

Technical training.
Product information.

G01 General Vehicle Electronics



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BMW Service

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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 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.

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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.

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1. Exterior Lights

1.1. Versions

The following exterior light versions are offered for the G01:

- LED headlights (Standard on the xDrive 30i)
- LED headlights with cornering lights (OE 5A4 optional on xDrive 30i)
- Adaptive full LED headlights (Standard on the M40i) (optional OE 552 on xDrive 30i).

The low-beam headlight is automatically switched on when the system recognizes that it is dark, even with the light switch in position 0 and when driving readiness is activated (country-specific).

1.2. Lighting, front

Headlight versions for the G01:

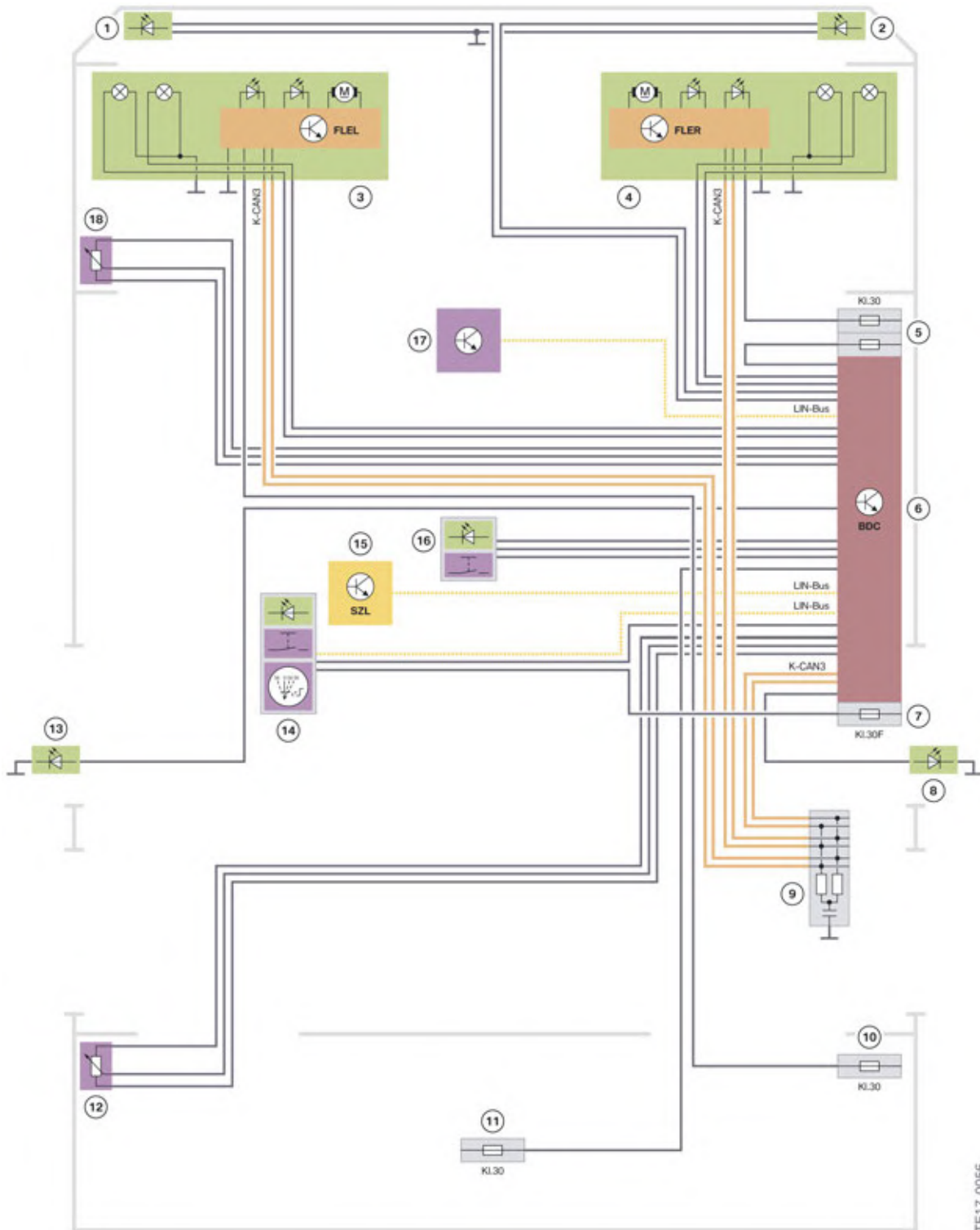


Headlight versions

Index	Explanation
1	LED headlights
2	LED headlights with cornering lights
3	Adaptive full LED headlights

1. Exterior Lights

1.2.1. System wiring diagram for the LED headlight



Front exterior lights, LED headlights

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1. Exterior Lights

Index	Explanation
1	Left fog light
2	Right 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

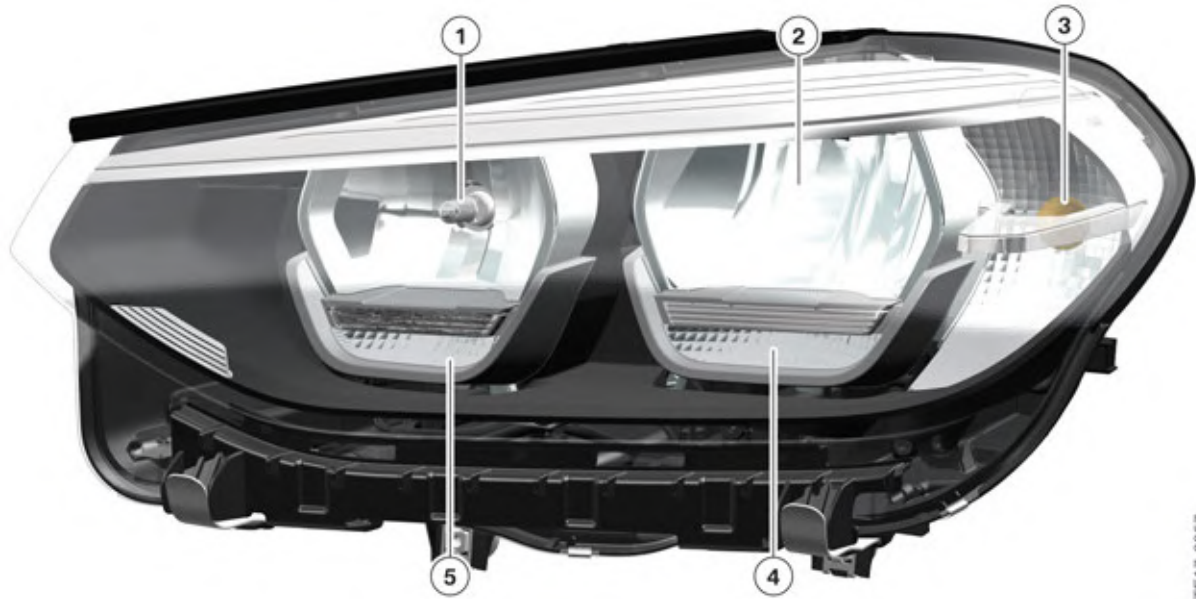
The system wiring diagram shows the basic version. Depending on the headlight version, different components are installed in the corresponding headlight.

The wiring diagram shows the turn indicator and the high beam headlight with bulbs. Depending on the headlight version, the turn indicator is designed either with LED technology or a bulb. A halogen bulb or LED is used for the high beam.

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1. Exterior Lights

1.2.2. LED headlights



LED headlights

Index	Explanation
1	High-beam headlight
2	Low-beam headlight
3	Turn indicator
4	Side lights and daytime driving lights
5	Side lights and daytime driving lights

In the LED headlight, the low-beam headlight is located in the outer reflector.

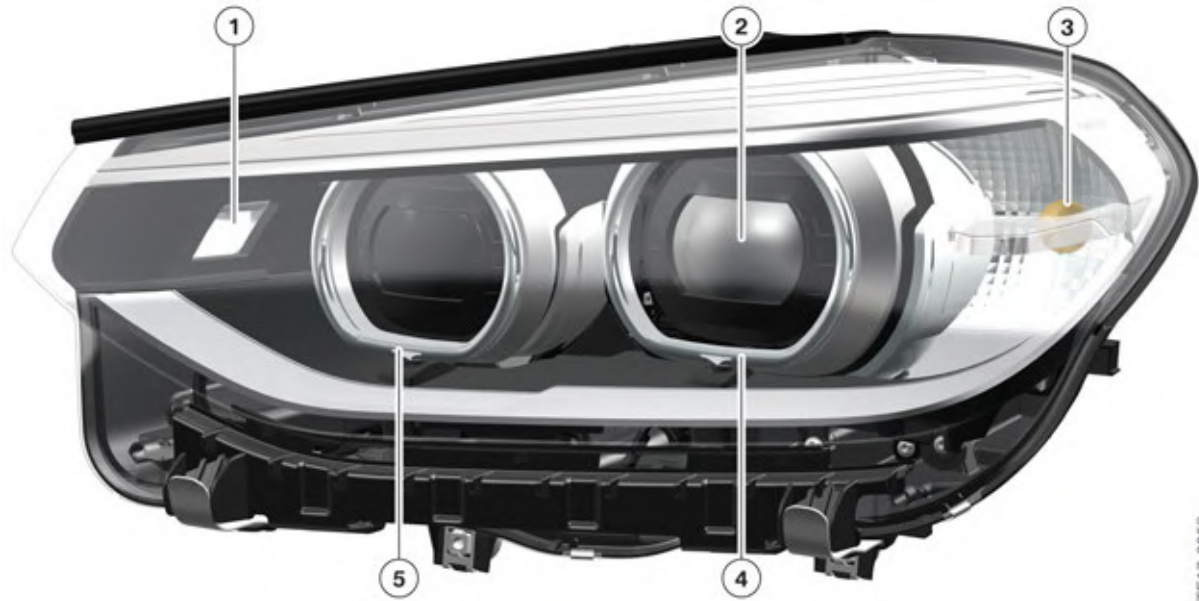
A halogen bulb is used for the high beam in the inner reflector.

A bulb is used for the turn indicator.

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1. Exterior Lights

1.2.3. LED headlights with cornering lights



Adaptive cornering light

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

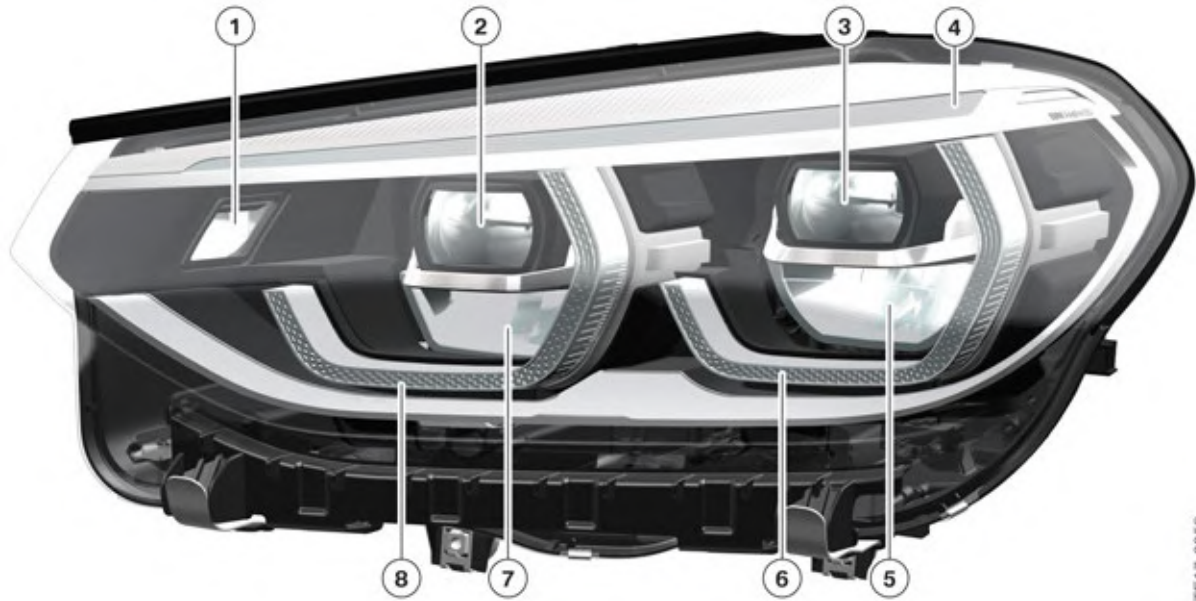
On the Adaptive Headlight the low-beam headlight and high beam are in the same reflector.

A bulb is used for the turn indicator.

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1. Exterior Lights

1.2.4. Adaptive full LED headlights



TE17-0059

Adaptive LED Headlights

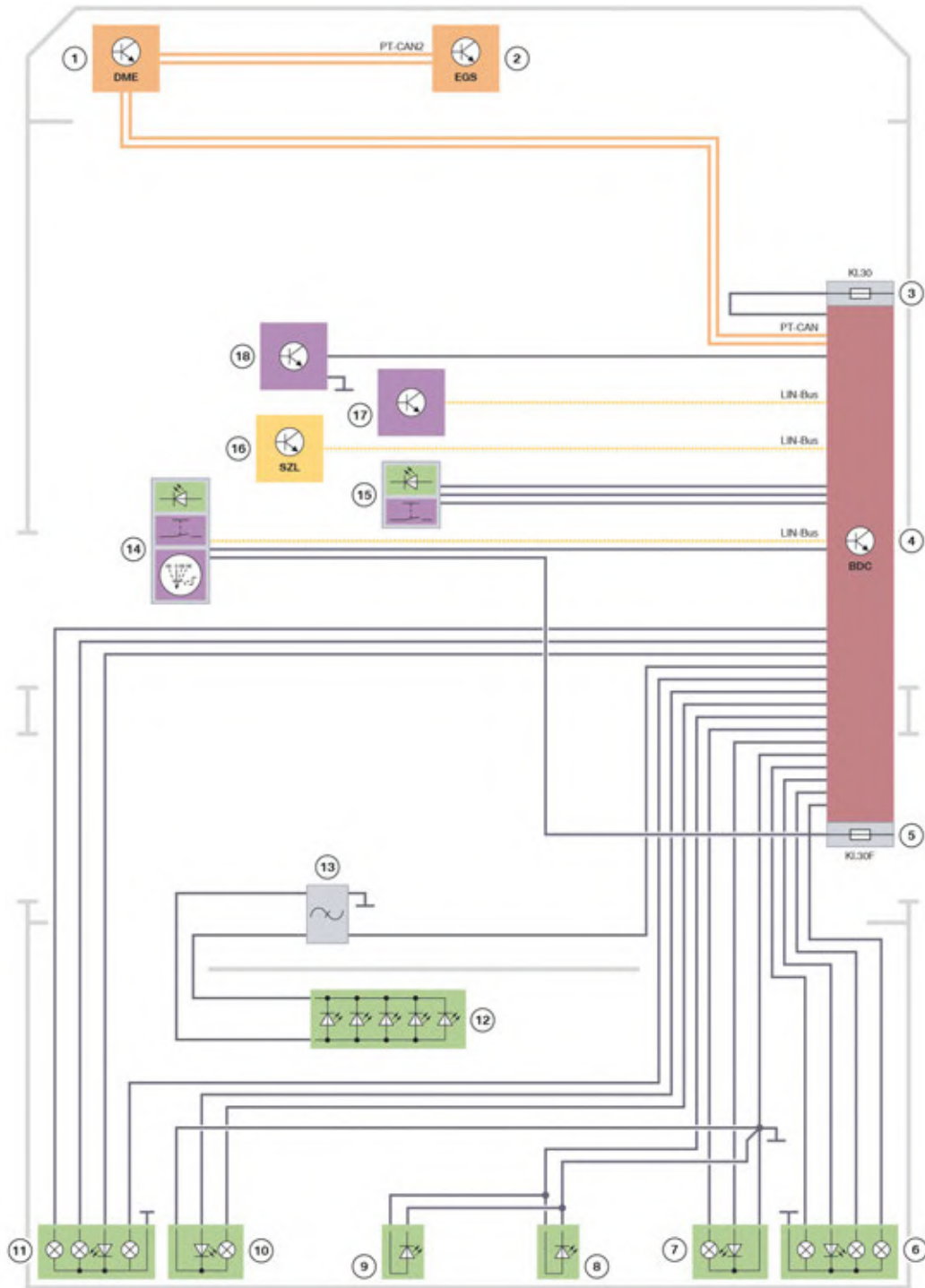
Index	Explanation
1	Cornering light
2	Low-beam headlight
3	Low-beam headlight
4	Turn indicator
5	High-beam headlight
6	Side lights and daytime driving lights
7	High-beam headlight
8	Side lights and daytime driving lights

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1. Exterior Lights

1.3. Lighting, rear

1.3.1. System wiring diagram



Rear exterior lights

TE17-0060_2

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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	License-plate light, right
9	License-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

The system wiring diagram shows the basic version with bulbs and LEDs for the tail light.

In the High version, all light functions are realized with LED technology.

1.3.2. Rear light

On the G01, 2 different rear lights are installed depending on the headlight version.

The Basic rear light is used on vehicles with the following equipment:

- LED headlights
- LED headlights with cornering lights.

The High rear light is used on vehicles with the following equipment:

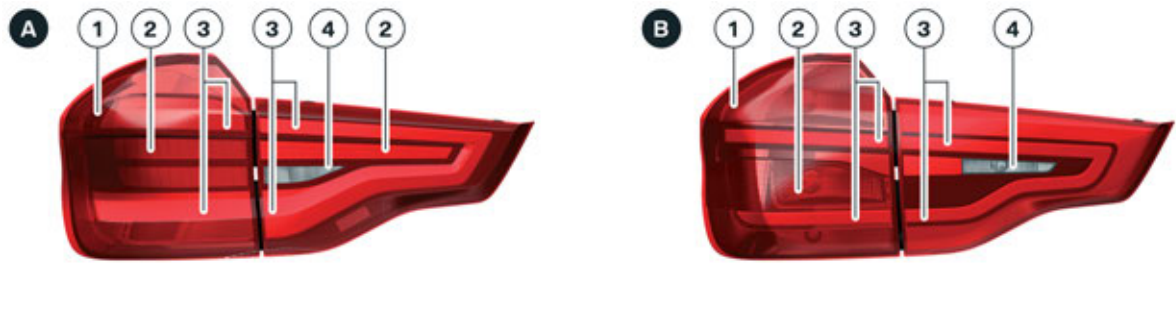
- Adaptive full LED headlights.

In the Basic rear light, only the tail light is in LED technology. Bulbs are used for all other light functions.

In the High rear light, all light functions are in LED technology.

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1. Exterior Lights



Rear light

Index	Explanation
A	High rear light
B	Rear light (basic version)
1	Brake light
2	Turn indicator
3	Tail light
4	Reversing light

1.4. Automatic high beams



High-beam assistant

On vehicles with camera-based driver assistance systems KAFAS, the function of the automatic high-beams is performed by KAFAS.

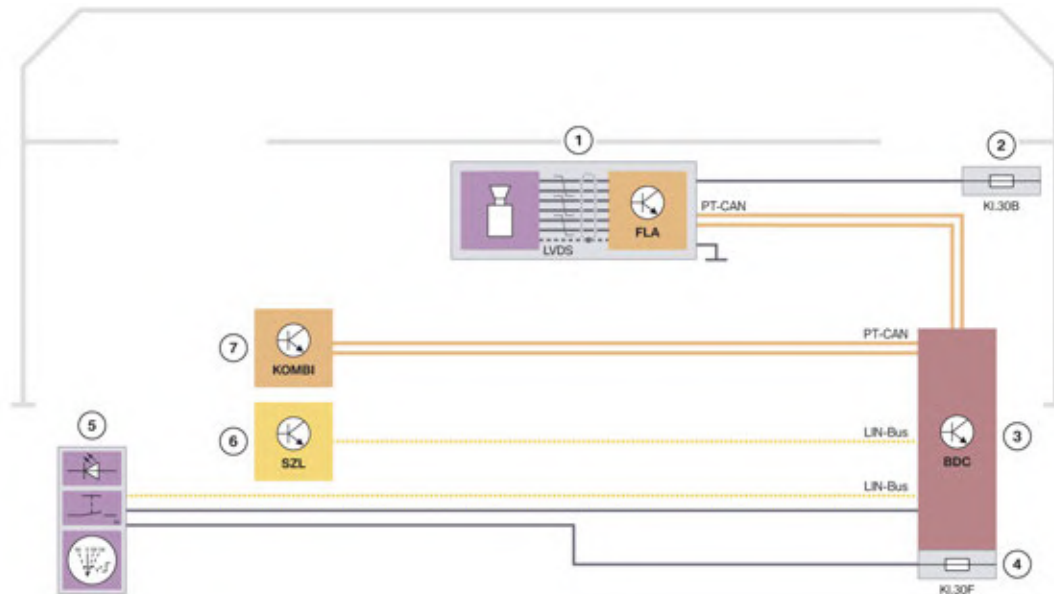
On vehicles without camera-based driver assistance systems KAFAS, the automatic high-beam is integrated in the interior mirror.

Automatic high beams are standard on the M40i and optional on the xDrive 30i (OE 5AC).

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1. Exterior Lights

1.4.1. System wiring diagram



TE17-0063

Automatic high-beams without KAFAS

Index	Explanation
1	Automatic high-beams (FLA)
2	Fuse for front right power distribution box
3	Body Domain Controller (BDC)
4	Fuse in the Body Domain Controller
5	Light switch
6	Steering column switch cluster (SZL)
7	Instrument cluster (KOMBI)

1.5. Entry lights, exterior

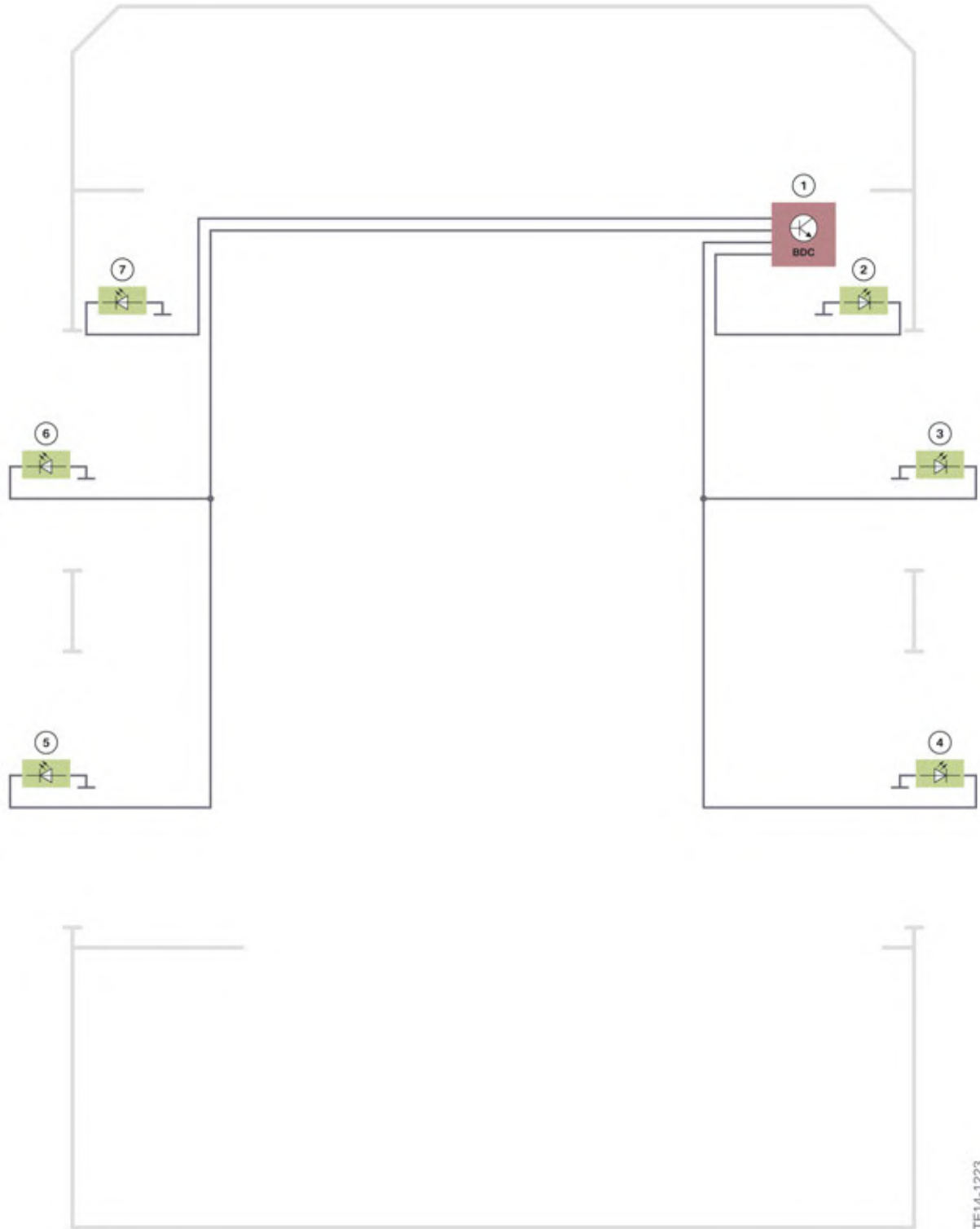
The exterior light staging for the G01 may include the following items, depending on the optional equipment:

- Ground lights
- Light carpet

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1. Exterior Lights

1.5.1. System wiring diagram



G01 General Vehicle Electronics

1. Exterior Lights

Index	Explanation
1	Body Domain Controller (BDC)
2	Light carpet, right
3	Door entry light in front passenger door
4	Door entry light in the rear passenger's side door
5	Door entry light in the rear driver's side door
6	Door entry light in the driver's door
7	Light carpet, left

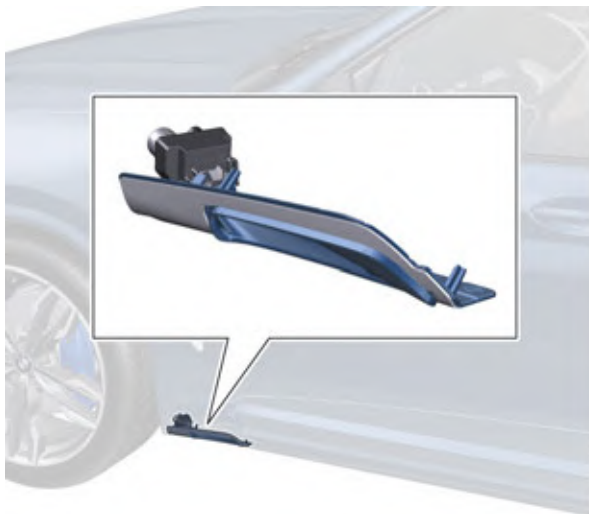
1.5.2. Ground lights

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

1.5.3. Light carpet

The light source is integrated in the side sill so that it is invisible for the customer. The function can be realized in a very small installation space through the use of a multi-lens array system. A very flat angle of radiation is also possible. The graphic is superposed several times by the multi-lens array system and is therefore insensitive to dirt contamination. The light carpet is activated by the Body Domain Controller (BDC).

LEDs in the side sill



LEDs in the side sill

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1. Exterior Lights

Light carpet



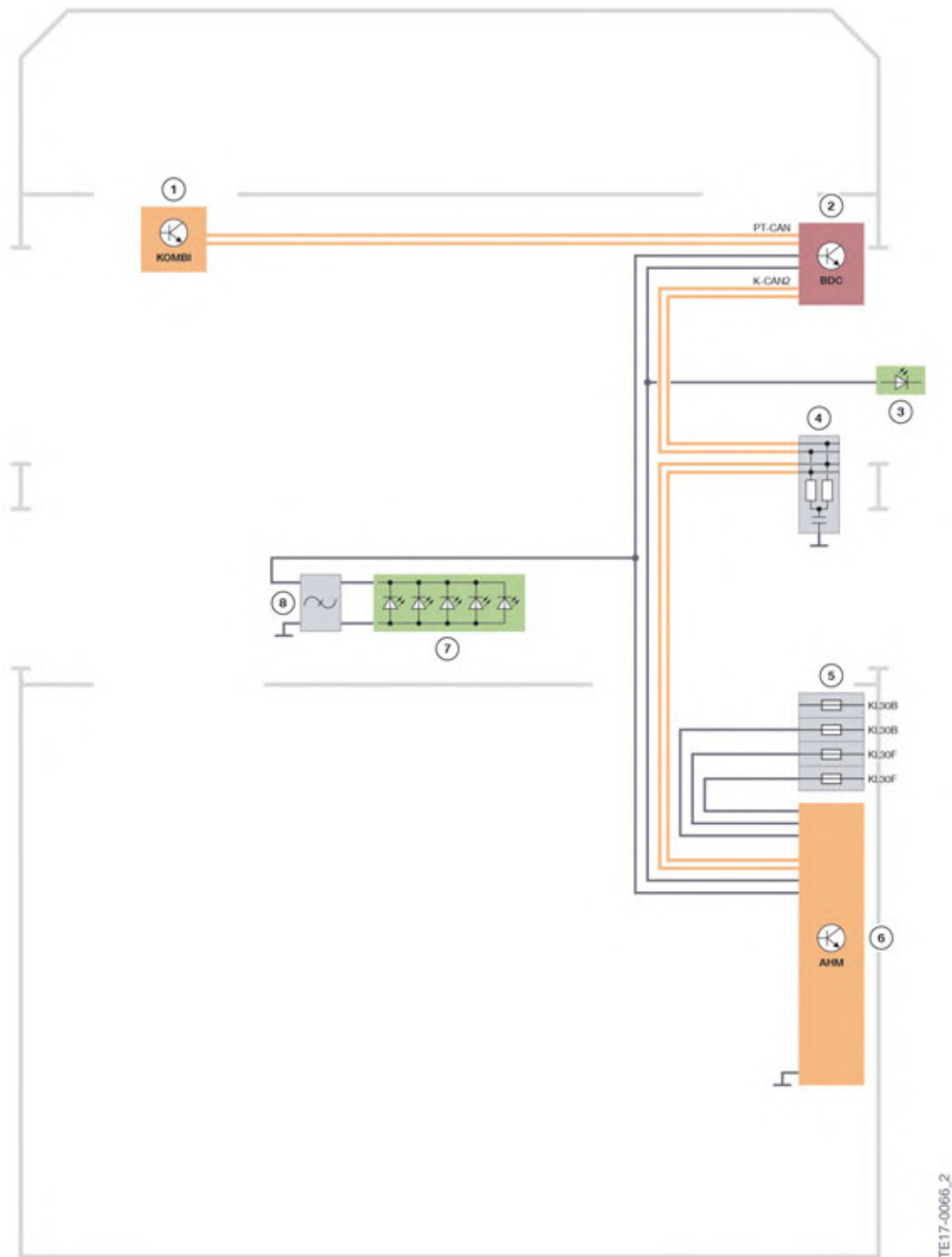
Light carpet

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1. Exterior Lights

1.6. Trailer lighting

1.6.1. System wiring diagram



Trailer lighting

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1. Exterior Lights

Index	Explanation
1	Instrument cluster (KOMBI)
2	Body Domain Controller (BDC)
3	Exterior mirror, front passenger side
4	CAN terminator
5	Power distribution box, rear
6	Trailer module (AHM)
7	Additional brake light
8	Interference suppression filter

Vehicles with a trailer coupling are equipped with a trailer module AHM. The trailer module is responsible for the following functions:

- Light control for trailer
- Monitoring the trailer power circuits

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2. Interior Lighting

2.1. Version

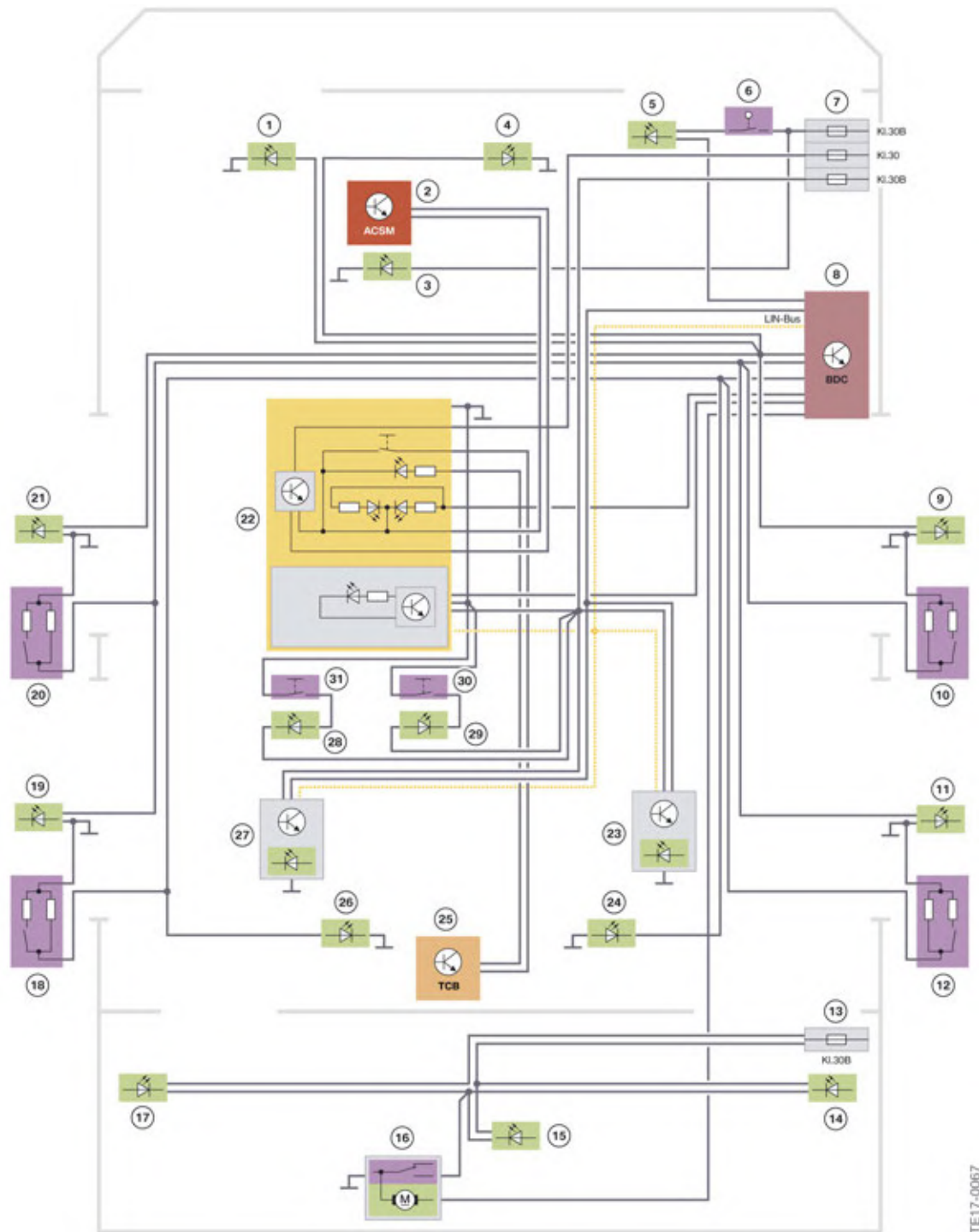
Depending on the optional equipment selected the G01 has different light elements for the interior lighting.

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2. Interior Lighting

2.2. Basic interior light

2.2.1. System wiring diagram



Basic interior light

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2. Interior Lighting

Index	Explanation
1	Footwell light, front left
2	Advanced Crash Safety Module (ACSM)
3	Lighting, center console
4	Footwell light, front right
5	Glove box light
6	Glove box switch
7	Fuses in the power distribution box, front right
8	Body Domain Controller (BDC)
9	Door entry lighting, front passenger side
10	Door contact, front passenger side, front
11	Door entry lighting passenger's side, rear
12	Door contact on front passenger side, rear
13	Fuse for rear right power distribution box
14	Luggage compartment light, right
15	Tailgate lighting
16	Tailgate contact switch in the tailgate lock
17	Luggage compartment light, left
18	Door contact on driver's side, rear
19	Door entry lighting driver's side, rear
20	Door contact, driver's side, front
21	Door entry lighting, driver's side
22	Front interior light
23	Interior light, rear right
24	Footwell light, rear right
25	Telematic Communication Box (TCB)
26	Footwell light, rear left
27	Interior light, rear left
28	Make-up mirror light, left
29	Make-up mirror light, right
30	Switch for make-up mirror, right
31	Switch for make-up mirror, left

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2. Interior Lighting

In the basic interior lighting configuration, the following interior lights are connected with the Body Domain Controller via LIN bus:

- Interior light in the roof function center (FZD)
- Interior lights in the rear passenger compartment.

The glove box light is switched by the glove box switch.

The luggage compartment light is switched by the tailgate contact switch in the tailgate lock.

All other interior lights are activated directly by the Body Domain Controller.

2.3. Ambient lighting

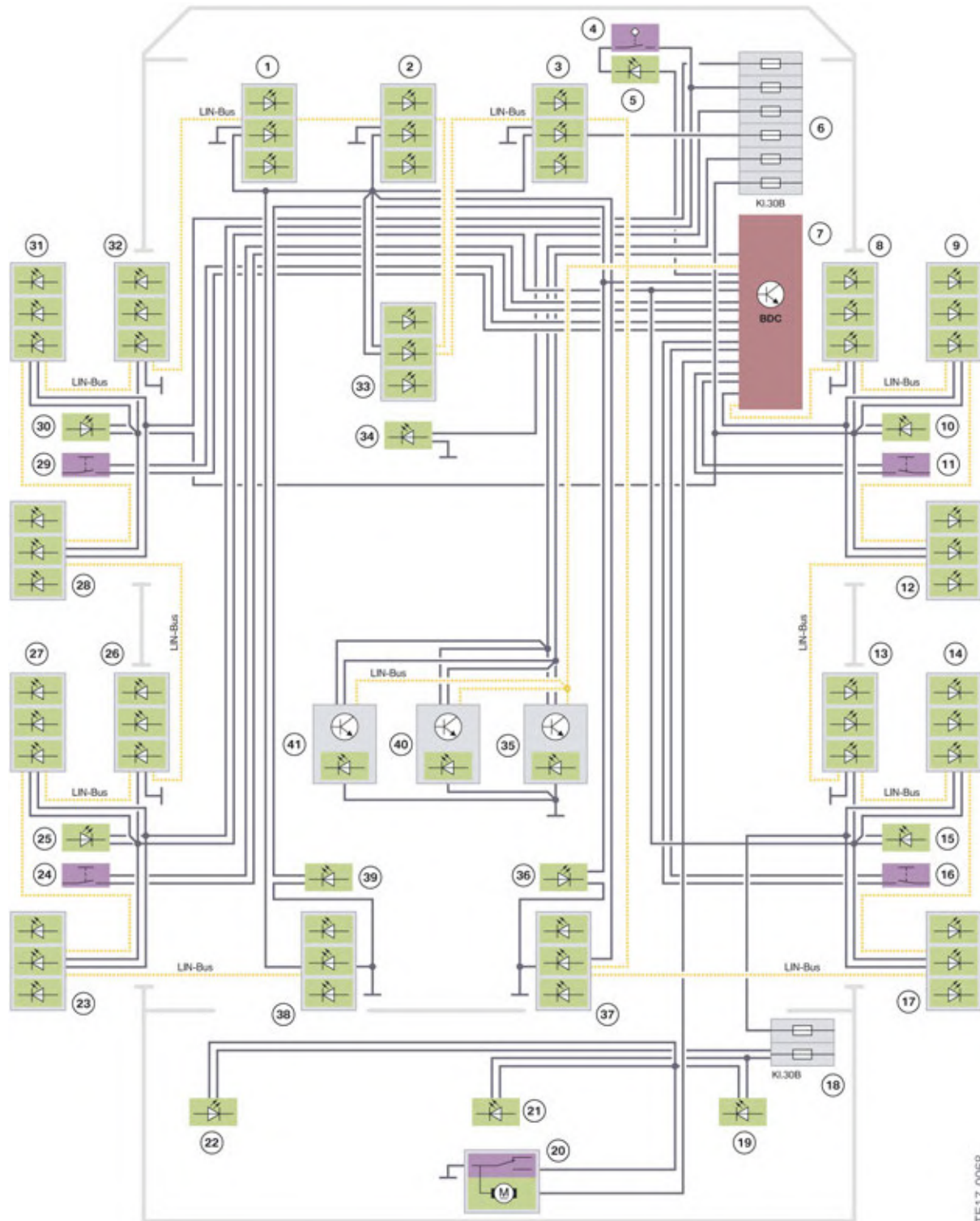
The ambient lighting has 6 different colors. It is possible to choose 11 different light designs.

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

2.3.1. System wiring diagram



Interior lighting, ambient lighting

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2. Interior Lighting

Index	Explanation
1	Footwell light, front left
2	Ambient lighting, instrument panel, passenger's side
3	Footwell light, front right
4	Glove box switch
5	Glove box light
6	Fuses in the power distribution box, front right
7	Body Domain Controller (BDC)
8	Lighting for door storage compartment, passenger's side
9	Door trim panel lighting, passenger's side
10	Door entry light, front passenger's side
11	Door contact, front passenger side, front
12	Door contour lighting, passenger's side
13	Lighting for door storage compartment, passenger's side rear
14	Door trim panel lighting, passenger's side rear
15	Door entry lighting passenger's side, rear
16	Door contact on front passenger side, rear
17	Door contour lighting, passenger's side rear
18	Fuse for rear right power distribution box
19	Luggage compartment light, right
20	Tailgate contact switch in the tailgate lock
21	Tailgate lighting
22	Luggage compartment light, left
23	Door contour lighting, driver's side rear
24	Door contact on driver's side, rear
25	Door entry lighting driver's side, rear
26	Door storage compartment lighting, driver's side rear
27	Door trim panel lighting, driver's side rear
28	Door contour lighting, driver's side
29	Door contact, driver's side, front
30	Door entry light, front driver's side
31	Door trim panel lighting, driver's side
32	Door storage compartment lighting, driver's side
33	Lighting, center stack
34	Lighting, center console
35	Interior light, rear right (on vehicles with panorama glass roof)

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2. Interior Lighting

Index	Explanation
36	Lighting, rear left seat
37	Footwell light, rear right
38	Footwell light, rear left
39	Lighting, rear right seat
40	Interior light, rear (in vehicles without panorama glass roof)
41	Interior light, rear left (on vehicles with panorama glass roof)

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

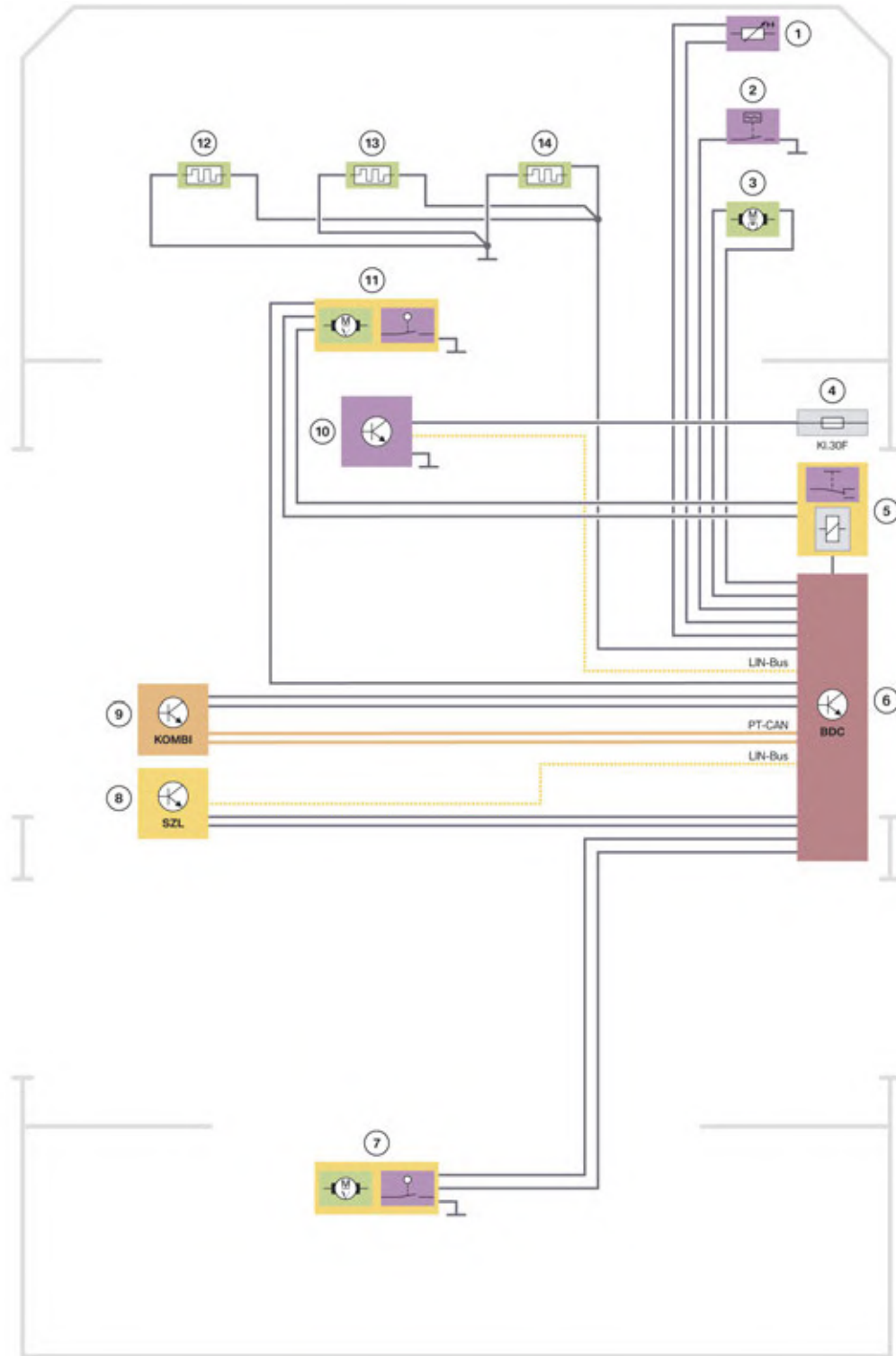
The lighting for the ambient interior lighting is controlled via a separate LIN bus. The individual LED modules are connected via a local interconnect network bus. The LED modules are connected in series to the LIN bus around the vehicle.

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.

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3. Wash/Wipe System

3.1. System wiring diagram



Wash/wipe system

TE17-0069

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3. Wash/Wipe System

Index	Explanation
1	Outside temperature sensor
2	Washer fluid level switch
3	Electric motor, windshield washer pump
4	Fuse in the Body Domain Controller (BDC)
5	Relay for wiper motor
6	Body Domain Controller (BDC)
7	Rear wiper
8	Steering column switch cluster (SZL)
9	Instrument cluster (KOMBI)
10	Rain-light-solar-condensation sensor
11	Wiper motor
12	Heated washer jet, left
13	Heated washer jet, center
14	Heated washer jet, right

The relays for the wiper motor are located in the Body Domain Controller.

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

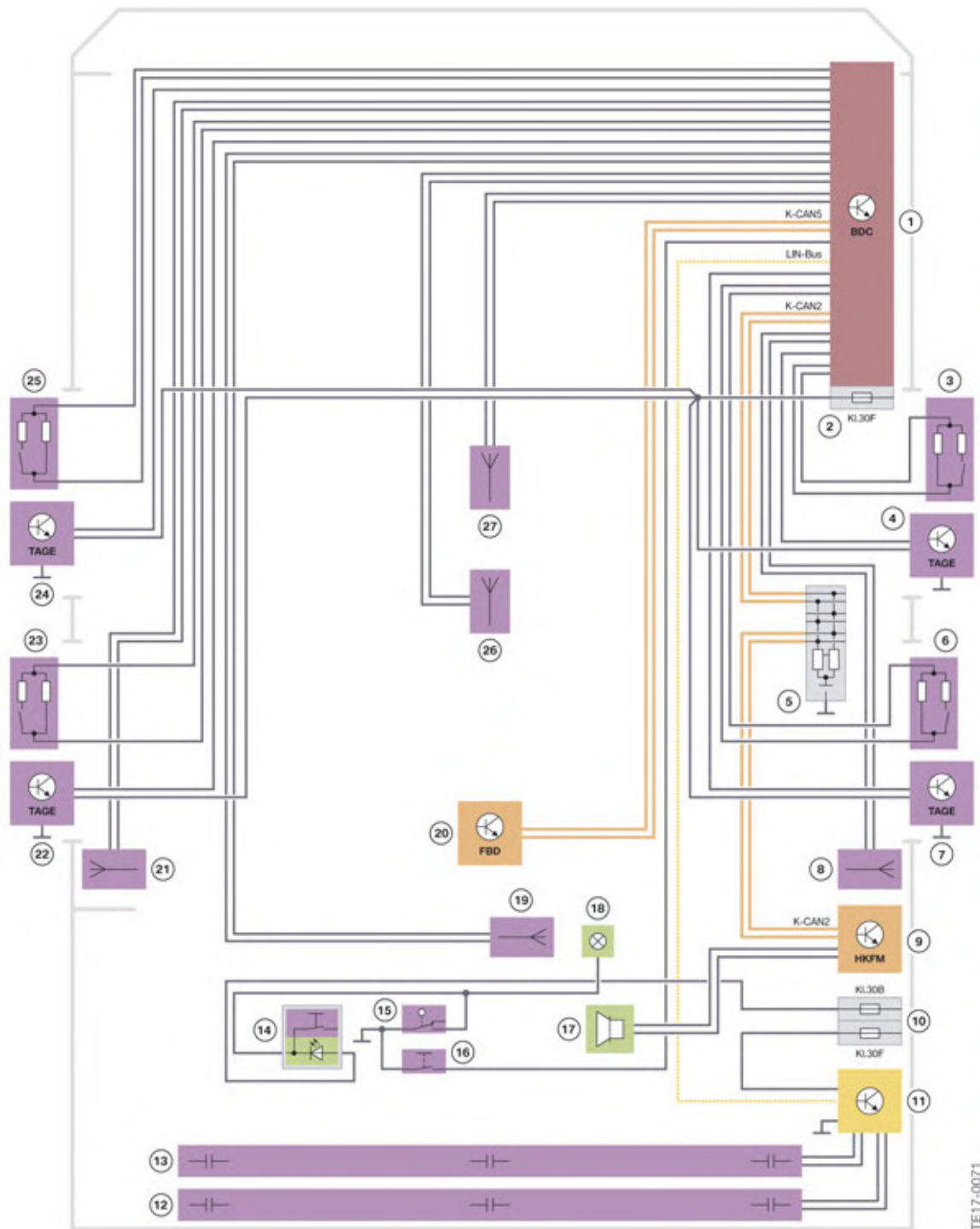
The Body Domain Controller is also responsible for actuation of the window washer pumps and evaluation of the washer fluid level switch.

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4. Locking and Security Functions

4.1. Comfort Access

4.1.1. System wiring diagram



Comfort Access

TE17-0071

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4. Locking and Security Functions

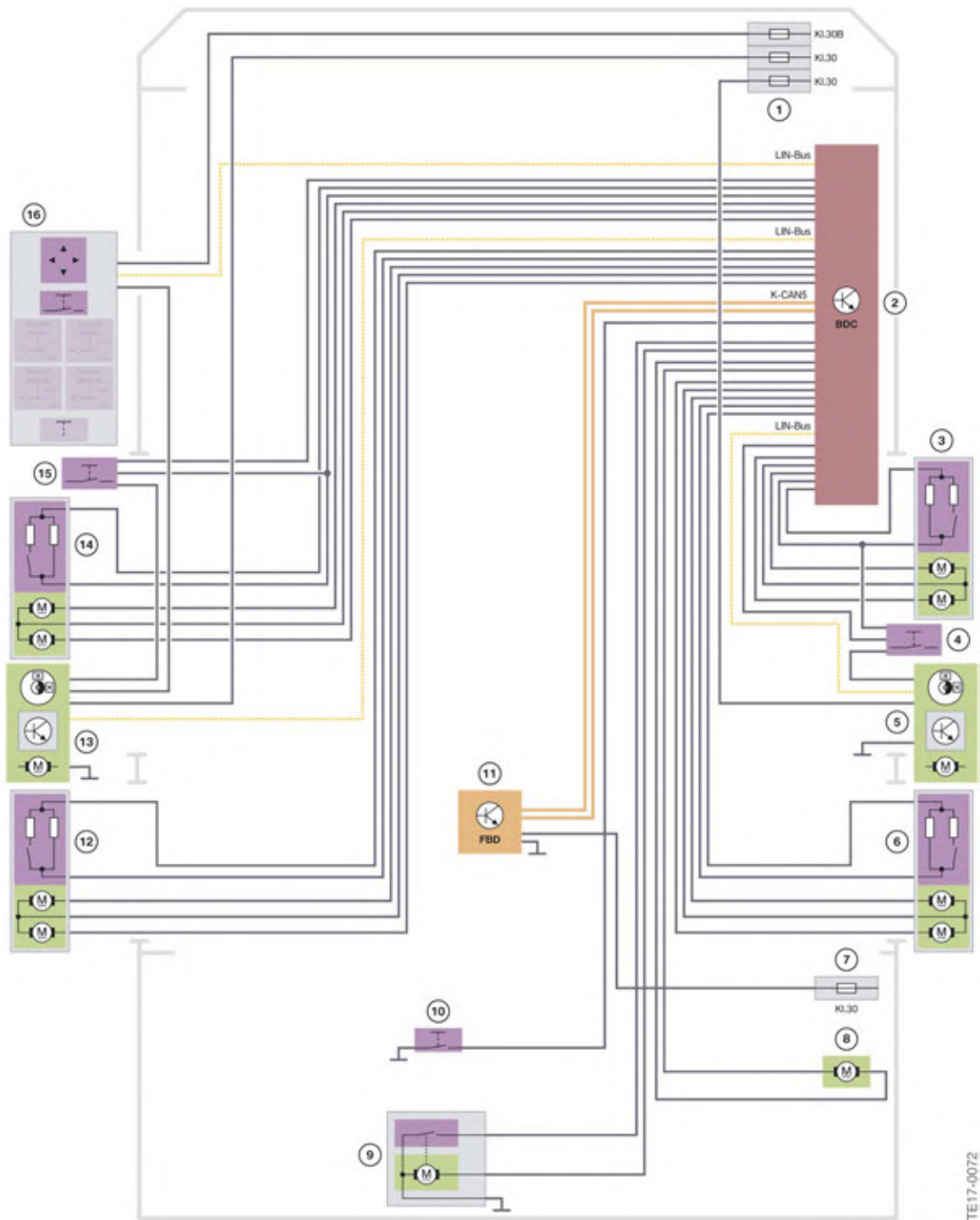
Index	Explanation
1	Body Domain Controller (BDC)
2	Fuse in the Body Domain Controller
3	Switch in door lock of front passenger door
4	Outside door handle electronics (TAGE), front passenger door
5	CAN terminator
6	Switch in door lock of rear passenger door
7	Outside door handle electronics (TAGE), rear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

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4. Locking and Security Functions

4.2. Central locking system

4.2.1. System wiring diagram



Central locking system

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4. Locking and Security Functions

Index	Explanation
1	Fuse for front right power distribution box
2	Body Domain Controller (BDC)
3	Door lock, front passenger door
4	Central locking button, front passenger door
5	Power window electronics, passenger's side front
6	Door lock, passenger's side, rear
7	Fuse in the rear power distribution box
8	Servodrive for fuel filler flap
9	Tailgate contact switch in the tailgate lock
10	Button for closing tailgate
11	Remote control receiver (FBD)
12	Door lock, driver's side, rear
13	Power window electronics, driver's side front
14	Door lock, driver's door
15	Central locking button, driver's door
16	Switch block, driver's door

4.2.2. Function

The function of the central locking system of the G01 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:

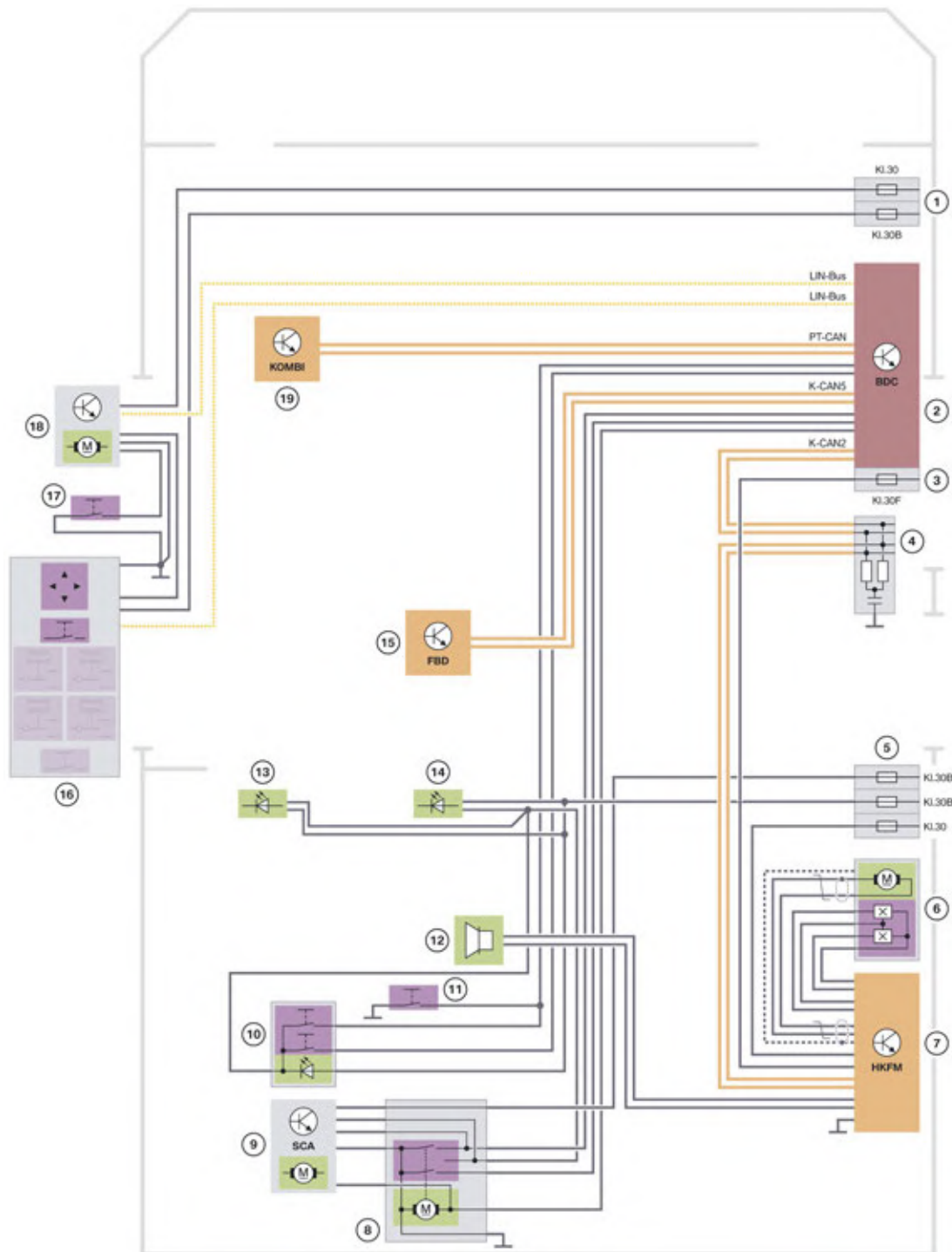
- The radio signal from the ID transmitter is received by the remote control receiver.
- The signal causes the BDC to activate the central locking system and the interior lighting.
- The BDC evaluates the status of all door contacts of the tailgate and the hotel position switch.
- The status of the central 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 tailgate.
- 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 tailgate

4.3.1. System wiring diagram



Automatic operation of tailgate

TE17-0073

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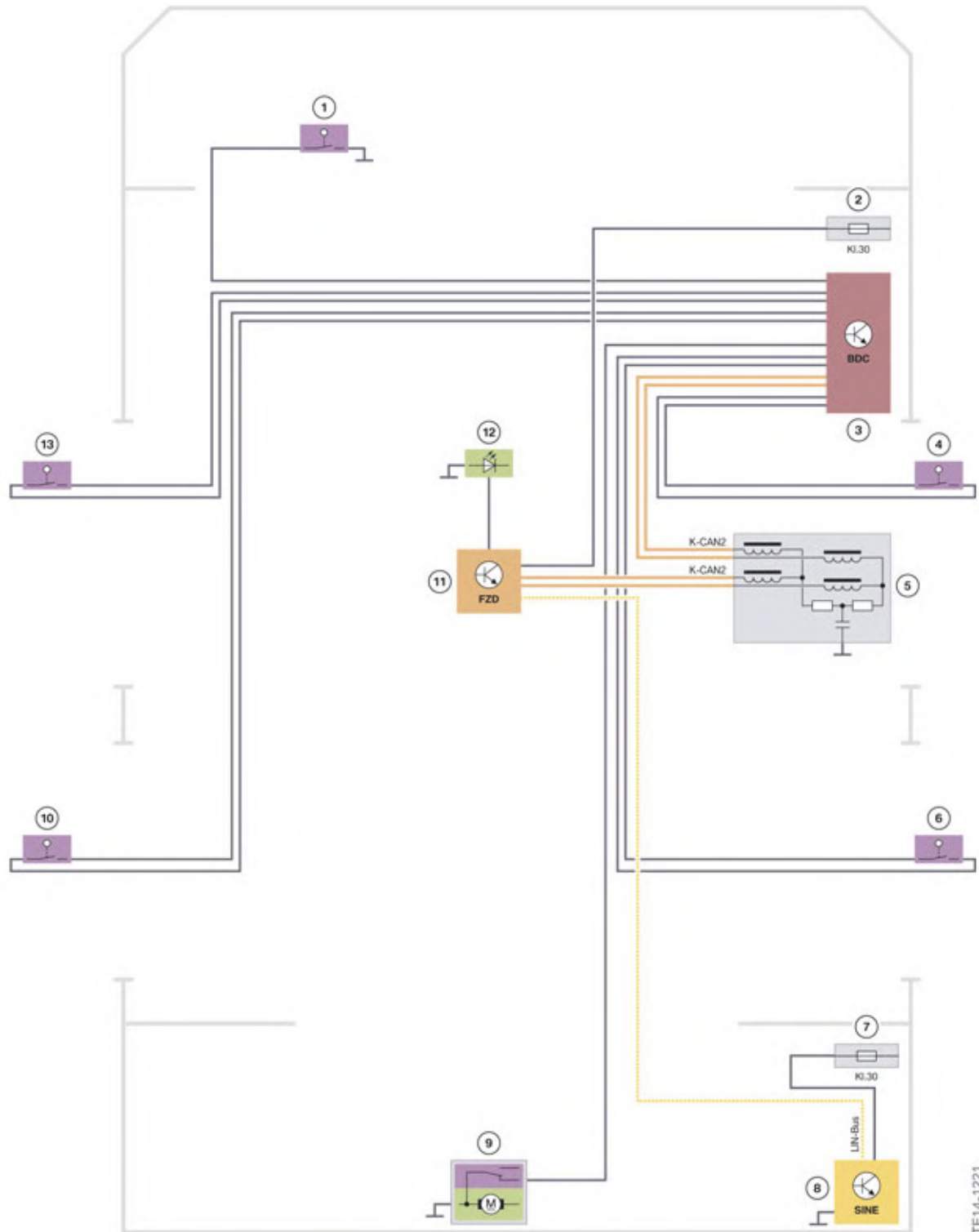
4. Locking and Security Functions

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

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5. Alarm System

5.1. System wiring diagram



Alarm system

TE14-1221

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5. Alarm System

Index	Explanation
1	Hood contact switch
2	Fuse for front right power distribution box
3	Body Domain Controller (BDC)
4	Door contact, front passenger side, front
5	CAN terminator
6	Door contact on front passenger side, rear
7	Fuse for rear right power distribution box
8	Siren with tilt alarm sensor
9	Tailgate contact switch in the tailgate lock
10	Door contact on driver's side, rear
11	Roof function center (FZD)
12	LED in the interior mirror
13	Door contact, driver's side, front

The alarm system in the G01 is equipped with an ultrasonic interior movement detector for monitoring the passenger compartment. The ultrasonic interior movement detector (USIS) is fully integrated in the roof function center (FZD).

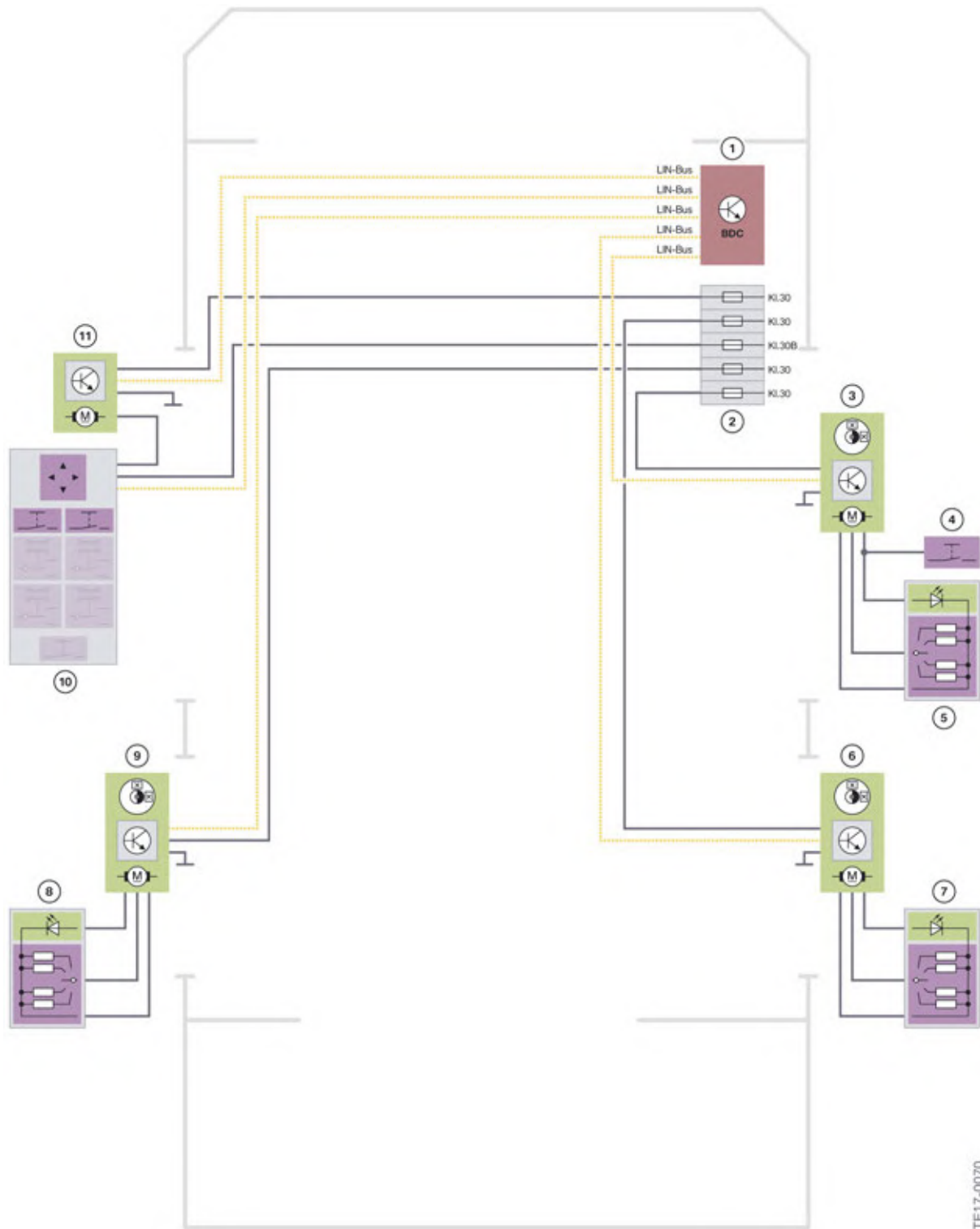
The door contacts, engine compartment lid contact switch and the opening of the tailgate are monitored by the Body Domain Controller. As soon as a status changes, the ultrasonic interior movement detector receives this information via the K-CAN2. If the alarm system is activated, the siren with tilt alarm sensor is activated by the control unit in the event of a break-in.

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

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

6. Power Windows

6.1. System wiring diagram



Power window regulator

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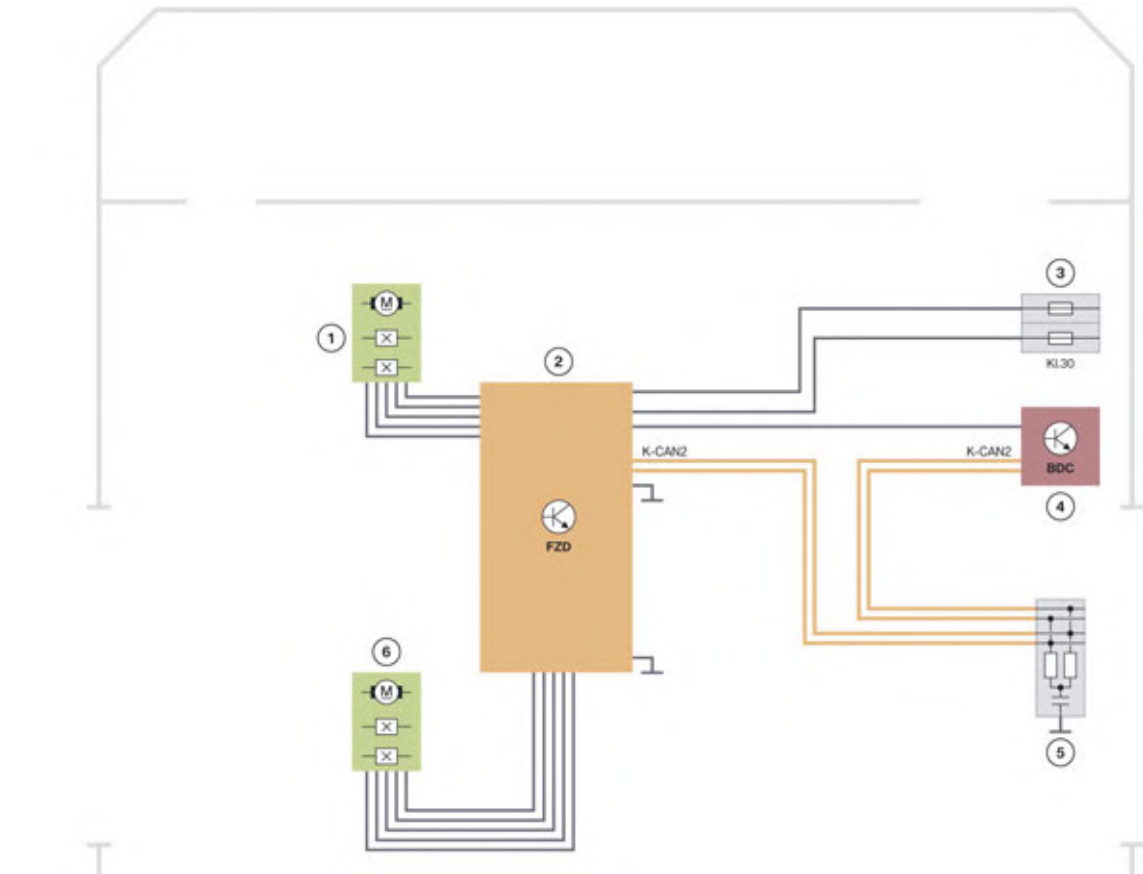
6. Power Windows

Index	Explanation
1	Body Domain Controller (BDC)
2	Fuses in the power distribution box, front right
3	Power window motor, passenger's side
4	Central locking button, front passenger door
5	Power window switch, front passenger side, front
6	Power window motor, passenger's side rear
7	Power window switch, front passenger side rear
8	Power window switch driver's side, rear
9	Power window motor, driver's side rear
10	Switch block, driver's door
11	Power window motor, driver's side front

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7. Panoramic Sunroof

7.1. System wiring diagram

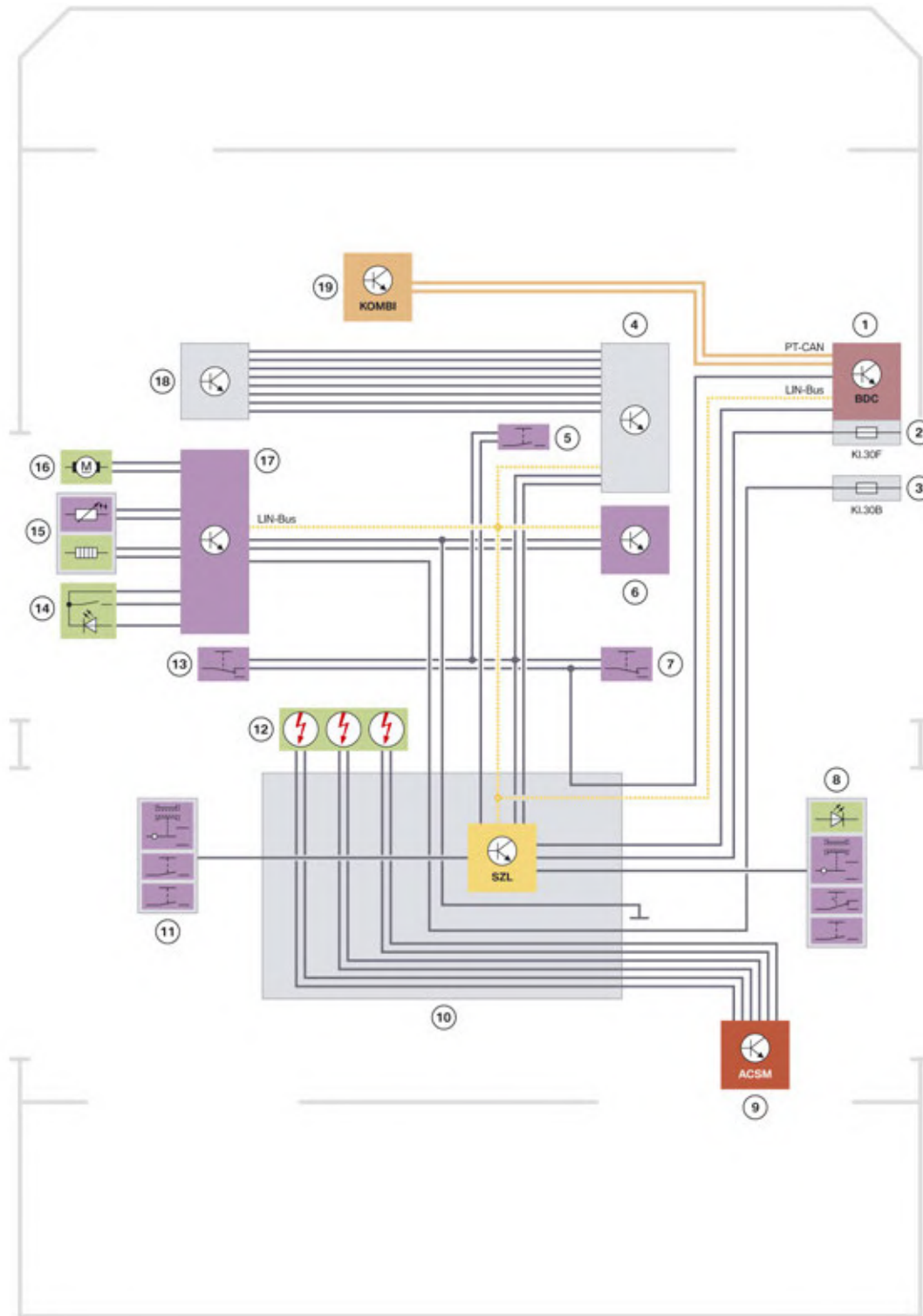


Index	Explanation
1	Motor, slide/tilt sunroof
2	Roof function center (FZD)
3	Fuses in the power distribution box, front right
4	Body Domain Controller (BDC)
5	CAN terminator
6	Sliding roofliner motor

G01 General Vehicle Electronics

8. Steering Column Switch Cluster

8.1. System wiring diagram



TE17-0074

Steering column switch cluster

G01 General Vehicle Electronics

8. Steering Column Switch Cluster

Index	Explanation
1	Body Domain Controller (BDC)
2	Fuse in the Body Domain Controller
3	Fuse for front right power distribution box
4	Multifunction steering wheel buttons, right
5	Horn button
6	Touch detection (Hands-Off Detection)
7	Shift paddle, right
8	Steering column switch, right
9	Advanced Crash Safety Module (ACSM)
10	Steering column switch cluster (SZL)
11	Steering column switch, left
12	Driver's airbag
13	Shift paddle, left
14	Steering-wheel heating button
15	Steering wheel heating
16	Vibration motor
17	Steering wheel module
18	Multifunction steering wheel buttons, left
19	Instrument cluster (KOMBI)

G01 General Vehicle Electronics

8. Steering Column Switch Cluster

8.2. SZL



TE17-0075

Steering column switch cluster (SZL)

The turn signal/high beam switch on the G01 engages mechanically in the corresponding position when operated. The return is mechanical via the steering wheel.

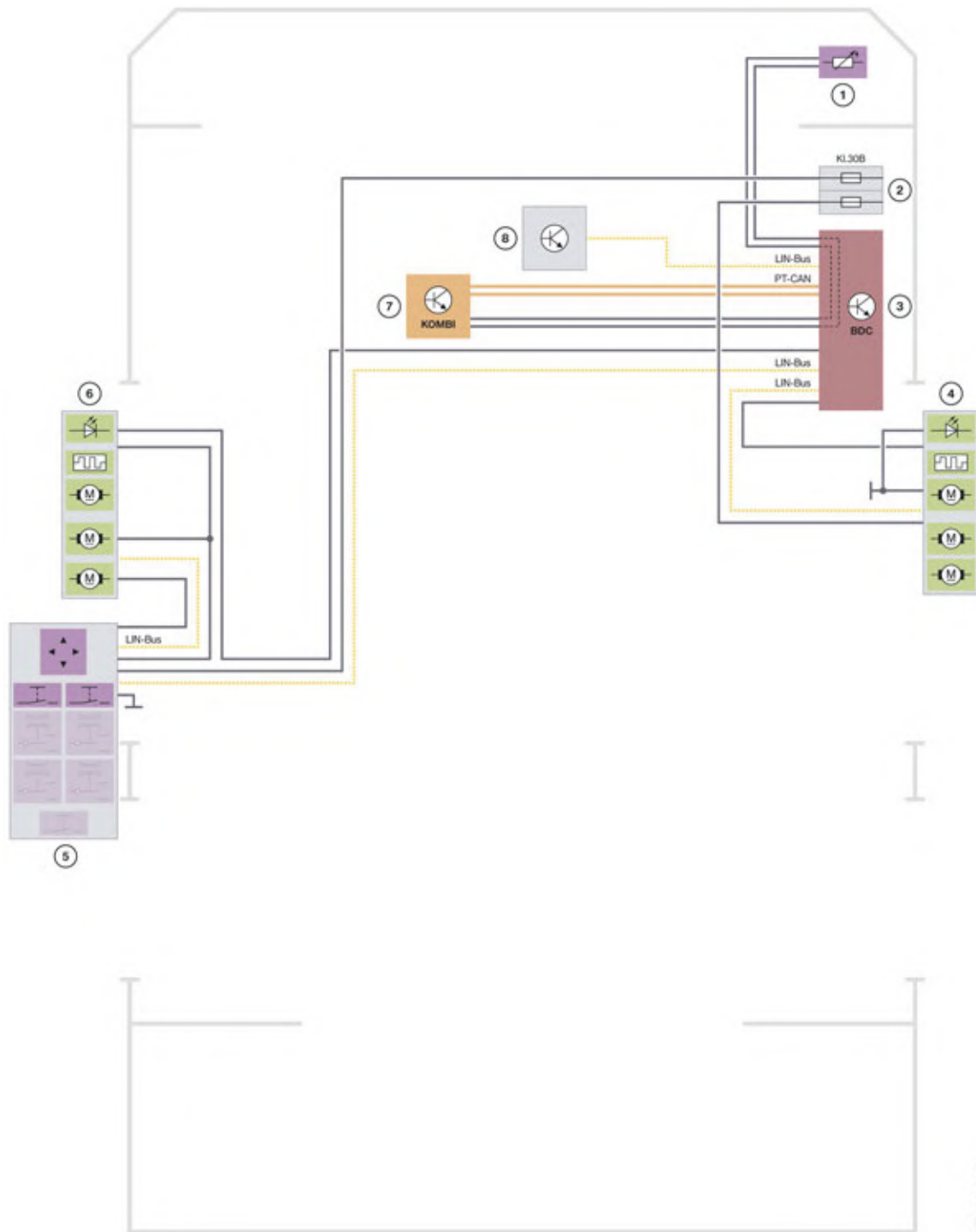
All signals of the buttons and switches of the multifunction steering wheel (MFL) and the steering column switch cluster (SZL) are transmitted via Local Interconnect Network to the Body Domain Controller (BDC).

G01 General Vehicle Electronics

9. Door Mirror

9.1. Exterior mirror

9.1.1. System wiring diagram



Exterior mirror

TE14-1219

G01 General Vehicle Electronics

9. Door Mirror

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

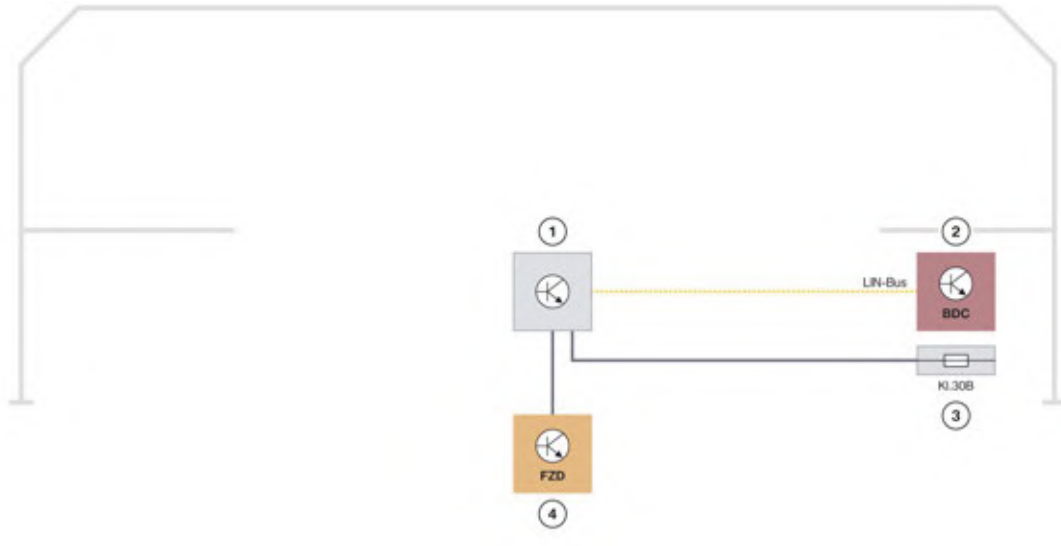
The instrument cluster receives the value of the ambient temperature from the outside temperature sensor and makes this available via the PT-CAN. The Body Domain Controller evaluates the signal and triggers the activation of the mirror heating via the local interconnect network bus. The control of the heater output is dependent on the ambient temperature and the switch position of the driving experience switch.

The mirror servomotors are activated by the mirror electronics. The request for adjusting the exterior mirror is received by the mirror electronics via the local interconnect network bus.

G01 General Vehicle Electronics

10. Interior Mirror

10.1. System wiring diagram



Inside mirror

Index	Explanation
1	Inside mirror
2	Body Domain Controller
3	Fuse for front right power distribution box
4	Roof function center (FZD)

The interior mirror is connected with the Body Domain Controller via LIN bus.

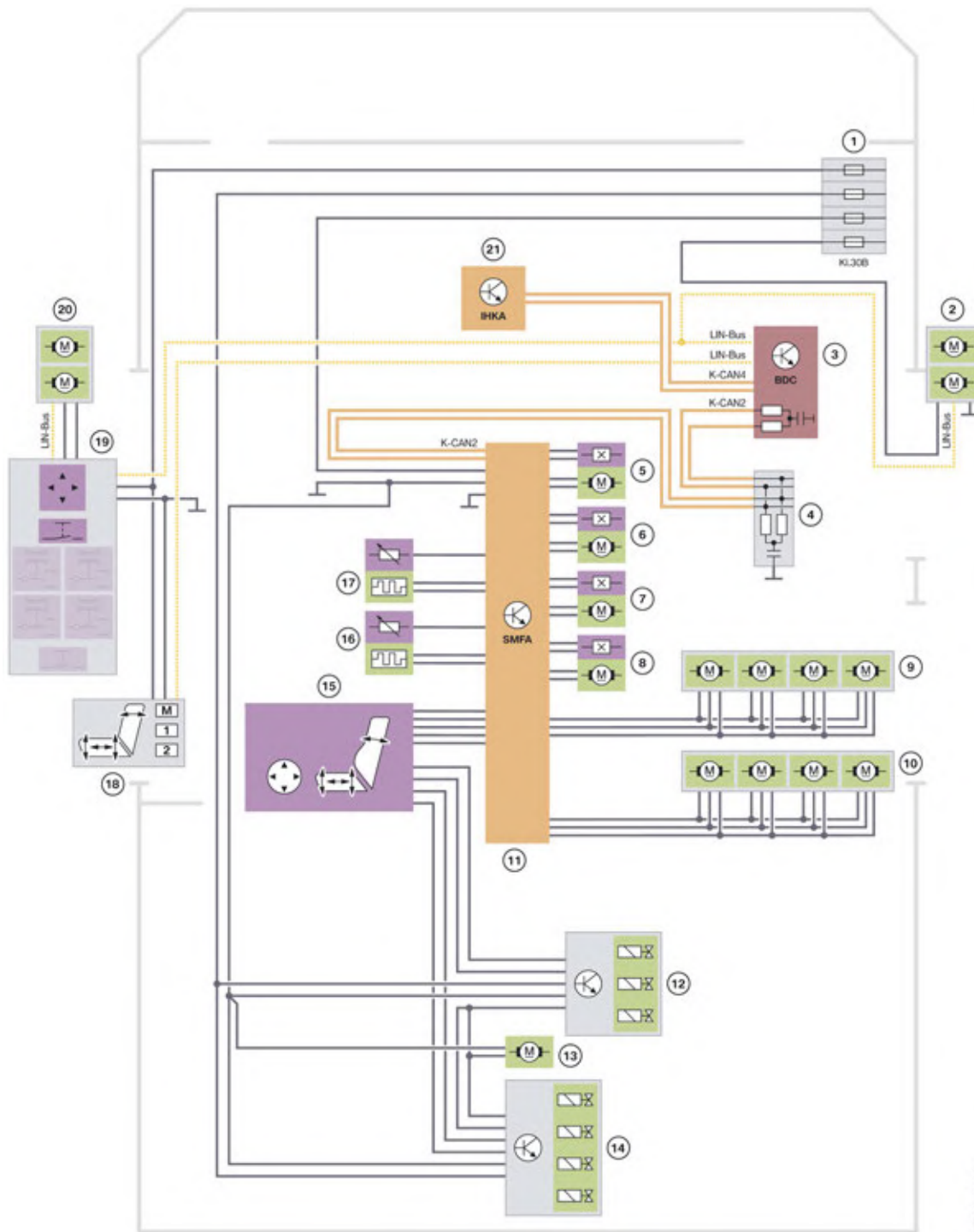
The LED for the alarm system is located at the interior mirror.

G01 General Vehicle Electronics

11. Seats

11.1. Front sport seats

11.1.1. Sport seats with memory, front, driver's side



Memory memory sports seat, driver's side, front

G01 General Vehicle Electronics

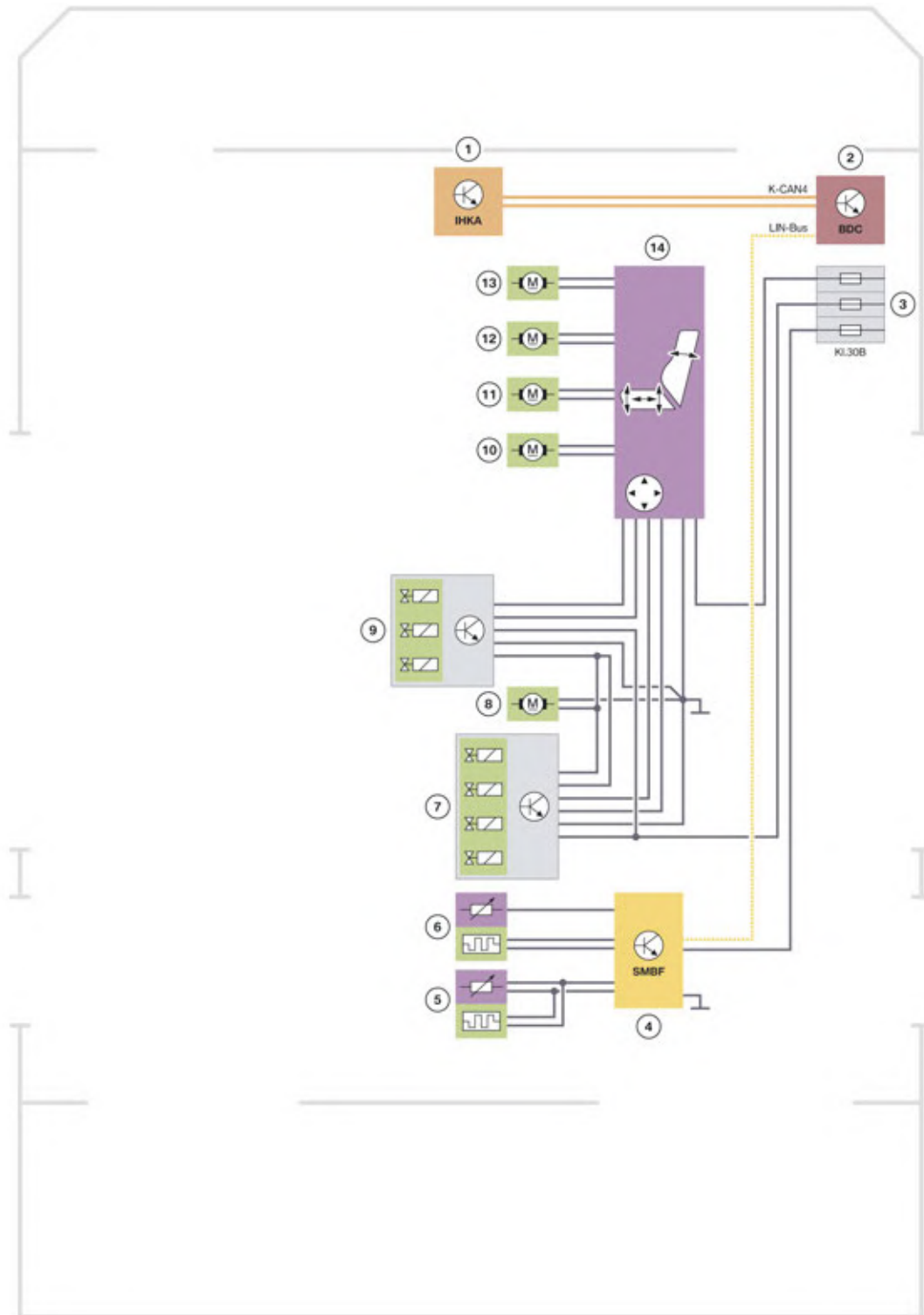
11. Seats

Index	Explanation
1	Fuses in the power distribution box, front right
2	Exterior mirror, front passenger side
3	Body Domain Controller (BDC)
4	CAN terminator
5	Motor, longitudinal seat adjustment
6	Motor, seat angle adjustment
7	Motor, seat height adjustment
8	Motor, backrest angle adjustment
9	Motors, active seat ventilation, seat surface
10	Motors, active seat ventilation, backrest
11	Driver's seat module (SMFA)
12	Valve block, backrest width adjustment
13	Seat pneumatics module pump
14	Valve block, lumbar-support adjustment
15	Switch, seat adjustment
16	Seat heating pad, backrest
17	Seat heating pad, seat surface
18	Memory switch
19	Switch block, driver's door
20	Exterior mirror, driver's side
21	Integrated automatic heating / air conditioning (IHKA)

G01 General Vehicle Electronics

11. Seats

11.1.2. Sport seat, front, passenger's side



Sport-electric seat, front, passenger's side

TE17-0079

G01 General Vehicle Electronics

11. Seats

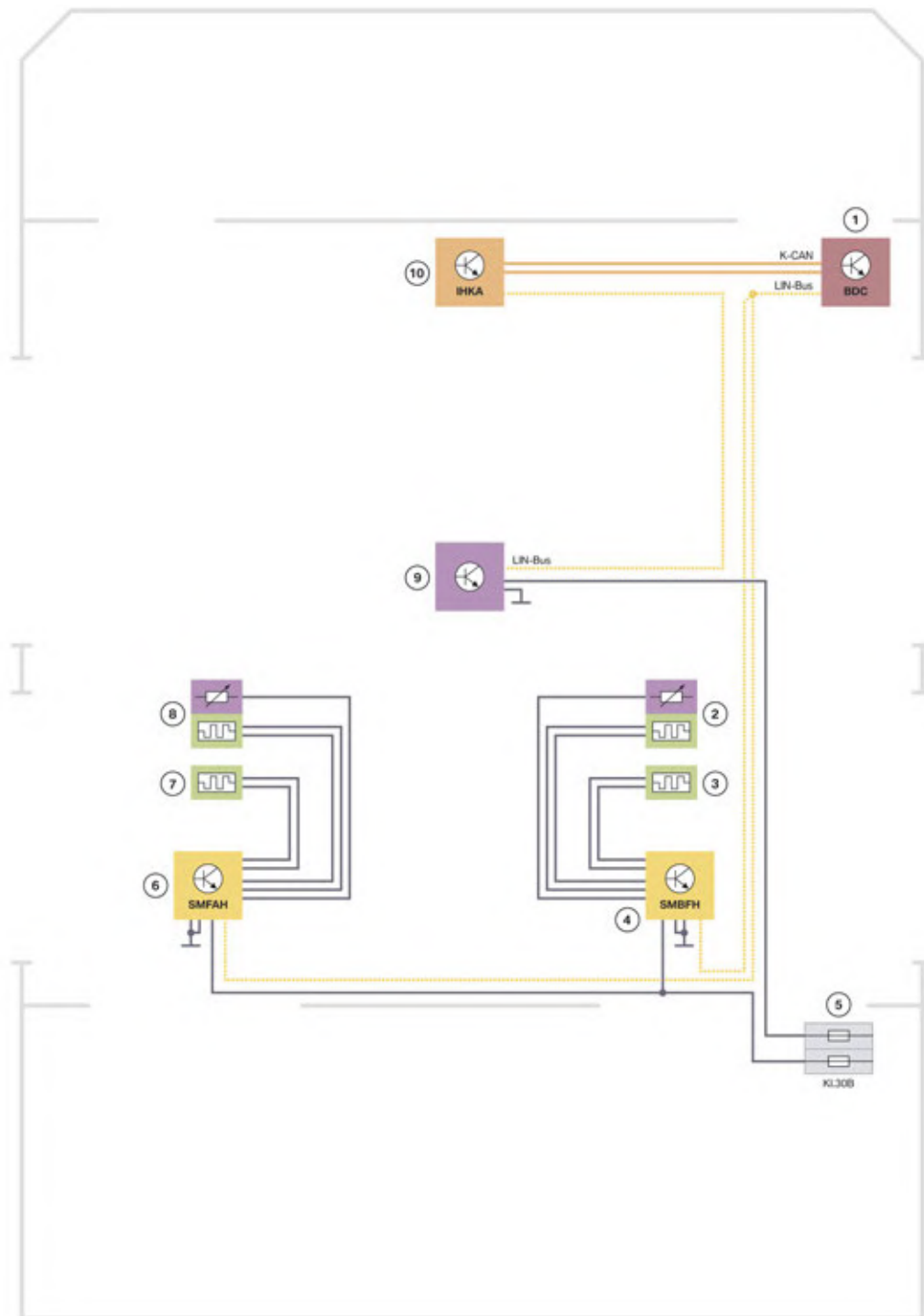
Index	Explanation
1	Integrated automatic heating / air conditioning (IHKA)
2	Body Domain Controller (BDC)
3	Fuses in the power distribution box, front right
4	Seat-heating electronics on front passenger side
5	Seat heating pad, backrest
6	Seat heating pad, seat surface
7	Valve block, lumbar-support adjustment
8	Seat pneumatics module pump
9	Valve block, backrest width adjustment
10	Motor, seat height adjustment
11	Motor, backrest angle adjustment
12	Motor, seat angle adjustment
13	Motor, longitudinal seat adjustment

G01 General Vehicle Electronics

11. Seats

11.2. Rear seats

11.2.1. Seat heating, rear passenger compartment



Seat heating, rear passenger compartment

G01 General Vehicle Electronics

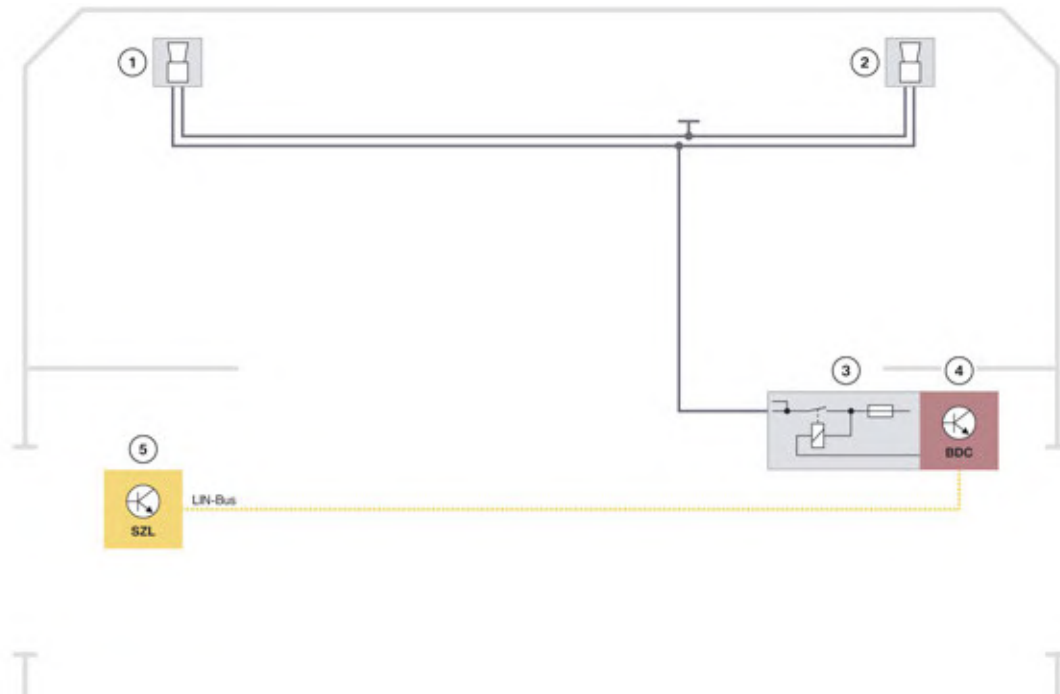
11. Seats

Index	Explanation
1	Body Domain Controller
2	Seat heating pad, seat surface, passenger's side rear
3	Seat heating pad, backrest, passenger's side rear
4	Seat-heating electronics, rear passenger's side
5	Fuse in the rear power distribution box
6	Seat-heating electronics, rear driver's side
7	Seat heating pad, backrest, driver's side rear
8	Seat heating pad, seat surface, driver's side rear
9	Control panel, rear passenger compartment
10	Integrated automatic heating / air conditioning (IHKA)

G01 General Vehicle Electronics

12. Horn

12.1. System wiring diagram



Horns

Index	Explanation
1	Horn, left
2	Horn, right
3	Relay in the Body Domain Controller
4	Body Domain Controller (BDC)
5	Steering column switch cluster (SZL)

Signal path of horn:

- The horn button is read in by the steering column switch cluster (SZL).
- The SZL sends the information via the local interconnect network bus to the Body Domain Controller.
- The Body Domain Controller evaluates the information and activates the relay for the fanfare.



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