# **Reference Manual**



# F34 LCI



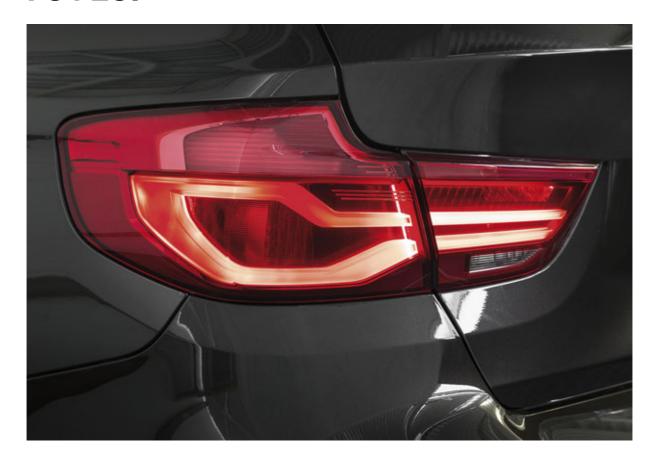
# **Technical Training**

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# **Technical Training**

**Product information.** 

## F34 LCI



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BMW Group University
Technical Training

ST1609

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#### **General information**

#### Symbols used

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



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

#### Information status and national-market versions

BMW Group vehicles meet the requirements of the highest safety and quality standards. Changes in requirements for environmental protection, customer benefits and design render necessary continuous development of systems and components. Consequently, there may be discrepancies between the contents of this document and the vehicles available in the training course.

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

#### Additional sources of information

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

- Owner's Handbook
- Integrated Service Technical Application.

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

Information status: March 2016

**Technical Training** 

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### 1. Introduction

In July 2016 the model revision or the Life Cycle Impulse (LCI) of the BMW 3 Series GT enters the market. The model revision of the BMW 3 Series GT also underscores the BMW-specific proportions, such as the short overhang in front, the long wheelbase and the BMW kidney grill.

Infotainment in the F34 LCI also contains some new features. For example, the F34 LCI is the first vehicle at BMW to offer Apple® CarPlay.



F34 LCI complete vehicle

This document refers to the BMW 3 Series GT model revision as the "F34 LCI".

The most important changes in the F34 LCI include:

- Modified bumpers
- Upgraded vehicle interior with chrome applications
- LED headlights
- Newly designed rear lights
- Expanded assistance systems
- New infotainment applications

In addition to the comprehensive offering of optional equipment, the F34 LCI can also be individualized with the following equipment packages:

- Luxury Line
- M Sport Package

### 1. Introduction

#### 1.1. New features

#### 1.1.1. TPMS

The F34 LCI receives the tire pressure control system TPMS as standard equipment.



When servicing, the different types of wheel electronics must be kept in mind. The wheel electronics of the two different systems must not be confused with one another.

Further information on the TPMS system can be found in the Technical Training manual "ST1403a I01 Complete Vehicle" Chassis & Suspension section.



F34 LCI aluminium screw valves RDCi

#### 1.1.2. Air conditioning

The F34 LCI uses the new refrigerant R1234yf.

The design of the filling valves of a R1234yf heating and air conditioning system, which are installed in the refrigerant circuit, are different from those of a R134a heating and air conditioning system. The R1234yf A/C service station has different service connections than the R134a service station.

R1234yf refrigerant is identified with **grey** screw caps on the filling valves along with the identification of the fill label under the hood specifying the R1234yf refrigerant.

### 1. Introduction



F34 LCI air conditioning screw caps



A mixture of the two gases (R134a and R1234yf) must always be avoided and is not permitted by law. If a mixture of R134a and R1234yf occurs, the refrigerant mixture must be removed from the heating and air-conditioning system and A/C service station and disposed of properly.

#### 1.1.3. Air conditioning control panel

The liquid crystal display of the air conditioning control panel integrated automatic heating/air conditioning system comes with automatic day/night changeover. The liquid crystal display is white, during daytime driving and turns orange at night time once the headlights are illuminated.



F34 LCI air conditioning control panel

## 1. Introduction

### 1.2. Identifying features

#### 1.2.1. Front

The following changes have been implemented in the F34 LCI:

- New front bumper design
- Headlights with LED technology



F34 LCI front view

Index	Explanation
1	LED headlights are standard
2	Modified bumper
3	LED fog lights are standard

## 1. Introduction

#### 1.2.2. Rear

The following changes have been implemented in the F34 LCI:

- New rear bumper design
- New rear light design
- Exhaust tailpipes with larger diameter



#### F34 LCI rear

Index	Explanation
1	LED rear light
2	Modified bumper
3	Exhaust tailpipe

## 1. Introduction

#### Rear spoiler

The rear spoiler design is identical to the F34. Further information on the active rear spoiler can be found in ST1304 "F34 Complete Vehicle" Training material.





F34 LCI active rear spoiler

#### 1.2.3. Passenger compartment

The selective use of chrome elements are used to upgrade the look of the vehicle interior. The storage compartment cover in the center console no longer folds out, but is a sliding cover. In combination with the standard ambient light package, indirect lighting at selected places creates an impression of high quality.



F34 LCI vehicle interior

### 2. Drivetrain

#### 2.1. Engine overview

#### 2.1.1. Engine

F34 LCI engines are exclusively engines from the modular engine strategy (Bxx). In adopting the new engine generation, certain model designations have also been changed:

- The BMW 328i GT becomes the BMW 330i GT
- The BMW 335i GT becomes the BMW 340i GT

The following table shows the gasoline engine models available in the F34 LCI together with their most important data:

Model	Engine	Power	Torque
BMW 330i GT xDrive	B46B20O0	185 kW (252 hp)	350 Nm (258 lb-ft)
BMW 340i GT xDrive	B58B30M0	240 kW (326 hp)	450 Nm (332 lb-ft)

#### 2.1.2. Further information

The following technical training reference manuals feature further information about each of the engines:

- ST1512 B46 Engine
- ST1505 B58 Engine

#### 2.2. Overview of the transmission

The F34 LCI comes with a 8-speed sport automatic transmission.

Model	Sport Automatic Transmission
BMW 330i GT xDrive	Standard equipment
BMW 340i GT xDrive	Standard equipment

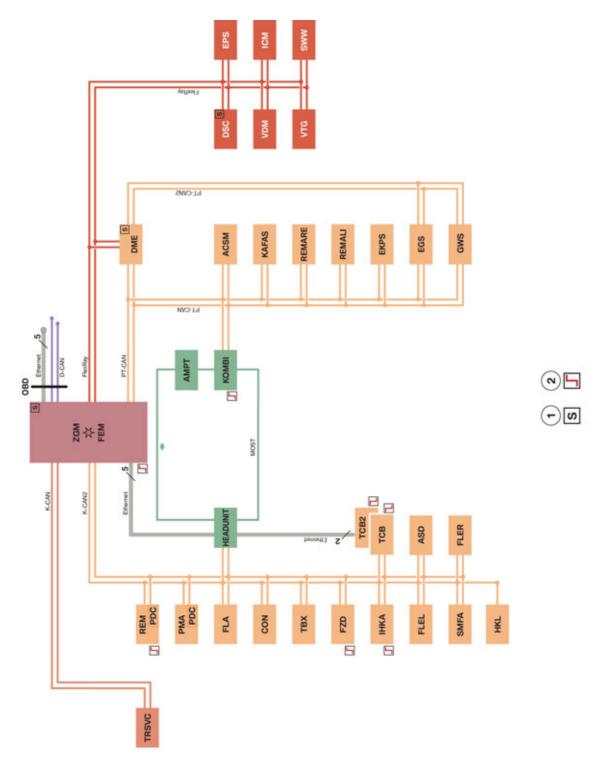
#### 2.3. xDrive overview

BMW xDrive is standard on all F34 LCI models:

- BMW 330i GT xDrive
- BMW 340i GT xDrive

# 3. General Vehicle Electrical System

### 3.1. Bus overview



F34 LCI bus overview

# 3. General Vehicle Electrical System

Index	Explanation
1	Start-up nodes; control units for starting and synchronizing the FlexRay bus system
2	Control units with wake-up authorisation
ACSM	Crash Safety Module
AMPT	Amplifier Top
ASD	Active Sound Design
CON	Controller
DME	Digital Motor Electronics
DSC	Dynamic Stability Control
EGS	Electronic transmission control
EKPS	Electronic fuel pump control
EPS	Electronic Power Steering
FEM	Front Electronic Module
FLA	High-beam assistant
FLEL	Frontal Light Electronics Left
FLER	Frontal Light Electronics Right
FZD	Roof function center
GWS	Gear selector
HEADUNIT	Head unit
HKL	Automatic operation of tailgate
ICM	Integrated Chassis Management
IHKA	Integrated automatic heating / air conditioning
KAFAS	Camera-based driver support systems
KOMBI	Instrument panel
OBD	Diagnostic socket
PMA	Parking Manoeuvring Assistant
REM	Rear Electronic Module
REMAFA	Reversible electric-driven reel, left
REMABF	Reversible electric-driven reel, right
SMFA	Seat module, driver
SWW	Lane change warning
TBX	Touchbox
TCB	Telematic Communication Box
TCB2	Telematic Communication Box 2
TRSVC	Control unit for rear view camera and side view

# 3. General Vehicle Electrical System

Index	Explanation
VDM	Vertical Dynamics Management
VTG	Transfer box
ZGM	Central gateway Module
	New control units in the F34 LCI
FLEL	Frontal Light Electronics Left
FLER	Frontal Light Electronics Right
TCB2	Telematic Communication Box 2

#### 3.2. Lighting

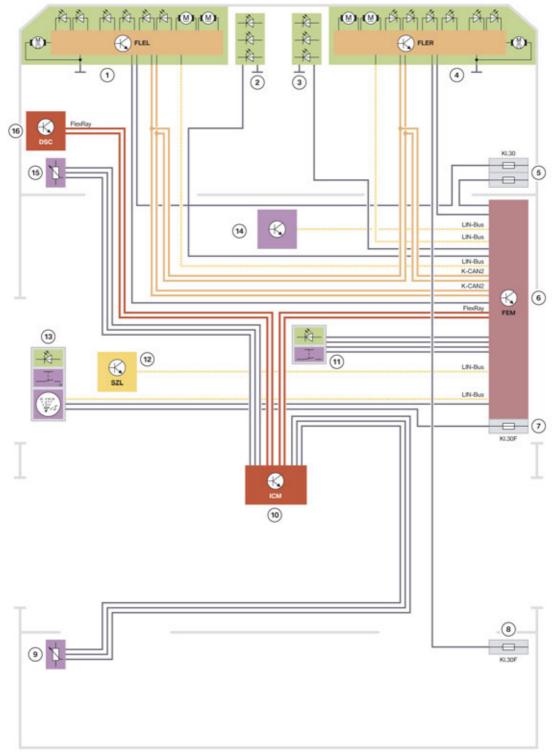
The F34 LCI comes with LED headlights as standard equipment. Halogen headlights or xenon headlights are no longer offered for the F34 LCI. LED fog lights are also standard. The rear lights have a new light design including LED technology.

#### 3.2.1. Headlight

Adaptive Full LED headlights (OE 552) may be ordered as optional equipment.

# 3. General Vehicle Electrical System

#### Adaptive LED headlight system wiring diagram



F34 LCI adaptive LED headlight system wiring diagram

00000

# 3. General Vehicle Electrical System

Index	Explanation
1	Frontal Light Electronics Left (FLEL)
2	LED fog light, left
3	LED fog light, right
4	Frontal Light Electronics Right (FLER)
5	Front passenger power distribution box fuse
6	Front Electronic Module (FEM)
7	FEM fuse
8	Luggage compartment power distribution box fuse
9	Ride-height sensor, rear left
10	Integrated Chassis Management (ICM)
11	Central locking button/hazard warning switch
12	Steering column switch cluster (SZL)
13	Light operating unit
14	Rain-light-solar-condensation sensor (RLSBS)
15	Ride height sensor, front left
16	Dynamic Stability Control (DSC)

#### 3.2.2. Rear lights

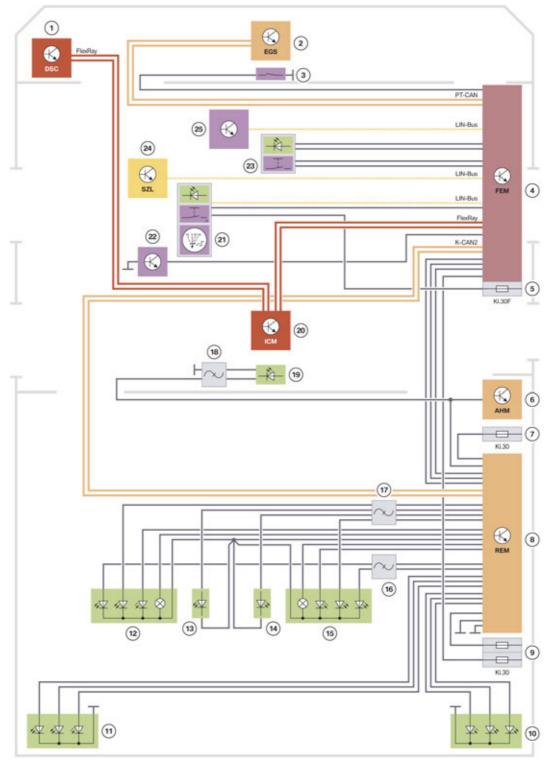
All rear lighting functions are done by LEDs with the exception of the reversing light which is a conventional bulb. The turn indicator extends across the entire widths of the rear lights for better visibility.



F34 LCI rear light

# 3. General Vehicle Electrical System

#### System wiring diagram



F34 LCI rear light system wiring diagram

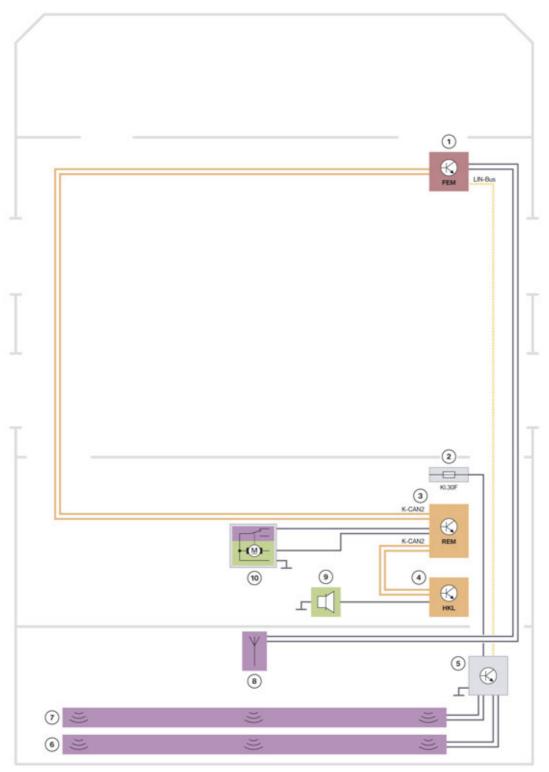
# 3. General Vehicle Electrical System

Index	Explanation
1	Dynamic Stability Control (DSC)
2	Electronic transmission control (EGS)
3	Reversing light switch (manual gearbox) (not for US)
4	Front Electronic Module (FEM)
5	Fuse in the FEM power distribution box
6	Trailer module AHM (not for US)
7	Luggage compartment power distribution box fuse
8	Rear Electronic Module (REM)
9	Battery power distribution box fuses
10	Rear light, outside right
11	Rear light, outside left
12	Rear light, inside left
13	License-plate light, left
14	License-plate light, right
15	Rear light, inside right
16	Interference suppression filter
17	Interference suppression filter
18	Interference suppression filter
19	Additional brake light
20	Integrated Chassis Management (ICM)
21	Light operating unit
22	Brake light switch
23	Central locking button/hazard warning switch
24	Steering column switch cluster (SZL)
25	Rain-light-solar-condensation sensor (RLSBS)

#### 3.3. Contactless tailgate opening

In combination with the Comfort Access (OE 322) optional equipment, the F34 LCI has contactless tailgate opening. This includes not only opening but also closing of the tailgate by a specific foot motion under the rear bumper.

# 3. General Vehicle Electrical System



F34 LCI system wiring diagram for contactless tailgate opening

F16 0407

## 3. General Vehicle Electrical System

Index	Explanation
1	Front Electronic Module (FEM)
2	Luggage compartment power distribution box fuse
3	Rear Electronic Module (REM)
4	Automatic operation of tailgate (HKL)
5	Control electronics for non-contact tailgate opening
6	Sensor at top for non-contact tailgate opening
7	Sensor at bottom for non-contact tailgate opening
8	Exterior Antenna, rear bumper
9	Acoustic warning device
10	Tailgate lock switch

Contactless tailgate opening operates unchanged compared with the F34. New in the F34 LCI compared with F34 is contactless tailgate closing. The same foot motion as for opening also closes the tailgate. When closing the tailgate by the contactless tailgate activation, a beeping sound is emitted by an acoustic warning device, which is installed in the tailgate.

#### 3.4. Assistance systems

#### **3.4.1. Overview**

#### The following optional assistance systems are available for the F34 LCI:

- Active Driving Assistant (OE 5AS)
- Parking Assistant (OE 5DP)
- Park Distance Control (OE 508)
- Rear view camera (OE 3AG)
- Side and top view cameras (OE 5DL)
- Automatic high-beams (OE 5AC)
- Active cruse control Stop&Go (OE 5DF)
- Active blind spot detection (OE 5AG)
- Speed limit info (OE 8TH)

#### The optional "Driving Assistant" (OE 5AS) contains the following systems:

- Lane departure warning
- Pedestrian & City Collision Mitigation
- Forward Collision Warning

## 3. General Vehicle Electrical System



If the vehicle comes with the combined optional equipment "Driving Assistant" (OE 5AS) and "ACC Stop & Go" (OE 5DF), the collision warning with City brake activation is expanded to collision warning with brake activation. That is, initial braking occurs over the entire speed range.

#### 3.4.2. New features in the F34 LCI compared with the F34

#### Lane change warning

Thanks to new radar sensors, vehicles can now be detected at speeds of 20 km/h / 12 mph and above.

#### **Side protection**

In combination with the optional Parking Assistant, (OE 5DP), the rear bumper comes with 2 additional PDC ultrasonic sensors on each side.



F34 LCI ultrasonic sensors for side protection

Besides the front and rear sides of the vehicle, the side area of the vehicle is now also monitored. The side protection is active at the same time as the Park Distance Control.

The measuring range around the B-pillar and parts of the doors is not monitored by the ultrasonic sensors. Instead this area is imaged using a computer model while the vehicle drives past.

Side protection is not active during an automatic parking manoeuvre by the Parking Assistant (PMA).

# 3. General Vehicle Electrical System



Side protection indication in the central information display (CID)

#### **Parking assistant**

The Parking Assistant (PMA) of the F34 LCI now also allows parking in spaces transverse to the roadway. You can find more information on this in the Technical Reference Manual for the "ST1502 F23 Complete Vehicle".

## 4. Displays and Controls

Numerous changes have occurred to the display and operating elements because of a new generation of head unit. The user interface in the F34 LCI has a new design. A new controller is also installed.

#### 4.1. Overview

The following table features an overview of the CIDs and controllers (CON) used in the F34 LCI:

Equipment	Central information display CID	Controller CON
Professional radio (standard equipment)	6.5" (800 x 480 pixels)	5-button
Navigation system (OE 609)	8.8" (1280 x 480 pixels)	7-button with touch control box (new)

#### 4.2. Central information display

In conjunction with the navigation system (OE 609), the user interface of the F34 LCI has a new design. The individual menus are no longer arranged in a list but appear as graphic tiles.



F34 LCI main menu

# 4. Displays and Controls

#### 4.3. Controller

In conjunction with the navigation system (OE 609), a new controller (touch control box) with modified direct access keys is used. Operation itself (turning, pressing, sliding) remains unchanged. The following graphic shows the differences between a controller from an F34 and one from an F34 LCI:





Controller comparison

Index	Explanation
1	Controller with touch control panel F34
2	Controller with touch control panel in F34 LCI

The following table shows the changes in the direct access keys:

Controller F34	Controller in F34 LCI	
RADIO and MEDIA	MEDIA	
TEL (telephone)	COM (communication)	
NAV (navigation)	NAV and MAP (navigation and navigation map)	

The Touchbox (TBX) control unit is installed near the A-pillar on the right side above the front electronic module (FEM).

## 5. Information and Communication

#### 5.1. Head unit

The following table features an overview of the head units used in the F34 LCI:

Equipment	Special features		
Professional radio (standard equipment) Headunit Basis (HU-B)	<ul><li>Controller with 5 buttons</li><li>CID with 6.5"</li><li>CD player</li></ul>		
Navigation system (OE 609) Head Unit High 2 (HU-H2)	<ul> <li>Navigation (3 years' map updating with no licence charges)</li> </ul>		
	<ul> <li>Automatic map updating (up to 4 times a year)</li> </ul>		
	Voice input		
	<ul> <li>Controller with 7 buttons and touch control box</li> </ul>		
	CID with 8.8"		
	<ul> <li>20 GB memory for audio files</li> </ul>		
	DVD drive		
	<ul> <li>Hands-free system with USB interface</li> </ul>		
	<ul> <li>Extended and enhanced instrument cluster</li> </ul>		
	<ul> <li>ConnectedShift</li> </ul>		
	<ul> <li>Proactive driving assistant (in ECO PRO mode)</li> </ul>		

#### 5.1.1. Apps



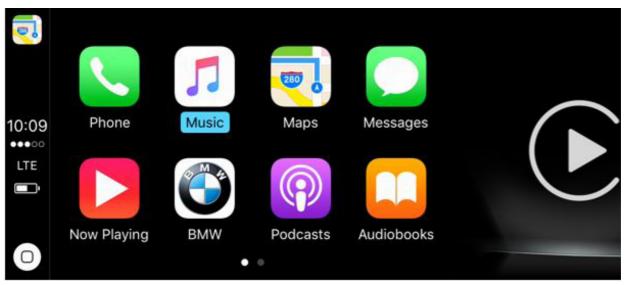
BMW Apps

Selected apps from third-party providers (e.g. Spotify®, Audible® etc.) can be transmitted to vehicles with an HU-H2 by means of Bluetooth. A prerequisite is the optional BMW Online and BMW Apps (OE 6AK).

### 5. Information and Communication

### 5.2. Apple® CarPlay

The F34 LCI is the first vehicle at BMW to offer Apple® CarPlay. Optional Apple® CarPlay preparation (OE 6CP) is available only in combination with the optional Professional navigation system (OE 609) and ConnectedDrive Services (OE 6AK) (Apple® CarPlay is already included with ConnectedDrive Services). Countries without ConnectedDrive Services must instead order Apps (OE 6NR) as optional equipment.

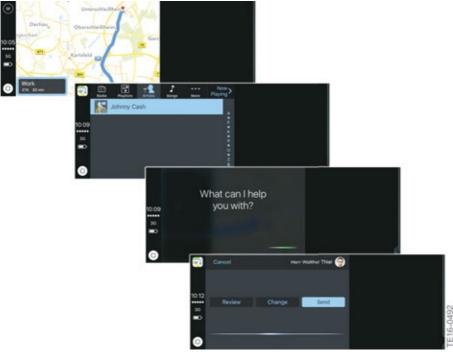


Apple® CarPlay

#### 5.2.1. Functions

Apple® CarPlay allows wireless, convenient use of an iPhone® in the vehicle. iPhone® content like music, messages, telephone, navigation and selected apps appear on the Central Information Display (CID) and are operated via the controller.

## 5. Information and Communication



Apple® CarPlay functions

#### 5.2.2. Connection

The iPhone® is connected to the vehicle via Bluetooth. After successful pairing, "Apple® CarPlay" is activated in the vehicle.



Apple® CarPlay selection in main menu

The design and operation of Apple® CarPlay are adjusted to the iPhone®.

An iPhone® connected to Apple® CarPlay is subject to the following restrictions:

- Phoning is possible only through Apple® CarPlay.
- The iPhone® cannot be registered as a second phone.
- The phone book entries are not transmitted to the vehicle.
- Only one additional phone can be connected to the vehicle.

<sup>&</sup>lt;sup>1</sup> The phone book of the iPhone® can be accessed via Apple® CarPlay.

## 5. Information and Communication

#### 5.3. Telematics

The F34 LCI comes with 2 different telematics control units, depending on the equipment level:

- Telematic Communication Box (TCB)
- Telematic Communication Box 2 (TCB2)

#### 5.3.1. Telematic Communication Box

In combination with a Professional radio (standard equipment) the Telematic Communication Box (TCB) telematics control unit familiar from other vehicles is installed.

#### 5.3.2. Telematic Communication Box 2

The Telematic Communication Box 2 is installed in combination with the optional Navigation system (OE 609).

The special features of the TCB2 are:

- The GPS antenna is connected to the TCB2. The navigation data are sent to the Head Unit High 2 via an OABR Ethernet connection.
- The TCB2 uses LTE for data transfer.
- A WLAN antenna for the WLAN hotspot is integrated in the TCB2.

## 5. Information and Communication



F34 LCI EBO for TCB2

#### WiFi Hotspot



WLAN

The optional WLAN hotspot (OE 6WD) is part of the optional Wireless Charging option code (OE 6WN), this allows the connection of mobile devices to the internet via the SIM card (P-SIM) integrated in the vehicle.

Up to 10 devices can be connected to the hotspot by WLAN. The maximum download rate is 100 Mbit/s.

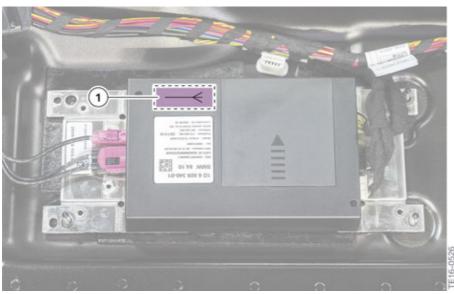
# 5. Information and Communication



F34 LCI WLAN hotspot reception

Index	Explanation
1	LTE transmitter
А	LTE antenna 1
В	LTE antenna 2
2	Emergency GSM antenna
3	Roof antenna
4	Telematic Communication Box 2 (TCB2)
5	WLAN
6	Passenger compartment

The corresponding WLAN Antenna is installed in the TCB2.



F34 LCI WLAN Antenna

### 5. Information and Communication

Index	Explanation
1	WLAN antenna for WLAN hotspot

Use of the WLAN hotspot is subject to a charge for the customer. After a test phase, the customer must independently renew the data plan with the provider. To this end, after the connection is established, a screen from the provider appears in which the customer can renew the agreement on his own.

#### 5.4. USB port

The USB port in the center console is standard equipment in the F34 LCI. In combination with the optional telephone with Wireless Charging (OE 6NW), a second USB port is located below the AC control panel.



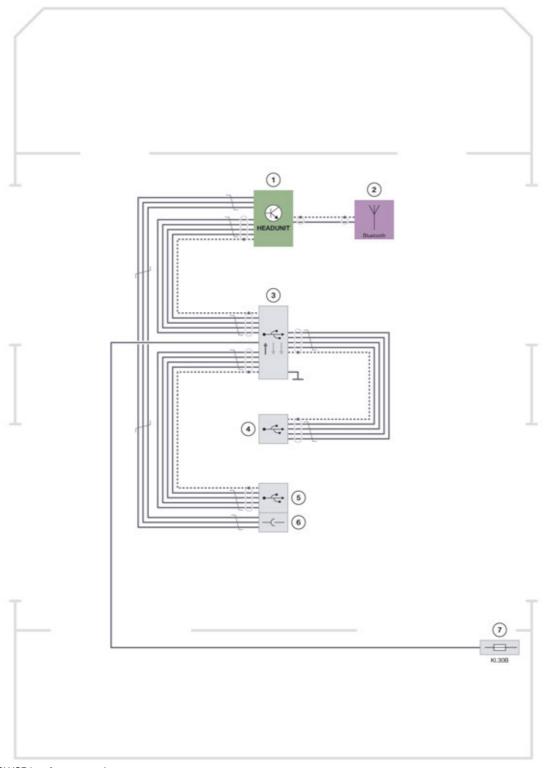
Second USB port in F34 LCI

#### 5.4.1. Connection

If only the USB port in the center console is present, it is directly connected to the head unit as before.

The optional telephone with Wireless Charging (OE 6NW) comes with a USB hub. In combination with the USB hub, both USB ports take a charge current of 2 amps (usually a USB port in the vehicle has a charge current of 500 mA).

# 5. Information and Communication



F34 LCI USB interface connection

### 5. Information and Communication

Index	Explanation
1	Head unit
2	Bluetooth Antenna
3	USB hub
4	Center stack USB port
5	USB audio interface
6	AUX-IN port
7	Luggage compartment power distribution box fuse

#### 5.5. Telephone

The F34 LCI is the first in the BMW 3 Series to offer optional telephone equipment in which the mobile phone battery is charged **inductively**.

#### 5.5.1. Variants

The following hands-free system versions are available for the F34 LCI:

- Hands-free Bluetooth and USB audio connection (Standard equipment)
- Wireless Charging (OE 6NW)

#### 5.5.2. Telephone with wireless charging

For the F34 LCI, telephone with wireless charging is available as optional equipment (OE 6NW).

Charging of the mobile phone battery and transmission of the antenna signals occur wirelessly via the wireless charging technology. This function is possible only for mobile phones that are compliant with the Qi® standard. The standard is identifiable by the icon. This standard ensures that the chargers are compatible with the devices.

For information on compatibility, go to: www.bmw.com/bluetooth

## 5. Information and Communication



Qi identification

The F34 LCI implements wireless charging via a special wireless charging tray.



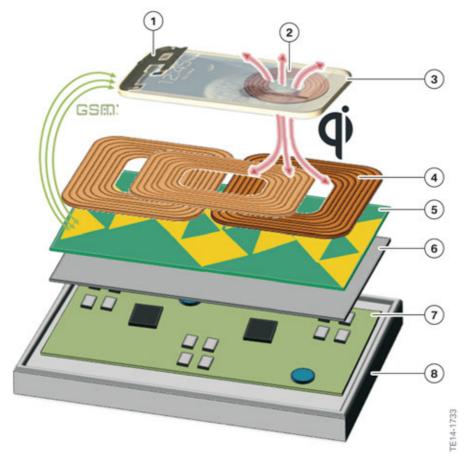
F34 LCI wireless charging

## 5. Information and Communication



#### Operation

Wireless charging is based on induction. A transmitter coil and a receiver coil contactlessly transmit the charging voltage for the mobile phone.



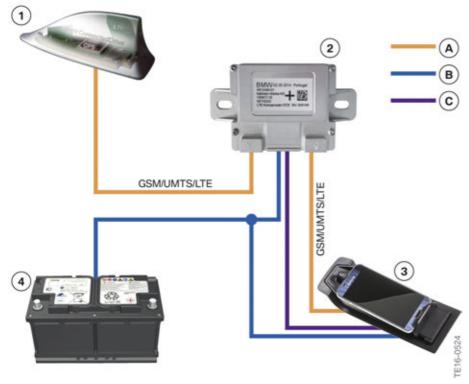
Basic principle of wireless charging

## 5. Information and Communication

Index	Explanation
1	Mobile phone with coupling antenna for mobile reception
2	Induction coil of mobile phone
3	Outer cover of the mobile phone with receiver coil
4	Charging/transmitting coil in the wireless charging tray
5	Telephone antenna in the wireless charging tray (inductive)
6	Ferrite in the wireless charging tray
7	Electronics with connections for the vehicle electrical system of the wireless charging tray
8	Outer cover of the wireless charging tray

#### Connection to the vehicle electrical system

The following diagram is a simplified depiction of how wireless charging telephone is integrated in the vehicle electrical system.



F34 LCI wireless charging connection

## 5. Information and Communication

Index	Explanation
А	Antenna lines
В	Voltage supply
С	Activation line
1	Roof antenna
2	Line compensator
3	Wireless charging tray
4	Battery

#### Line compensator

A LTE-capable line compensator compensates for the loss in wireless transmission. With this line compensator, the reception quality of the wireless charging transmit/receive system reaches the level of conventional telephone with a snap-in adapter. The line compensator is integrated in the luggage compartment on the left.



 Index
 Explanation

 1
 Telephone Antenna – roof-mounted antenna connection

 2
 Voltage supply and activation line

 3
 Antenna – wireless charging tray connection

### 5. Information and Communication

#### **Status LED**

The status of the wireless charging tray is signalled by an LED.

The LED lights up blue once a metallic object is inserted in the wireless charging tray. During this time the electronics check whether the metallic object complies with the Qi® standard. If so, the LED continues to be blue, otherwise the LED goes out.

Because of self-diagnosis during activation of the wireless charging tray (actuate slide, hold briefly and release), the LED remains blue for 10 seconds. No mobile phone need be inserted for this purpose. This can cause misunderstandings on the part of customers. The LED always remains blue for 10 seconds during the activation, even if an incompatible mobile phone is inserted.



If a Qi®-compatible device and a further metallic object (e.g. a coin) are located on the wireless charging tray, the charging procedure will be cancelled after a short while.

Status LED	Explanation
Blue	Self-diagnosis; charging procedure
Orange	Shutdown because of excess temperature (60°C / 140°F) Detected foreign body (e.g. coin)
Red	Internal fault (Antenna diagnosis)



The Qi® standard is not fully identical in all devices. In certain mobile phones problems during the charging procedure can therefore occur.

#### 5.6. Further information

The following table gives an overview of the product information sheets for further details on selected topics:

Topic	Product information
Head Unit High 2 (HU-H2)	Information & Communication System News I/15
Headunit Basis (HU-B)	Information & Communication System News I/14
Apple® CarPlay	Infotainment News 2016
WiFi Hotspot	Infotainment News 2016



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