Technical training.

Product information.

G05 Infotainment



Edited for the U.S. market by:

BMW Group University
Technical Training

BMW Service

General information

Symbols used

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



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

Information status: 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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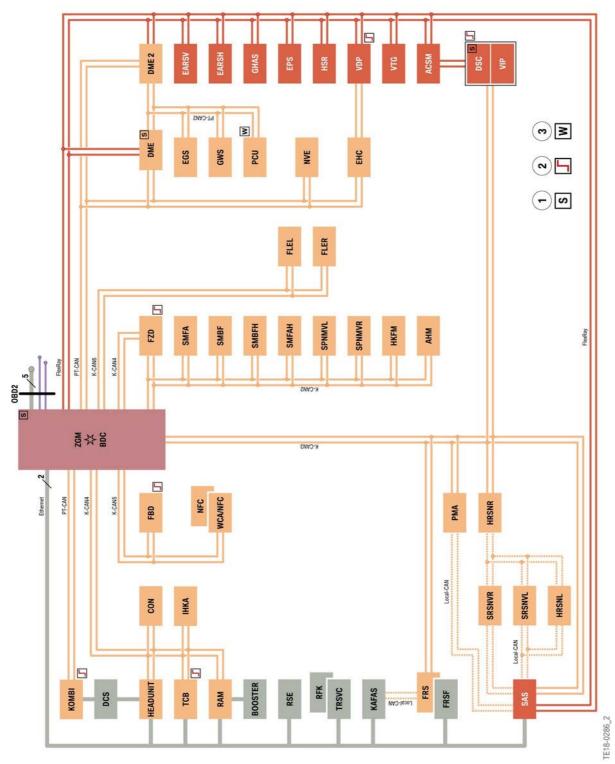
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1. Head Unit

1.1. Bus overview



Bus overview

1. Head Unit

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
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
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
NFC	Near Field Communication
NVE	Night Vision Electronics
PCU	Power Control Unit
PMA	Parking Maneuvering Assistant
RAM	Receiver Audio Module
RFK	Rear view camera
RSE	Rear Seat Entertainment
SAS	Optional equipment system

1. Head Unit

Index	Explanation
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

1. Head Unit

1.2. Head Unit High 3

A new generation of head units is being introduced at BMW with the G05: the Head Unit High 3, HU-H3.



Head Unit High 3

Additionally, the user interface ID7 in the Central Information Display has been designed for the new head unit.

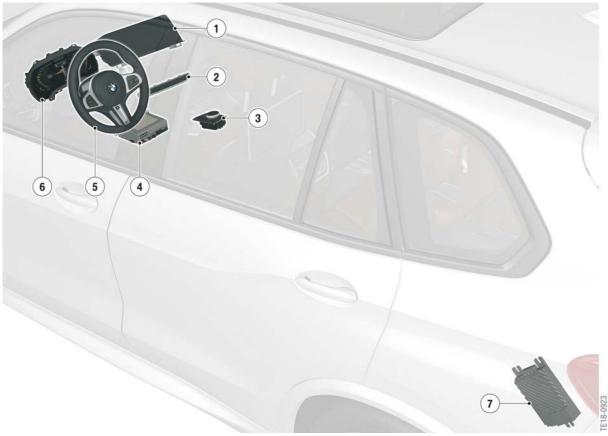


ID7 main menu

1. Head Unit

1.2.1. System components

Here is an overview of the iDrive system components of the Head Unit High 3.

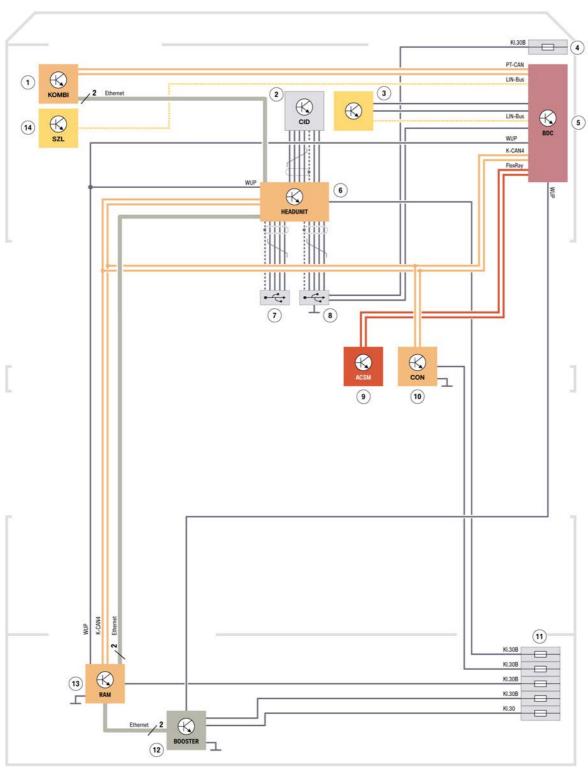


G05 Overview of system components for head unit

Index	Explanation
1	Central Information Display (CID)
2	Audio operating unit
3	Controller (CON)
4	Head Unit
5	Multifunction steering wheel (MFL)
6	Instrument cluster (KOMBI)
7	Receiver Audio Module (RAM)

1. Head Unit

1.2.2. System wiring diagram



G05 System wiring diagram HU-H3

1. Head Unit

Index	Explanation
1	Instrument cluster (KOMBI)
2	Central Information Display (CID)
3	Audio operating unit
4	Fuse for front right power distribution box
5	Body Domain Controller (BDC)
6	Head Unit
7	USB port type A in the center console
8	USB port type C in the center armrest
9	Advanced Crash Safety Module (ACSM)
10	Controller (CON)
11	Fuses, power distribution box, luggage compartment
12	Booster
13	Receiver Audio Module (RAM)
14	Steering column switch cluster (SZL)

1.2.3. Installation location

The Head Unit High 3 is located in the front section of the center console below the center stack.



Installation location of Head Unit High 3

1. Head Unit

1.3. USB ports

1.3.1. USB variants

Three different USB ports are installed in the G05, depending on the equipment:

- USB type A with charging function and data transfer
- USB type C with charging function and data transfer
- USB type C with charging function.







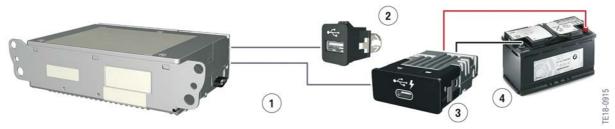
Overview of USB ports in the G05

Index	Explanation
1	USB port type A with charging function and data transfer
2	USB port type C with charging function and data transfer
3	USB port type C with charging function

Standard equipment

The following USB ports are installed as standard equipment:

- USB type A with 1.5 A charging function and data transfer
- USB type C with 3 A charging function and data transfer



G05 Overview of standard equipment for USB ports

1. Head Unit

Index	Explanation
1	Head Unit
2	USB type A with 1.5 A charging function and data transfer
3	USB type C with 3.0 A charging function and data transfer
4	Voltage supply

Optional equipment Travel and Comfort System (SA 4FL)

Two further USB ports are installed in combination with the optional equipment Travel and Comfort System (SA 4FL). These are located on the backrests of the front seats and are provided for the passengers in the 2nd row of seats.

The USB ports in the 2nd row of seats have the following characteristics:

- USB port type C
- For charging of mobile devices
- Charge current: maximum 3 A.



Overview of USB ports with the optional equipment Travel and Comfort System

Index	Explanation
1	Head Unit
2	USB type A with 1.5 A charging function and data transfer
3	USB type C with 3.0 A charging function and data transfer
4	USB type C with 3.0 A charging function
5	Voltage supply

Additionally, a quick connector is located on the backrests of the front seats. Accessories for the optional equipment Travel and Comfort System can be attached in the quick connectors.

1. Head Unit



Travel and Comfort System

Index	Explanation
1	USB port type C
2	Quick connector for optional accessories

The various Travel and Comfort System components are inserted and locked in the quick connector.

The following accessories are available for the Travel and Comfort System:

1. Head Unit



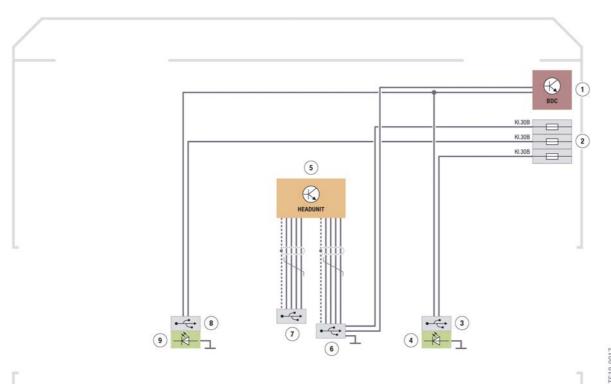
Overview of accessories for Travel and Comfort System

Index	Explanation
1	Tablet safety case
2	Universal hook
3	Folding table
4	Clothes hangers
5	Holder for Action Camera
6	Holder for Apple iPad
7	Universal holder for tablets (only in combination with the tablet safety cases)

TE1

1. Head Unit

1.3.2. System wiring diagram for USB ports



System wiring diagram for USB G05

Index	Explanation
1	Body Domain Controller (BDC) (terminal 58g for the dimmable lighting)
2	Fuses in the power distribution box, front right
3	USB port in backrest of front passenger seat (SA 4FL)
4	LED in backrest of front passenger seat (SA 4FL)
5	Head Unit
6	USB connection in the center console under the center armrest
7	USB port, center console front
8	USB port in backrest of driver's seat (SA 4FL)
9	LED in backrest of driver's seat (SA 4FL)

1. Head Unit

1.3.3. Installation locations

The following graphic shows an overview of the installation locations of the USB ports:



Installation locations of the USB ports in the G05

Index	Explanation
а	USB port type A with charging function and data transfer in the center console
b	USB port type C with charging function and data transfer in the center armrest
С	USB port type C with charging function (SA 4FL) behind the backrests of the front seats

1. Head Unit

1.4. External CD player

1.4.1. Introduction

A CD/DVD drive is **not** integrated into the new Head Unit High 3. When ordering the vehicle, the customer can also order the optional equipment "Preparation for external CD player (SA 65A)". In doing so, it is important to bear in mind that this is only the preparation of the vehicle wiring harness used to connect the external CD player. The external CD player is available as an optional accessory.

It is not possible subsequently to retrofit the optional equipment "Preparation for external CD player (SA 65A)" to the vehicle.

When purchasing the optional accessories, the frame and the CD player are installed in the vehicle at the workshop. The CD player is automatically detected by the head unit once the vehicle has gone to sleep. Coding is therefore also not necessary.

The external CD player is installed in the glove compartment.

Audio data read by the CD player is transferred to the head unit via a USB connection or ID3 tags. The head unit processes the data and forwards it to the Receiver Audio Module, which has the task of playing the music back via the loudspeakers.

The CD player supports the following file formats, among others:

- MP3
- M4A
- WAV
- CD-DA
- FLAC
- ID3 tag.

DVDs are **not** detected by the CD player. The external CD player has no diagnostic capability.

1. Head Unit

1.4.2. Front view



1.4.3. Rear view

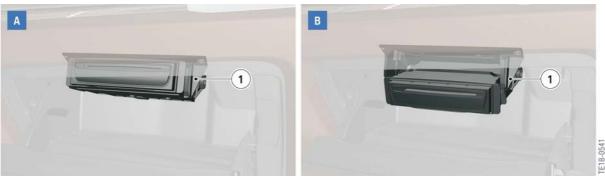
The following graphic shows the USB port of the CD player.

Rear view of external CD player

Index	Explanation
1	USB port

1.4.4. Installation location

The external CD player is located in the upper section of the glove compartment.



Installation location of external CD player

1. Head Unit

Index	Explanation
А	CD player in engaged state
В	CD player in extended state
1	CD player

When the external CD player is gently pressed from below, a spring mechanism in the latch is triggered which causes the CD player to move down mechanically. The CD player must be pushed up to the limit position in order to lock the mechanism. During this movement, the spring mechanism is tensioned and the latch is locked.

2. Telephone/Telematics

The G05 offers the following telephone systems:

- Bluetooth hands-free system (standard equipment)
- Telephony with wireless charging (SA 6NW).

2.1. Bluetooth hands-free system

The G05 is equipped with a Bluetooth hands-free system as standard.

Features	Bluetooth hands-free system (standard equipment)
Number of mobile phones	2 mobile phones can be active at the same time.
USB ports	2
Wireless charging	_
Bluetooth audio	Yes
Screen mirroring	Yes
Number of microphones	1 (driver's side)
Wi-Fi hotspot preparation	_
WLAN hotspot (SA 6WD)	_
Office functions	_
NFC for BMW Digital Key	Yes (with SA 322)
Connection to the telephone aerial of the vehicle	_

2.2. Telephony with wireless charging (SA 6NW)

The wireless charging station is available as optional equipment for the G05. The vehicle can be equipped with NFC for BMW Digital Key (SA 322) independently of the optional equipment Telephony with wireless charging (SA 6NW).

An LTE compensator is provided in vehicles equipped with SA 6NW which has the task of amplifying the aerial signals.

Features	Telephony with wireless charging (SA 6NW)
Number of mobile phones	2 mobile phones and an audio player can be active at the same time.
USB ports	2
Wireless charging	Yes
Bluetooth audio	Yes

2. Telephone/Telematics

Features	Telephony with wireless charging (SA 6NW)
Screen mirroring	Yes
Number of microphones	2 (driver's and passenger's side)
Wi-Fi hotspot preparation	Yes
WLAN hotspot (SA 6WD)	Optional equipment (SA 6WD)
Office functions	Yes, depending on telephone
NFC for BMW Digital Key	Yes (with SA 322)
Connection to the telephone aerial of the vehicle	Yes

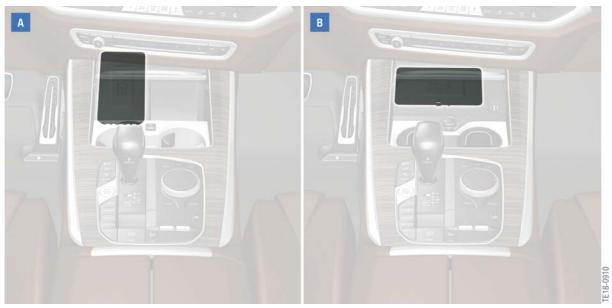


Wireless charging station (SA 6NW) with NFC for BMW Digital Key (SA 322)

2.2.1. Installation location

The wireless charging station in the G05 is located in front of the cup holder. The wireless charging station is installed crosswise in combination with the optional equipment Heated and Cooled Cupholders (SA 442).

2. Telephone/Telematics

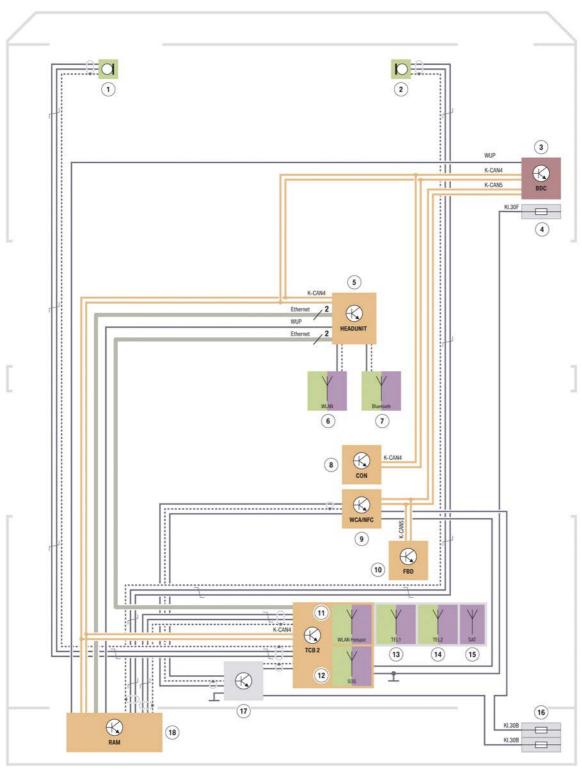


G05 Wireless charging station installation location

Index	Explanation
А	Wireless charging station
В	Wireless charging station in combination with the optional equipment Heated and Cooled Cupholders (SA 442)

2. Telephone/Telematics

2.2.2. System wiring diagram



 $\ensuremath{\mathsf{G05}}$ System wiring diagram for wireless charging with NFC

00000

2. Telephone/Telematics

Index	Explanation
1	Microphone, driver's side
2	Microphone on passenger's side (in combination with telephony with wireless charging (SA 6NW))
3	Body Domain Controller (BDC)
4	Fuse for front right power distribution box
5	Head Unit
6	WLAN aerial for vehicle WLAN
7	Bluetooth aerial
8	Controller (CON)
9	Wireless charging station (WCA) with Near Field Communication (NFC)
10	Remote control receiver
11	Telematic Communication Box 2 (TCB2) with integrated WLAN aerial for Wi-Fi hotspot
12	GSM aerial for emergency
13	TEL1 aerial (customer's mobile phone connection)
14	TEL2 aerial
15	SDARS aerial SAT for the navigation
16	Fuses, power distribution box, luggage compartment
17	LTE compensator
18	Receiver Audio Module (RAM)

2.3. Smartphone trays

2 different smartphone trays with NFC electronics are used:

- Wireless charging and NFC electronics
- Smartphone tray with NFC electronics.

Only a smartphone tray with NFC is installed in vehicles **without** the optional equipment Telephony with wireless charging (SA 6NW) but with the optional equipment Comfort Access (SA 322). The smartphone **cannot** be charged in this tray but can be placed there in order to use the BMW Digital Key. This kind of tray is easy to identify because there is no indicator light or battery symbol on the tray.

2. Telephone/Telematics



Index	Explanation
1	Wireless charging station with NFC electronics
2	Smartphone tray with NFC electronics

2.4. Screen mirroring

The screen of a smartphone can be displayed on the Central Information Display by establishing a Wi-Fi direct connection between the smartphone and Head Unit.

The sound is played back via the loudspeakers in the vehicle.



G05 view of screen mirroring

The Head Unit cannot decide which screen contents are streamed to the vehicle via screen mirroring.

In the interest of traffic safety, the contents in the CID are switched off when driving at speeds of 7 km/h or more.

Screen mirroring can therefore only be used when the vehicle is at a standstill.

3. Speaker Systems

3.1. Overview

In the G05, two speaker systems are offered. A Hi-Fi stereo system is installed as standard equipment. The G05 comes with 2 different speaker systems, depending on equipment:

- Hi-Fi system (SA 676) (standard equipment)
- Top HiFi system (Harman Kardon surround sound system (SA 688)).

The high-end Bowers & Wilkins Diamond surround sound system will be available in the G05 from December 2018.

	Hi-Fi system (SA 676)	Top HiFi (Harman Kardon surround sound system (SA 688))
Overall power	205 W	464 W
Number of tweeters	3	7
Number of broadband loudspeakers	_	_
Number of mid-range speakers	5	7
Number of bass loudspeakers	2	2
Amplifier	Receiver Audio Module	Receiver Audio Module and Booster

3.2. Hi-Fi system

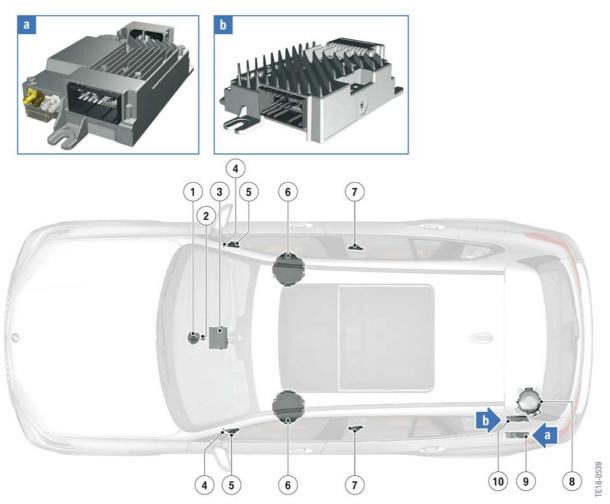
The Hi-Fi system is composed of the following components:

- 3 tweeters
- 5 mid-range speakers
- 2 bass speakers
- Receiver Audio Module (RAM).

The amplifier for the stereo system is located in the Receiver Audio Module.

3. Speaker Systems

3.2.1. Component overview

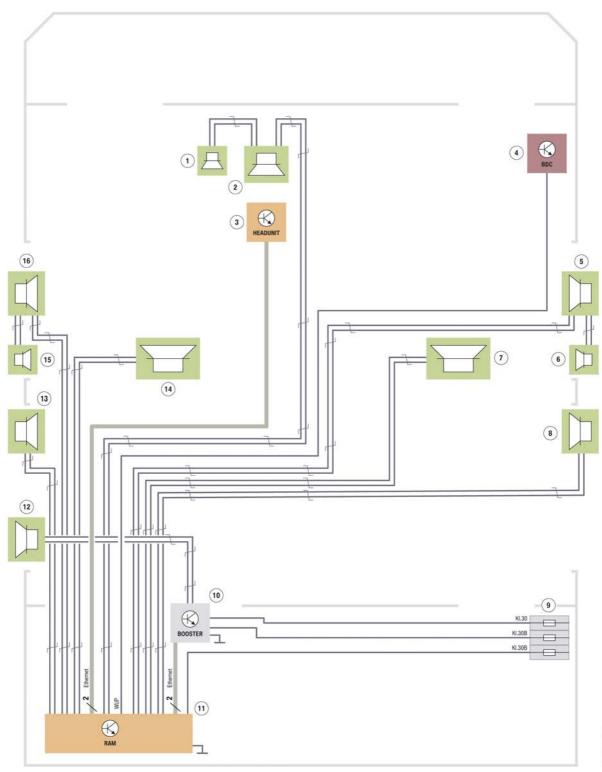


G05 System overview Hi-Fi system

Index	Explanation
1	Tweeter, front center
2	Mid-range speaker, front center
3	Head Unit
4	Tweeter, front
5	Mid-range speaker, front
6	Bass speakers
7	Mid-range speaker, rear
8	Speaker for outside sound (Not for US)
9	Receiver Audio Module (RAM)
10	Booster

3. Speaker Systems

3.2.2. System wiring diagram



G05 system wiring diagram of Hi-Fi system

3. Speaker Systems

Index	Explanation
1	Tweeter, front center
2	Mid-range speaker, front center
3	Head Unit
4	Body Domain Controller (BDC)
5	Tweeter, front right
6	Mid-range speaker, front right
7	Bass speaker, right
8	Mid-range speaker, rear right
9	Fuses, power distribution box, luggage compartment
10	Booster
11	Receiver Audio Module (RAM)
12	Loudspeakers for outside sound (Not for US)
13	Mid-range speaker, rear left
14	Bass speaker, left
15	Tweeter, front left
16	Mid-range speaker, front left

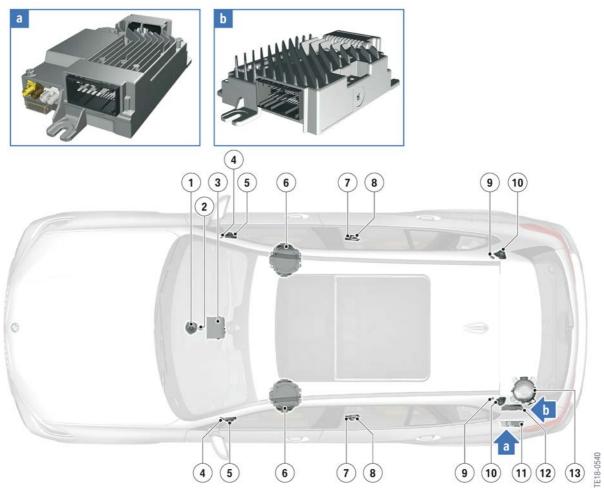
3.3. Top HiFi system

The Harman Kardon Surround Sound system is composed of the following components:

- 7 tweeters
- 7 mid-range speakers
- 2 bass speakers
- Receiver Audio Module (RAM)
- Booster

3. Speaker Systems

3.3.1. Component overview



G05 System overview Top HiFi system

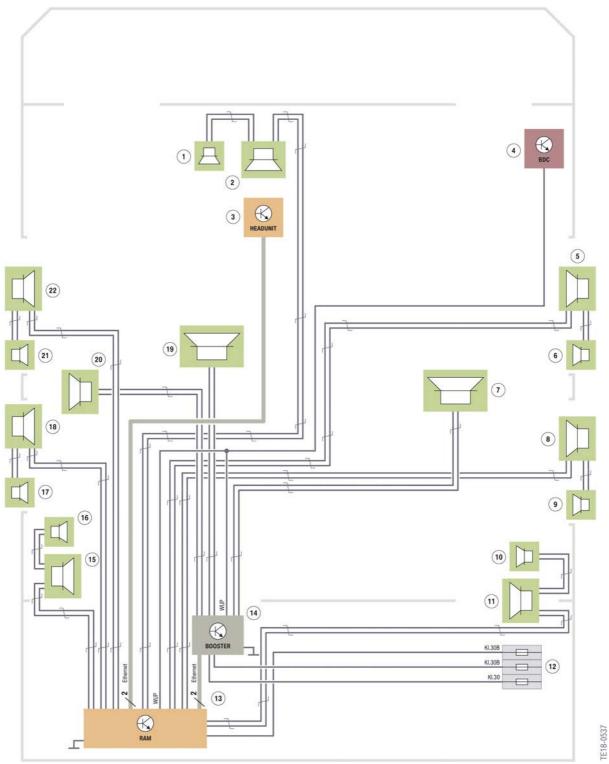
Index	Explanation
1	Tweeter, front center
2	Mid-range speaker, front center
3	Head Unit
4	Tweeter, front
5	Mid-range speaker, front
6	Bass speakers
7	Mid-range speaker, rear
8	Tweeter, rear
9	Tweeter, D-pillar

3. Speaker Systems

Index	Explanation
10	Mid-range speaker, D-pillar
11	Receiver Audio Module (RAM)
12	Booster
13	Speaker for outside sound (Not for US)

3. Speaker Systems

3.3.2. System wiring diagram



G05 system wiring diagram of Top HiFi system

3. Speaker Systems

Index	Explanation
1	Tweeter, front center
2	Mid-range speaker, front center
3	Head Unit
4	Body Domain Controller (BDC)
5	Mid-range speaker, front right
6	Tweeter, front right
7	Bass speaker, right
8	Mid-range speaker, rear right
9	Tweeter, rear right
10	Tweeter, right D-pillar
11	Mid-range speaker, right D-pillar
12	Fuses, power distribution box, luggage compartment
13	Receiver Audio Module (RAM)
14	Booster
15	Mid-range speaker, left D-pillar
16	Tweeter, left D-pillar
17	Tweeter, rear left
18	Mid-range speaker, rear left
19	Bass speaker, left
20	Loudspeakers for outside sound (SA 1MA) (Not for US)
21	Tweeter, front left
22	Mid-range speaker, front left

3.4. Receiver Audio Module

The Receiver Audio Module (RAM) is being used for the first time in the G05.

Depending on the equipment, the following functions are integrated in the RAM:

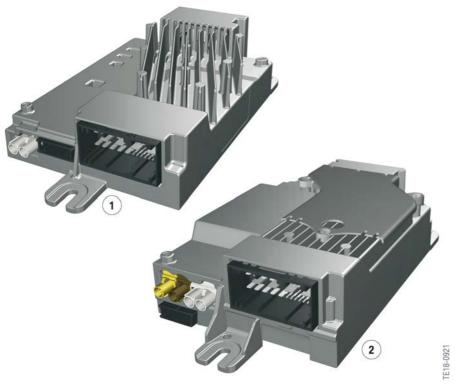
- AM/FM tuner
- SDARS-Tuner
- Aerial diversity module
- Audio amplifier (stereo system, Hi-Fi system).

3. Speaker Systems

3.4.1. Variants

Two variants of the RAM are used in the G05, depending on the equipment:

- RAM mid
- RAM high.

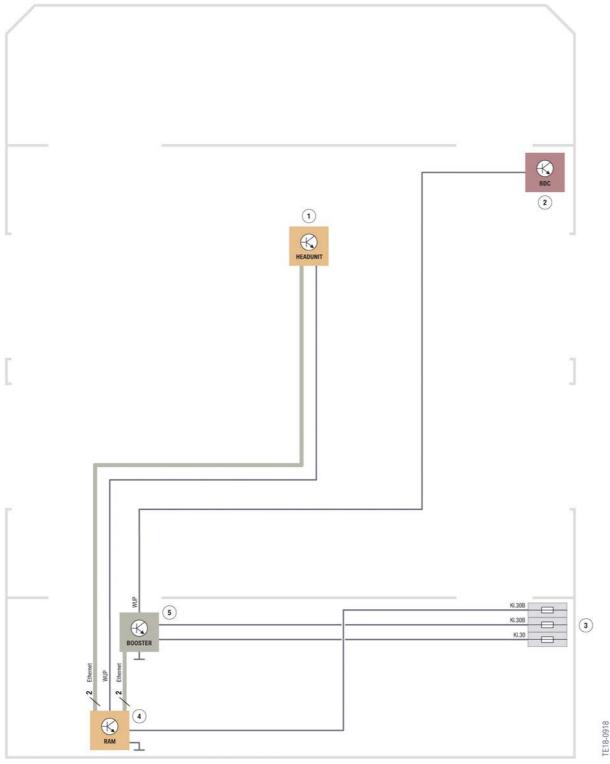


Overview of the RAM variants in the G05

Index	Explanation
1	Receiver audio module RAM mid
2	Receiver audio module RAM high

3. Speaker Systems

3.4.2. System wiring diagram



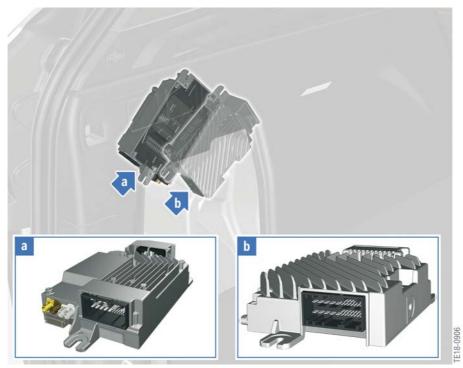
G05 System wiring diagram for Receiver Audio Module

3. Speaker Systems

Index	Explanation
1	Head Unit
2	Body Domain Controller (BDC)
3	Fuses in the power distribution box of the luggage compartment
4	Receiver Audio Module (RAM)
5	Booster

3.4.3. Installation location

The Receiver Audio Module is located in the luggage compartment on the left behind the side trim panel.



G05 Installation location of Receiver Audio Module

Index	Explanation
а	Receiver Audio Module (RAM)
b	Booster

3. Speaker Systems

3.5. Booster

3.5.1. Introduction

The Booster is used in the G05 and is an additional audio amplifier in the vehicle.

3.5.2. Variants

The Booster is installed in the G05 with the following optional equipment:

• Harman Kardon Surround Sound System (SA 688).

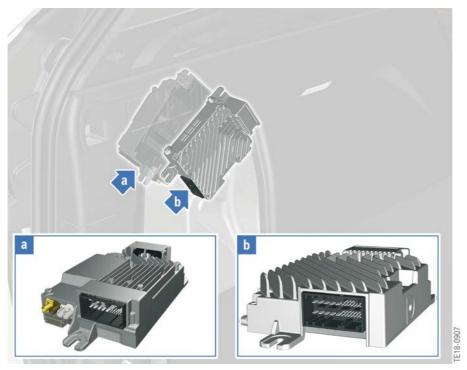


G05 View of Booster

3.5.3. Installation location

The Booster is located in the luggage compartment on the left behind the side trim panel.

3. Speaker Systems



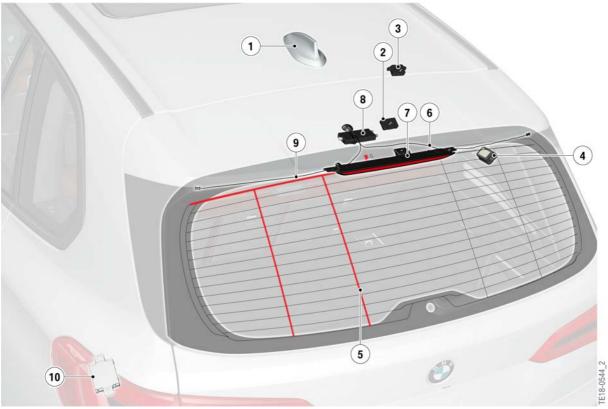
G05 Installation location of Booster

Index	Explanation
а	Receiver Audio Module (RAM)
b	Booster

4. Aerial system

4.1. Overview

The following graphic gives you an overview of the aerial system of the G05.



G05 overview of aerial system

Index	Explanation
1	Roof aerial (SAT aerial for the navigation, TEL1 and TEL2 aerial, SDARS aerial)
2	Interference suppression filter for the additional brake light
3	Wave trap for the rear window heating
4	Remote control receiver
5	FM1 aerial
6	FM2 aerial
7	Additional brake light
8	Aerial amplifier (AM, FM1, FM2 aerial)
9	AM aerial
10	LTE compensator

4. Aerial system

The following table shows the different aerial systems:

Aerial	System	Installation location
FM aerial	Radio	 FM1 aerial in the rear window
		 FM2 aerial in the roof spoiler
AM aerial	Radio	AM aerial sensor in the roof spoiler
SDARS aerial	Radio	Roof aerial
SAT aerial	Navigation system	Roof aerial
Telephone aerial	Telephone	Roof aerial
Bluetooth aerial	Telephone	Integrated in the wiring harness
WLAN aerial	Telephone	Integrated in the wiring harness
Wi-Fi hotspot aerial	Telephone	Telematic Communication Box 2
GSM aerial for emergency	Telephone	Telematic Communication Box 2

4. Aerial system

4.2. Component overview

4.2.1. Vehicle WLAN aerial

The following graphic shows an overview of the installation locations of the Bluetooth aerial and also the vehicle WLAN aerial:



G05 Aerials

Index	Explanation
а	Rear view of center console
1	Bluetooth aerial
2	Vehicle WLAN aerial

4. Aerial system

4.2.2. Bluetooth aerial

The installation location of the Bluetooth aerial is shown in the following graphic:



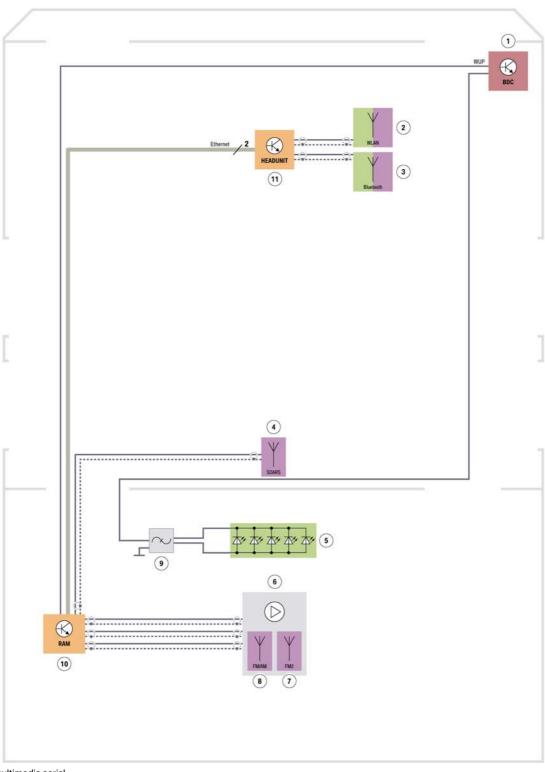
G05 Bluetooth aerial

Index	Explanation
1	Bluetooth aerial

4.3. System wiring diagram

4. Aerial system

4.3.1. Multimedia



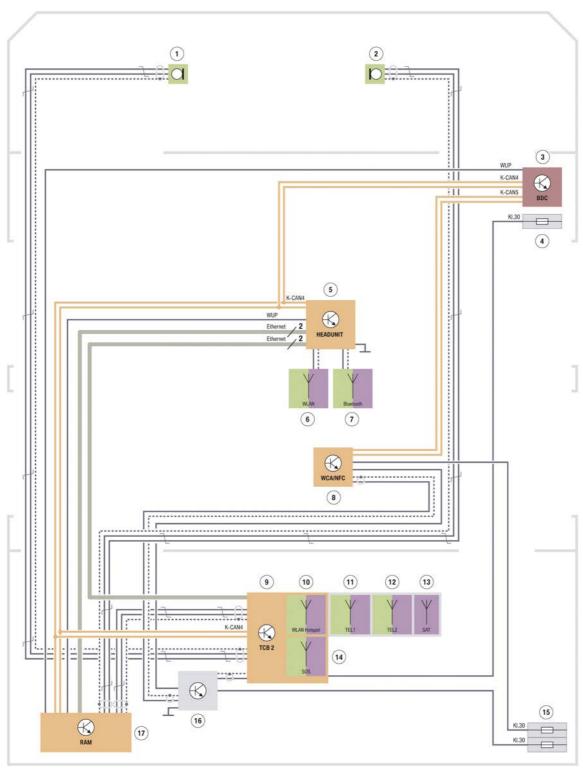
G05 multimedia aerial

4. Aerial system

Index	Explanation
1	Body Domain Controller (BDC)
2	Vehicle WLAN aerial
3	Bluetooth aerial
4	SDARS aerial
5	Additional brake light
6	Aerial amplifier
7	FM2 aerial
8	AM/FM1 aerial
9	Interference suppression filter
10	Receiver Audio Module (RAM)
11	Head Unit

4. Aerial system

4.3.2. Telematics/connectivity



G05 telematics aerial

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4. Aerial system

Index	Explanation
1	Microphone, driver's side
2	Microphone on passenger's side (in combination with telephony with wireless charging (SA 6NW))
3	Body Domain Controller (BDC)
4	Fuse for front right power distribution box
5	Head Unit
6	Vehicle WLAN aerial
7	Bluetooth aerial
8	Wireless charging station (WCA) with Near Field Communication (NFC)
9	Telematic Communication Box 2 (TCB2)
10	WLAN aerial for Wi-Fi hotspot
11	TEL1 aerial (customer's mobile phone connection)
12	TEL2 aerial
13	SDARS aerial SAT for the navigation
14	GSM aerial for emergency
15	Fuses in the power distribution box of the luggage compartment
16	LTE compensator
17	Receiver Audio Module (RAM)

