

Technical training.
Product information.

G05 Driver Assistance Systems



BMW Service

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

ST1831

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: July 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.

The information contained in the training course materials is solely intended for participants in this training course conducted by BMW Group Technical Training Centers, or BMW Group Contract Training Facilities.

This training manual or any attached publication is not intended to be a complete and all inclusive source for repair and maintenance data. It is only part of a training information system designed to assure that uniform procedures and information are presented to all participants.

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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G05 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. A year later, the G30 has increased the variety of the product range with new Driver Assistance Systems.

The new BMW X5, with the development code G05, continues these innovations. The market introduction of the fourth BMW X5 generation sees the availability for the first time of the Back-up Assistant, which facilitates comfortable and automatically steered reversing. Furthermore, many of the assistance systems introduced in the G30 acquire new functions and thus help the driver to control the vehicle by:

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

G05 Driver Assistance Systems

1. Introduction

1.1. Further information

This reference manual introduces the innovations and adaptations of the Driver Assistance Systems in the G05. The focus is particularly on **vehicle-specific** features. Basic, **system-specific** descriptions of the new features and already established Driver Assistance Systems can be found in the following reference manual:

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	

G05 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 / junction 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

G05 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, the list contains all the Driver Assistance Systems available in the G05. This overview constitutes the information status at the series launch of the G05.

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

Standard equipment

The G05 always has the KAFAS Mid camera and rear radar sensors short range (left and right) as standard equipment. The following table shows the Driver Assistance System functions included as standard equipment.

Active Driving Assistant (SA 5AS)

- 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**

G05 Driver Assistance Systems

1. Introduction

Optional equipment

The customer can choose between two additional levels of optional equipment in the G05: Active Cruise Control with Stop&Go function (SA 5DF) or Active Driving Assistant Professional (SA 5AU). When Active Driving Assistant Professional (SA5AU) is ordered, Active Cruise Control with Stop&Go function is included.

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**



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



Active Cruise Control with Stop&Go function (SA 5DF)

- Active Cruise Control with Stop&Go function (up to 160 km/h)
- **Speed Limit Assistant**



G05 Driver Assistance Systems

1. Introduction

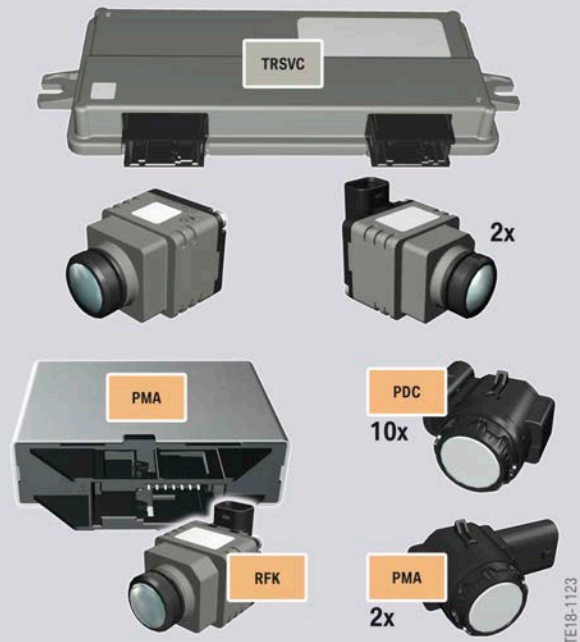
1.2.2. "Parking" options structure

The already established optional equipment Parking Assistant Plus (SA 5DN) is also offered in the new BMW X5. The functions for the optional equipment Parking Assistant Plus (SA 5DN) have been expanded to include the Back-up Assistant and parking space exit functions.

Vehicles that do not have Automatic Parking but do have Park Distance Control (PDC) have a separate control unit, which is recognized as the PMA control unit by diagnosis and is also referred to by this name in the bus diagram. In other words, there is no longer a difference in the naming of the PDC and PMA control unit (there are however differences in the hardware design between the control units and the software is adapted to the equipment specification).

Parking Assistant Plus (SA 5DN)

- 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



Park Distance Control (PDC) (standard)

- Front and rear
- Auto PDC



G05 Driver Assistance Systems

1. Introduction

1.2.3. Innovations

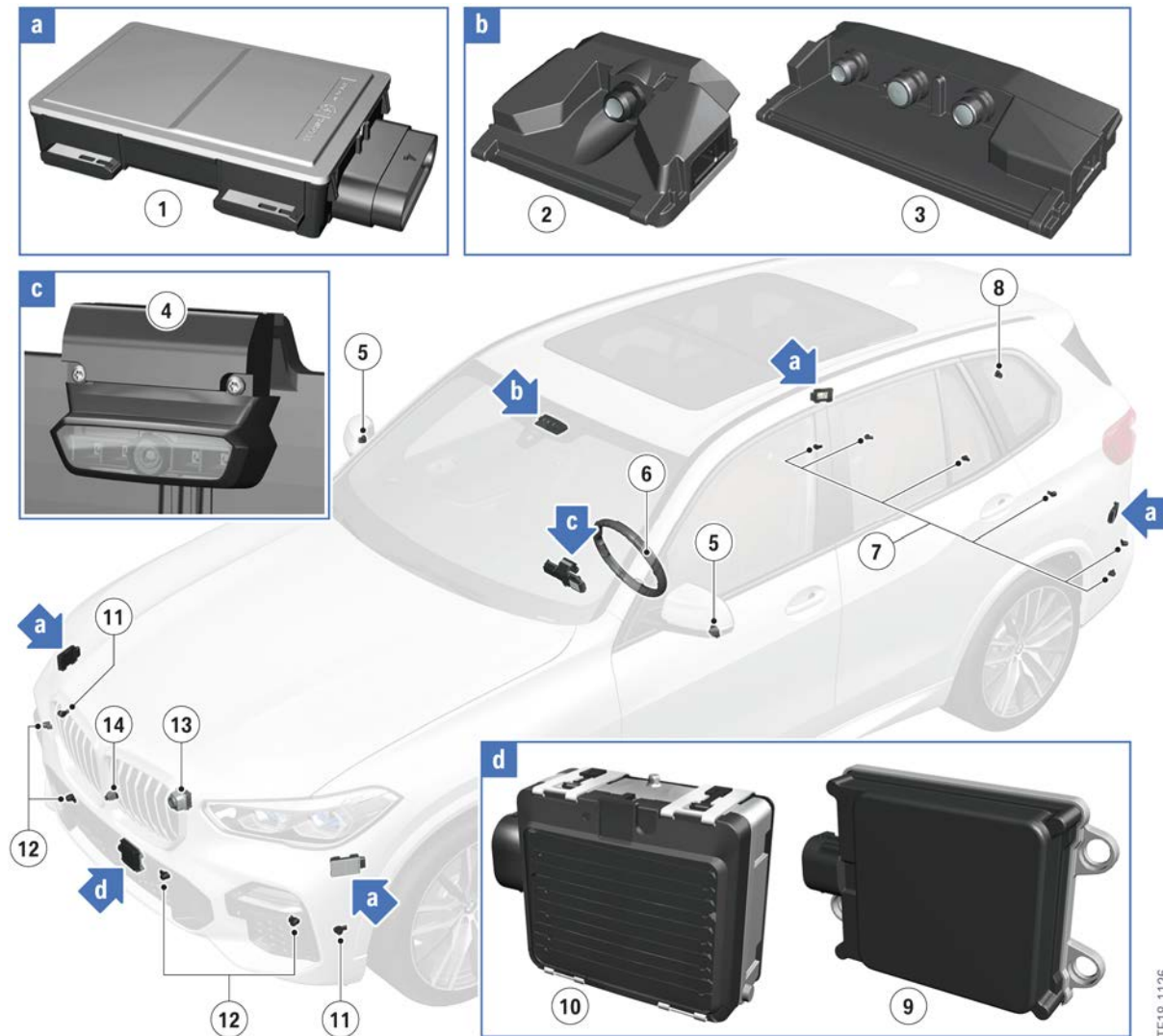
- The G05 always has a KAFAS camera and radar sensors in the rear of the vehicle.
- The instrument cluster has a camera (Driver Camera System (DCS) aimed at the driver with optional equipment Active Driving Assistant Professional (SA 5AU).
- Active Driving Assistant Professional (SA 5AU) developed from the optional equipment Active Driving Assistant Plus (SA 5AT), known from the G12 & G30.
- A new MODE button in the Driver Assistance Systems control pad on the multifunction steering wheel.
- LED displays on the steering wheel (only with optional equipment Active Driving Assistant Professional SA 5AU).
- The Daytime Pedestrian Protection function now also warns of cyclists.
- Speed Limiter is available for Dynamic Cruise Control (DCC).
- Speed Limit Assistant is available for the optional equipment Active Cruise Control with Stop&Go function (SA 5DF or SA 5AU).
- With Speed Limit Assistant the upcoming speed limit 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 by a city braking function.
- Lane Departure Warning performs an active steering intervention to the middle of the road with Active Driving Assistant (SA 5AS). Previously, the optional equipment Active Driving Assistant Plus (SA 5AT) was required for this.
- Automatic Parking for the first time supports maneuvering out of parallel parking spaces.
- The parking assistance button no longer has to be pressed and held while maneuvering into a parking space when using Automatic Parking.
- The Back-up Assistant is used for the first time.

G05 Driver Assistance Systems

1. Introduction

1.2.4. Installation locations of sensors

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



G05 sensor overview of assistance systems

Index	Explanation
1	Side radar sensor (HRSNR, HRSNL, SRSNVR, SRSNVL)
2	KAFAS Mid camera
3	KAFAS High camera
4	Driver Camera System (DCS)
5	Side view camera
6	Capacitive sensor mat on the steering wheel rim
7	Ultrasonic sensors, Park Distance Control (PDC), rear

G05 Driver Assistance Systems

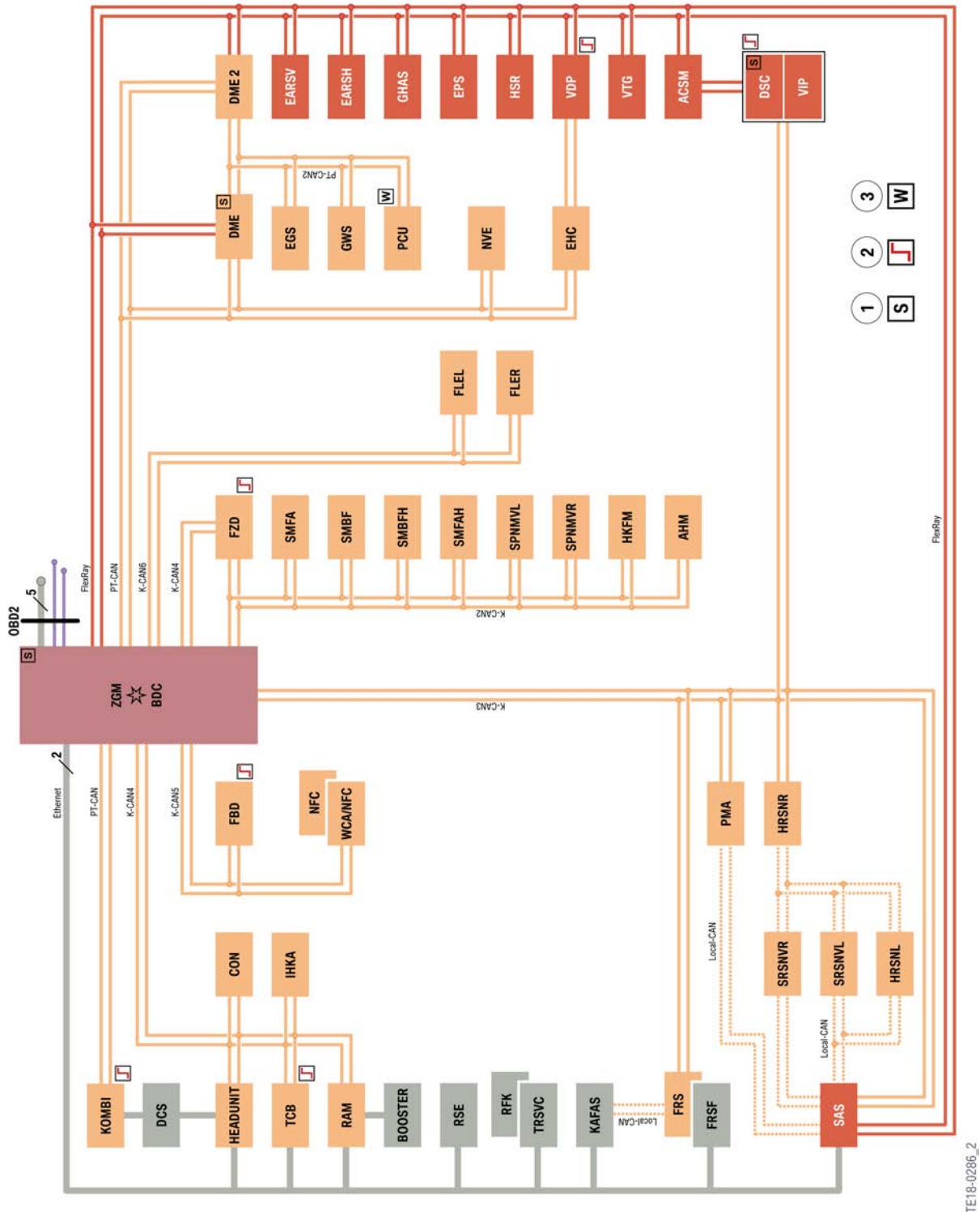
1. Introduction

Index	Explanation
8	Rear view camera (RFK)
9	Front radar sensor long range (FRSF)
10	Front radar sensor (FRS)
11	Ultrasonic sensor, Parking Maneuvering Assistant (PMA)
12	Ultrasonic sensors, Park Distance Control (PDC), front
13	Night Vision camera
14	Front camera

G05 Driver Assistance Systems

1. Introduction

1.3. Bus overview



G05 bus overview

G05 Driver Assistance Systems

1. Introduction

Index	Explanation
ACSM	Advanced Crash Safety Module
AHM	Trailer module
BDC	Body Domain Controller
Booster	Booster
CON	Controller
DCS	Driver Camera System
DME	Digital Motor Electronics
DME2	Digital Engine Electronics 2
DSC	Dynamic Stability Control
EARSH	Electric active roll stabilization rear
EARSV	Electric active roll stabilization front
EGS	Electronic transmission control
EHC	Electronic ride height control
EPS	Electromechanical Power Steering
FDB	Remote control receiver
FLER	Frontal Light Electronics Right
FLEL	Frontal Light Electronics Left
FRS	Front radar sensor
FRSF	Front radar sensor long range
FZD	Roof function center
GHAS	Regulated rear axle differential lock
GWS	Gear selector switch
HEADUNIT	Head Unit
HKA Rear climate control	Automatic rear air-conditioning and heating
HKFM	Tailgate function module
HRSNL	Rear radar sensor short range left
HRSNR	Rear radar sensor short range right
IHKA	Integrated automatic heating / air conditioning
KAFAS	Camera-based Driver Assistance Systems
KOMBI	Instrument cluster
NVE	Night Vision Electronics
NFC	Near Field Communication
PCU	Power Control Unit
PMA	Parking Maneuvering Assistant

G05 Driver Assistance Systems

1. Introduction

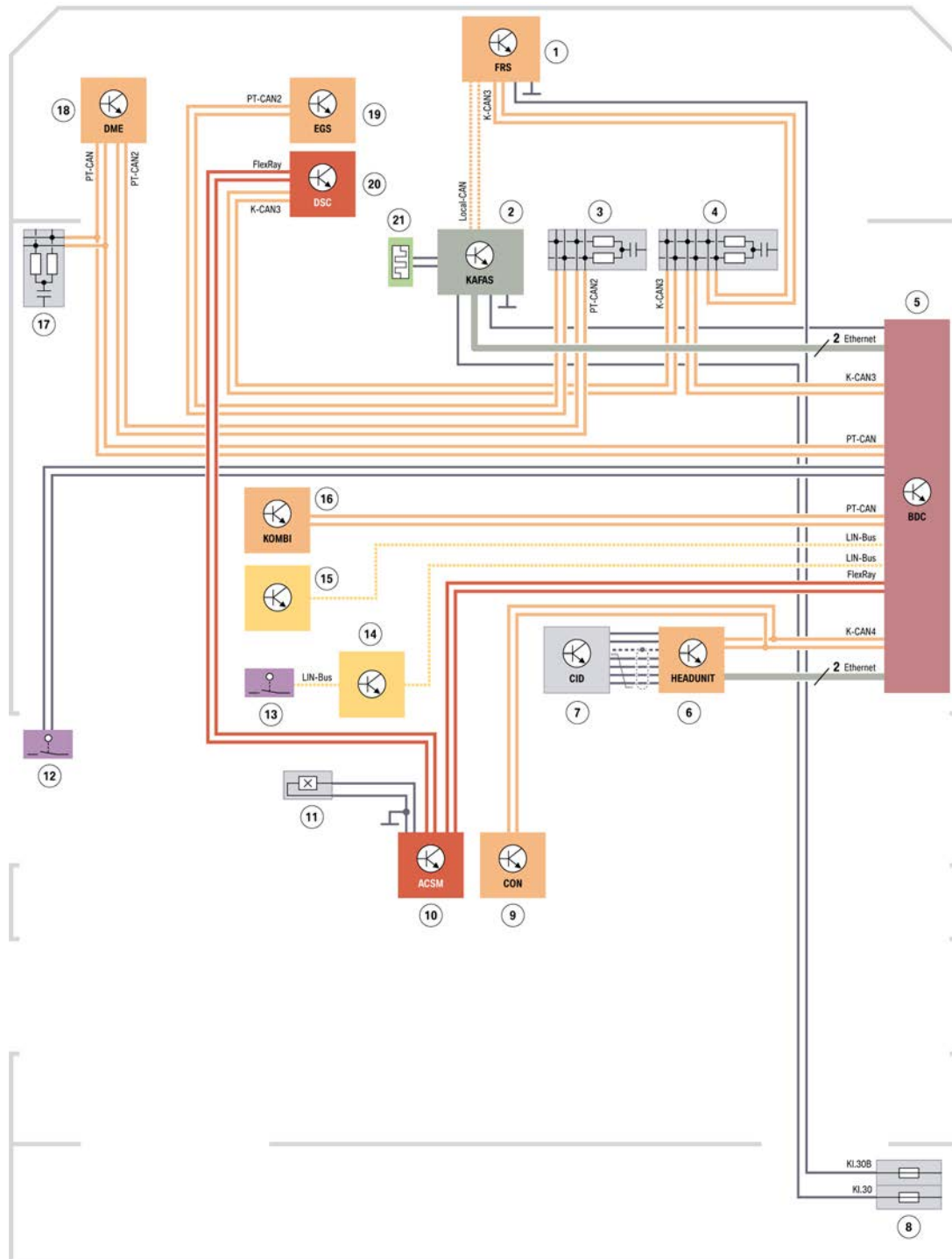
Index	Explanation
RAM	Receiver Audio Module
RFK	Rear view camera
RSE	Rear Seat Entertainment
SAS	Optional equipment system
SMBF	Seat module, front passenger
SMBA	Seat module, driver
SMBFH	Seat module, passenger rear
SMFAH	Seat module, driver rear
SPNMVL	Seat pneumatics module front left
SPNMVR	Seat pneumatics module front right
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/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 at terminal 15WUP

G05 Driver Assistance Systems

1. Introduction

1.4. System wiring diagrams

1.4.1. Active Cruise Control with Stop&Go (SA 5DF)



G05 with optional equipment ACC Stop&Go (SA 5DF)

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G05 Driver Assistance Systems

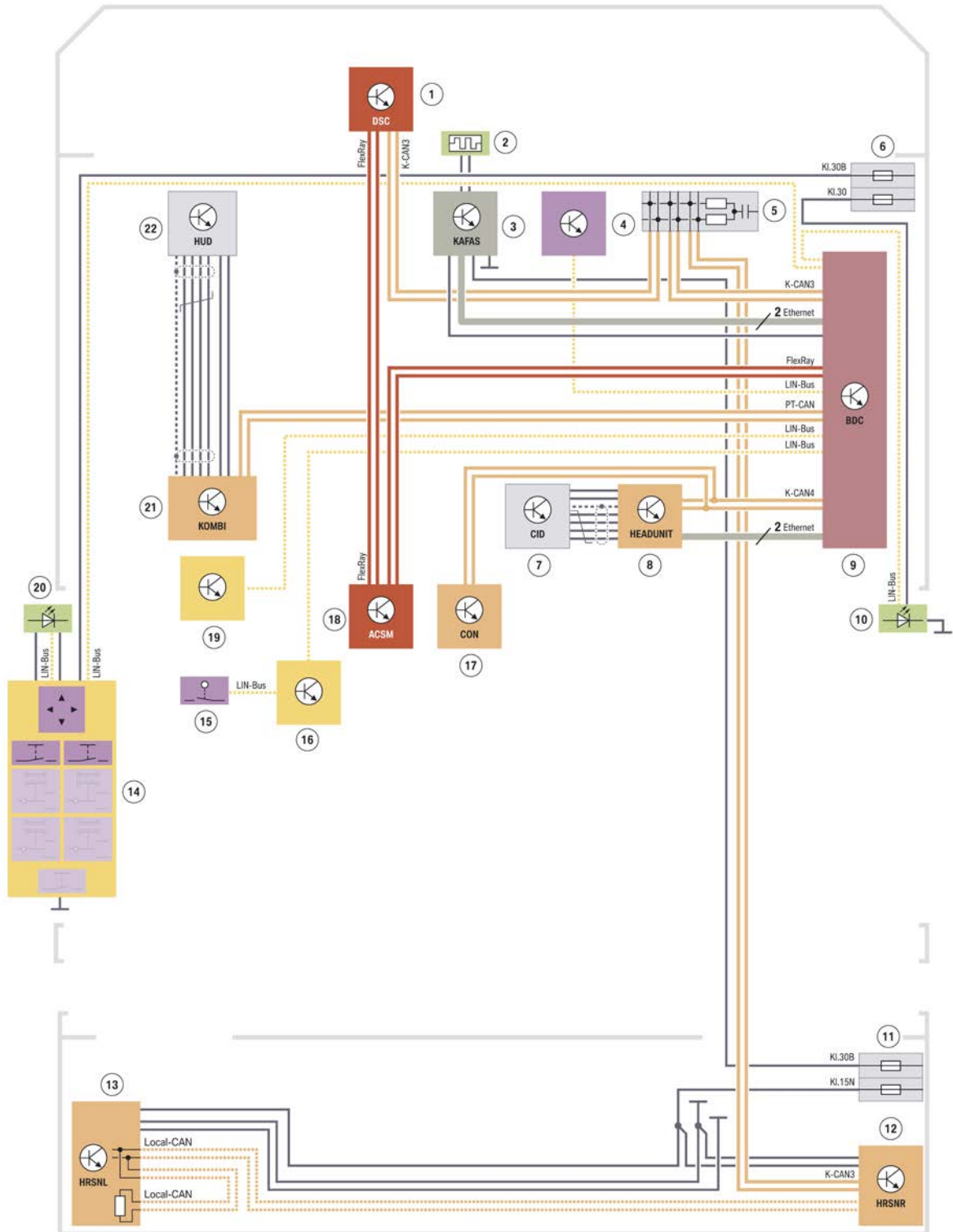
1. Introduction

Index	Explanation
1	Front Radar Sensor (FRS)
2	KAFAS Mid camera
3	CAN terminator
4	CAN terminator
5	Body Domain Controller (BDC)
6	Head Unit
7	Central Information Display (CID)
8	Fuse for rear right power distribution box
9	Controller (CON)
10	Advanced Crash Safety Module (ACSM)
11	Seat belt buckle contact, driver's seat
12	Door contact, driver's door
13	Intelligent Safety button
14	Audio operating unit
15	Steering column switch cluster (SZL)
16	Instrument cluster (KOMBI)
17	CAN terminator
18	Digital Motor Electronics (DME)
19	Electronic transmission control (EGS)
20	Dynamic Stability Control (DSC)
21	Heating for KAFAS Mid camera

G05 Driver Assistance Systems

1. Introduction

1.4.2. Active Driving Assistant (SA 5AS)



G05 with standard equipment Active Driving Assistant (SA 5AS)

TE18-0467

G05 Driver Assistance Systems

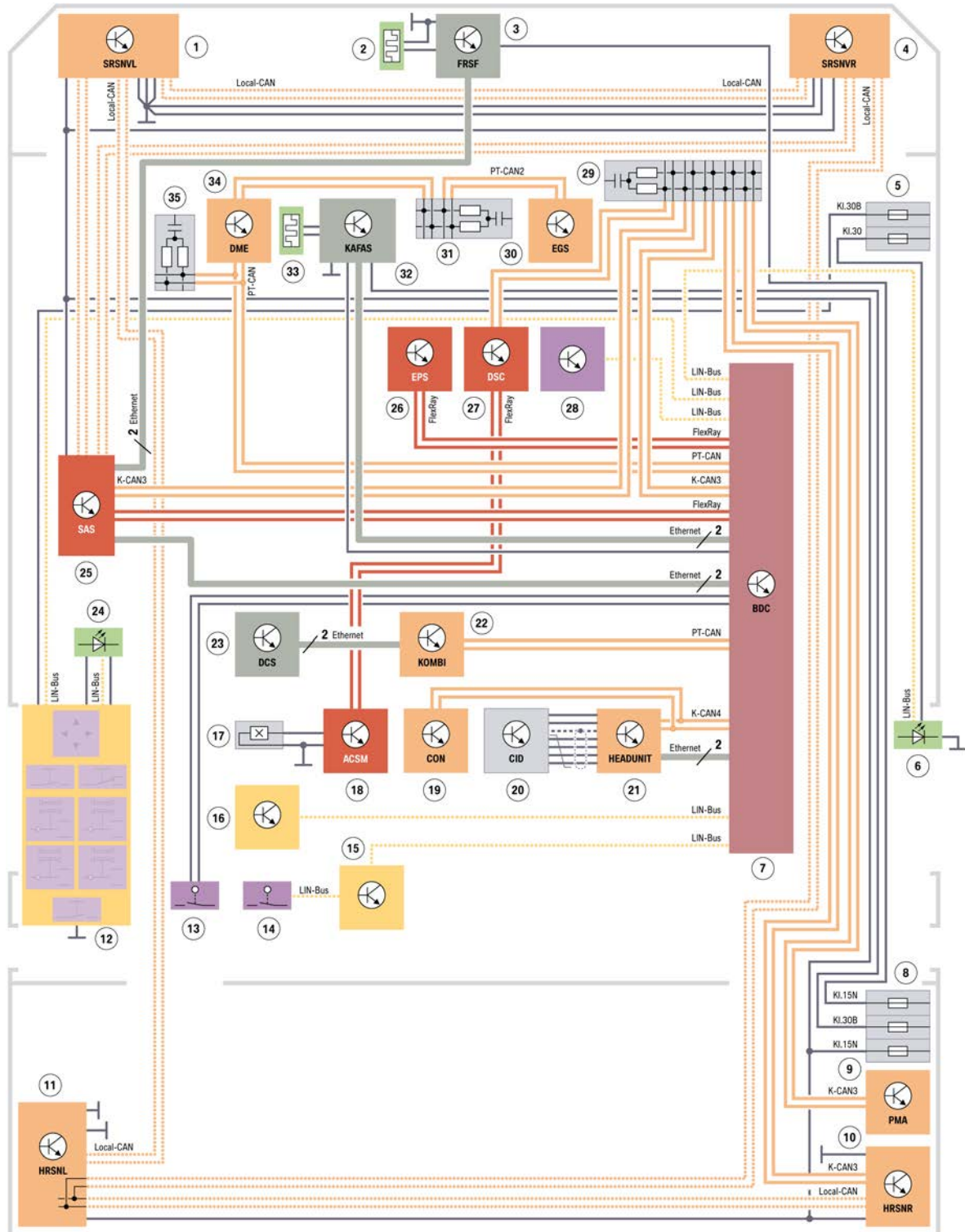
1. Introduction

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	CAN terminator
6	Fuse for front right power distribution box
7	Central Information Display (CID)
8	Head Unit
9	Body Domain Controller (BDC)
10	Signal unit (LED) in right mirror glass
11	Fuse for rear right power distribution box
12	Rear radar sensor short range right (HRSNR)
13	Rear radar sensor short range left (HRSNL)
14	Switch block, driver's door
15	Intelligent Safety button
16	Audio operating unit
17	Controller (CON)
18	Advanced Crash Safety Module (ACSM)
19	Steering column switch cluster (SZL)
20	Signal unit (LED) in left mirror glass
21	Instrument cluster (KOMBI)
22	Head-Up Display (HUD) (optional)

G05 Driver Assistance Systems

1. Introduction

1.4.3. Active Driving Assistant Professional (SA 5AU)



G05 with optional equipment Active Driving Assistant Professional (SA 5AU)

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G05 Driver Assistance Systems

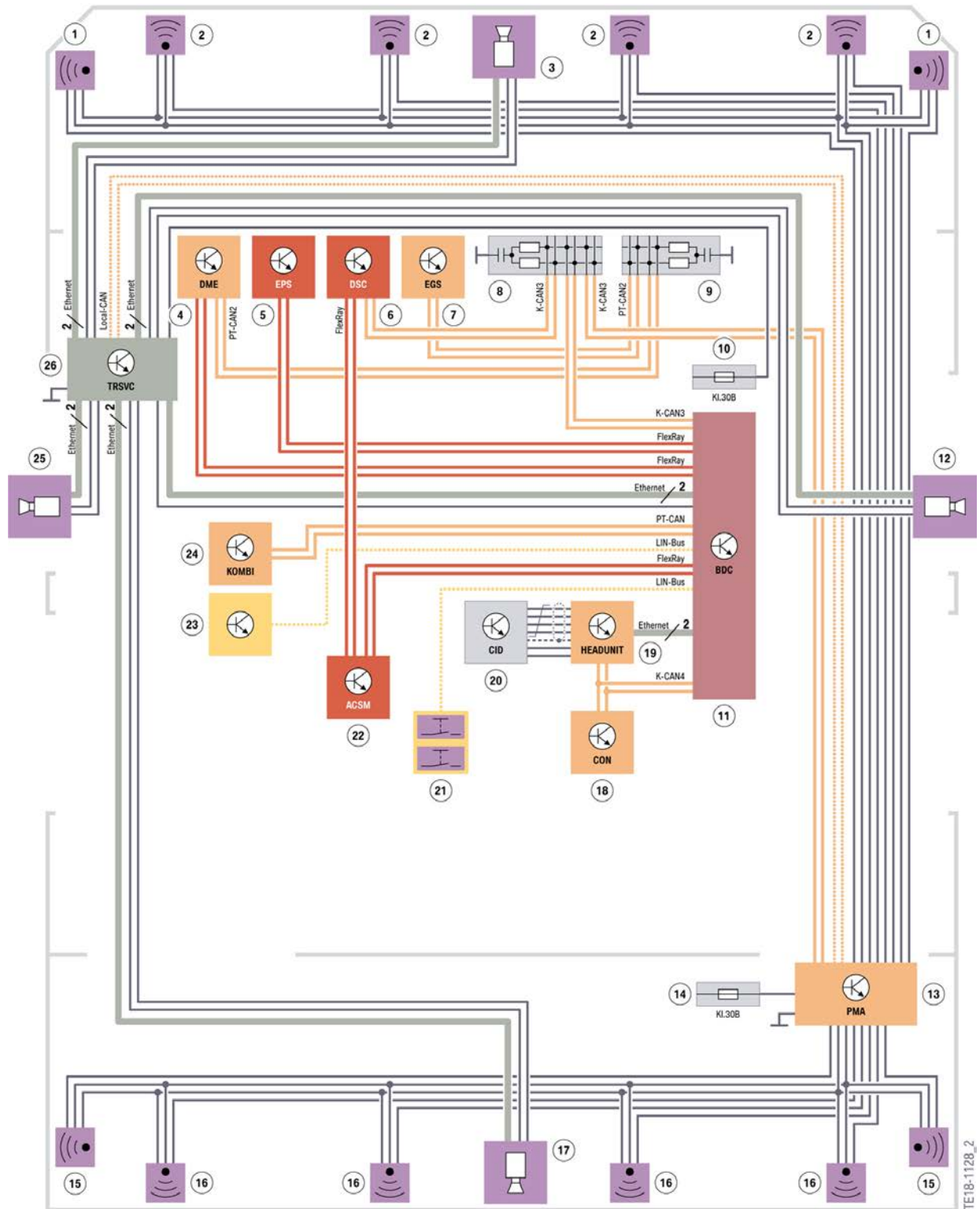
1. Introduction

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

G05 Driver Assistance Systems

1. Introduction

1.4.4. Parking Assistant Plus (SA 5DN)



G05 with optional equipment Parking Assistant Plus (SA 5DN)

G05 Driver Assistance Systems

1. Introduction

Index	Explanation
1	Ultrasonic sensor for PMA
2	Ultrasonic sensor for 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 rear side
16	Ultrasonic sensor for PDC rear
17	Rear view camera (RFK)
18	Controller (CON)
19	Head Unit
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)

G05 Driver Assistance Systems

2. Control Elements

The Driver Assistance Systems are operated during driving by means of 4 operating elements:

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



G05 Driver Assistance Systems operating elements

Index	Explanation
1	Light operating unit
2	Driver Assistance Systems control pad 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 section. A full description of the display and operating elements of the G05 can be found in the reference manual "G05 Displays and Controls".

G05 Driver Assistance Systems

2. Control Elements

2.1. Light operating unit

The Night Vision button for activating the heat image view in the Central Information Display (CID) is located in the light operating unit.



G05 Night Vision button for heat image view in the CID

Index	Explanation
1	Night Vision button

2.2. Multifunction steering wheel (MFL)



G05 Driver Assistance Systems control pad on the multifunction steering wheel (MFL)

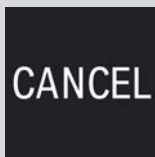
Index	Explanation
A	Control pad for standard equipment
B	Control pad for optional equipment "Active Cruise Control with Stop&Go" (SA 5DF)
C	Control pad for optional equipment "Active Driving Assistant Professional" (SA 5AU)

G05 Driver Assistance Systems

2. Control Elements



Resume button for resuming a set speed



Cancel button for temporarily deactivating the cruise control



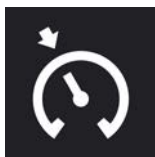
Rocker button for changing the set speed



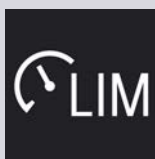
Set button for saving the current speed

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 Dynamic Cruise Control (DCC)



Button for activating/deactivating the Speed Limiter function



Button for activating/deactivating ACC Stop&Go (SA 5DF)



Button for increasing the distance to the vehicle in front

G05 Driver Assistance Systems

2. Control Elements



Button for reducing the distance to the vehicle in front



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



MODE button for selecting the Driver Assistance System
Possible selection:

- **Only** ACC Stop&Go
- 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 which can be selected with the MODE button are displayed to the driver in the instrument cluster in the form of a selection list.

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

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2. Control Elements



G05 setting menu, LED lighting 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 G05, 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.


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3. Daytime Pedestrian Protection

The Daytime Pedestrian Protection function in the G05 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
	<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.

G05 Driver Assistance Systems

4. Intersection Collision Warning

The Intersection collision warning is also used in the G05. 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 G05, 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.



G05 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.

G05 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 G05 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	Responsible control unit
Active Driving Assistant (SA 5AS)	<ul style="list-style-type: none">• DSC• KAFAS Mid camera
Active Cruise Control with Stop&Go (SA 5DF)	<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

G05 Driver Assistance Systems

6. Automatic Lane Change

The G05 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.

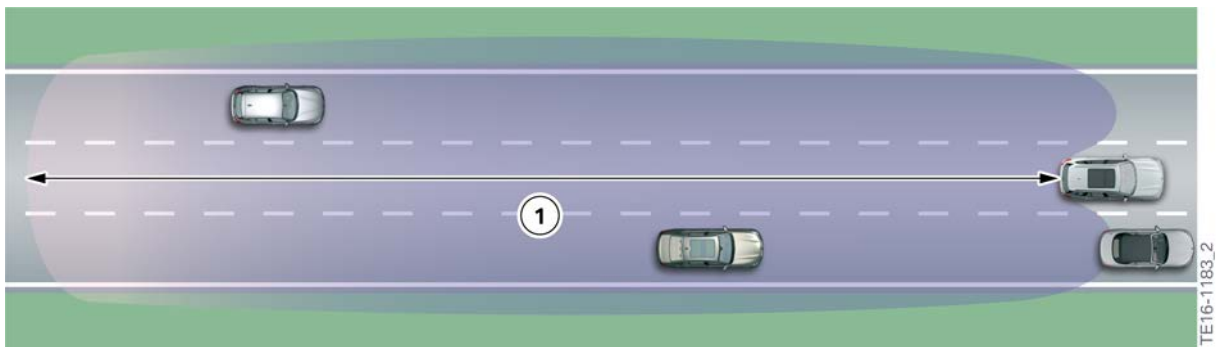
First the system analyzes whether a danger-free lane change is possible, and also whether sufficient room for the maneuver is available. The surroundings are monitored by the side radar sensors and the data from the KAFAS camera. The KAFAS camera is principally used for lane detection.

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



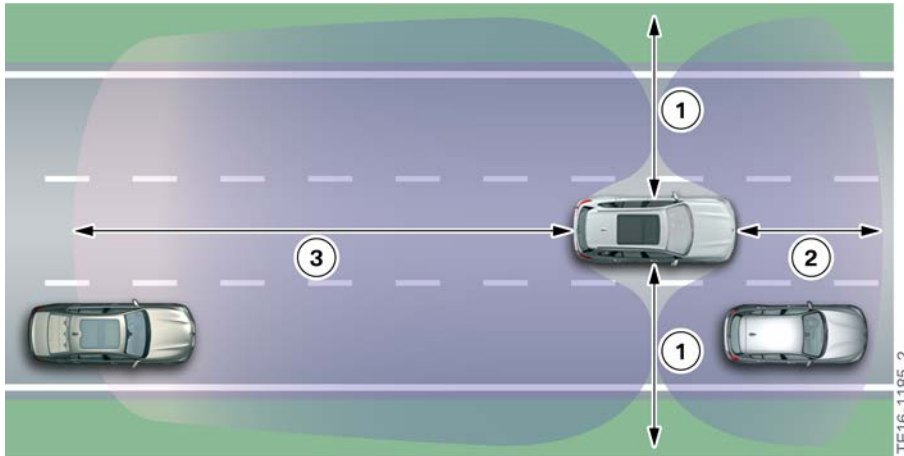
G05 sensor monitoring range for vehicles behind the vehicle

Index	Explanation
1	approximately 70 m

G05 Driver Assistance Systems

6. Automatic Lane Change

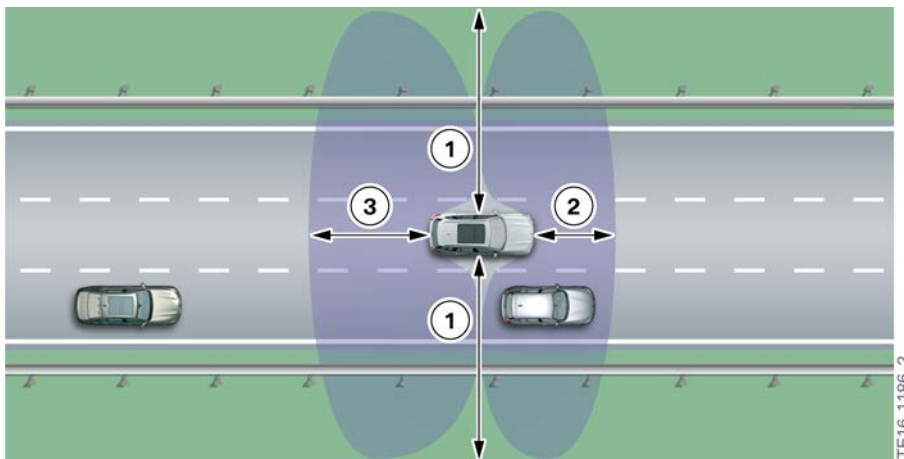
Sensor monitoring range for vehicles to the sides



G05 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



G05 sensor monitoring range for stationary objects (roadside structures) to the sides

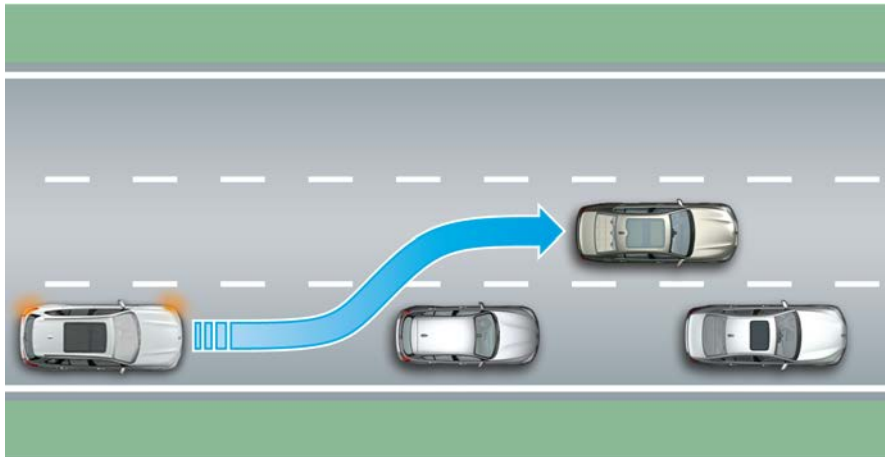
Index	Explanation
1	approximately 10 m
2	approximately 4 m
3	approximately 6 m

G05 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.



G05 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.



G05 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.

G05 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.

G05 Driver Assistance Systems

7. Cruise Control

7.1. Active Cruise Control with Stop&Go function

The new front radar sensor (FRS) is used with the optional equipment Active Cruise Control with Stop&Go function (SA 5DF). The adjustment range for the set speed is limited to a maximum of **160 km/h** since the FRS has a shorter range than the FRSE.

On vehicles with the optional equipment Active Driving Assistant Professional (SA 5AU) the set speed is limited, as always, to a maximum of **180 km/h**.

7.2. Speed Limiter

The G05 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.

G05 Driver Assistance Systems

7. Cruise Control

7.3. Speed Limit Assistant

The G05 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 Cruise Control with Stop&Go function (SA 5DF or SA 5AU).

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



G05 displays in the instrument cluster when Speed Limit Assistant is activated

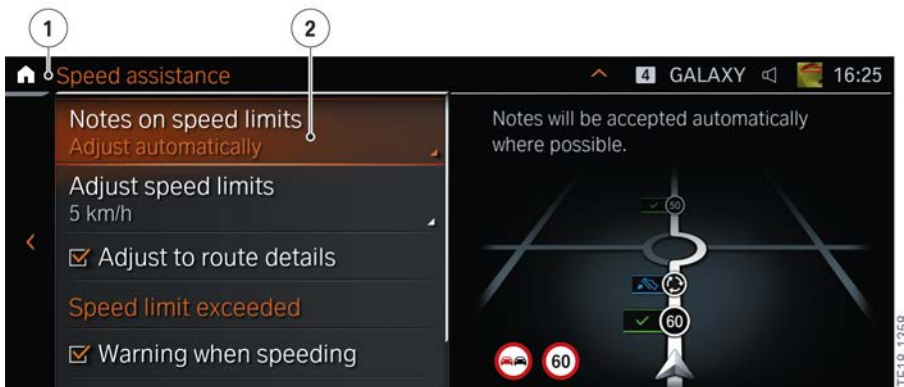
Index	Explanation
A	Speed Limit Assistant suggested speed adopted
B	Speed Limit Assistant suggested speed available
1	Speed limit is confirmed by pressing the SET button on the MFL
2	Speed limit
3	Speed limit available to be adopted by pressing the SET button on the MFL

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.

G05 Driver Assistance Systems

7. Cruise Control



G05 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"

G05 Driver Assistance Systems

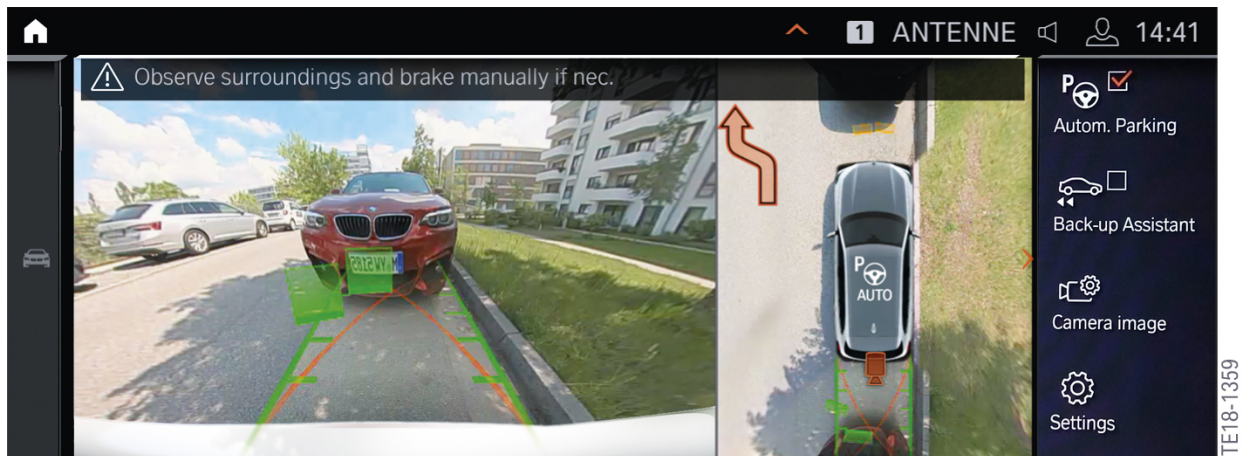
8. Automatic Parking

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.



G05 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:

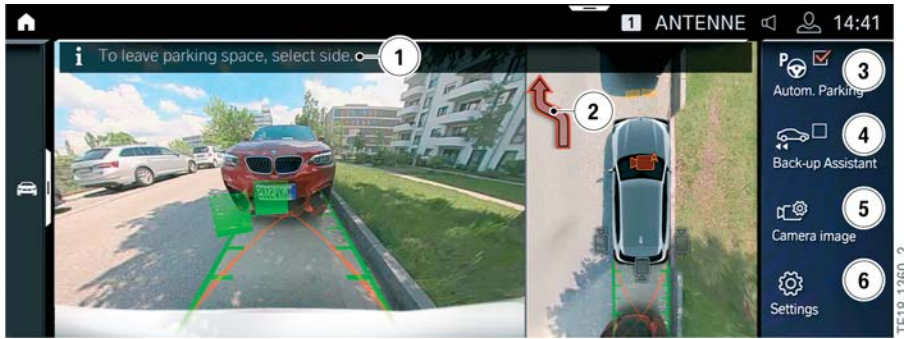
- The vehicle must have been maneuvered into the parking space with Automatic Parking beforehand
- An obstacle must be detected in front of the vehicle
- The parking space must be at least 0.8 m longer than the vehicle.

G05 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).



G05 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.

G05 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.



G05 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.



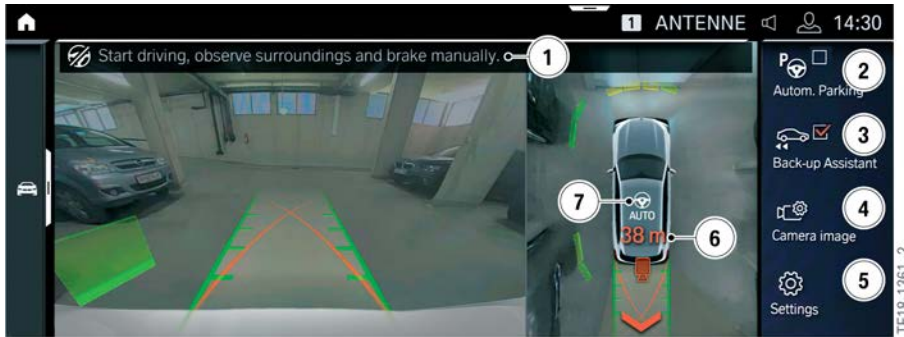
The driver himself remains responsible for accelerating and braking. A change of environment after the distance covered is stored, for example due to a changed parking position of a different vehicle, is not taken into consideration. The driver is thus responsible for monitoring the vehicle environment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

G05 Driver Assistance Systems

9. Back-up Assistant

9.2. 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 activated directly via the controller or in the Central Information Display (CID).



G05 view, Back-up Assistant in the CID

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.



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