Technical training.
Product information.

G30 General Vehicle Electronics

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BMW Group University
Technical Training
ST1604 11/1/2016

BMW Service

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 and national-market versions

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.

This document basically relates to the European version of left hand drive vehicles. Some operating elements or components are arranged differently in right-hand drive vehicles than shown in the graphics in this document. Further differences may arise as the result of the equipment specification in specific markets or countries.

Additional sources of information

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

- Owner's Handbook
- Integrated Service Technical Application.

Contact: conceptinfo@bmw.de

The information contained in this document forms an integral part of the BMW Group Technical Qualification and is intended for the trainer and participants in the seminar. Refer to the latest relevant information systems of the BMW Group for any changes/additions to the technical data.

Information status: **September 2016**
Technical training.

G30 General Vehicle Electronics

Contents

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Contents

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1. Exterior Lights

1.1. Versions

The following exterior light versions are available for the G30:

- LED Adaptive headlights with cornering light
- Adaptive Full LED headlight (OE 552) is optional
- LED fog lights

1.2. Lighting, front

The following are the headlight versions available for the G30:

Headlight versions

Index	Explanation
1	LED adaptive headlights with cornering light
2	Adaptive Full LED Headlights

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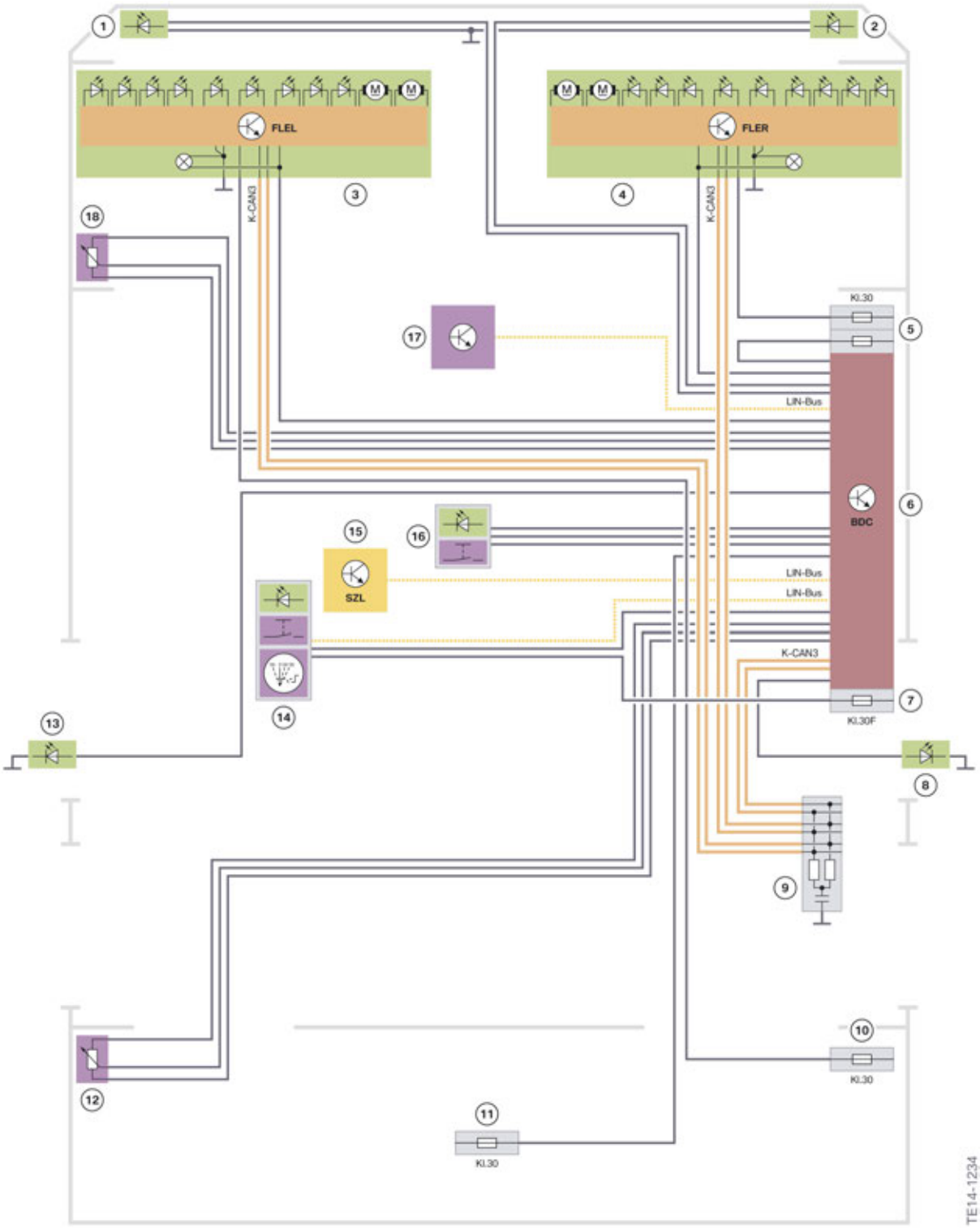
1. Exterior Lights

1.2.1. System wiring diagram



Front exterior lights

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1. Exterior Lights

Index	Explanation
1	Left LED fog light
2	Right LED fog light
3	Left headlight with Frontal Light Electronics Left (FLEL)
4	Right headlight with Frontal Light Electronics Right (FLER)
5	Fuses in the power distribution box, front right
6	Body Domain Controller (BDC)
7	Fuse in the Body Domain Controller
8	Turn indicator in exterior mirror, right
9	CAN terminator
10	Fuse for rear right power distribution box
11	Fuse in the power distribution box, battery
12	Ride-height sensor, rear left
13	Turn indicator in exterior mirror, left
14	Light switch
15	Steering column switch cluster (SZL)
16	Hazard warning switch/Intelligent Safety button
17	Rain-light-solar-condensation sensor (RLSBS)
18	Ride height sensor, front left

The turn indicator with LED technology and bulb are shown in the wiring diagram. Depending on the headlight version, the turn indicator is designed either with LED technology or as a bulb.

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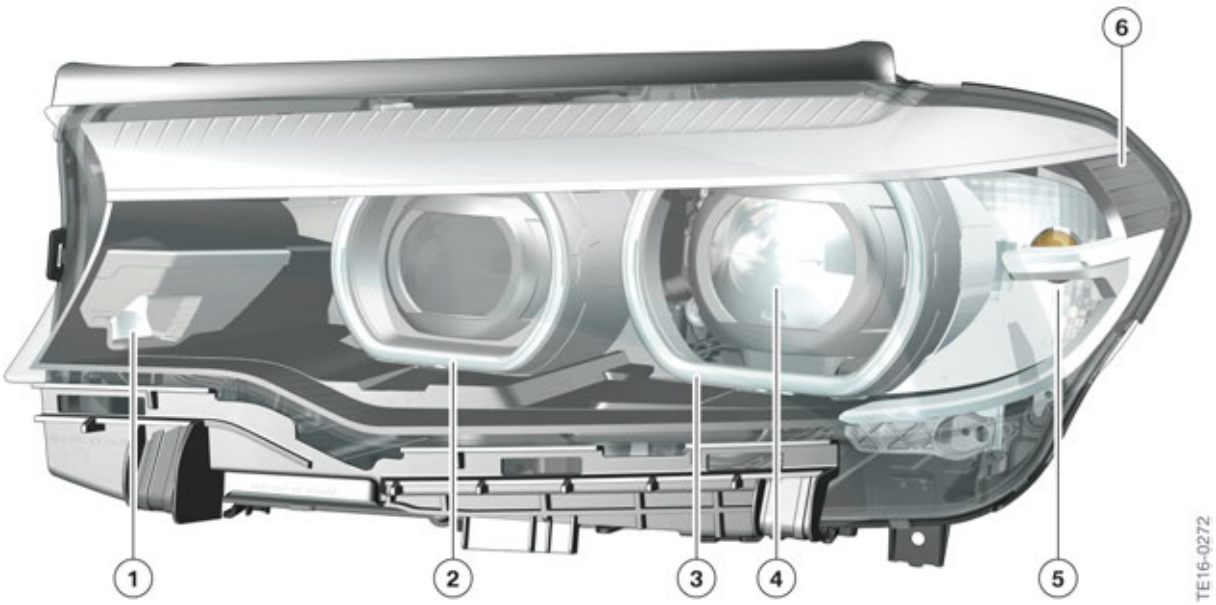
1. Exterior Lights

1.2.2. LED adaptive headlight with cornering light



LED adaptive headlight with cornering light

Index	Explanation
1	Cornering lights
2	Side lights and daytime driving lights
3	Side lights and daytime driving lights
4	Low-beam headlight/High-beam headlight
5	Turn indicator
6	Side marker light

On the LED adaptive headlight with cornering light, the low-beam headlight and high beam are in the same reflector.

A bulb is also used for the turn indicator.

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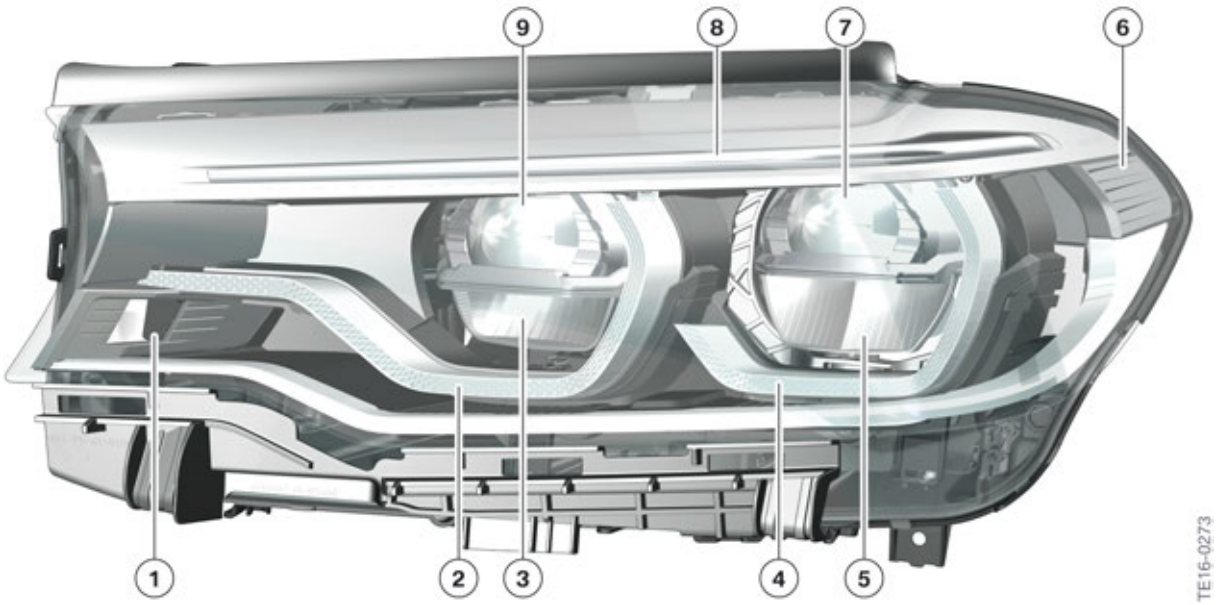
1. Exterior Lights

1.2.3. Adaptive full LED headlights



Adaptive LED Headlights

Index	Explanation
1	Cornering lights
2	Side lights and daytime driving lights
3	High-beam headlight
4	Side lights and daytime driving lights
5	High-beam headlight
6	Side marker light
7	Low-beam headlight
8	Turn indicator
9	Low-beam headlight

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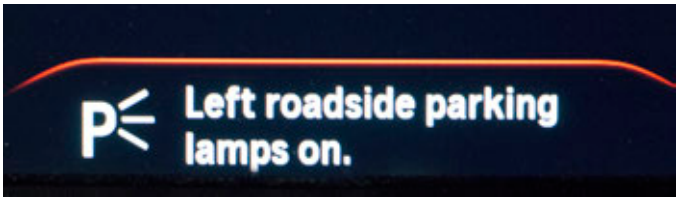
1. Exterior Lights

Headlight switch

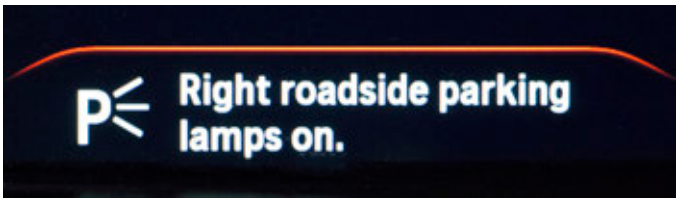
There are two additional buttons on the headlight switch of the G30. These buttons on the right side of the switch, are to illuminate the right or left side parking lamps when the vehicle condition is switched to PARKING (asleep).

Headlight switch

Once the button is pressed a check control message will appear in the KOMBI to inform the driver of this feature.



Left roadside parking lamps on



Right roadside parking lamps on

Roadside parking lamps off

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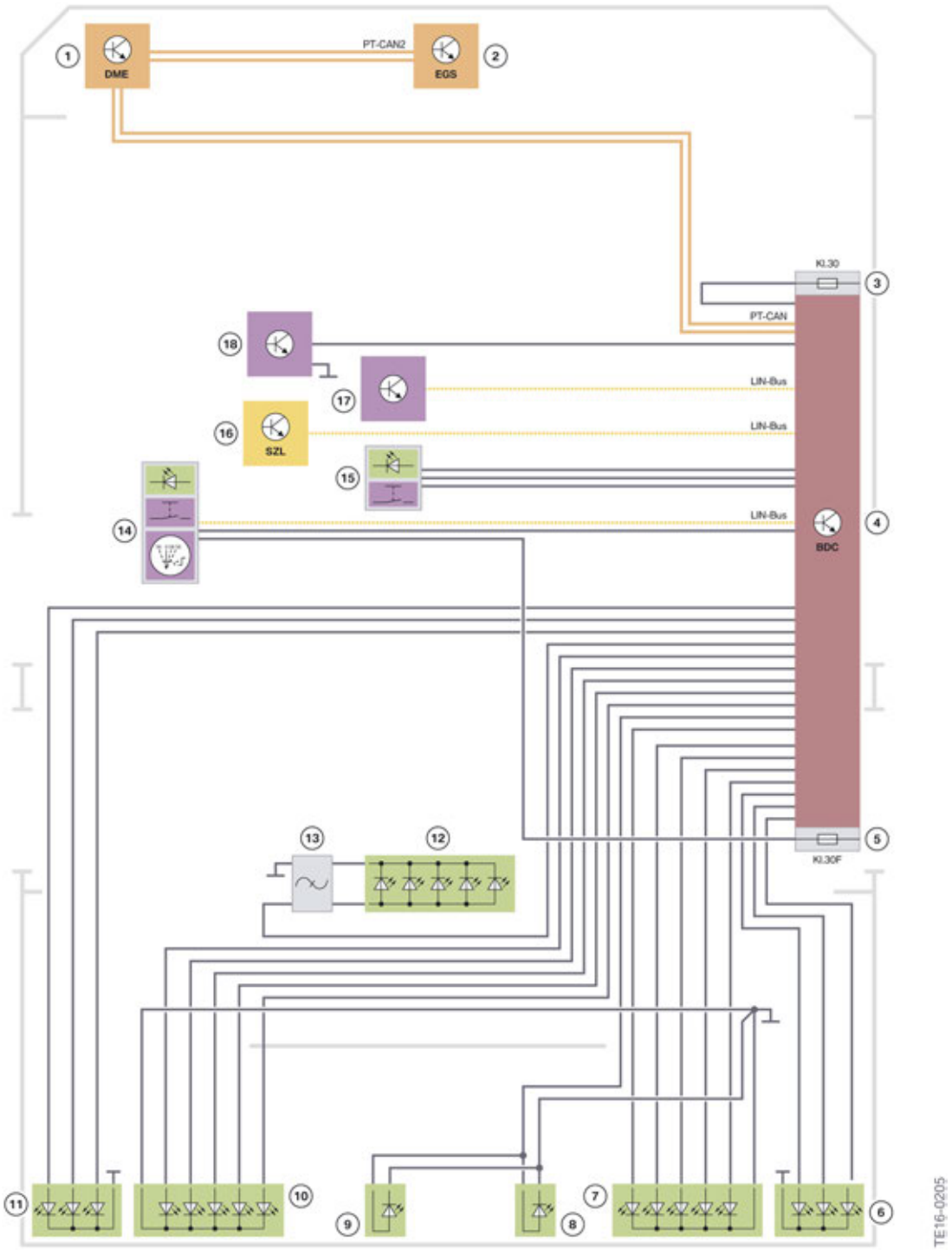
1. Exterior Lights

1.3. Lighting, rear

1.3.1. System wiring diagram



Rear exterior lights

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1. Exterior Lights

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

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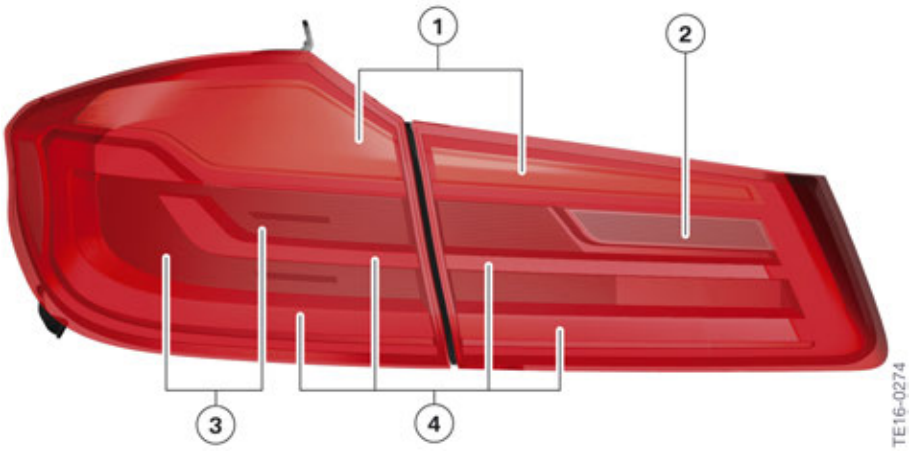
1. Exterior Lights

1.3.2. Rear light



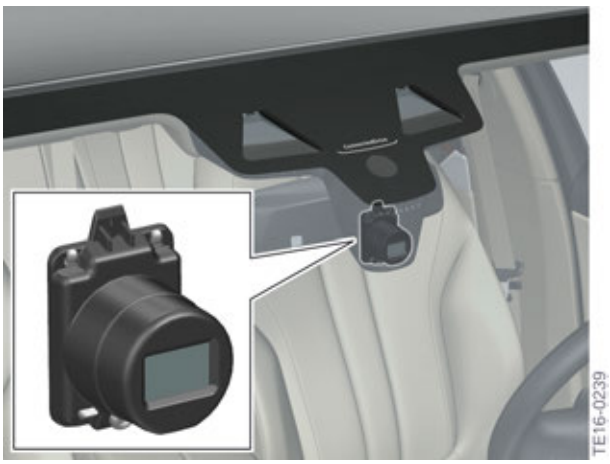
Rear light

Index	Explanation
1	Turn indicator
2	Reversing light (bulb)
3	Brake light
4	Tail light

1.4. High-beam assistant

On vehicles with Camera-based driver assistance systems (KAFAS), the function of the high-beam assistant is performed by the KAFAS.

On vehicles without Camera-based driver assistance systems (KAFAS), the high-beam assistant is integrated in the interior mirror.



High-beam assistant (FLA)

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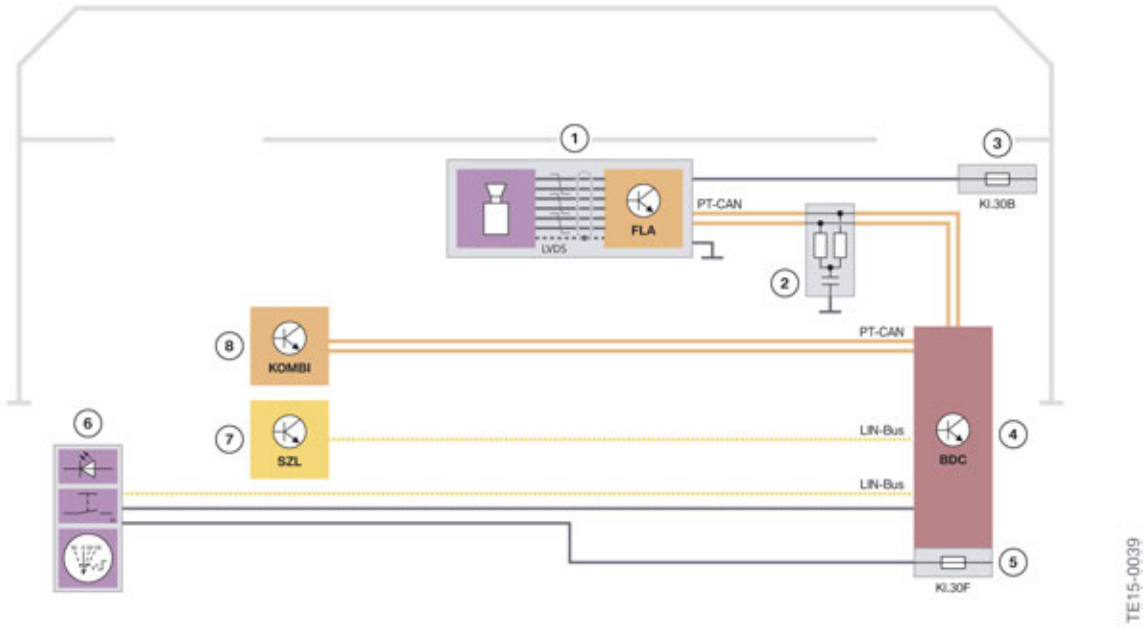
1. Exterior Lights

1.4.1. System wiring diagram



High-beam assistant

Index	Explanation
1	High-beam assistant (FLA)
2	CAN terminator
3	Fuse for front right power distribution box
4	Body Domain Controller (BDC)
5	Fuse in the Body Domain Controller
6	Light switch
7	Steering column switch cluster (SZL)
8	Instrument panel (KOMBI)

1.5. Ground lights

The ground lighting is integrated in the corresponding door modules. The LEDs of the ground lighting are directly activated by the Body Domain Controller (BDC).

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2. Interior Lighting

2.1. Ambient lighting

The ambient lighting includes 6 predefined, selectable light designs.

Adjust the lighting design and the brightness with the controller. The selected design is displayed on the CID.

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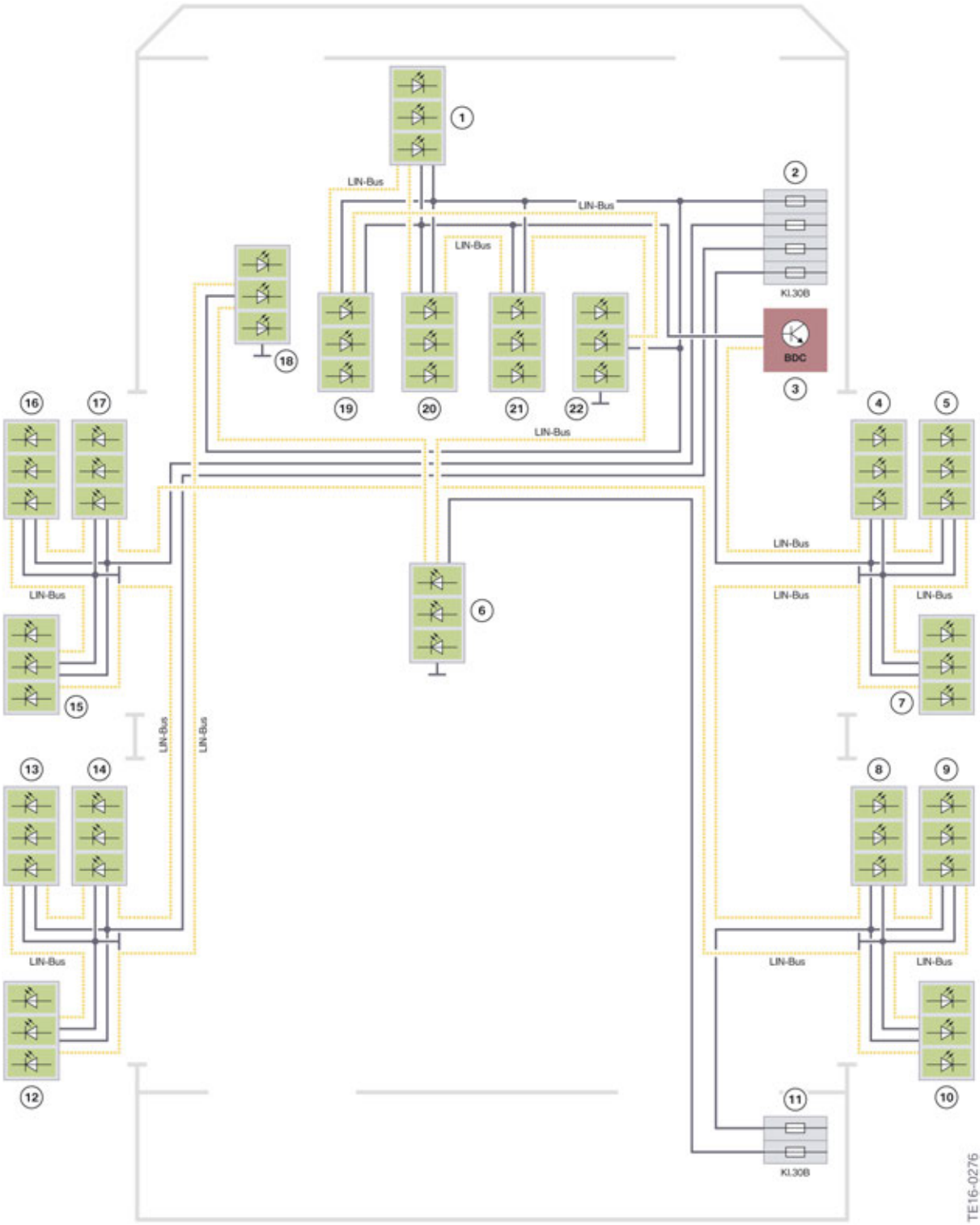
2. Interior Lighting

2.1.1. System wiring diagram



Interior lighting, ambient lighting

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2. Interior Lighting

Index	Explanation
1	Ambient lighting, instrument panel, passenger's side
2	Fuses in the power distribution box, front right
3	Body Domain Controller (BDC)
4	Lighting for door storage compartment, passenger's side
5	Door trim panel lighting, passenger's side
6	Lighting, center stack
7	Door contour lighting, passenger's side
8	Lighting for door storage compartment, passenger's side rear
9	Door trim panel lighting, passenger's side rear
10	Door contour lighting, passenger's side rear
11	Fuse in the power distribution box, rear right
12	Door contour lighting, driver's side rear
13	Door trim panel lighting, driver’s side rear
14	Door storage compartment lighting, driver’s side rear
15	Door contour lighting, driver's side
16	Door trim panel lighting, driver’s side
17	Door storage compartment lighting, driver’s side
18	Footwell light, front left
19	Contour lighting, instrument panel, driver's side
20	Contour lighting, instrument panel, passenger's side
21	Contour lighting, instrument panel, passenger's side
22	Footwell light, front right

RGB (Red, Green and Blue) LED modules are used for the ambient lighting.

The lighting for the ambient interior lighting is controlled via a separate LIN bus. The individual LED modules are connected via a local interconnect network bus. The LED modules are connected in series to the LIN bus around the vehicle.

If the LIN bus is interrupted at a certain point or the micro controller on the LED is faulty, then further light transmittance is interrupted at this point. A search for the fault must be carried out at the location where the last LED illuminates.

2.2. Light Effect Manager

On a vehicle with a Bowers & Wilkins audio system, the actuation of the lighting of the speaker trims is implemented via the Light Effect Manager.

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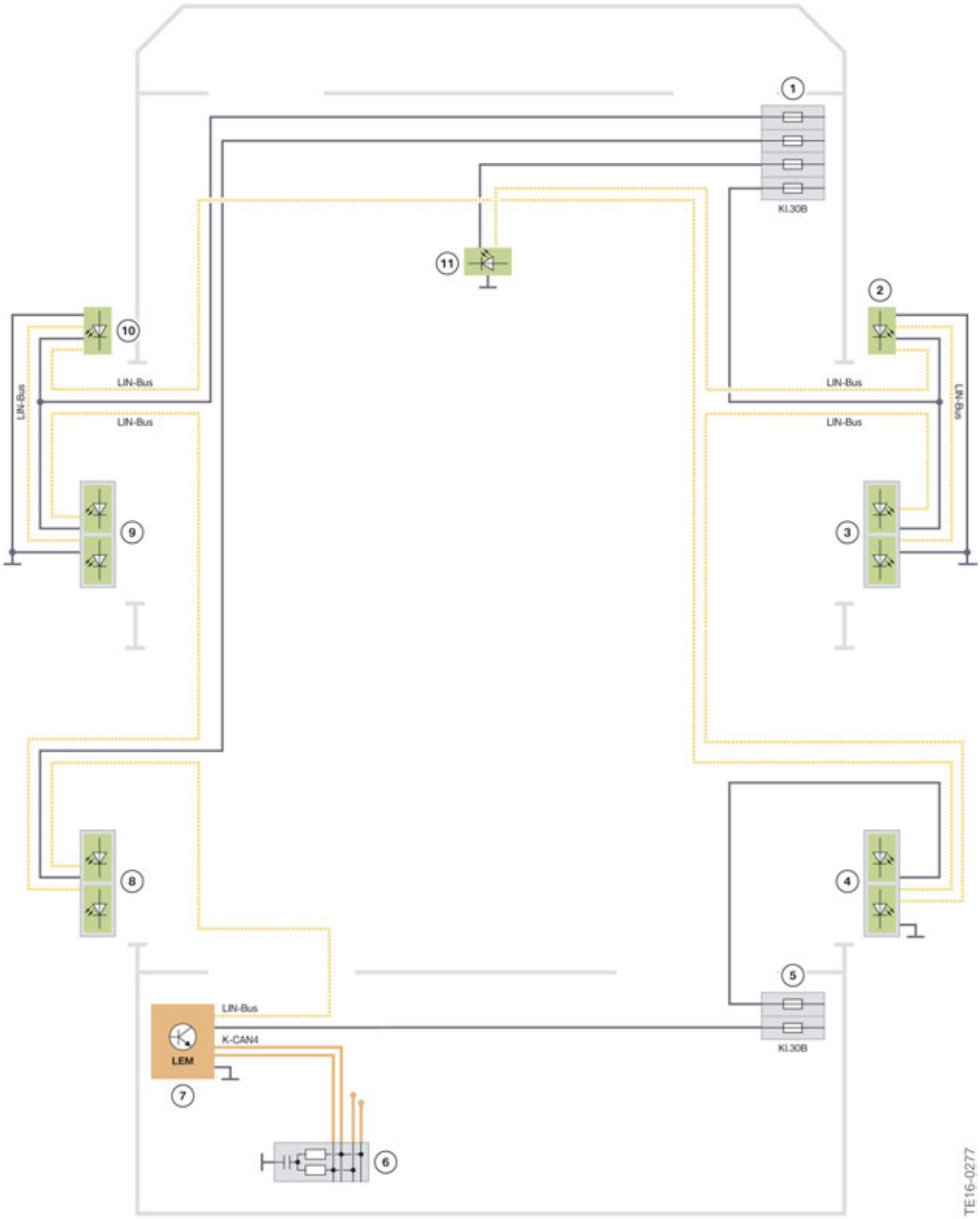
2. Interior Lighting

2.2.1. System wiring diagram



Light Effect Manager

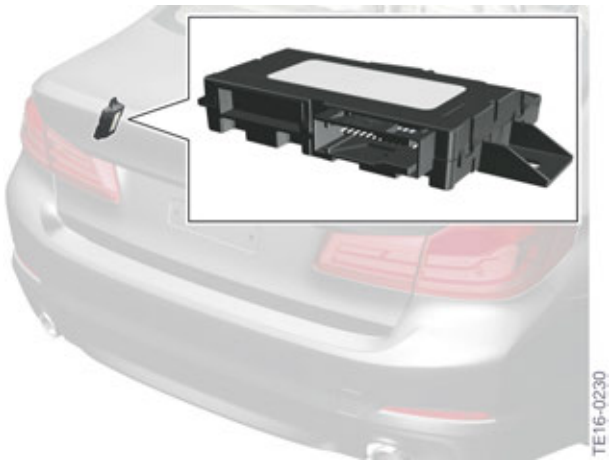
Index	Explanation
1	Fuses in the power distribution box, front right
2	Lighting for tweeter cover, passenger's side door
3	Lighting for mid-range speaker cover, passenger's side door
4	Lighting for mid-range speaker cover, rear passenger's side door
5	Fuses in the power distribution box, rear right
6	CAN terminator
7	Light Effect Manager (LEM)
8	Lighting for mid-range speaker cover, door, driver's side rear
9	Lighting for mid-range speaker cover, driver's side door
10	Lighting for tweeter cover, driver's side door
11	Lighting for center speaker

LED modules are used for the speaker cover lighting for the Bowers & Wilkins audio system.

The lighting is controlled via a LIN bus by the Light Effect Manager to the LED modules of the speaker trims.

2.2.2. System components

Light Effect Manager



Light Effect Manager

The control Light Effect Manager control unit (LEM) is responsible for controlling the lighting of the speaker covers in the Bowers & Wilkins audio system.

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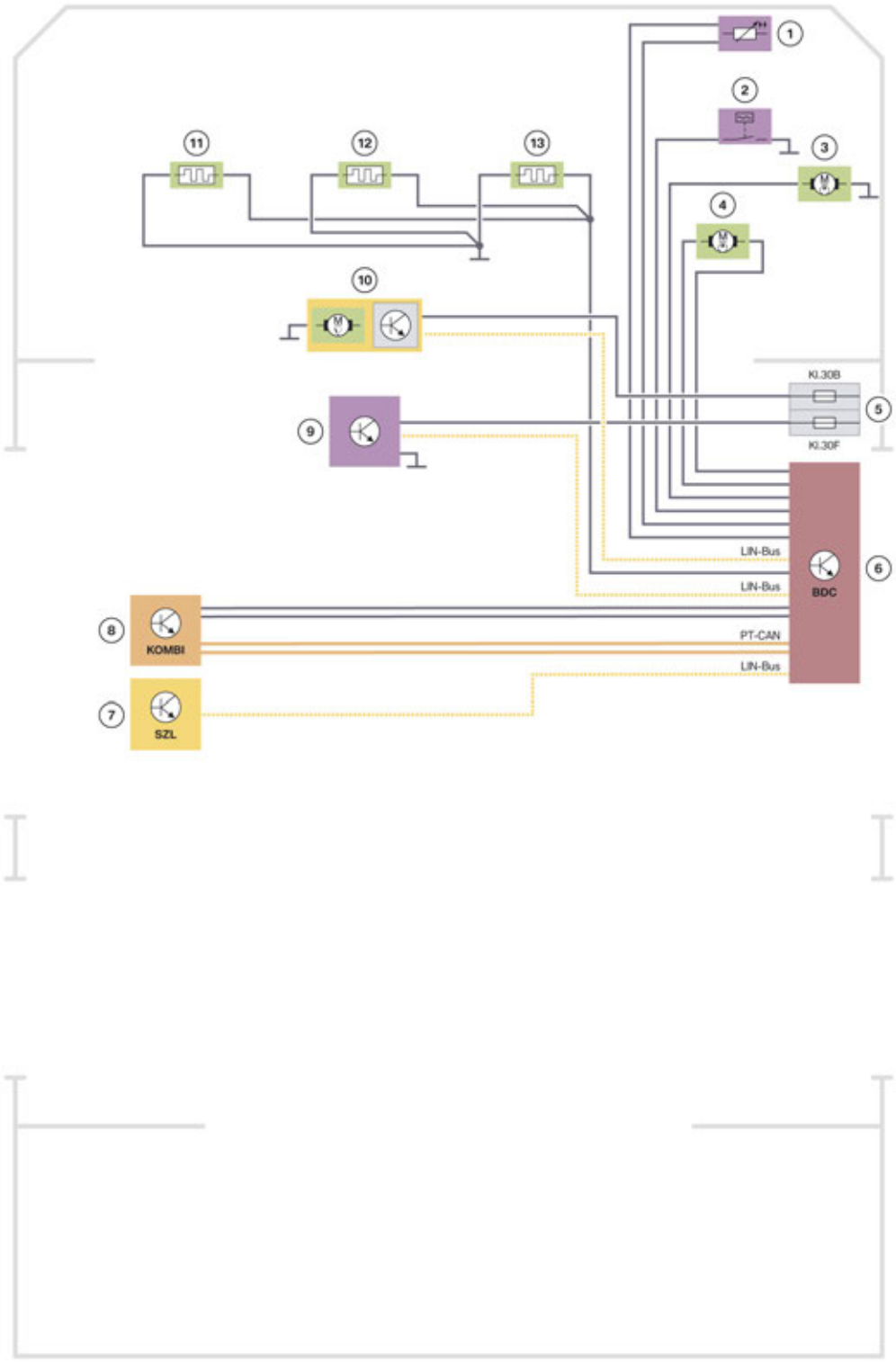
3. Windshield Wiper/Washer System

3.1. System wiring diagram



Wash/wipe system

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3. Windshield Wiper/Washer System

Index	Explanation
1	Outside temperature sensor
2	Washer fluid level switch
3	Washer pump for headlight cleaning system
4	Electric motor, windscreen washer pump
5	Fuses in the power distribution box, front right
6	Body Domain Controller (BDC)
7	Steering column switch cluster (SZL)
8	Instrument panel (KOMBI)
9	Rain-light-solar-condensation sensor
10	Wiper motor
11	Heated washer jet, left
12	Heated washer jet, center
13	Heated washer jet, right

The wiper motor is a 12 V motor with transmission. The control unit, wiper motor and the transmission form one complete unit. This wiper motor unit consists of:

- A permanently excited direct current motor with attached reduction gear.
- Control unit electronics with eccentric shaft sensor with attached plug connection.

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

- Faults in the control unit electronics.
- Short circuits at the motor and sensor system.
- Open lines at the motor and sensor system.

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

The heated washer jets are activated by the Body Domain Controller.

The Body Domain Controller is also responsible for actuation of the windshield washer pump and evaluation of the washer fluid level switch.

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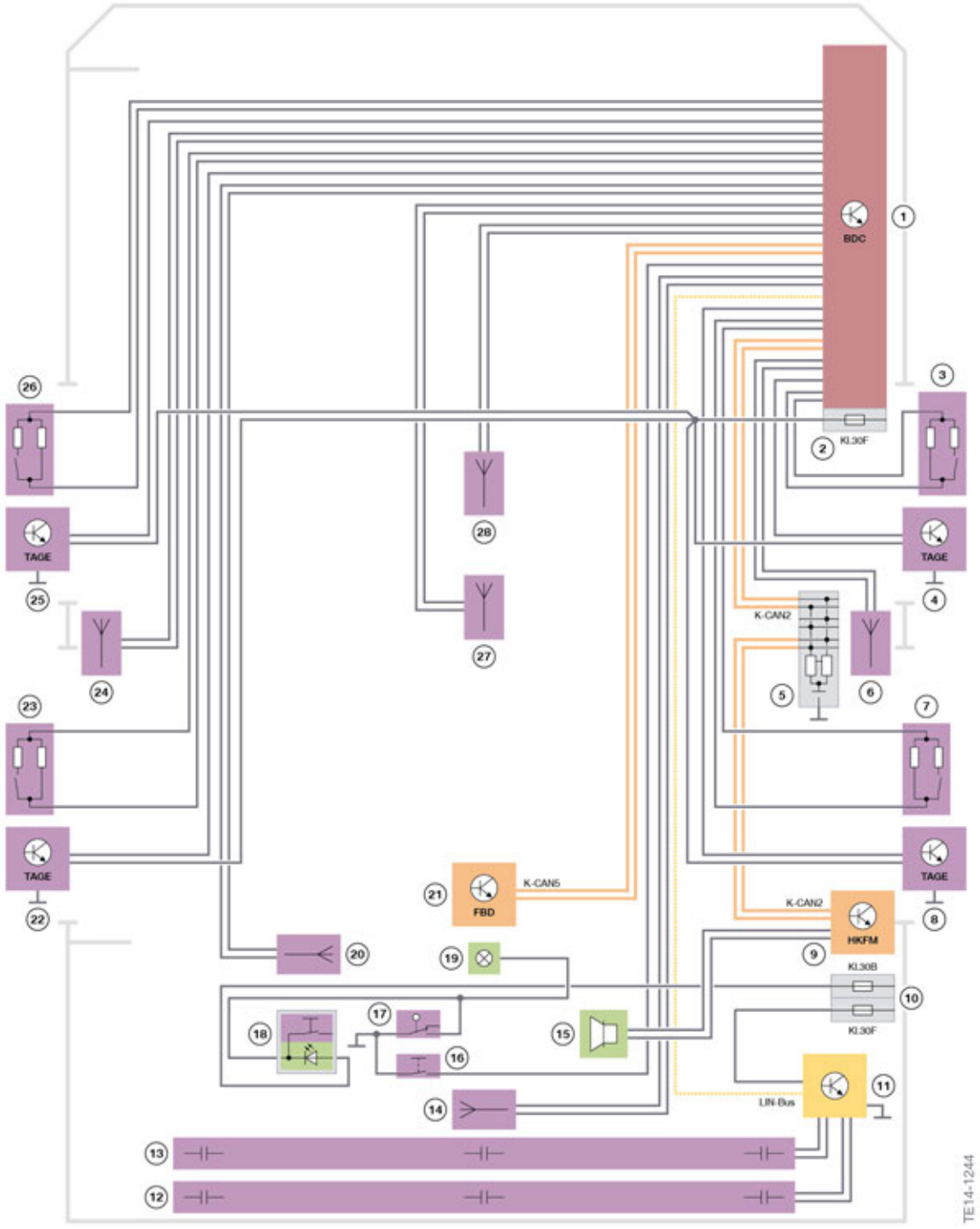
4. Locking and Security Functions

4.1. Comfort Access

4.1.1. System wiring diagram



Comfort Access

G30 General Vehicle Electronics

4. Locking and Security Functions

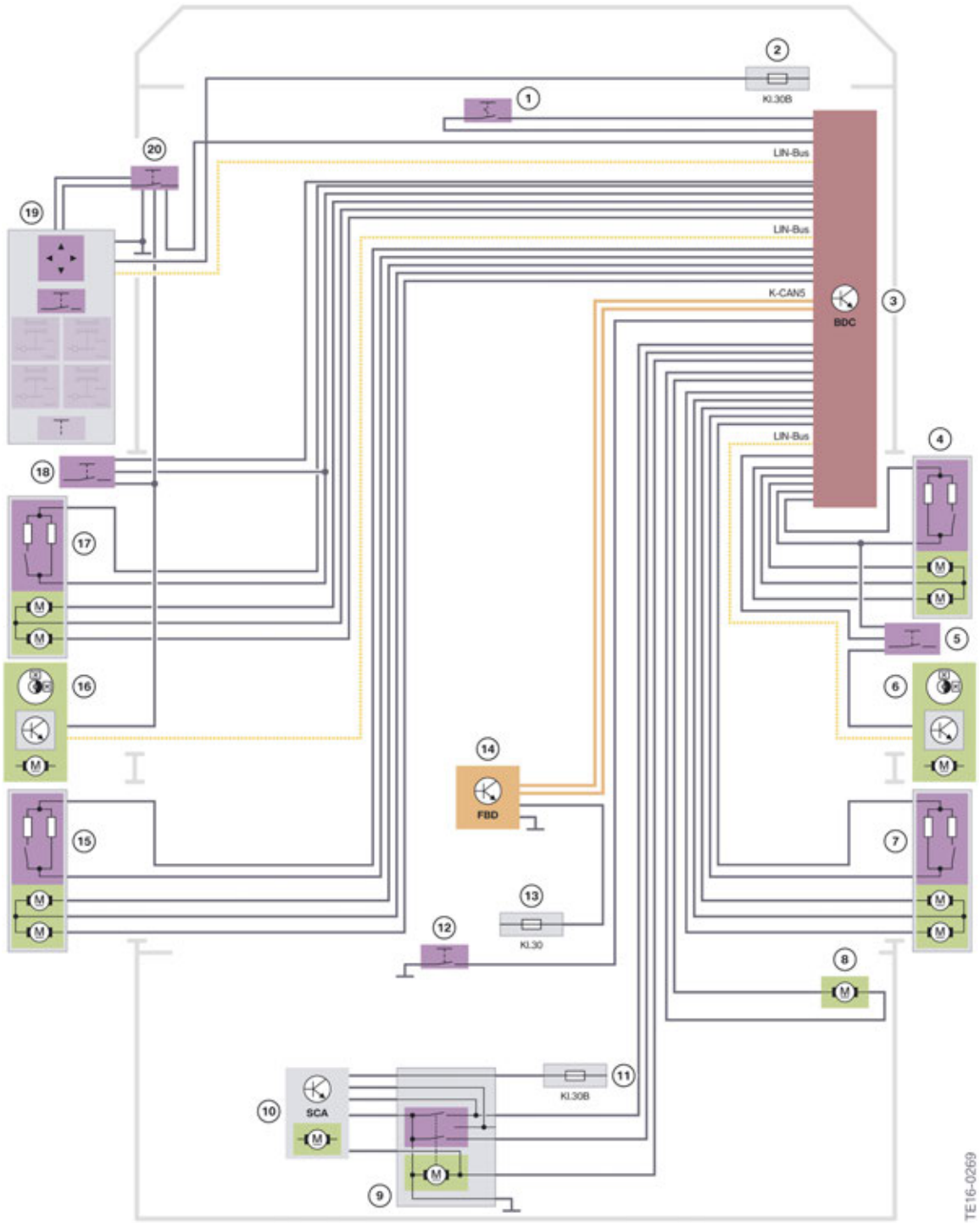
Index	Explanation
1	Body Domain Controller (BDC)
2	Fuse in the Body Domain Controller
3	Switch in door lock of front passenger door
4	Outside door handle electronics (TAGE), front passenger door
5	CAN terminator
6	Comfort Access antenna, side sill, right
7	Switch in door lock of rear passenger door
8	Outside door handle electronics (TAGE), rear passenger door
9	Trunk function module (HKFM)
10	Fuses in the power distribution box, rear right
11	Control unit for hands free rear lid opening
12	Sensor at bottom for non-contact trunk opening
13	Sensor at top for non-contact trunk opening
14	Antenna for the parking assistant for the rear bumper
15	Acoustic warning device for trunk activation
16	Button for trunk
17	Trunk contact switch in the trunk lock
18	Button for closing trunk
19	Luggage compartment light
20	Comfort Access antenna, luggage compartment
21	Remote control receiver (FBD)
22	Outside door handle electronics (TAGE), rear driver's side door
23	Switch in door lock of rear driver's side door
24	Comfort Access antenna, side sill, left
25	Outside door handle electronics (TAGE), driver's door
26	Switch in door lock of driver's door
27	Comfort Access antenna, passenger compartment
28	Comfort Access antenna, passenger compartment

G30 General Vehicle Electronics

4. Locking and Security Functions

4.2. Central locking system

4.2.1. System wiring diagram



Central locking system

Index	Explanation
1	Hotel position switch
2	Fuse for front right power distribution box
3	Body Domain Controller (BDC)
4	Door lock, front passenger door
5	Central locking button, front passenger door (depending on the national-market version)
6	Power window electronics, passenger's side front
7	Door lock, passenger's side, rear
8	Actuator for fuel filler flap
9	Trunk contact switch in the trunk lock
10	Automatic Soft Close drive
11	Fuse in the rear power distribution box
12	Button for closing trunk
13	Fuse in the rear power distribution box
14	Remote control receiver (FBD)
15	Door lock, driver's side, rear
16	Power window electronics, driver's side front
17	Door lock, driver's door
18	Central locking button, driver's door
19	Switch block, driver's door
20	Button for opening trunk

4.2.2. Function

The function of the central locking system of the G30 is based on that of current BMW models. All functions relevant for the central locking system are controlled by the Body Domain Controller. The function is as follows:

- The radio signal from the ID transmitter is received by the remote control receiver.
- The signal causes the BDC to activate the central locking system and the interior lighting.
- The BDC evaluates the status of all door contacts of the trunk and the hotel position switch.
- The status of the central locking system button is also evaluated by the BDC. The BDC activates the central locking system, depending on the status.
- The BDC is responsible for activation of the central locking system and the drive for automatic soft-close in the trunk.
- Activation of fuel filler flap unlocking is also performed by the BDC.

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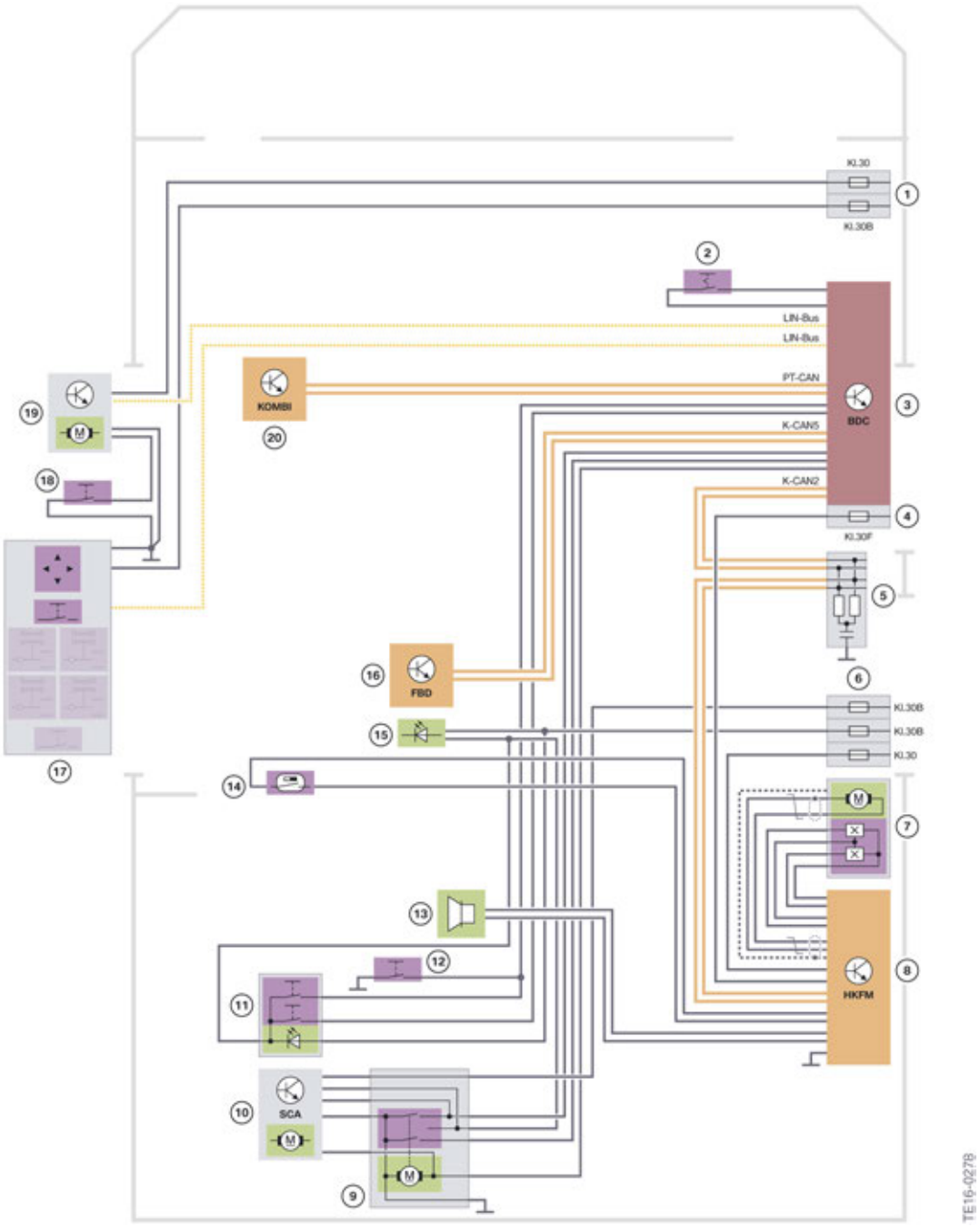
4. Locking and Security Functions

4.3. Automatic operation of trunk

4.3.1. System wiring diagram



Automatic operation of trunk

G30 General Vehicle Electronics

4. Locking and Security Functions

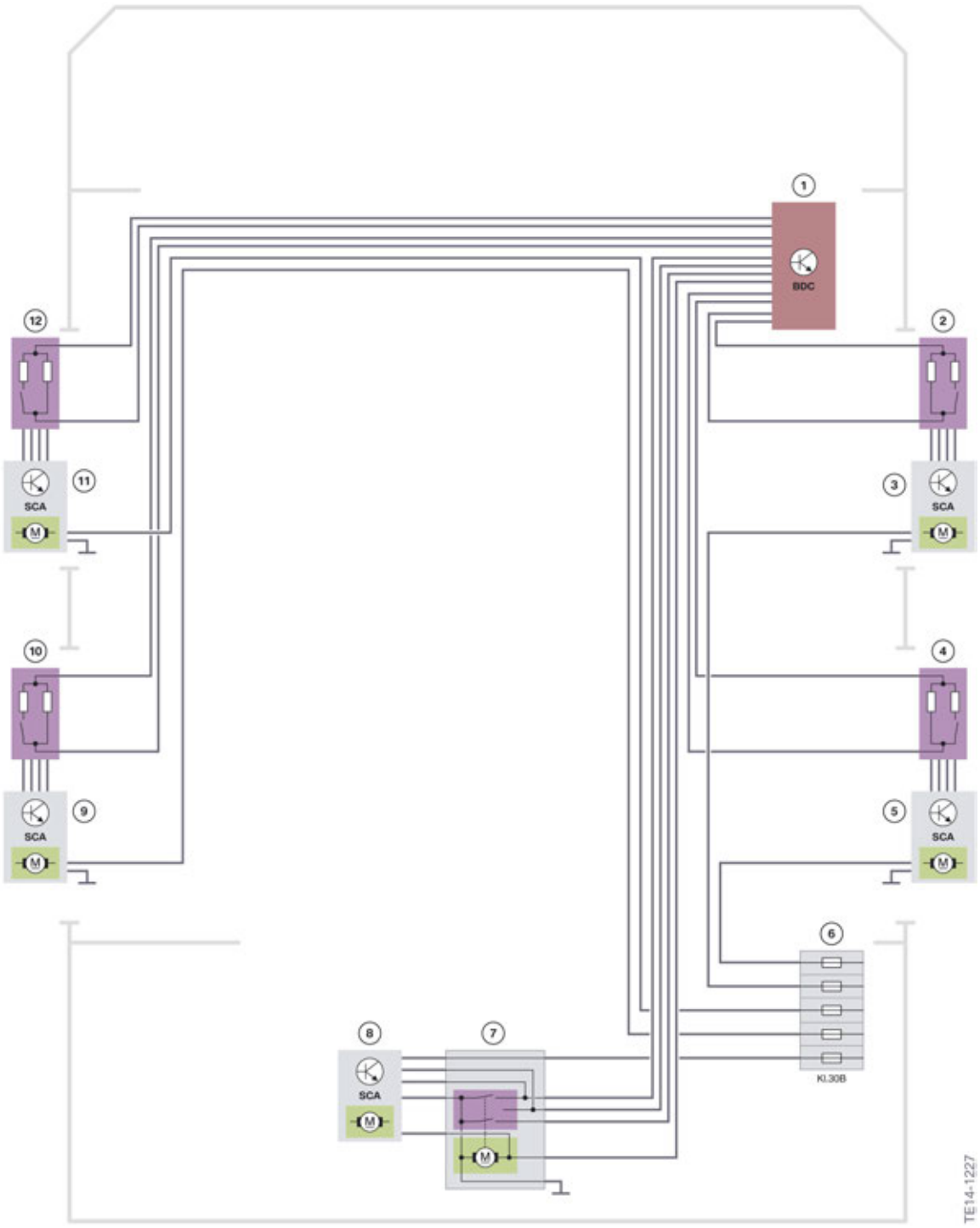
Index	Explanation
1	Fuses in the power distribution box, front right
2	Hotel position switch
3	Body Domain Controller (BDC)
4	Fuse in the Body Domain Controller
5	CAN terminator
6	Fuses in the rear power distribution box
7	Trunk lift drive, right
8	Trunk function module (HKFM)
9	trunk contact switch in the trunk lock
10	Automatic Soft Close drive
11	Button for closing trunk (inner)
12	Button for trunk
13	Acoustic warning device for trunk activation
14	Reed contact
15	Luggage compartment light
16	Remote control receiver (FBD)
17	Switch block, driver's door
18	Button for opening trunk
19	Power window motor, driver's side front
20	Instrument panel (KOMBI)

G30 General Vehicle Electronics

4. Locking and Security Functions

4.4. Automatic Soft Close system

4.4.1. System wiring diagram



Automatic Soft Close system

G30 General Vehicle Electronics

4. Locking and Security Functions

Index	Explanation
1	Body Domain Controller (BDC)
2	Switch in door lock of front passenger door
3	Automatic Soft Close drive, front passenger door
4	Switch in door lock of rear passenger door
5	Automatic Soft Close drive, rear passenger door
6	Fuses in the power distribution box, rear right
7	Trunk contact switch in the trunk lock
8	Automatic Soft Close drive, trunk
9	Automatic Soft Close drive, rear driver's-side door
10	Switch in door lock of rear driver's side door
11	Automatic Soft Close drive, driver's door
12	Switch in door lock of driver's door

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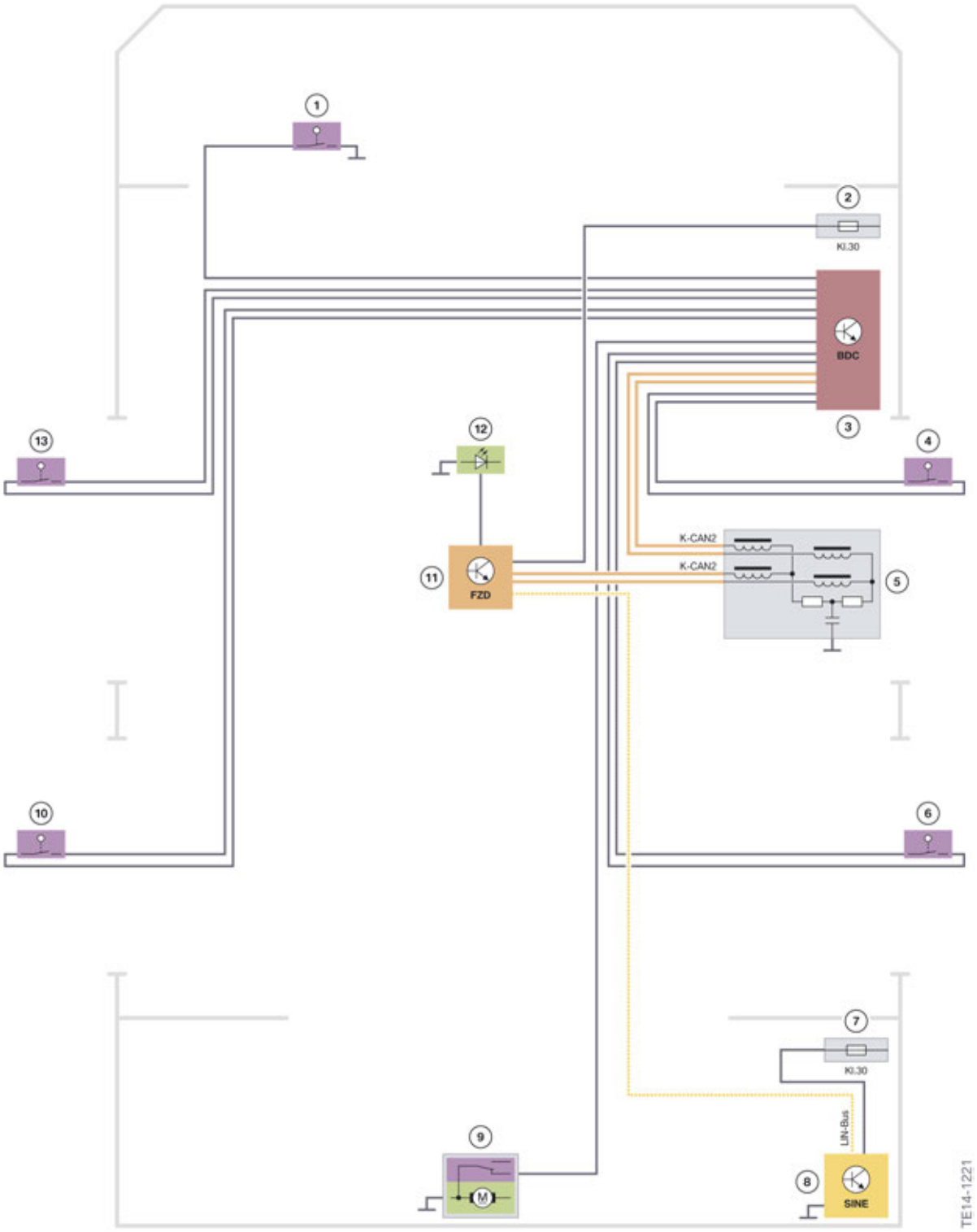
5. Alarm System

5.1. System wiring diagram



Alarm system