

# G30 Voltage Supply and Bus Systems

## 3. Control Units

### 3.5.2. Parking Maneuver Assistant (PMA)



Parking manoeuvring assistant (PMA)

The PMA control unit performs the corresponding functions depending on equipment:

- Park Distance Control (PDC)
- Parking assist
- Parking Maneuver Assistant Plus

Park Distance Control (PDC) assists the driver when pulling in and out of a parking space. The current distance from an obstruction is indicated by acoustic signals and on a visual display.

The Parking Maneuver Assistant performs parking in parking spaces.

In a vehicle with Parking Maneuver Assistant (PMA) all sensors of the Park Distance Control (PDC) are used. In addition, there is a sensor for the PMA in each case on the left and right of the front and rear bumper panels. For the parking assistant the camera systems of the vehicle are also required.

# G30 Voltage Supply and Bus Systems

## 3. Control Units

### 3.5.3. Lane change warning (SWW) also know as the Short Range Radar Sensor (SRR)



Lane change warning (SWW/SRR)

Both control units lane change warning SWW (primary) and SWW2 (secondary) also know as the Short Range Radar Sensor (SRR/SRR2) are shown in the picture. The SWW/SRR (primary) control unit is located on the right. The control unit lane change warning SWW2/SRR2(secondary) is on the left.

The control unit for the lane change warning (SWW/SRR) is required for the following optional equipment:

- Driving Assistant Plus (SA5AT)

The SWW/SRR is the primary control unit, and it is also used for diagnosis of the additional control units connected to the local CAN. The control unit lane change warning SWW2/SRR2 (secondary) is required for the lane change warning.

The following control units are additionally required for the optional equipment Driving Assistant Plus:

- Radar sensor, front left
- Radar sensor, front right

# G30 Voltage Supply and Bus Systems

## 3. Control Units

### 3.6. Control units on the K-CAN4

#### 3.6.1. Active Sound Design (ASD)



Active Sound Design (ASD)

The control unit for Active Sound Design generates the engine sound for output in the vehicle interior. The engine sound is calculated according to the programmed sound specification and various parameters such as the accelerator pedal angle (driver's desired load), engine speed and torque. It is then output via the vehicle's own audio system in the passenger compartment.

# G30 Voltage Supply and Bus Systems

## 3. Control Units

### 3.6.2. Controller (CON)



Controller (CON)

On the G30 a controller with touchpad is used. On the controller with touch control box the customer can input location information for the navigation system or phone numbers and contact details as numbers and letters. In the map operation the map section for example can be moved and enlarged or reduced by finger movement.

### 3.6.3. Integrated automatic heating / air conditioning (IHKA)



Integrated automatic heating / air conditioning (IHKA)

The integrated automatic heating/air conditioning system (IHKA) is standard equipment in the G30.

# G30 Voltage Supply and Bus Systems

## 3. Control Units

### 3.6.4. Light Effect Manager (LEM)



Light Effect Manager (LEM)

The control unit LEM is responsible for controlling the following lighting systems:

- Speaker covers in the High End Bowers & Wilkins audio system.

# G30 Voltage Supply and Bus Systems

## 3. Control Units

### 3.6.5. Telematic Communication Box (TCB)



Telematic Communication Box (TCB)

The 2nd-generation Telematic Communication Box (TCB) is installed in the G30. The Telematic Communication Box (TCB) is connected directly to the roof-mounted antenna and is responsible for the following functions:

- BMW ConnectedDrive services (incl. BMW Assist with ECALL (emergency call function)) + BMW Online.
- BMW Internet using a SIM card integrated in the vehicle (P-SIM).
- Remote functions (reception and controller).
- "Speech-to-text" function in Office area.
- BMW Teleservices via P-SIM.
- WLAN hotspot via P-SIM.

# G30 Voltage Supply and Bus Systems

## 3. Control Units

### 3.7. Control units on the K-CAN5

#### 3.7.1. Remote control receiver (FBD)



Remote control receiver

The control unit remote control receiver (FBD) is responsible for communication of the remote control services. It receives the data of the wheel electronics for the tire pressure control.

The control unit for the remote control service is not displayed by the BMW diagnosis system ISTA in the bus overview. Diagnosis is performed via the Body Domain Controller.

### 3.8. Control units on the Ethernet

#### 3.8.1. Active Cruise Control (ACC) Long Range Radar (LRR) sensor



Active Cruise Control ACC Long Range Radar (LRR) sensor

The control unit for active cruise control for ACC Stop & Go contains a radar-based sensor for sensing the area in front of the vehicle. Both the near and far ranges are monitored by this sensor.

# G30 Voltage Supply and Bus Systems

## 3. Control Units

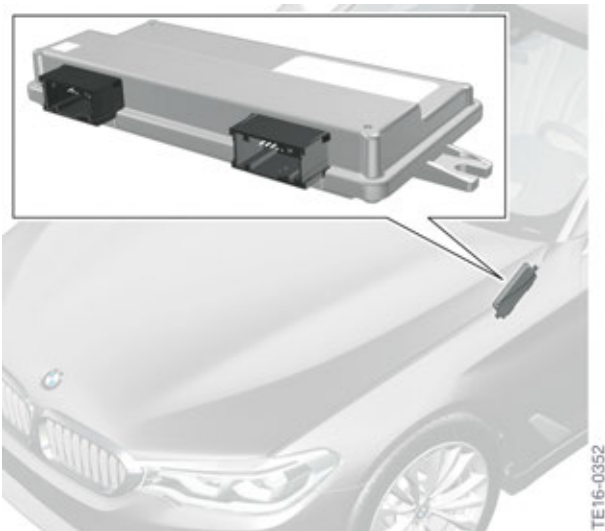
### 3.8.2. Rear view camera (RFK)



Reversing camera

On vehicles with a rear view camera only, the rear view camera is connected to the Ethernet.

### 3.8.3. Top Rear Side View Camera (TRSVK)



Top Rear Side View Camera (TRSVK)



# G30 Voltage Supply and Bus Systems

## 3. Control Units

The control unit Top Rear Side View Camera receives the picture information from the following cameras:

- Front camera
- Exterior mirror camera, left
- Exterior mirror camera, right
- Rear view camera

The cameras are connected to the TRSVC via Ethernet.

### 3.8.4. Camera-based driver support systems (KAFAS)

The control unit camera-based driver support systems (KAFAS) is required for the following optional equipment:



Camera-based driver support systems (KAFAS)

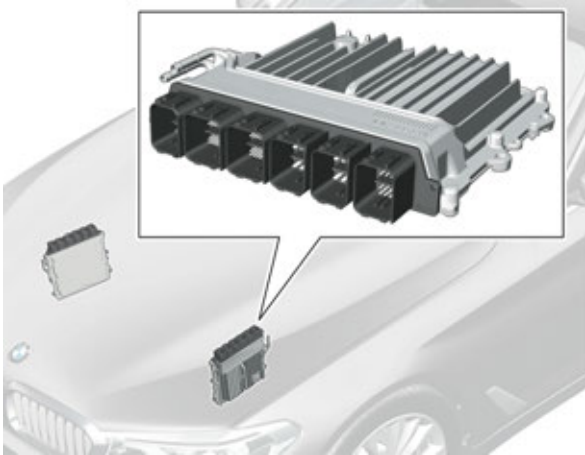
- Camera-based cruise control with Stop & Go function
- Traffic Jam Assist
- Speed limit information
- Person recognition with city braking function
- Collision warning with city braking function

# G30 Voltage Supply and Bus Systems

## 3. Control Units

### 3.9. Control units on the PT-CAN

#### 3.9.1. Digital Motor Electronics (DME, DME2)



Digital Motor Electronics DME and DME2

The illustration shows the DME and DME2 control units. The DME control unit is on the left side (seen in the direction of travel).

The DME is responsible for the control of the combustion engine. In addition, the DME is the gateway between PT-CAN and PT-CAN2.

The DME control unit is installed for 4 and 6-cylinder gasoline engines.

The DME2 control unit is installed in addition to the DME control unit for 8-cylinder engines.

#### 3.9.2. High-beam assistant (FLA)



High-beam assistant (FLA)

On vehicles without camera-based driver assistance systems (KAFAS), the control unit for the high-beam assistant is integrated in the interior mirror. On vehicles with KAFAS, the function of the high-beam assistant is performed by the camera-based driver assistance system.

# G30 Voltage Supply and Bus Systems

## 3. Control Units

### 3.9.3. Instrument panel (KOMBI)



Instrument panel (KOMBI)

One instrument cluster version is used in the G30, since the navigation system is standard equipment.

### 3.9.4. Night vision electronics (NVE)



Night vision electronics (NVE)

The control unit Night Vision Electronics receives picture information from the Night Vision camera. The picture information is transmitted via Color Video Blanking Signal to the HEADUNIT and can then be displayed on in the CID, instrument cluster and Head-Up Display.

# G30 Voltage Supply and Bus Systems

## 3. Control Units

### 3.10. Control units on the PT-CAN2

#### 3.10.1. Electronic transmission control (EGS)



Electronic transmission control (EGS)

The control unit for electronic transmission control is installed directly inside the automatic transmission.

#### 3.10.2. Gear selector switch (GWS)



Gear selector switch (GWS)

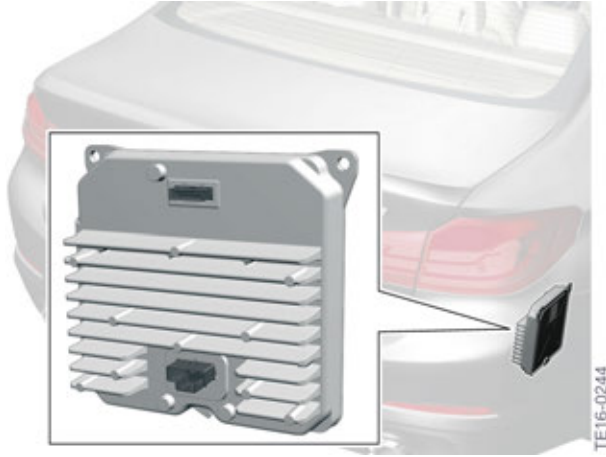
The gear selector switch (GWS) is used for selecting a drive position.

The bus connection is via the PT-CAN2 and additionally via a local CAN to the electronic transmission control (EGS) unit.

# G30 Voltage Supply and Bus Systems

## 3. Control Units

### 3.10.3. Power Control Unit (PCU)



Power Control Unit (PCU)

The Power Control Unit is required:

- For charging the auxiliary battery.
- For supplying the vehicle electrical system from the auxiliary battery.

The Power Control Unit (PCU) contains a DC/DC converter with a power of 500 W.

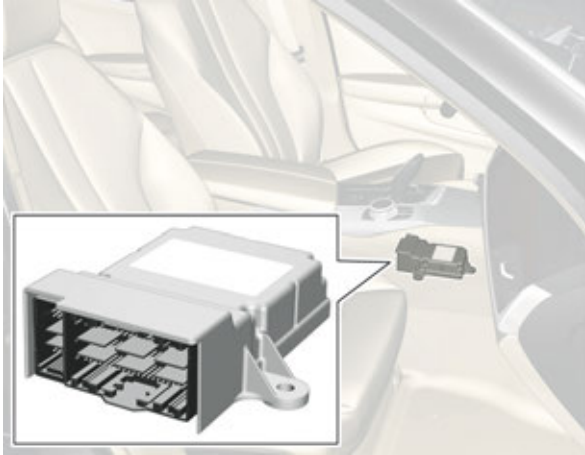
The preconditions for the direction of the energy management are calculated from the use of the vehicle. The auxiliary battery is charged by the PCU when the engine is running. During the phases in which the combustion engine is not running, e.g. automatic engine start/stop function, the PCU supplies energy from the auxiliary battery to the vehicle electrical system.

# G30 Voltage Supply and Bus Systems

## 3. Control Units

### 3.11. Control units on the FlexRay

#### 3.11.1. Advanced Crash Safety Module (ACSM)



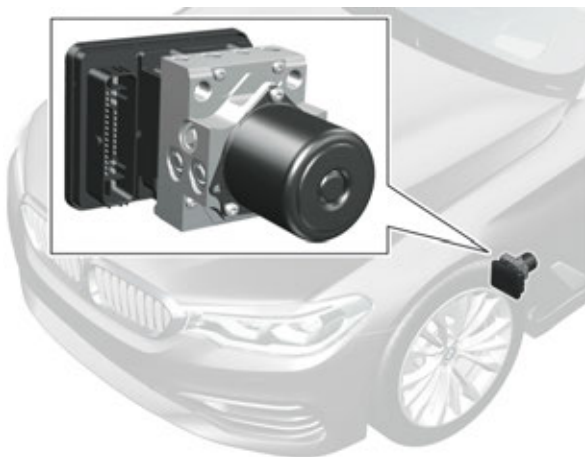
Advanced Crash Safety Module (ACSM)

The function of the Advanced Crash Safety Module (ACSM) is to evaluate all sensor signals in order to identify a crash situation. The ACSM evaluates the information from the sensors and then forwards corresponding measures for selective activation of the necessary restraint systems.

The ACSM records the yaw rate and sends this information on the FlexRay data bus.

No additional yaw sensors are therefore required for the other systems.

#### 3.11.2. Dynamic Stability Control (DSC)



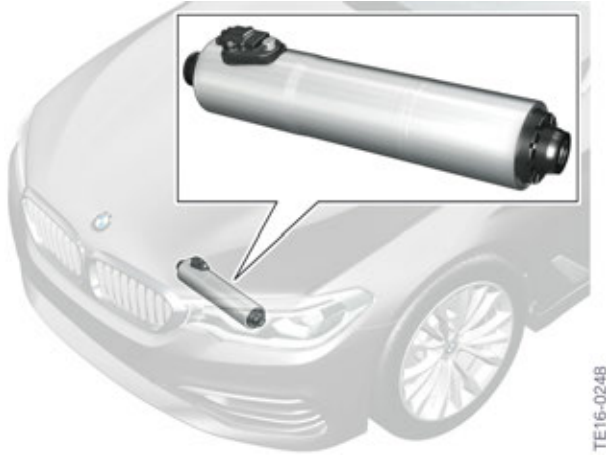
Dynamic Stability Control (DSC)

The DSC control unit and the DSC hydraulic control unit are screwed together. The DSC control unit can be replaced individually to reduce servicing costs. The functions of the tire pressure control (TPMS) and the electric parking brake are integrated in the DSC control unit.

# G30 Voltage Supply and Bus Systems

## 3. Control Units

### 3.11.3. Electric Active Roll Stabilization (EARS)



Electric active roll stabilization front (EARSV)



Electric active roll stabilization rear (EARSH)

Above are the electric active roll stabilization units for the rear EARSH and front EARSV.

The control units for EARS are directly integrated in the corresponding actuator.

# G30 Voltage Supply and Bus Systems

## 3. Control Units

### 3.11.4. Electronic Power Steering (EPS)



Electronic Power Steering (EPS)

The Electronic Power Steering (EPS) is supplied with 12 V or 24 V depending on the equipment and engine.

An auxiliary battery, a separating element and a charging unit for the auxiliary battery are required for the 24 V version. These components are installed in the luggage compartment of the G30.

The steering angle information is determined by the EPS and made available to the other control units via the FlexRay bus.

### 3.11.5. Rear axle slip angle control (HSR)



Rear axle slip angle control (HSR)

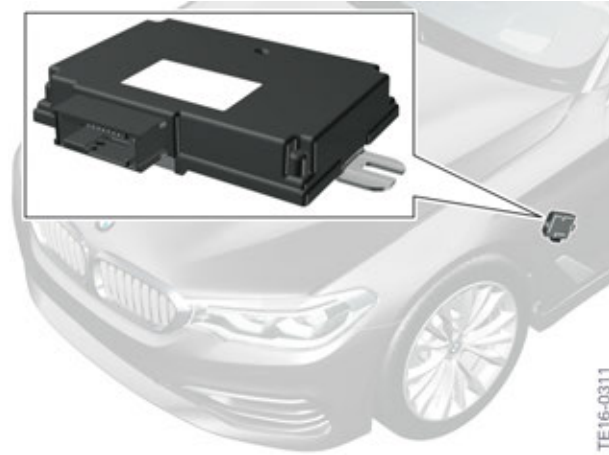
The control unit for slip angle control is responsible for steering the rear axle.



# G30 Voltage Supply and Bus Systems

## 3. Control Units

### 3.11.6. Optional equipment system (SAS)



Optional equipment system (SAS)

The optional equipment system control unit provides a variety of driver assistance functions. The SAS does not have any installed sensors. The information needed for the functions is made available by the corresponding control units and sensors. The SAS activates the control units necessary for the corresponding function.

Possible functions:

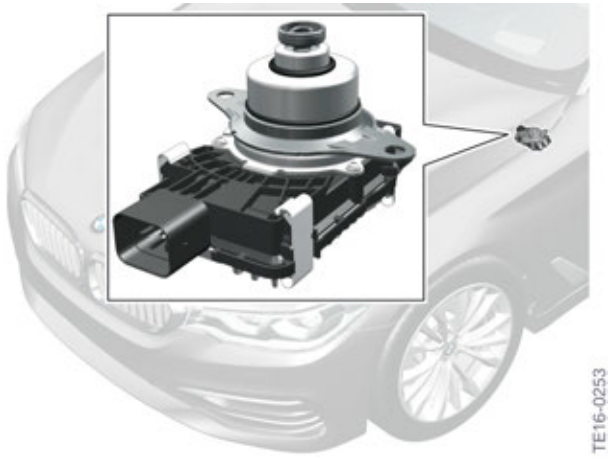
- Collision warning with city braking function
- Cruise control with braking function
- Person recognition with city braking function
- Parking Maneuver Assistant
- Traffic Jam Assist
- Camera-based cruise control with Stop & Go function
- Proactive driving assistant

The image information required by the optional equipment system is provided by the camera-based driver support systems.

# G30 Voltage Supply and Bus Systems

## 3. Control Units

### 3.11.7. Transfer case



Transfer case

The control unit for the transfer case controls the clutch in the transfer case on vehicles with xDrive.

### 3.11.8. Vertical Dynamics Platform (VDP)



Vertical Dynamics Platform (VDP)

The control unit for the vertical dynamic platform is required for the following equipment:

- Dynamic Damper Control

The VDP control unit is responsible for:

- Valve control in the shock absorbers
- Detection of vehicle ride heights by the ride height sensors

# G30 Voltage Supply and Bus Systems

## 3. Control Units

### 3.12. Control units on the local CAN

The control units on the local CAN are not displayed in the bus overview by the BMW diagnosis system ISTA. Diagnosis takes place via the corresponding primary control unit.

#### 3.12.1. Radar sensor (primary)



Radar sensor, left (RSL) and radar sensor, right (RSR)

The control units for the radar sensor, front right (RSR) and radar sensor, front left (RSL) are installed at the front right and front left of the vehicle for the optional equipment Driving Assist Plus.

#### 3.12.2. Lane change warning SWW2 (secondary) also known as the Short Range Radar Sensor (SRR2)



Lane change warning

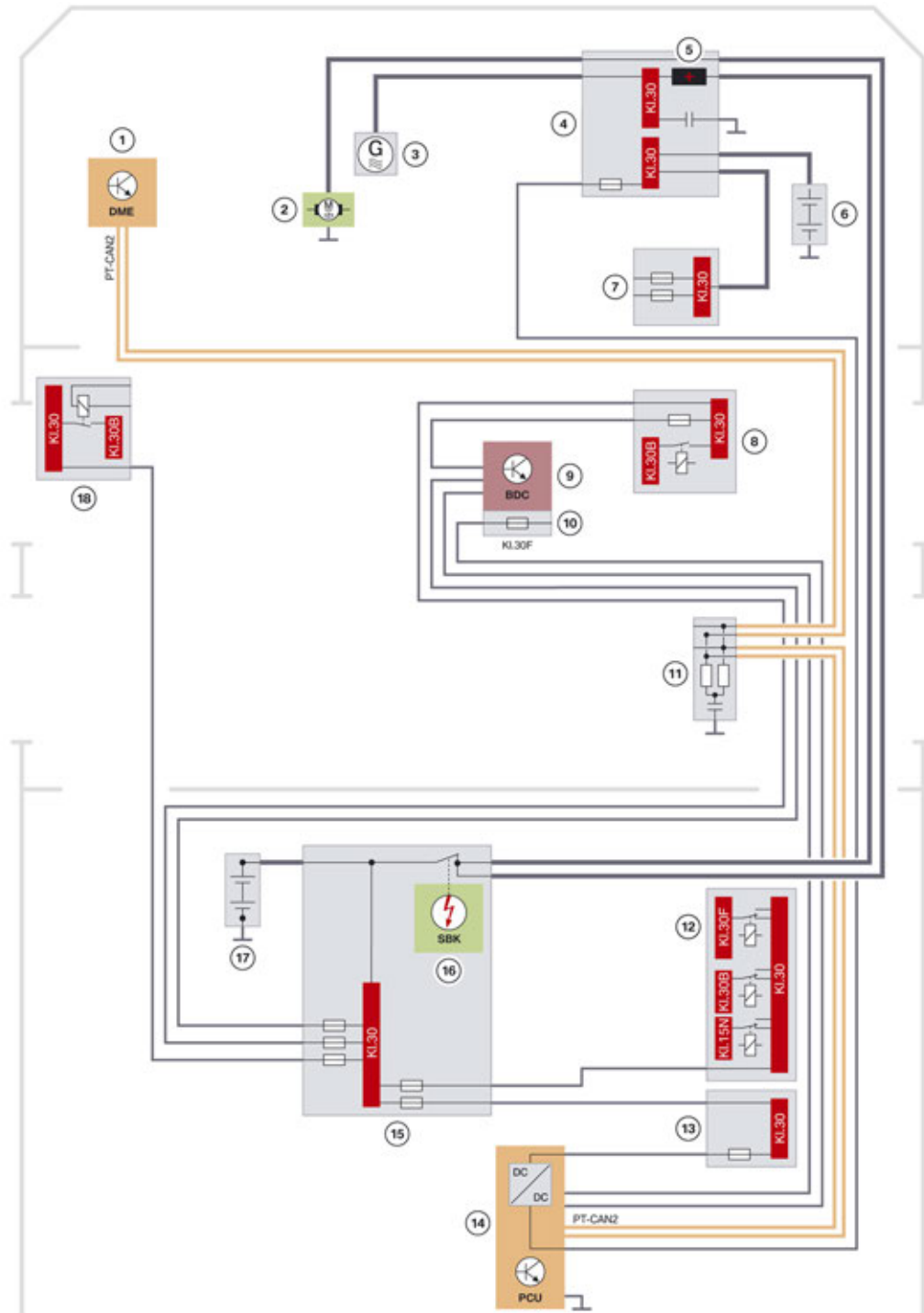
Both control units lane change warning SWW/SRR (primary) and SWW2/SRR2 (secondary) are shown in the picture. The SWW/SRR (primary) control unit is located on the right. The control unit lane change warning SWW2/SRR2 (secondary) is on the left. The control unit lane change warning SWW2/SRR2 (secondary) is connected with the control unit lane change warning SWW/SRR (primary) via a local CAN. Diagnose with the BMW diagnosis system takes place via the primary control unit.

# G30 Voltage Supply and Bus Systems

## 4. Voltage Supply

### 4.1. Overview of voltage supply

#### 4.1.1. System wiring diagram



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Voltage supply

# G30 Voltage Supply and Bus Systems

## 4. Voltage Supply

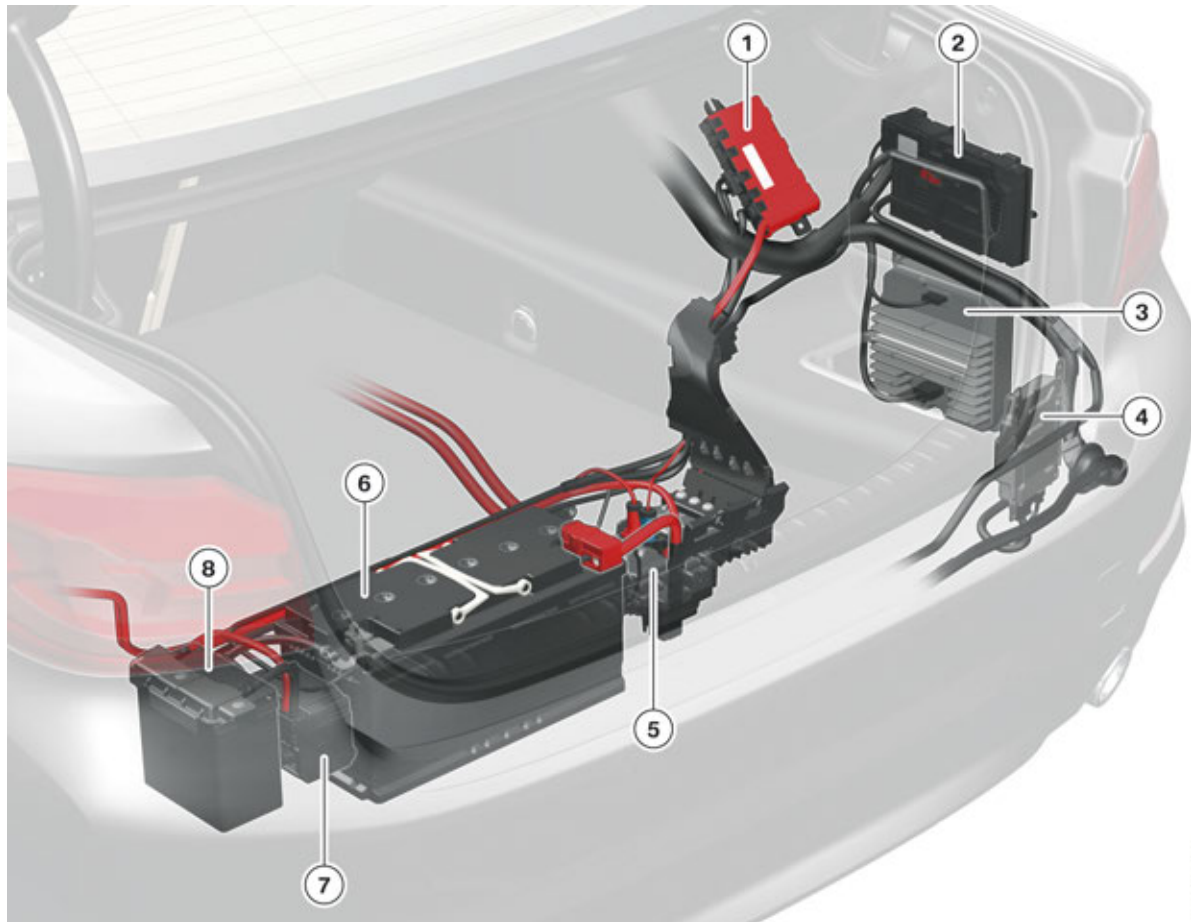
Index	Explanation
1	Digital Motor Electronics (DME)
2	Starter motor
3	Alternator
4	Power distribution box, engine compartment
5	Jump start terminal point
6	Auxiliary battery, engine compartment
7	Power distribution box, auxiliary battery, engine compartment
8	Power distribution box, front right
9	Body Domain Controller (BDC)
10	Fuse in the Body Domain Controller
11	CAN terminator
12	Power distribution box, rear
13	Fuse in the power distribution box, battery, right
14	Power Control Unit PCU 500 W
15	Battery power distribution box
16	Safety battery terminal
17	Battery
18	Power distribution box, front left (PHEV version only)

# G30 Voltage Supply and Bus Systems

## 4. Voltage Supply

### 4.2. Components

#### 4.2.1. Overview of luggage compartment



Battery

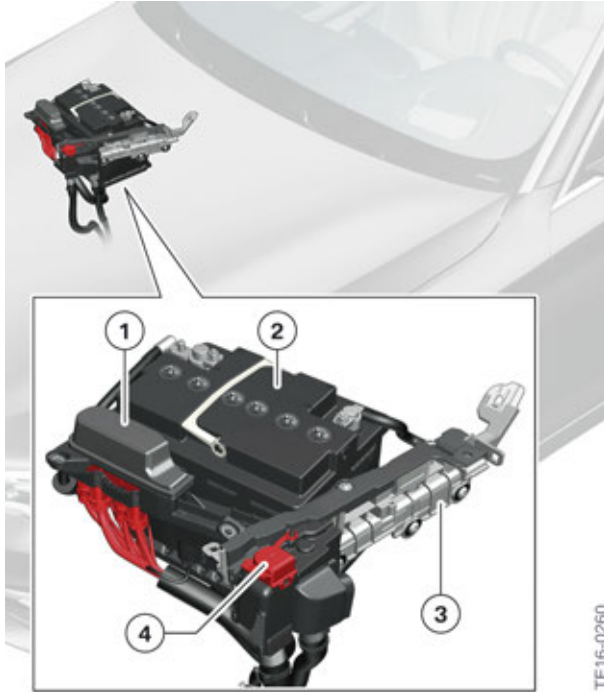
Index	Explanation
1	Power distribution box, battery, right
2	Power distribution box, rear
3	Power Control Unit (PCU) 500 W
4	Power Control Unit (PCU) 150 W
5	Power distribution box with safety battery terminal
6	Battery
7	Separator
8	Auxiliary battery, luggage compartment

The vehicle battery in the G30 is an AGM battery with 90 Ah or 105 Ah. The battery variant depends on the engine version and optional equipment.

# G30 Voltage Supply and Bus Systems

## 4. Voltage Supply

### 4.2.2. Overview of engine compartment



Auxiliary battery, engine compartment

Index	Explanation
1	Power distribution box, engine compartment
2	Auxiliary battery, engine compartment
3	Power distribution box, auxiliary battery, engine compartment
4	Jump start terminal point

The auxiliary battery in the engine compartment of the G30 is an AGM battery with 50 Ah or 60 Ah. The battery variant depends on the engine version and optional equipment.

### 4.2.3. Battery

AGM batteries are used for the voltage supply in the G30.

There may be 1, 2 or 3 batteries in the vehicle depending on the engine version and vehicle equipment.

- Starter battery in the luggage compartment with 90 Ah or 105 Ah.
- Auxiliary battery in the engine compartment with 50 Ah or 60 Ah.
- Auxiliary battery in the luggage compartment with 12 Ah for vehicles with 24 V steering.

An auxiliary battery in the engine compartment is used to provide assistance for the vehicle electrical system. On vehicles with electric active roll stabilization, the two anti-roll bar actuators are also supplied with power by this battery.

# G30 Voltage Supply and Bus Systems

## 4. Voltage Supply

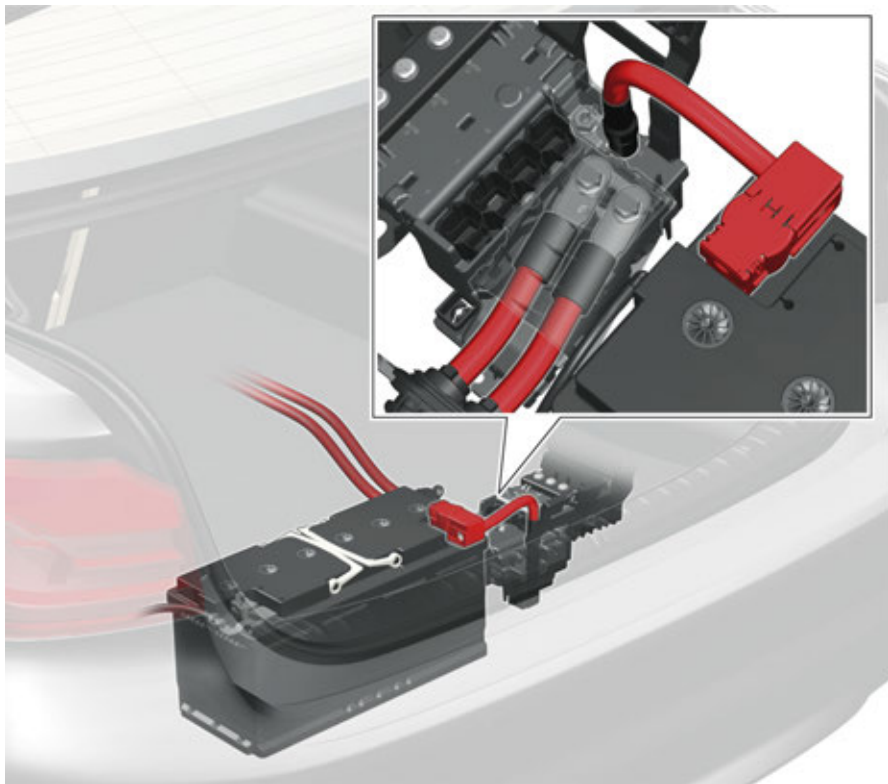
### 4.2.4. Intelligent battery sensor

The IBS records the following data of the 12 V battery:

- Voltage
- Current
- Temperature

The IBS performs the calculation and the evaluation of the information. The results are then forwarded to the DME and BDC via the local interconnect network bus.

### 4.2.5. Safety battery terminal



Safety battery terminal

The safety battery terminal (SBK) is activated in the event of an accident of corresponding severity. The voltage supply to the positive battery connection point in the engine compartment is interrupted and the consumers connected to this are de-energized. The safety battery terminal is installed in the power distribution box next to the battery.



# G30 Voltage Supply and Bus Systems

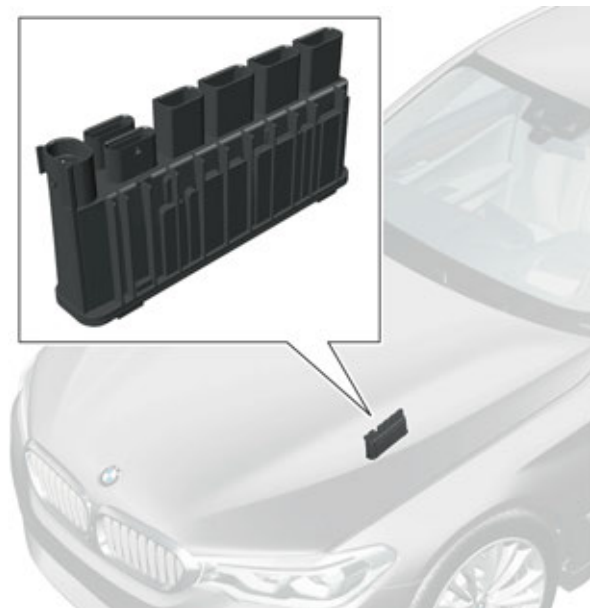
## 4. Voltage Supply

### 4.2.6. Alternator

Alternators with increased efficiency are used in the G30. The increase in alternator efficiency is achieved by reducing the losses in the rectifier. The loss-causing diodes are replaced by actively activated MOSFET transistors. A reduction in fuel consumption is achieved by increasing the efficiency.

- Bosch with 180 A and 250 A, for 4 and 6-cylinder engines.
- Valeo with 252 A, for 8-cylinder engine.

### 4.2.7. Integrated supply module



Integrated supply module

The engine control and its components are supplied with a 12 V voltage via the integrated supply module.

# G30 Voltage Supply and Bus Systems

## 4. Voltage Supply

### 4.2.8. Power distribution box, front right

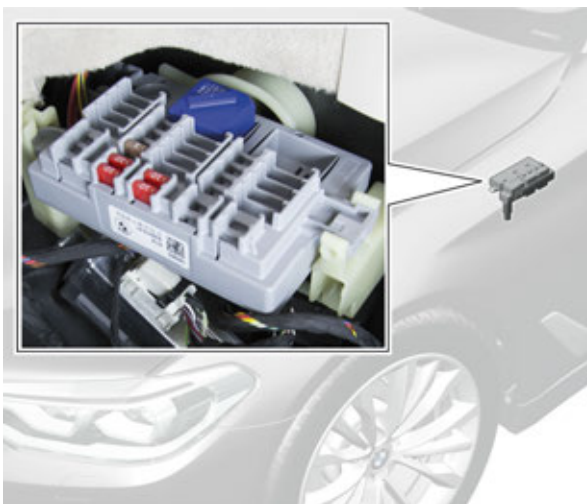


Power distribution box, front right

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

Consumers are supplied with terminal 30, terminal 30B and terminal 15N and provided with corresponding fuse protection by the front right power distribution box. Terminal 15N is supplied from the front power distribution box by the rear power distribution box.

### 4.2.9. Power distribution box, front left (PHEV Version only)



Power distribution box, front left

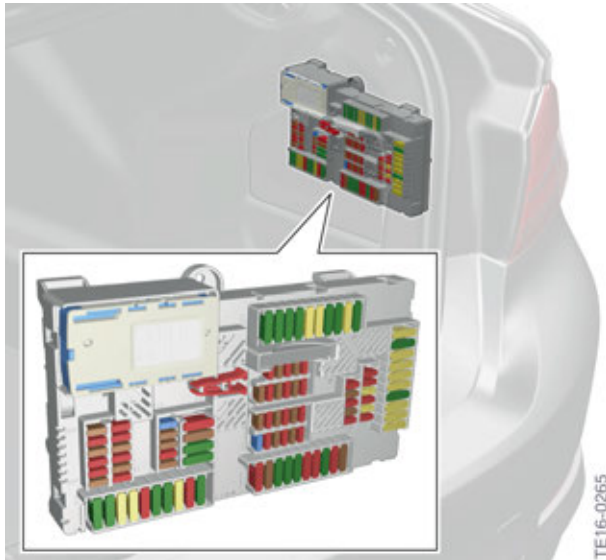
A relay for terminal 30B is installed in the front left power distribution box.

Consumers are supplied with terminal 30 and terminal 30B and provided with corresponding fuse protection by the front left power distribution box.

# G30 Voltage Supply and Bus Systems

## 4. Voltage Supply

### 4.2.10. Power distribution box, rear



Power distribution box, rear

The following relays are installed in the rear power distribution box:

- 2 Relay's, terminal 30F
- 2 Relay's, terminal 30B
- Relay, terminal 15N
- Relay for rear window heating

All relays are bi-stable relays. The relays are activated by the Body Domain Controller via LIN. The hard-wired terminal 30B relays of the two front power distribution boxes are activated via the rear power distribution box.

### 4.2.11. Body Domain Controller

The Body Domain Controller (BDC) is responsible for the terminal control.

A terminal 30F relay is installed in the BDC.

A number of consumers are supplied with terminal 30 and terminal 30F and provided with corresponding fuse protection via the BDC.

# G30 Voltage Supply and Bus Systems

## 4. Voltage Supply

### 4.2.12. PCU with vehicle electrical system assistance measure

Modern vehicles have a high energy consumption due to the many electrical consumers. As a result, there is a high demand on the battery particularly in phases in which the combustion engine is not running and the alternator supplies no energy (e.g. engine start/stop phases).

In order to protect the vehicle battery, a DC/DC converter is installed in the Power Control Unit (PCU) and an auxiliary battery in the engine compartment in the G30.

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, e.g. automatic start/stop function, the energy is supplied from the auxiliary battery into the conventional vehicle electrical system.

The Power Control Unit PCU contains a control unit which is connected to the PT-CAN2 and a DC/DC converter with a power of 500 W.

On vehicles with the equipment electric active roll stabilization, this is supplied by the auxiliary battery in the engine compartment.

### 4.2.13. 24 V Electronic Power Steering

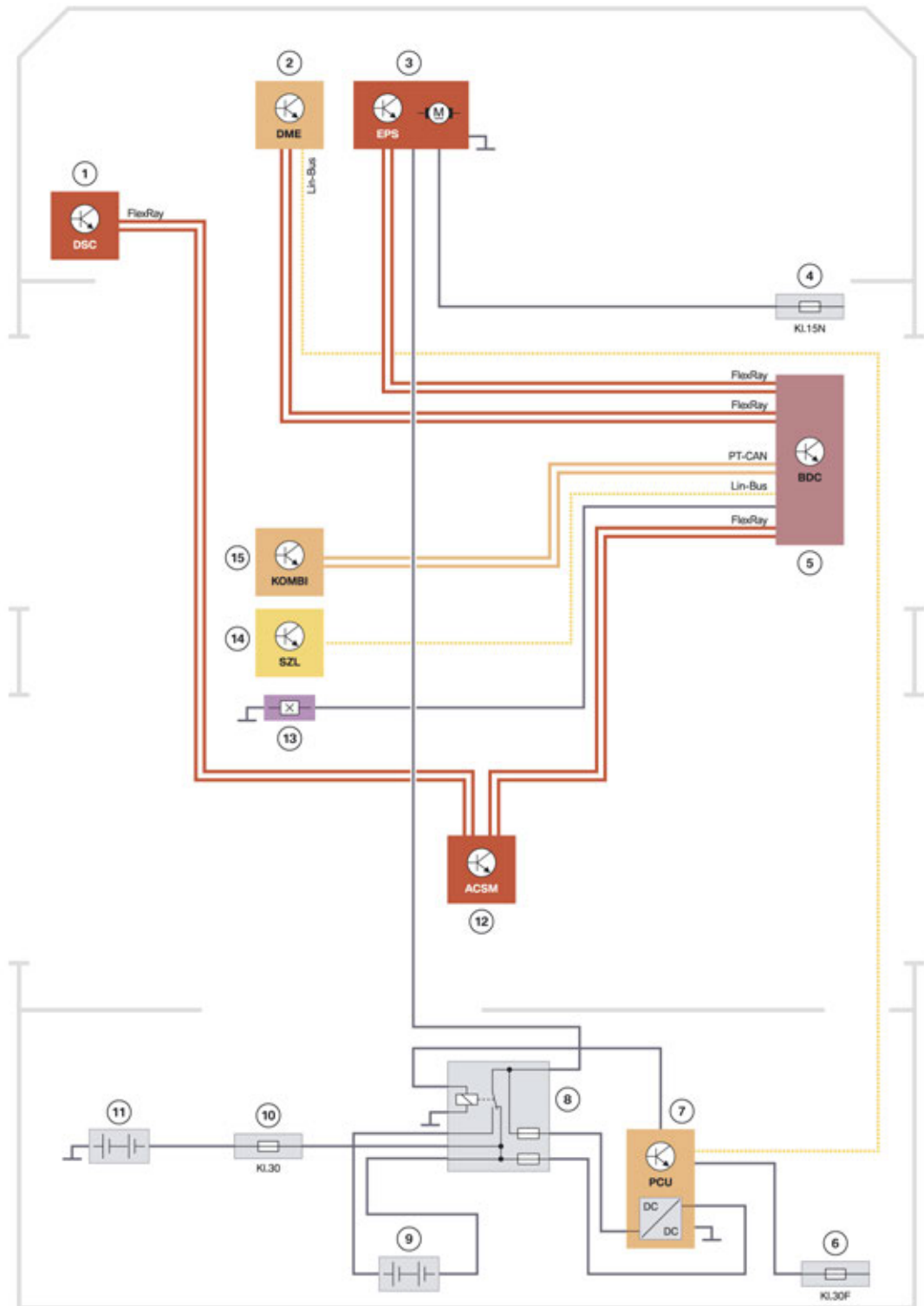
The greater weight of the engines in the G30 on vehicles with 8-cylinder engines results in a higher front axle load. This has the effect that the required power of the steering assist increases. Due to these high currents, it is necessary to increase the voltage supply of the EPS to 24 V.

An auxiliary battery, separating element and a charging unit for the auxiliary battery are required for this. These components are installed in the luggage compartment of the G30.

The charging unit monitors the state of charge and also charges the auxiliary battery using a DC/DC converter. The EPS is only supplied with 24 V once this relay has been activated. The EPS can also be operated with 12 V in the event of a fault.

# G30 Voltage Supply and Bus Systems

## 4. Voltage Supply



Voltage supply for 24 V steering

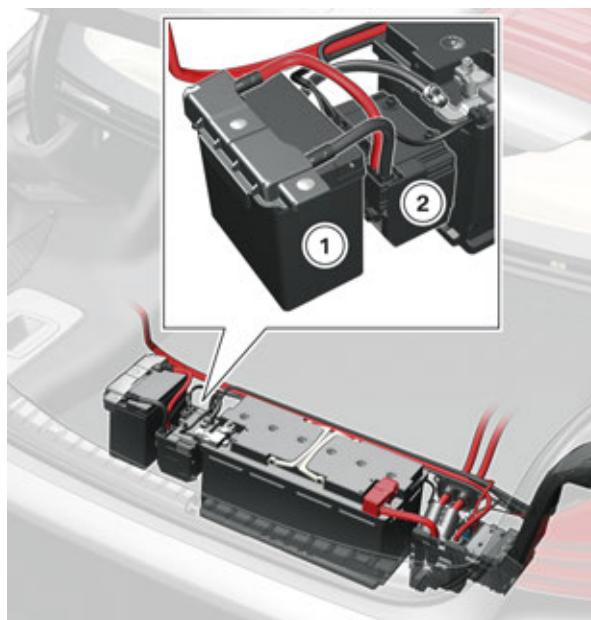
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# G30 Voltage Supply and Bus Systems

## 4. Voltage Supply

Index	Explanation
1	Dynamic Stability Control (DSC)
2	Digital Motor Electronics (DME)
3	Electronic Power Steering (EPS)
4	Fuse for front right power distribution box
5	Body Domain Controller (BDC)
6	Fuse in the rear power distribution box
7	Power Control Unit PCU 150 W
8	Separator
9	Auxiliary battery in the luggage compartment
10	Fuse in the power distribution box, battery
11	Battery
12	Advanced Crash Safety Module (ACSM)
13	Brake light switch
14	Steering column switch cluster (SZL)
15	Instrument panel (KOMBI)

### Auxiliary battery with separating element



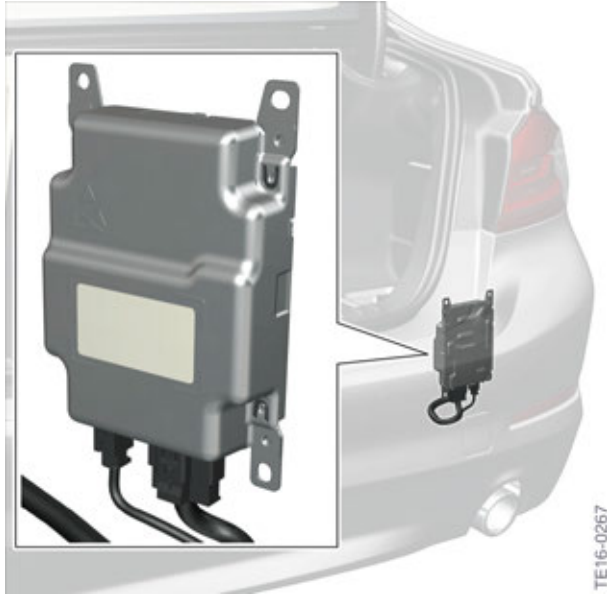
Battery and separating element

Index	Explanation
1	Auxiliary battery in the luggage compartment
2	Separator

# G30 Voltage Supply and Bus Systems

## 4. Voltage Supply

### Power Control Unit



150 W Power Control Unit

The Power Control Unit monitors the state of charge and also charges the auxiliary battery using a DC/DC converter.

# G30 Voltage Supply and Bus Systems

## 5. Terminal Control

### 5.1. Introduction

The terminal control in the G30 is identical to the terminal control of the G12. In the G30, the vehicle is always in the right condition from the point of view of the customer. The terminals are controlled via a customer-oriented condition management. The terminal control is dependent on the driving conditions.

### 5.2. Vehicle conditions

The G30 vehicle may be in the following conditions:

- PARKING (asleep)
- RESIDING (awake)
- DRIVING (ready)

The different vehicle functions are possible depending on the relevant conditions.

#### **PARKING (asleep)**

- Customer not in the vehicle.
- Vehicle secured or not used for a certain time.
- Vehicle functions cannot be operated.

#### **RESIDING (awake)**

- Customer in the vehicle.
- No driving readiness.
- Functions that are relevant when the vehicle is stationary can be operated.

#### **DRIVING (ready)**

- Customer in the vehicle.
- Driving readiness established.
- All functions are available.

The driving conditions are changed by condition management, taking into account the customer behavior. Additional information is also evaluated that may help to determine the vehicle condition, e.g.:

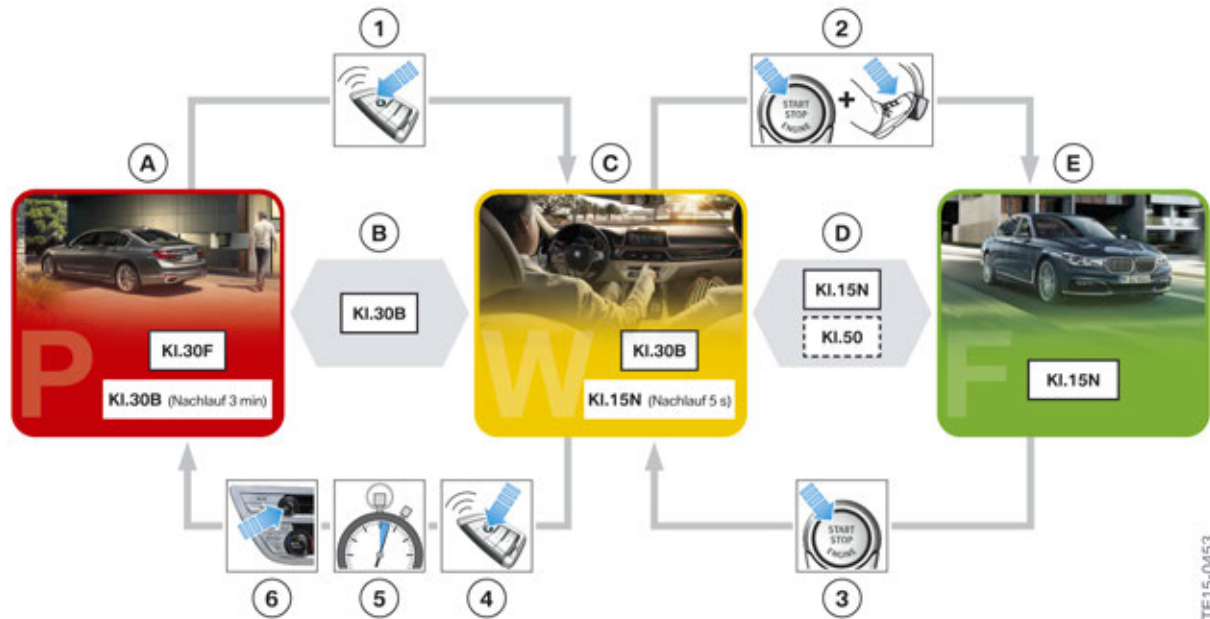
- Door opening
- Door closing
- Operations in the vehicle



# G30 Voltage Supply and Bus Systems

## 5. Terminal Control

The following diagram shows the changes between the vehicle conditions.



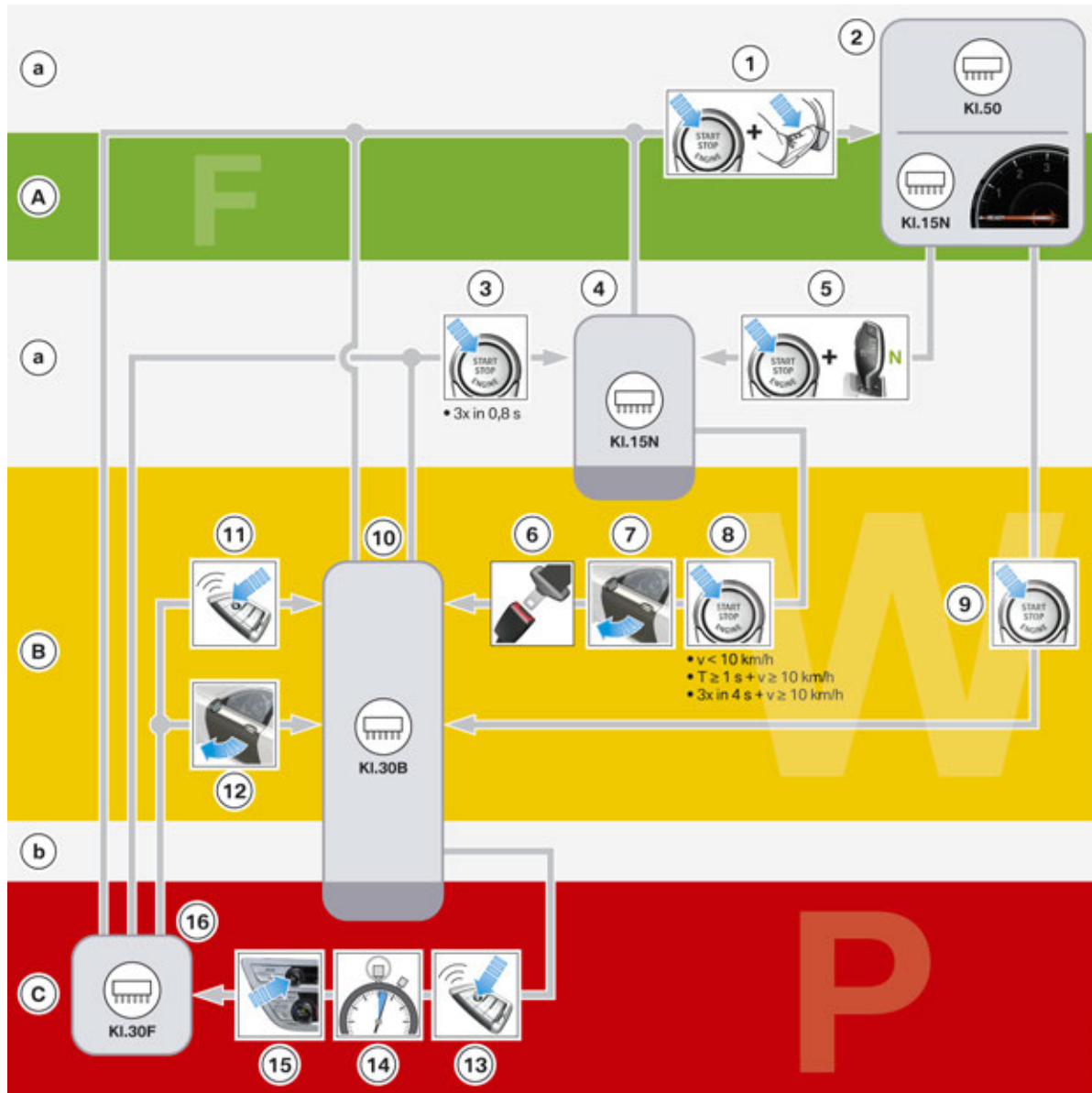
Vehicle conditions

Index	Explanation
A	Vehicle condition PARKING (asleep)
B	Transitional condition with stationary functions
C	Vehicle condition RESIDING (awake)
D	Transitional condition for establishing driving readiness or ending driving readiness or Testing/Analysis/Diagnosis (PAD)
E	Vehicle condition DRIVING (ready)
1	Unlock vehicle
2	Operation of start/stop button + brake pedal
3	Press START/STOP button
4	Locks vehicle
5	No activity of a vehicle user detected for 10 minutes
6	Extended press

# G30 Voltage Supply and Bus Systems

## 5. Terminal Control

Detailed overview of vehicle conditions.



Overview of vehicle conditions

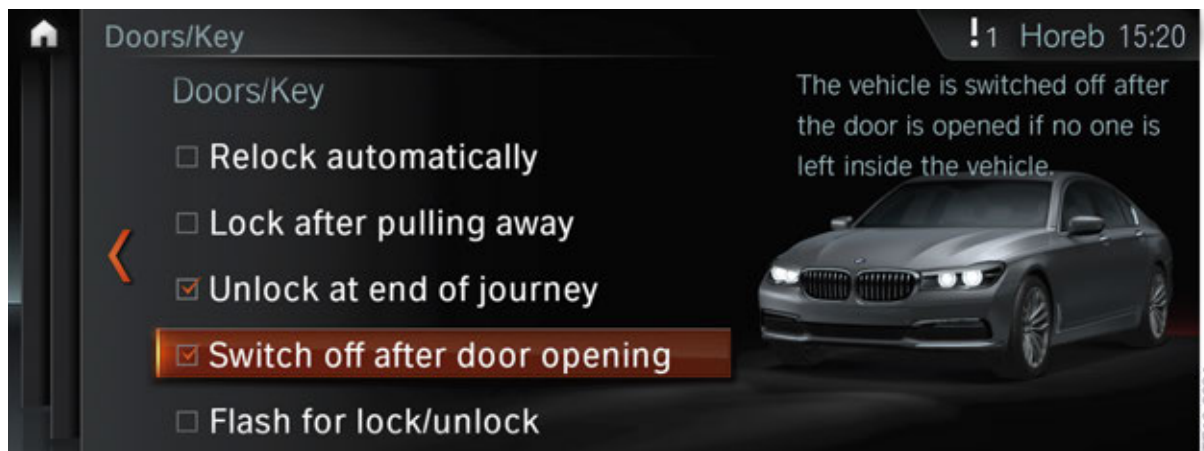
Index	Explanation
A	Vehicle condition DRIVING (ready)
B	Vehicle condition RESIDING (awake)
C	Vehicle condition PARKING (asleep)
a	Transitional condition for Establishing/ending driving readiness — Testing/Analysis/Diagnosis (PAD)
b	Transitional condition with STATIONARY FUNCTIONS

# G30 Voltage Supply and Bus Systems

## 5. Terminal Control

Index	Explanation
1	Operation of start/stop button + brake pedal + valid remote control or valid ID transmitter in the vehicle interior
2	Driving readiness established, terminal 15N (terminal 50)
3	Operation of start/stop button (three times within 0,8 s) + valid remote control or valid ID transmitter in the vehicle interior
4	Terminal 15N
5	Operation of start/stop button + selector lever in Neutral
6	Undoing driver's seat belt ( $v < 0.1$ km/h, driver's door opened, selector lever not in Neutral, brake not pressed, low beam off, no OBD communication, no diagnosis mode, no assembly mode)
7	Door contact change ( $v < 0.1$ km/h, driver's seat belt undone, selector lever not in Neutral, brake not pressed, low beam off, no OBD communication, no diagnosis mode, no assembly mode)
8	Press start/stop button + vehicle is stationary or press start/stop button for at least 1 s + driving speed $\geq 10$ km/h (6 mph) or press start/stop button at least three times within 4 s + driving speed $\geq 10$ km/h (6 mph)
9	Press START/STOP button
10	Terminal 30B
11	Unlock vehicle
12	Residing interaction or stationary function interaction
13	Locks vehicle
14	No customer interaction for 3 minutes
15	Extended press of head unit media button
16	Terminal 30F

### Automatic switch-off



Automatic switch-off

Switch off after door opening.

# G30 Voltage Supply and Bus Systems

## 5. Terminal Control

In the menu "Doors/Keys", an immediate change from the vehicle condition RESIDING to the vehicle condition PARKING can be activated.

If this option is activated, then the system will immediately change to the vehicle condition PARKING when the driver's door is opened. The omission of the after-running period in the vehicle condition RESIDING saves energy.

### 5.3. Power supply terminals

Control units in the vehicle must be supplied with power only when they are needed. The following terminals are used in the G30:

- Terminal 15N
- Terminal 30B
- Terminal 30F
- Terminal 30

Terminal 15N supplies control units which are needed only when driving and which may be needed to safely end a journey. After-run of 5 s starts at the transition from DRIVING to RESIDING.

Terminal 30B is used to supply control units that are needed in the stationary mode RESIDING and for stationary functions where the customer is not in the vehicle. An after-run of 6 minutes starts at the transition from RESIDING to PARKING, and terminal 30B is then switched off.

Terminal 30F is used to supply control units which must perform functions in PARKING condition. Terminal 30F is normally switched on in PARKING condition, but may be switched off due to faults in the vehicle electrical system. The terminal is switched off with an after-running period of 1 min if a fault is detected.

Terminal 30 control units (e.g. alarm system) are always supplied with voltage and are also not switched off in the event of a fault.

	Terminal 30F	Terminal 30B	Terminal 15N
PARKING, vehicle electrical system not OK (fault in vehicle electrical system)	OFF	OFF	OFF
PARKING, vehicle electrical system OK	ON	OFF	OFF
Stationary functions (customer not in vehicle)	ON	ON	OFF
RESIDING	ON	ON	OFF
DRIVING	ON	ON	ON

# G30 Voltage Supply and Bus Systems

## 5. Terminal Control

### Programming-analysis-diagnosis (PAD) mode

The vehicle condition programming-analysis-diagnosis is still present for diagnosis. All terminals are switched on in this mode. This ensures that diagnosis can be performed with all control units. This vehicle condition is displayed in the BMW diagnosis system ISTA.

#### Activation of the PAD mode:

- Operation of the start/stop button (three times within 0.8 s) + valid remote control or valid ID transmitter in the vehicle interior.
- By the BMW diagnosis system ISTA.

The PAD mode is exited by pressing the start/stop button or by closing the diagnosis with the BMW diagnosis system ISTA.

### 5.4. Partial network operation

Today's premium vehicles contain up to 70 control units with well over 100 micro-controllers which are networked with each other. However, depending on the current vehicle condition or the vehicle user requirements, not all convenience and assistance systems may always be needed.

It is possible to save energy, relieve the load on the battery and also prolong the battery life by targeted deactivation and activation on control units which are not needed, so-called selective partial network operation.

If functions are not used or needed when driving, e.g.:

- Seat adjustment

#### 5.4.1. Prerequisites for partial network operation

The partial network in the Body Domain Controller calculates the partial network status on the basis of the current vehicle condition and the required functions. The control units that are not required are switched off by means of the corresponding bus messages.

#### 5.4.2. Prerequisites of control units for partial network operation

Different transceivers are used in order to operate the partial network operation in control units. 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 corresponding control unit being present. If a valid wake-up event for the corresponding control unit is sent on the bus, the transceiver can activate the voltage regulator of the micro-controller and the control unit starts up. The control unit is switched off by deactivation of the voltage regulator.



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