assistant Professional (SA 5AU). As previously, the set speed is limited to a maximum of **180 km/h**.

7.2. Speed Limiter

The G15 introduces the Speed Limiter to the US market. This function has been available in European markets for many years.

With the Speed Limiter, the maximum speed of the vehicle can be limited by the driver. The minimum value that can be selected is 30 km/h.

If required, the driver can consciously exceed the speed limit by firmly accelerating (pressing the accelerator pedal down fully). The limit is automatically reactivated when the driver speed drops below the set limit.

The Speed Limiter does not initiate any active brake interventions. This means that if the driver inadvertently exceeds the set speed limit, as can be the case during downhill driving for example, the system does not brake automatically.

7.2.1. Operation

The Speed Limiter can be activated and deactivated using the LIM button on the multifunction steering wheel (MFL). The vehicle's current speed is adopted as the speed limit. If the system is activated while the vehicle is stationary, 30 km/h is automatically set as the speed limit. The driver can increase or decrease the chosen speed limit by using the rocker switch on the left side of the multifunction steering wheel (MFL).

A mark is set at the corresponding speed in the KOMBI.



The system should only be used when it is possible to drive at a constant speed. The driver is solely responsible for the vehicle and the speed at which it is driven.

G15 Driver Assistance Systems

7. Cruise Control

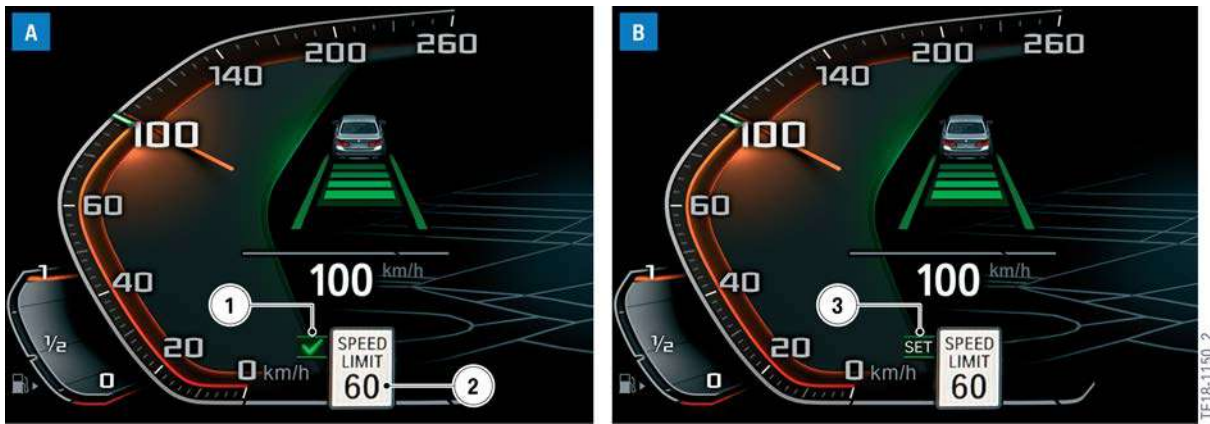
7.3. Speed Limit Assistant

The G15 introduces the Speed Limit Assistant to the US market. The Speed Limit Assistant function supports the driver by adopting the speed limits.

Speed Limit Assistant is available for the following systems:

- Active Driving Assistant Professional (SA 5AU).

Manual adoption of the speed limit is executed via the SET button.



G15 displays in the instrument cluster when Speed Limit Assistant is activated

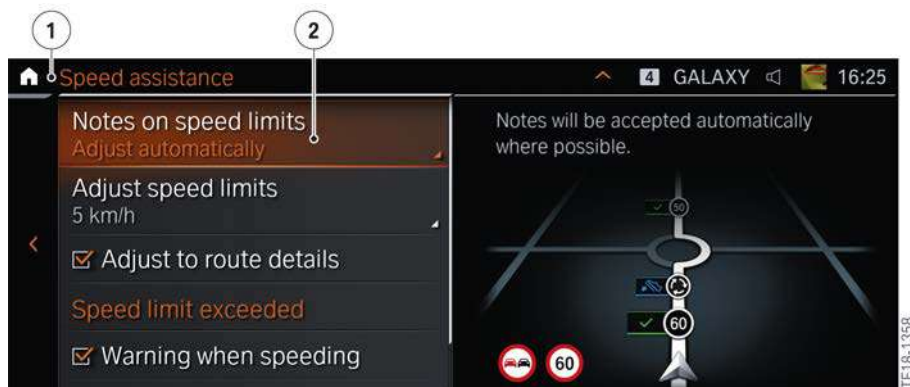
| Index | Explanation |
|-------|---|
| A | Speed Limit Assistant suggested speed adopted |
| B | Speed Limit Assistant suggested speed available |
| 1 | Speed limit is confirmed by pressing the SET button on the MFL |
| 2 | Speed limit |
| 3 | Speed limit available to be adopted by pressing the SET button on the MFL |

With Speed Limit Assistant the speed limit can be adopted, after driver confirmation, as the new set speed when the cruise control is activated.

Manual adoption of the upcoming speed limit must be activated in the iDrive menu and can also be configured and deactivated in the same place. Manual adoption is executed by pressing the "SET button" on the multifunction steering wheel (MFL). **Automatic** adoption of the upcoming speed limit is not available for the US market.

G15 Driver Assistance Systems

7. Cruise Control



G15 settings menu, speed assistance in the CID: Speed Limit Assistant

| Index | Explanation |
|-------|--|
| 1 | Settings menu: "Speed Limit Assistant" |
| 2 | Speed Limit Assistant switched on |

Speed Limit Assistant can be set in the iDrive menu under the following menu items:

- "Settings"
- "Driver assistance"
- "Driving"
- "Speed Limit Assist"

G15 Driver Assistance Systems

8. Automatic Parking

Automatic Parking was previously known as Parking Maneuvering Assistant (PMA). The control module is still referred to as PMA in technical systems.

8.1. Maneuvering out of a parking space

With the launch of the Service Pack 2018, Automatic Parking supports maneuvering out of **parallel parking spaces**. Here the system assumes acceleration, braking and steering until the vehicle comes to a stop in such a way that it can be driven by the driver out of the parking space without further steering wheel movement. The necessary drive position changes and switching on the turn indicator are likewise performed by the PMA. The LED lights of the multifunction steering wheel light up green here.

This function is planned for release at a later date.



G15 view, parking space exit function in the CID (maneuvering by means of Automatic Parking)



The driver remains responsible for maneuvering out of the parking space and merging into traffic.

A number of functional requirements must be met to enable Automatic Parking to maneuver out of the parking space automatically:

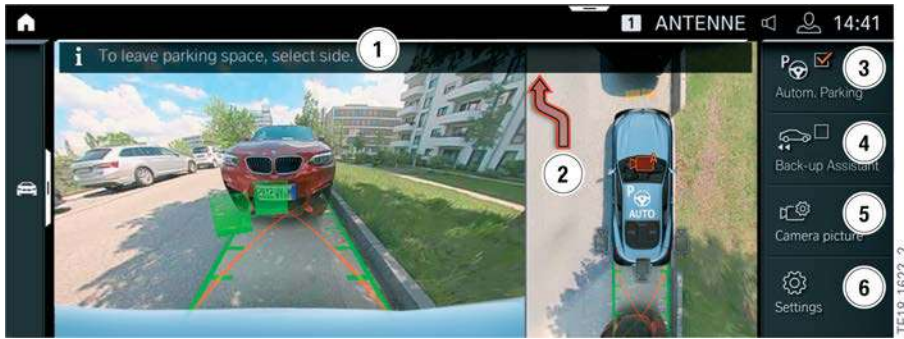
- The vehicle must have been maneuvered into the parking space with Automatic Parking beforehand
- An obstacle must be detected in front of the vehicle
- The parking space must be at least 0.8 m longer than the vehicle.

G15 Driver Assistance Systems

8. Automatic Parking

8.2. Operation

The function menu can be called up after the engine has started by pressing the parking assistance button or by selecting reverse gear. Then the function can be selected directly via the controller or by the Central Information Display (CID).



G15 Automatic Parking operation

| Index | Explanation |
|-------|---|
| 1 | Instructions |
| 2 | Selection option: "Parking space exit direction" |
| 3 | Selection option: "Automatic Parking" |
| 4 | Selection option: "Back-up Assistant" |
| 5 | Settings menu: "Camera picture" (brightness and contrast) |
| 6 | Settings menu: "Parking and maneuvering" |

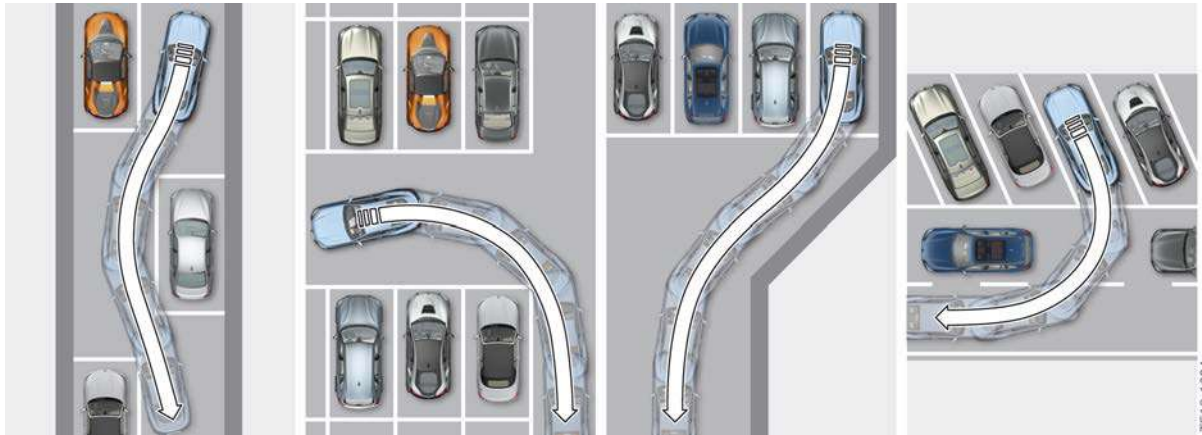
To start the maneuvering operation, it is necessary to select the parking space exit direction via the controller or the Central Information Display (CID). At the end of the automatic maneuvering operation the driver is prompted by appropriate instructions in the Central Information Display (CID) to assume control of the vehicle again.

G15 Driver Assistance Systems

9. Back-up Assistant

9.1. Functional principle

The Back-up Assistant supports the driver when reversing out of entrances and narrow streets or in multi-story parking garages. For this purpose, the Back-up Assistant stores the distance travelled and the steering wheel movements made before the vehicle is parked. This is performed automatically under a speed of approximately 35 km/h for the last 50 meters covered in the forward direction.



G15 Back-up Assistant (examples of possible applications)

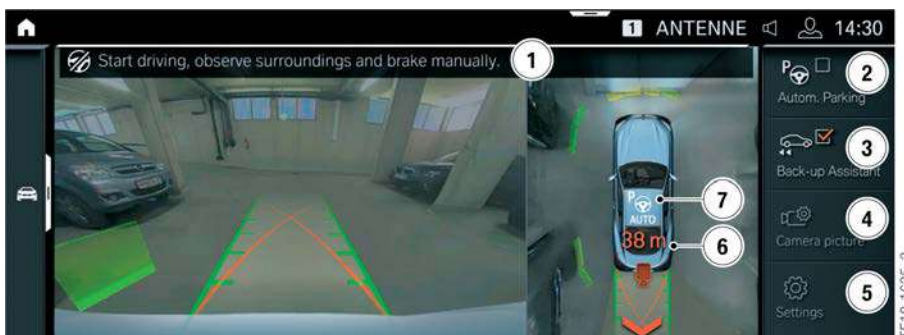
After the Back-up Assistant is activated, the vehicle assumes lateral guidance for the stored distance covered. The LED displays on the multifunction steering wheel light up green in the process.



The driver himself remains responsible for accelerating and braking. A change of environment after the distance covered is stored, for example due to a changed parking position of a different vehicle, is not taken into consideration. The driver is thus responsible for monitoring the vehicle environment and must brake or if necessary steer himself accordingly.

9.2. Operation

The function menu can be called up in the Central Information Display (CID) after starting the engine by pressing the parking assistance button or by selecting the reverse gear. The function can then be activated directly via the Controller or in the Central Information Display (CID).



G15 view, Back-up Assistant in the CID

G15 Driver Assistance Systems

9. Back-up Assistant

| Index | Explanation |
|-------|---|
| 1 | Instructions |
| 2 | Selection option: "Automatic Parking" |
| 3 | Selection option: "Back-up Assistant" |
| 4 | Settings menu: "Camera picture" (brightness and contrast) |
| 5 | Settings menu: "Parking and maneuvering" |
| 6 | Visualization: Remaining distance covered |
| 7 | Visualization: Vehicle assumes lateral guidance |

The remaining distance covered is displayed during the automatic reversing maneuver. At the end of the stored distance covered the driver is prompted by appropriate instructions in the Central Information Display (CID) to assume control of the steering again.



Technical training.
Product information.

G15 Displays and Controls



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General information

Symbols used

The following symbol is used in this document to facilitate better comprehension or to draw attention to very important information:



Contains important safety information and information that needs to be observed strictly in order to guarantee the smooth operation of the system.

Information status: June 2018

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

- Owner's Handbook
- Integrated Service Technical Application
- Aftersales Information Research (AIR)

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G15 Displays and Controls

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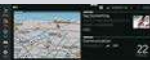

G15 Displays and Controls

1. Operating Elements

1.1. Introduction

1.1.1. New features in the G15

The following table shows the new features of and changes to the display and operating elements in the G15:

| Function | New feature/change |
|---|---|
| Controllers | Controller with 8 direct access keys |
|  | |
| Central Information Display | 12.3" Central Information Display with a Head Unit High 3 |
|  | |
| User interface | User interface ID7 |
|  | |
| Light operating unit | Rotary controller has been replaced by push buttons |
|  | |

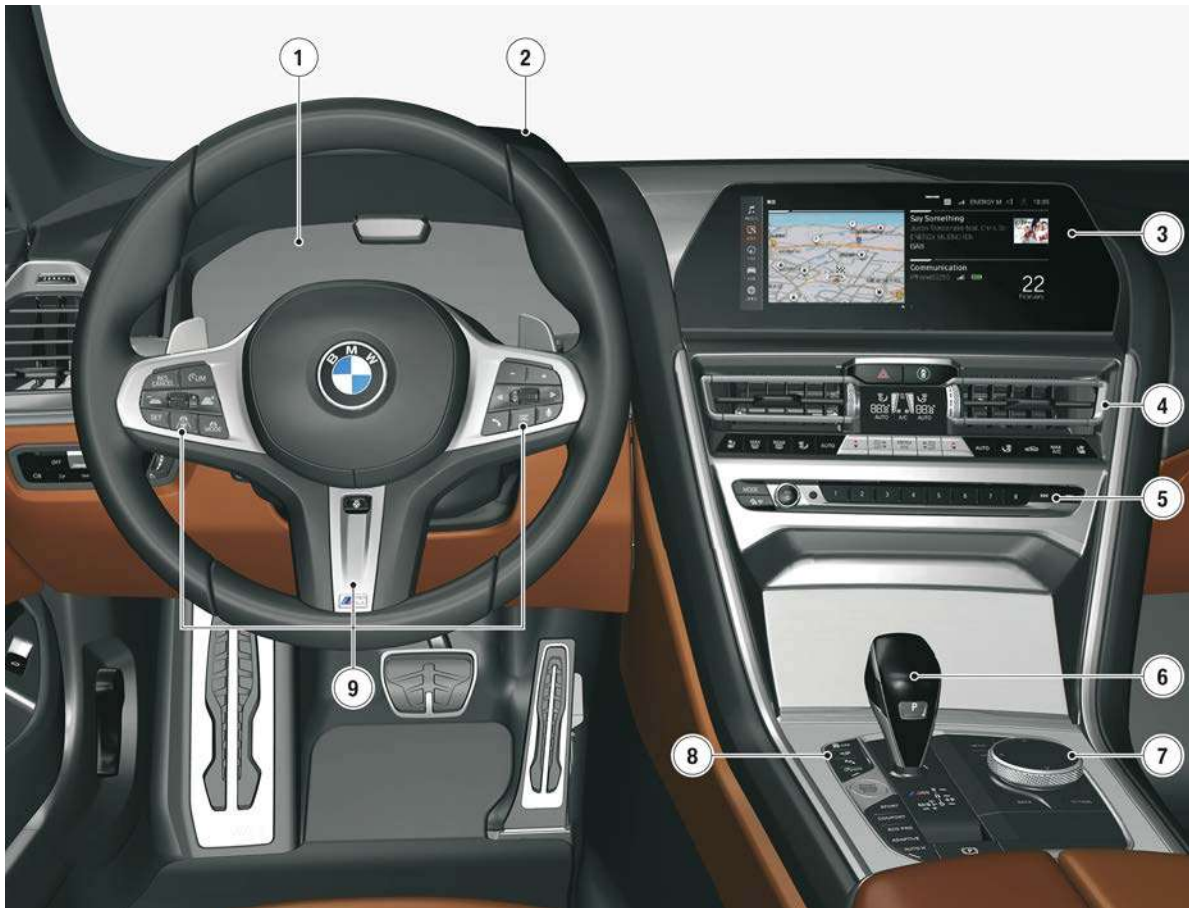
G15 Displays and Controls

1. Operating Elements

1.1.2. Overview of the interior

The interior and the operating area (cockpit) of the G15 have been newly designed. Among the new features is the new layout of the air conditioning control and the audio operating unit.

The following graphic shows the display and operating elements of the G15:



G15 Overview of the interior

| Index | Explanation |
|-------|--------------------------------|
| 1 | Instrument cluster |
| 2 | Head-Up Display |
| 3 | Central Information Display |
| 4 | Air conditioning control panel |
| 5 | Audio operating unit |
| 6 | Gear selector switch |
| 7 | Controllers |
| 8 | Center console control panel |
| 9 | Multifunction steering wheel |

G15 Displays and Controls

1. Operating Elements

1.1.3. Overview of displays



G15 overview of displays

| Index | Explanation |
|-------|-----------------------------------|
| 1 | Head-Up Display (HUD) |
| 2 | Central Information Display (CID) |
| 3 | Instrument cluster (KOMBI) |

1. Operating Elements

1.1.4. Audio operating unit



G15 audio operating unit

| Index | Explanation |
|-------|---|
| 1 | Select AM, FM |
| 2 | Change entertainment source |
| 3 | Press: Switch sound output on/off; turn: Set volume |
| 4 | Favorite buttons |
| 5 | Press once: Change station/track; press and hold: fast forward/rewind track |

1.1.5. Heating and air-conditioning controls



G15 Heating and air conditioning controls

1.2. Center console switch cluster

The following graphic shows the operating elements in the Center console:

G15 Displays and Controls

1. Operating Elements



G15 Center Operation Unit

| Index | Explanation |
|-------|---------------------------------------|
| 1 | Gear selector switch |
| 2 | Controller |
| 3 | Electromechanical parking brake |
| 4 | Automatic Hold |
| 5 | Driving experience switch |
| 6 | Start/Stop button |
| 7 | Activate/deactivate engine start/stop |
| 8 | Parking Manoeuvring Assistant |
| 9 | Surround view camera |
| 10 | Dynamic Stability Control |

G15 Displays and Controls

1. Operating Elements

1.2.1. Variants

The center console switch cluster consists of two different equipment specifications:

- Standard
- Glass controls (SA 4A2)



Center console switch cluster variants

| Index | Explanation |
|-------|---|
| A | Center console switch cluster with the standard equipment |
| B | Center console switch cluster with the optional glass controls (SA 4A2) |

G15 Displays and Controls

1. Operating Elements

1.3. Light operating unit

A new light operating unit is used for the first time in the G15. The light switch element is situated next to the steering wheel. With the optional equipment Night Vision with Pedestrian Detection (SA 6UK) the light operating unit is additionally equipped with a Night Vision button.

The following graphic shows a light operating unit that features the maximum equipment specification.



G15 light operating unit

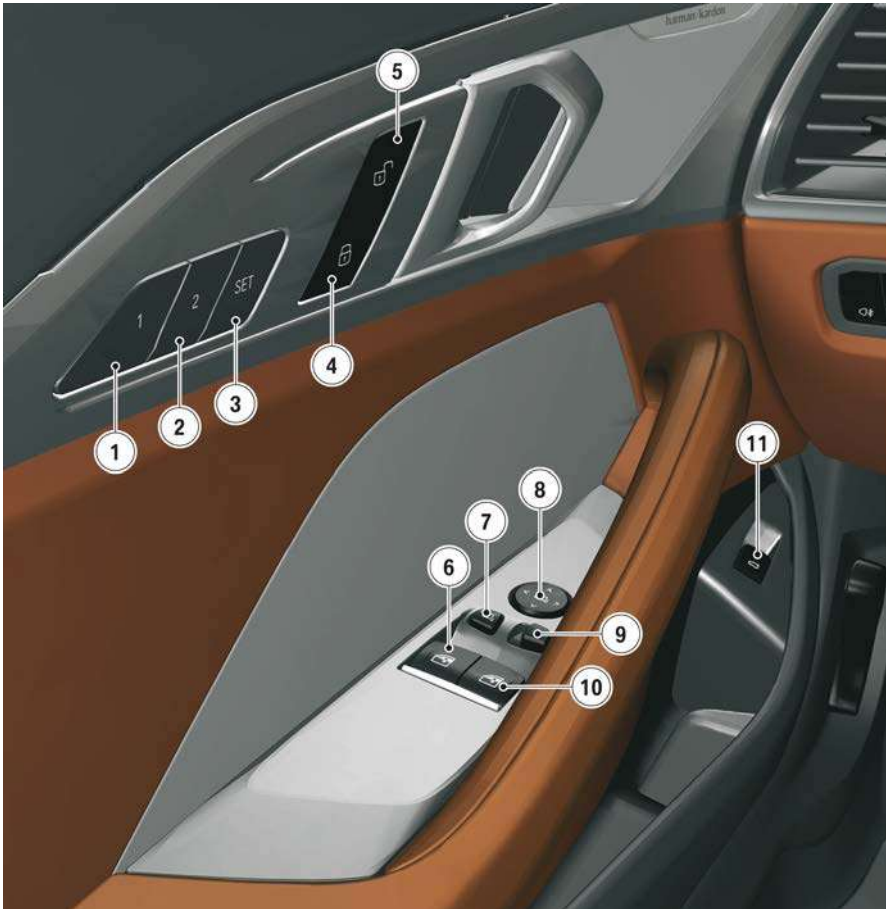
| Index | Explanation |
|-------|---|
| a | Light switch |
| 1 | Lights off; daytime driving lights |
| 2 | Automatic driving lights control; adaptive lighting functions |
| 3 | Low-beam headlight |
| 4 | Night Vision (SA 6UK) |
| 5 | Instrument lighting |
| 6 | Right parking light |
| 7 | Side lights |
| 8 | Left parking light |

G15 Displays and Controls

1. Operating Elements

1.4. Doors

Here you can see an overview of the door operating unit:



G15 operating element, door, driver's side

| Index | Explanation |
|-------|--|
| 1 | Button for adjusting the seat position memory 1 |
| 2 | Button for adjusting the seat position memory 2 |
| 3 | Memory button set |
| 4 | Button for locking the vehicle |
| 5 | Button for unlocking the vehicle |
| 6 | Power window regulator, driver's side |
| 7 | Fold the exterior rearview mirrors in and out |
| 8 | Button for adjusting the exterior rearview mirrors |
| 9 | Select the mirror, Automatic mirror dip |
| 10 | Power window regulator, passenger side |
| 11 | Open/close trunk |

G15 Displays and Controls

1. Operating Elements

1.5. 2/2-zone air conditioning control panel

The 2/2 zone air conditioning is included in the standard equipment of the G15. It provides the driver and front passenger with individual and separate left/right temperature control and the ability to individually select an automatic program. All functions on this control panel are controlled using buttons. Depending on the equipment specification, the following settings can be controlled via the air conditioning control panel:

- Amount of air, driver/front passenger
- Seat heating
- Seat ventilation



G15 air conditioning control panel, fresh air grille

| Index | Explanation |
|-------|---|
| 1 | Hazard warning switch |
| 2 | Intelligent Safety button |
| 3 | Active seat ventilation/seat heating, right |
| 4 | Max. cooling on/off |
| 5 | Air recirculation function |
| 6 | Manual air distribution regulation, right |
| 7 | Automatic program, right |
| 8 | Temperature adjustment, right |
| 9 | Decrease/increase amount of air, right |
| 10 | Up A/C menu, down A/C On/Off |
| 11 | Decrease/increase amount of air, left |

G15 Displays and Controls

1. Operating Elements

| Index | Explanation |
|-------|--|
| 12 | Temperature adjustment, left |
| 13 | Automatic program, left |
| 14 | Manual air distribution regulation, left |
| 15 | Rear window heating on/off |
| 16 | Windshield defrosting |
| 17 | Active seat ventilation/seat heating, left |
| 18 | Display |

Further information on the heating and air conditioning systems of the G15 can be found in the Product Information "G15 Body".

G15 Displays and Controls

2. Instrument Cluster

2.1. Introduction

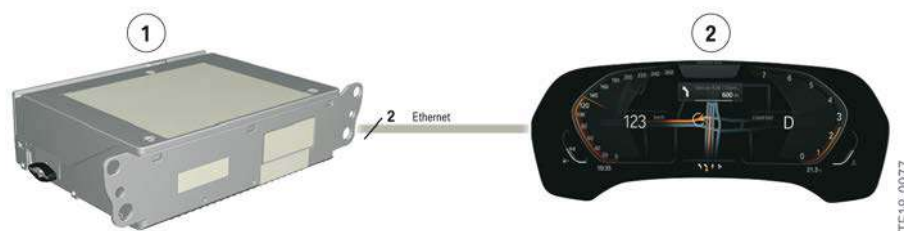
A new instrument cluster is installed in the G15. The displays of the instrument cluster are shown on a 12.3" TFT display.



G15 instrument cluster

2.2. Connection

The instrument cluster is connected with the Head Unit High 3 via an Ethernet cable.



G15 connection of instrument cluster with the head unit

| Index | Explanation |
|-------|----------------------------|
| 1 | Head unit |
| 2 | Instrument cluster (KOMBI) |

G15 Displays and Controls

2. Instrument Cluster

Head-Up Display is additionally connected with the instrument cluster via an APIX connection.



G15 connection of Head-Up Display

| Index | Explanation |
|-------|----------------------------|
| 1 | Head unit |
| 2 | Instrument cluster (KOMBI) |
| 3 | Head-Up Display (SA610) |

G15 Displays and Controls

3. Controller

3.1. Overview

A new controller is used in the G15. The controller has 8 direct access keys.



G15 controller view

| Index | Explanation |
|-------|----------------|
| 1 | Communication |
| 2 | Media |
| 3 | ConnectedDrive |
| 4 | Home |
| 5 | Navigation map |
| 6 | Navigation |
| 7 | Option |
| 8 | Back |

G15 Displays and Controls

3. Controller

3.2. Installation location

The controller is situated in the Center Operation Unit.



G15 controller view

G15 Displays and Controls

4. Central Information Display

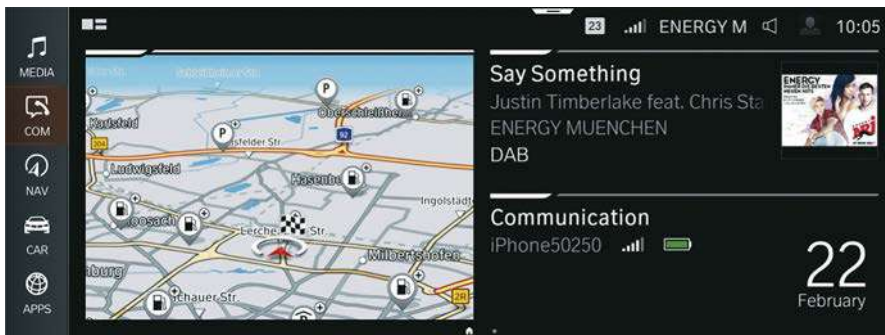
The G15 contains in combination with BMW Live Cockpit Pro a Central Information Display with a screen diagonal of 10.25". The Live Cockpit Pro is standard equipment in the G15.



G15 Central Information Display

4.1. ID7

The G15 contains a new user interface. This is called ID7 (BMW iDrive 7th generation).



ID7 menu view

G15 Displays and Controls

4. Central Information Display

Among other things, the menu view can be individually adapted with the ID7 user interface.



Menu views of the ID7

Further information on the ID7 user interface can be found in the Product Information "Displays and Controls 2018".

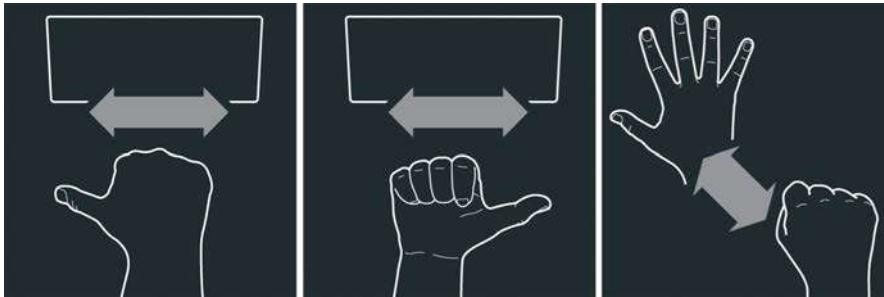
G15 Displays and Controls

5. Gesture Control

5.1. Introduction

Some iDrive functions can be controlled by moving the hands with BMW gesture control.

With gesture control, 3 new gestures are additionally recognized by the gesture recognition camera in the G15.



New gesture functions

The detection range of the gesture recognition camera extends from the steering wheel via the Central Information Display (CID) to the glove box.



G15 detection range, gesture recognition camera

G15 Displays and Controls

5. Gesture Control

Further information and an overview of the gesture functions used in the G15 can be found in the Product Information "Displays and Controls 2018".

5.2. Installation location

The gesture recognition camera is integrated in the roof function center (FZD).



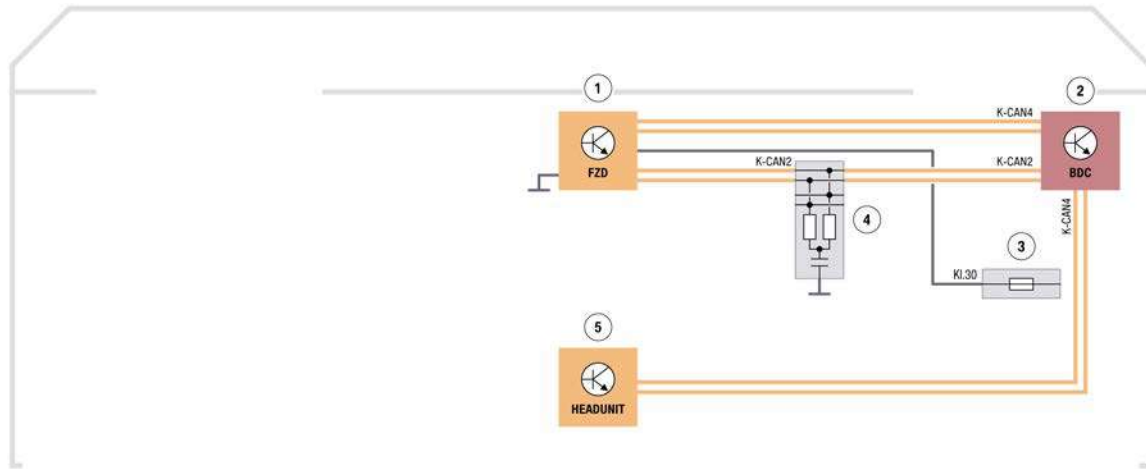
G15 installation location, gesture recognition camera

| Index | Explanation |
|-------|----------------------------|
| 1 | Gesture recognition camera |

G15 Displays and Controls

5. Gesture Control

5.3. System wiring diagram



G15 system wiring diagram, gesture control

| Index | Explanation |
|-------|---|
| 1 | Roof Function Center (FZD) |
| 2 | Body Domain Controller (BDC) |
| 3 | Fuse for front right power distribution box |
| 4 | CAN terminator |
| 5 | Head unit |

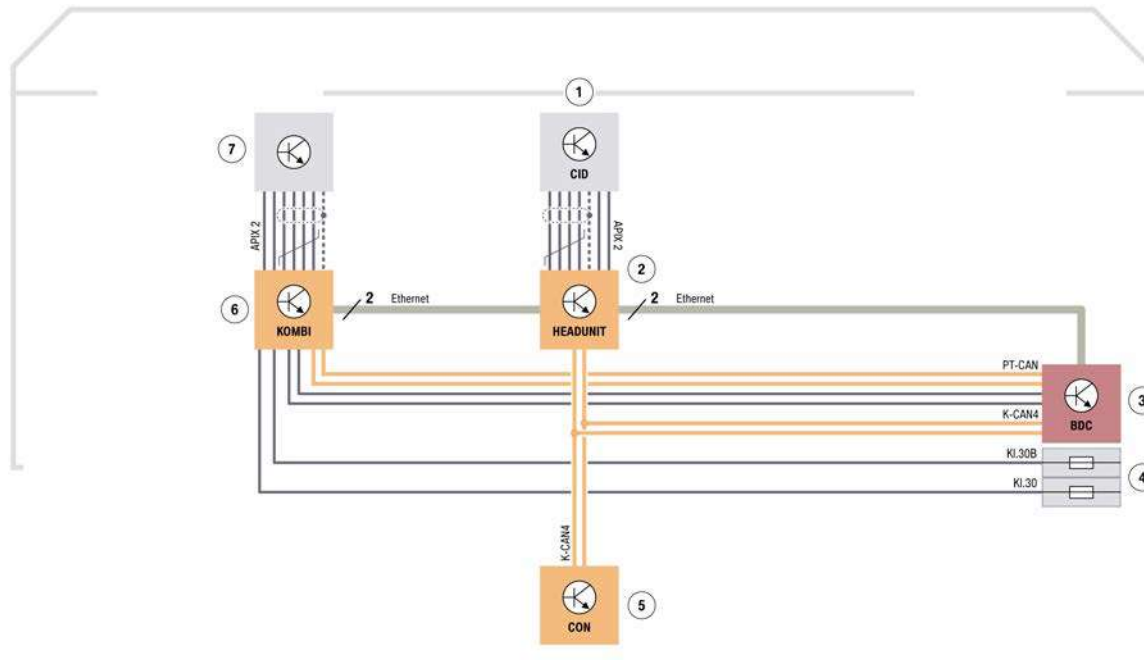
G15 Displays and Controls

6. Head-Up Display

6.1. Introduction

The Head-Up Display (HUD) projects a virtual, transparent image onto the windscreen in the driver's field of view. It offers the driver the opportunity to see all the information relevant to the driver directly in his/her field of view floating above the roadway.

6.2. System wiring diagram



G15 system wiring diagram for Head-Up Display

| Index | Explanation |
|-------|--|
| 1 | Central Information Display (CID) |
| 2 | Head unit |
| 3 | Body Domain Controller (BDC) |
| 4 | Fuses in power distribution box, front right |
| 5 | Controllers |
| 6 | Instrument cluster (KOMBI) |
| 7 | Head-Up Display (HUD) |

G15 Displays and Controls

7. Multifunction Steering Wheel

7.1. Control panels

7.1.1. Assistance systems

The following graphic provides an overview of the assistance system buttons on the multifunction steering wheel with the maximum equipment specification.

Further information on the control panels can be found in the Product Information "G15 Driver Assistance Systems".



G15 multifunction steering wheel, assistance systems

| Index | Explanation |
|-------|--|
| 1 | Set speed |
| 2 | LED display |
| 3 | Speed limit ON/OFF (LIM) |
| 4 | Increase distance to the vehicle ahead |
| 5 | Button for selecting the assistance system Possible selection: Only ACC with Stop&Go or ACC Stop&Go with Steering Assistant |
| 6 | Button for activate/deactivating the assistance system selected via the Mode button |
| 7 | Store the current speed |
| 8 | Reduce distance to the vehicle ahead |
| 9 | Stop cruise control/continue cruise control with last setting |

G15 Displays and Controls

7. Multifunction Steering Wheel

7.1.2. Multimedial

The following graphic provides an overview of the buttons for multimedia applications on the multifunction steering wheel.



G15 multifunction steering wheel, multimedia

| Index | Explanation |
|-------|--|
| 1 | Knurled wheel, select in the selection list |
| 2 | LED display |
| 3 | Rocker switch +, increase volume |
| 4 | Press once: change station/track; press and hold: fast forward track |
| 5 | Voice processing system |
| 6 | Selection lists |
| 7 | Telephone |
| 8 | Press once: change station/track; press and hold: fast rewind track |
| 9 | Rocker switch -, reduce volume |

The Selection lists button can be used to display lists such as the Entertainment list or the playlist in the instrument cluster or in the Head-Up Display.

G15 Displays and Controls

7. Multifunction Steering Wheel



Displays of selection lists

| Index | Explanation |
|-------|--|
| 1 | Display of the playlist in the Head-Up Display |
| 2 | Entertainment list in the instrument cluster |

7.1.3. Steering wheel heating



G15 steering wheel heating

G15 Displays and Controls

7. Multifunction Steering Wheel

| Index | Explanation |
|-------|--------------------------------|
| 1 | Button, steering wheel heating |

