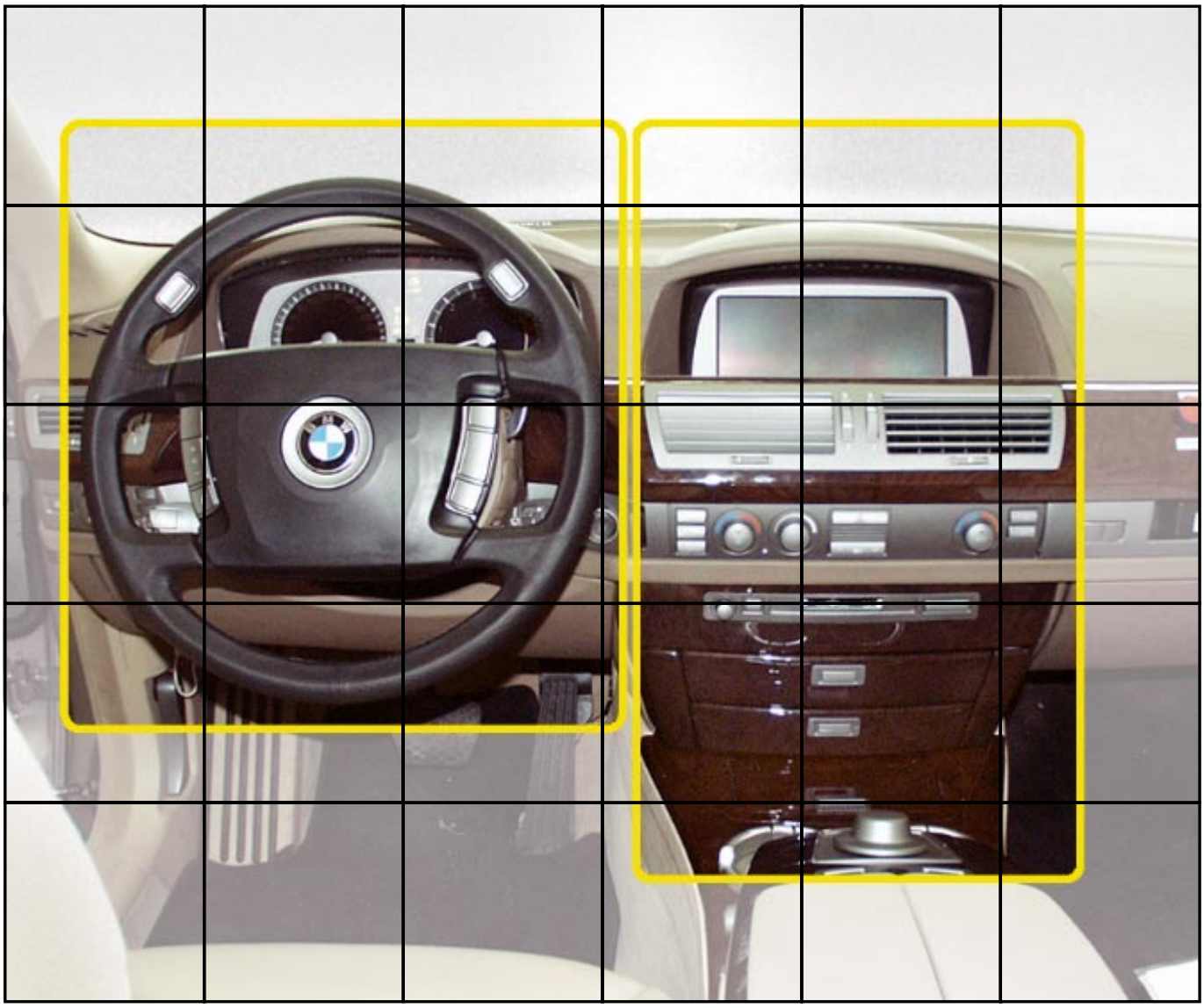
BMW
Service Training

iDrive
Seminar Working Material



NOTE
The information contained in this training course manual is intended solely for participants of the BMW Service Training course.
Refer to the relevant "Technical Service" information for any changes/ supplements to the Technical Data.

VS-42 MFP-HGK-BRK-E65_0640

Contents

Introduction/History

What is iDrive?

The number of advanced driver assistance systems and communication and convenience functions with new and wide-ranging capabilities is continually increasing in modern-day vehicles.
And that trend is set to continue at an ever growing speed, driven on by the digitisation of electronic and communication technologies.

As a consequence, conventional display and control systems are reaching the limits of their capabilities.

The 700 or so control functions that are possible on the E65 would create a totally unmanageable conglomeration of switches, controls and displays if the conventional arrangement had to be used.

iDrive redefines the concept of active driving and of passenger, and specifically, driver-orientated ergonomics.

This new control and display concept enables driver and passenger to access more information and functions in spite of the smaller number of buttons and switches.

It lends a unique and intuitive feel to the process of controlling the E65, thereby increasing safety on the road as well as the pleasure of driving.

The name **iDrive** is a term which expresses BMW's trademark driver's car image.
The **letter i** in iDrive not only identifies a specific system, it also stands for a whole spectrum of system attributes:

- **i**nteractive
- **i**ntelligent
- **i**nnovative
- **i**ntuitive
- **i**ntegrated
- **i**nformative
- **i**nspired

The **iDrive** concept is divided into two sections:

- The **"Driving Area"** (steering wheel and immediately adjacent controls operated by driver only); all driver-operated functions are concentrated in the area immediately within the driver's reach.
- The **"Comfort Area"** (in the middle of the dashboard) which gives both the driver and front passenger easy access to all convenience functions.

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Fig. 1: Driving Area and Comfort Area

Three-level function structure

Basic functions such as gear shifting, windscreen wipers and electro-mechanical parking brake (EMF), that are of greatest importance in terms of driving and safety, are positioned in the area around the steering wheel within the immediate reach of the driver - the zone referred to as the "driving area".

Frequently used basic functions such as lights, air conditioning/ heating temperature, radio volume and rear window heater are controlled by means of switches on the instrument panel in the conventional manner.

The additional convenience, communication and driver-assistance functions are operated by means of a controller (central control panel) and displayed on a control display (central display screen).

Advantages of iDrive:

- Reducing the number of switches and controls creates an uncluttered driver environment.
- Operation of controls is simple and logical.
- Apart from the instrument cluster, there is only one other display, the control display. Instead of a multiplicity of individual displays it provides a better, simpler and quicker means of indicating a whole range of different information.
- The excellent ergonomics and intuitive controls mean that the driver is far less likely to be distracted from what is happening on the road.

Driving Area

Overview

Specifically, the following controls are within the Driving Area:

- Ignition switch (ZAS) and starter/stop button
- Instrument cluster incorporating LCD technology
- Multifunction steering wheel (MFL)
- Steering column control centre (SZL)
- Electromechanical parking brake button (EMF)

The Driving Area includes all of the control functions that are important for driving and traffic safety, e.g. selector lever, switch for cruise control system or turn indicator and dipped-beam switch.

That means that the driver can direct his/her full attention to the road and traffic conditions.

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Fig. 2: Driving Area

Index	Description
1	Ignition switch (ZAS) and start/stop button and remote control
2	Instrument cluster incorporating LCD technology
3	Steering column control centre (SZL) and multifunction steering wheel
4	Parking brake button

Ignition switch with start/stop button

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Fig. 3: Ignition switch and starter/stop button

Index	Description
1	Starter/stop button
2	Reception unit for remote control

Function

The remote control is the access and driver authorisation for the vehicle.
It contains the radio electronics, the transponder function for the electronic immobilizer and an accumulator with charging electronics.

The remote control is inserted manually via linear guides into the reception unit of the ZAS.

When the remote control is inserted, the sensor system in the reception unit (CAS) detects a request for locking.

If the remote control is authorised, the electromechanical withdrawal lock is activated and the remote control is locked in place mechanically.

Starting the engine:

- Authorised remote control locks in place in the reception unit
- Press brake pedal
- Press start/stop button

As an additional prerequisite to starting, the automatic transmission must be in position P or N.

Choice of electrical system status:

Pressing the starter/stop button without pressing the brake pedal cycles through the various electrical system statuses.

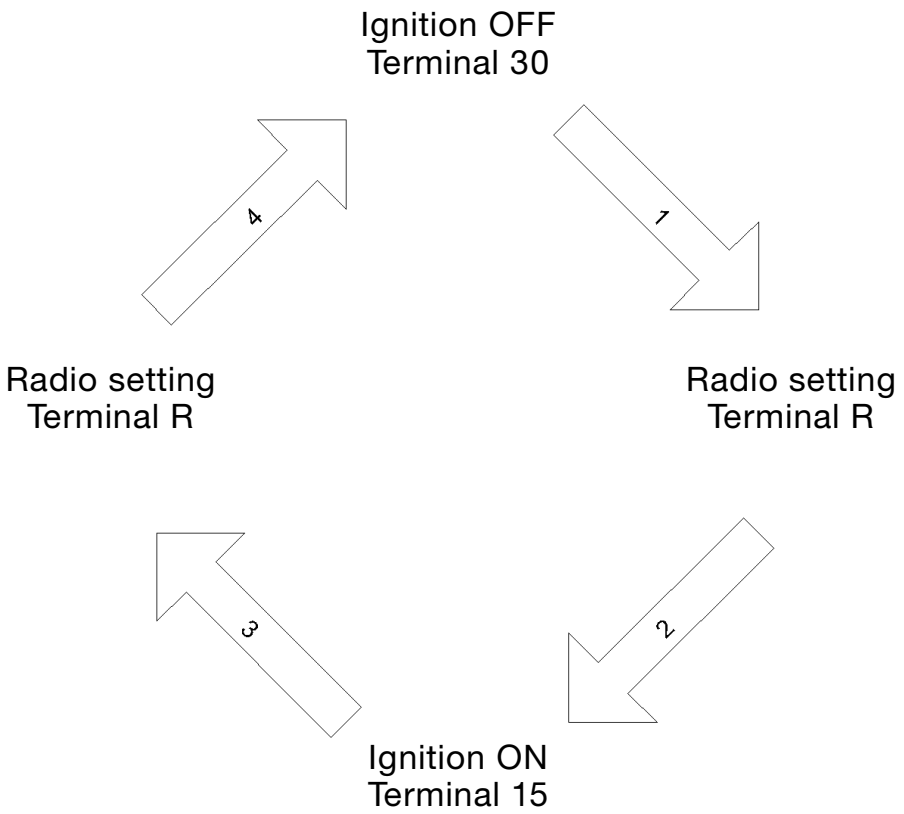

Fig. 4: Choice of electrical system statuses

Steering column control centre (SZL)

- Overview

The steering column control centre (SZL) handles all functional components of the multi-function steering wheel (MFL) and the steering column.

Those include

- audio system, telephone, Steptronic, fanfare horn and a definable-function button
  via the MFL function buttons

- direction indicators/main-beam headlights, transmission selector lever, windscreen wiper, cruise control (FGR),
  via the 4 control stalks on the steering column

- semi/fully electrical steering wheel adjustment
  via the button on the left of the steering column

- steering wheel heater
  via the button on the left of the steering column

The steering angle sensor is also integrated in the SZL.

The SZL processes the control commands and sends them via the ***byteflight*** bus system to the appropriate control units.

The E65 is the first model on which a steering column control centre with such an extensive range of functions has been used.

Fig. 5: Steering column control centre

Index	Description
1	MFL with function buttons
2	Direction indicator and headlamp dip switch (FAS)
3	Transmission selector lever
4	Wiper switch
5	Cruise control switch
6	Steering wheel heater switch
7	Steering wheel adjuster button

The electronic control system for the steering column control centre is divided between two electronic modules that are integrated respectively in the steering column control centre and the steering wheel.

The signal transfer from the control elements in the multifunction steering wheel (MFL) to the steering column control centre (SZL) is ensured by a coil spring.

- Steering wheel components

The multi-function steering wheel (MFL) in the E65 is the most complex steering wheel produced by BMW at present and consists of the following components:

- Steering wheel rim
- Airbag unit
- Left and right-hand function buttons
- Steptronic buttons
- Steering wheel module (control unit)

In addition to the function buttons familiar from the E38, the Steptronic can now also be operated from the steering wheel.

The left-hand group of function buttons on the steering wheel are used to control the functions voice input, audio/telephone (volume), telephone (accept/end call).

The function buttons on the right operate the functions sports program/manual gear shift, station search for radio channels, and an additional programmable function.

The Steptronic buttons integrated in the steering wheel now, for the first time, enable gear shifts to be made without letting go of the steering wheel. There are two buttons on each side on the front for changing down and two buttons on the back for changing up.

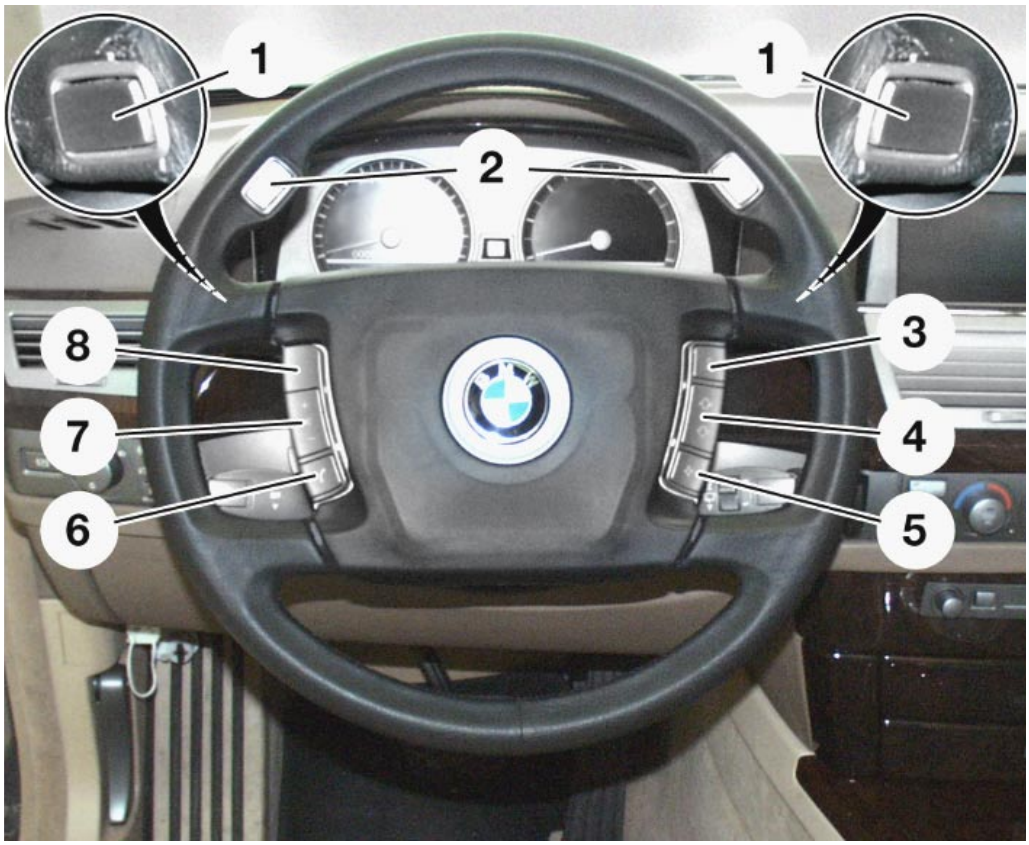

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Fig. 6: Multifunction steering wheel (MFL)

Index	Description
1	Steptronic buttons for changing up
2	Steptronic buttons for changing down
3	S/M button (sports/manual transmission)
4	Search up/down, e.g. for radio stations
5	Programmable function button
6	Telephone receiver button
7	Volume +/-
8	Voice input (PTT, push to talk)

- Steering column components

Steering column stalks and steering column module

The 4 steering column stalks and the steering column module form a single unit.

The steering column stalks of the steering column control centre are:

- Turn indicator and dipped-beam switch
- Transmission selector lever
- Wiper switch
- The cruise control lever

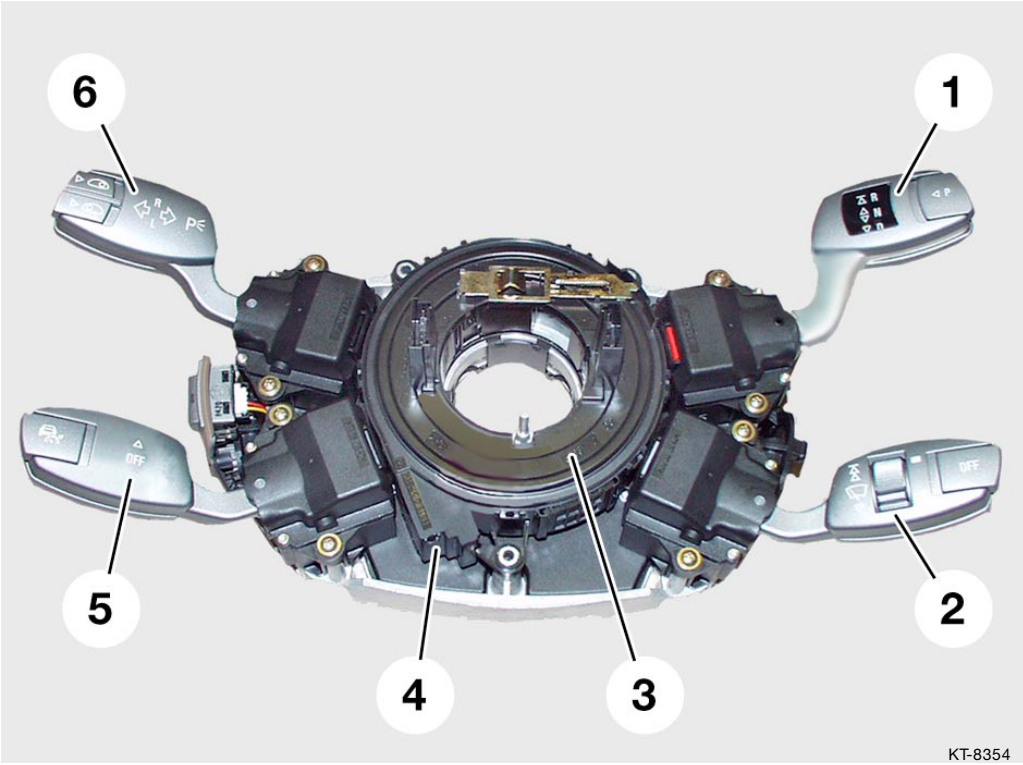

Fig. 7: Steering column stalks and steering column module

Index	Description	Index	Description
1	Transmission selector lever	4	Steering column module
2	Wiper switch	5	Cruise control lever
3	Coil-spring conductor cassette	6	Turn indicator and dipped-beam switch FAS (including axial button BC/ CC)

On the E65, a new design of steering column stalk has been introduced.

What is new is that the steering column stalks are now in effect buttons (flick switches).
That means that they no longer engage in fixed positions for their various functions.

Thus, in order to operate the direction indicators, for example, the stalk is pushed beyond a perceptible point of resistance. When released, it returns to its centre position.

- Overview of bus network

The steering column control centre (SZL) is a satellite of the overall ISIS system (intelligent safety and integration system) on the ***byteflight*** bus system.

In addition to the bus link, there are also two conventional cable connections to the LM and EGS systems for safety reasons.

The central gateway module provides the link to other bus systems as follows:

- The PT-CAN and the subsystems electronic transmission control (EGS) and cruise control (FGR); the cruise control is a function of the digital engine electronics (DME)

- The System K-CAN with the subsystems rain/light sensor (automatic interval control, AIC), light module (LM) and wiper module (WIM)

- The MOST and the subsystems Control Display, instrument cluster, navigation system, aerial amplifier/tuner, amplifier (LOGIC7), phone, voice processing system, CD changer and audio system controller.

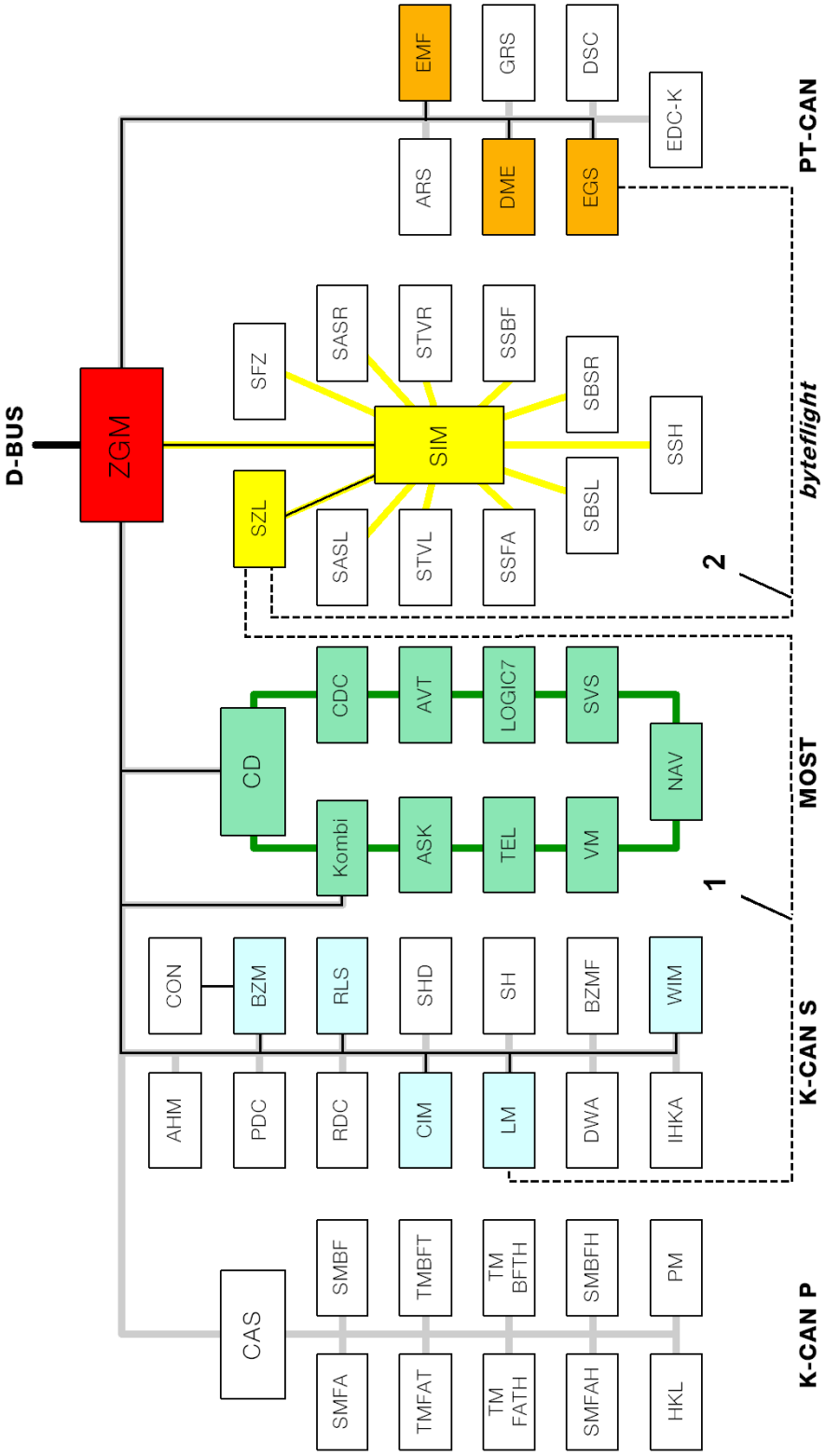

Fig. 8: Bus network

Index	Description	Index	Description
SZL	Steering column control centre	ASK	Audio system controller
SIM	Safety Information Module	CDC	CD changer
ZGM	Central gateway module	SVS	Voice processing system
DME	Digital engine electronics	TEL	Telephone
EGS	Electronic transmission control	LOGIC7	Amplifiers
EMF	Parking brake (electromechanical handbrake)	BZM	Control panel module, centre console
CD	Control Display	RLS	Rain/light sensor (Automatic Interval Control, AIC)
Kombi	Instrument cluster	WIM	Wiper module
NAV	Navigation system	LM	Light module
AVT	Aerial amplifier/tuner	CIM	Chassis Integration Module
1	Redundant lead to light module	2	Redundant lead to electronic transmission control system

- Schematic diagram of steering column control centre

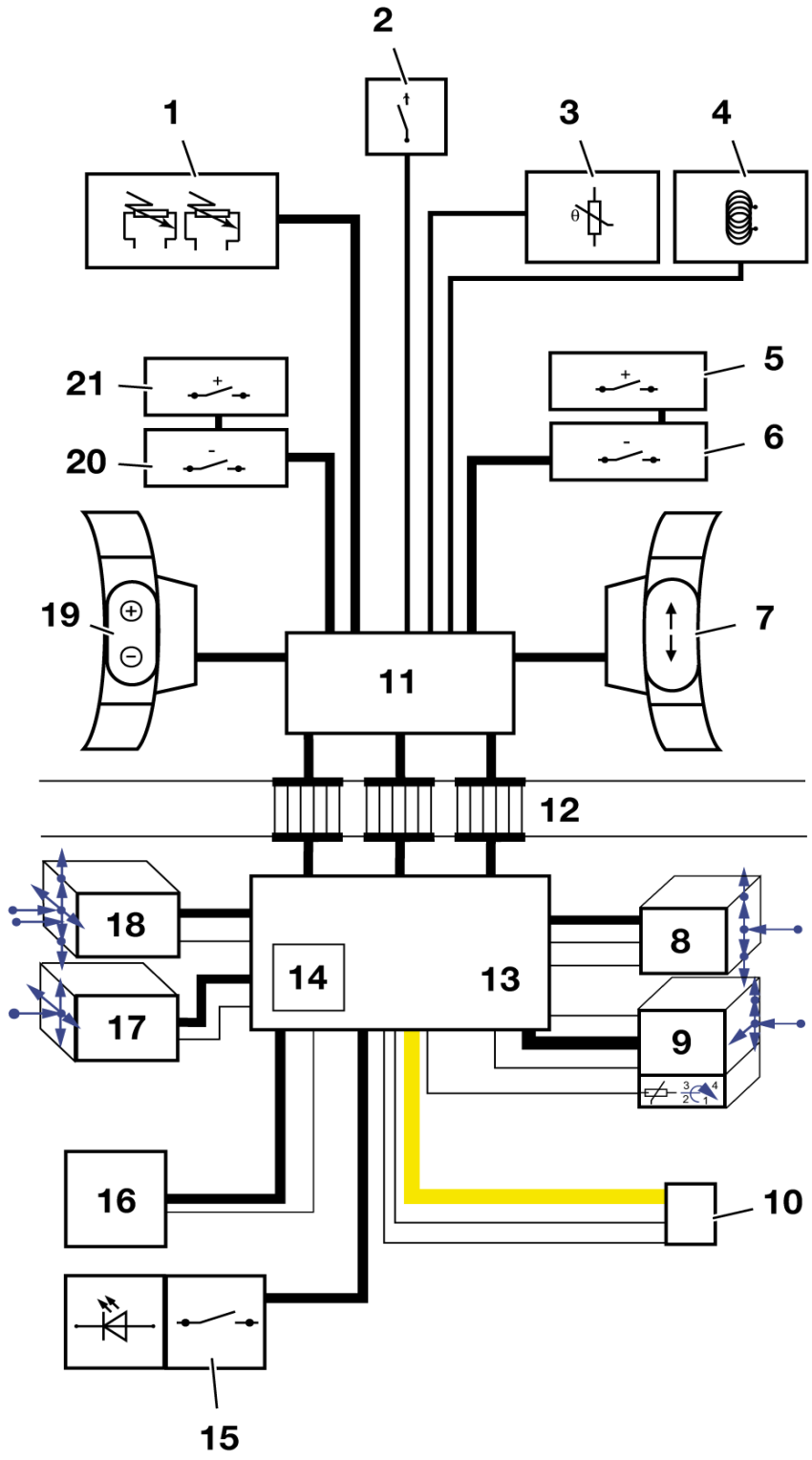

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Fig. 9: Schematic diagram of steering column control centre

Index	Description	Index	Description
1	Driver's airbag	12	Coil spring
2	Horn switch	13	Steering column module (LSE)
3	Steering wheel heater temperature sensor	14	Steering angle sensor
4	Steering wheel heater	15	Steering wheel heater switch
5	Steptronic + right	16	Steering wheel adjuster button
6	Steptronic - right	17	Cruise control switch
7	Function buttons, right	18	Turn indicator and dipped-beam switch
8	Transmission selector lever	19	Function buttons, left
9	Wiper switch	20	Steptronic - left
10	Connector for ***byteflight***	21	Steptronic + left
11	Steering wheel module (LRE)		

Note:

The steering angle sensor is a component of the steering column module and is integrated in it.

The blue arrows in the schematic diagram indicate the possible directions of movement of the four steering column stalks.

- Pin assignment

The steering column switch centre has a 5-pin and an 8-pin plug connection (pin 6, 7 and 8 are gold-plated).

The 5-pin connector forms the interface with the ***byteflight*** bus system.

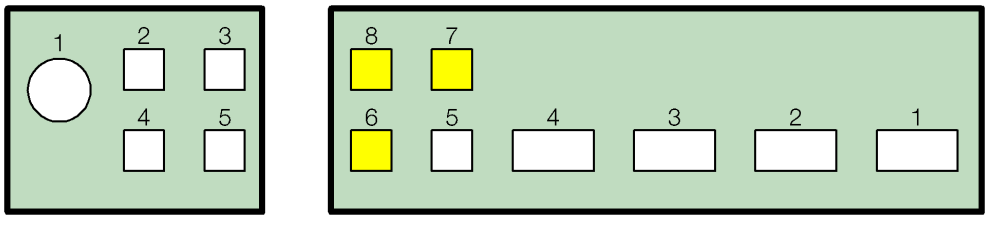

Fig. 10: Steering column control centre connectors

- Vehicle speed control

The cruise control (FGR) is a function of the digital engine electronics (DME) and has a multi-speed capability on the E65.

This **new** multi-speed function allows the driver to program and store multiple speed settings which can then be activated as required.

This means that frequently required speed settings such as 30, 50, 60 or 100 km/h can be selected directly at the touch of a button without having to drive the vehicle at precisely that speed beforehand. This is a considerable added convenience.

These pre-programmed "request speeds" are set by the driver and then called up while the vehicle is being driven.

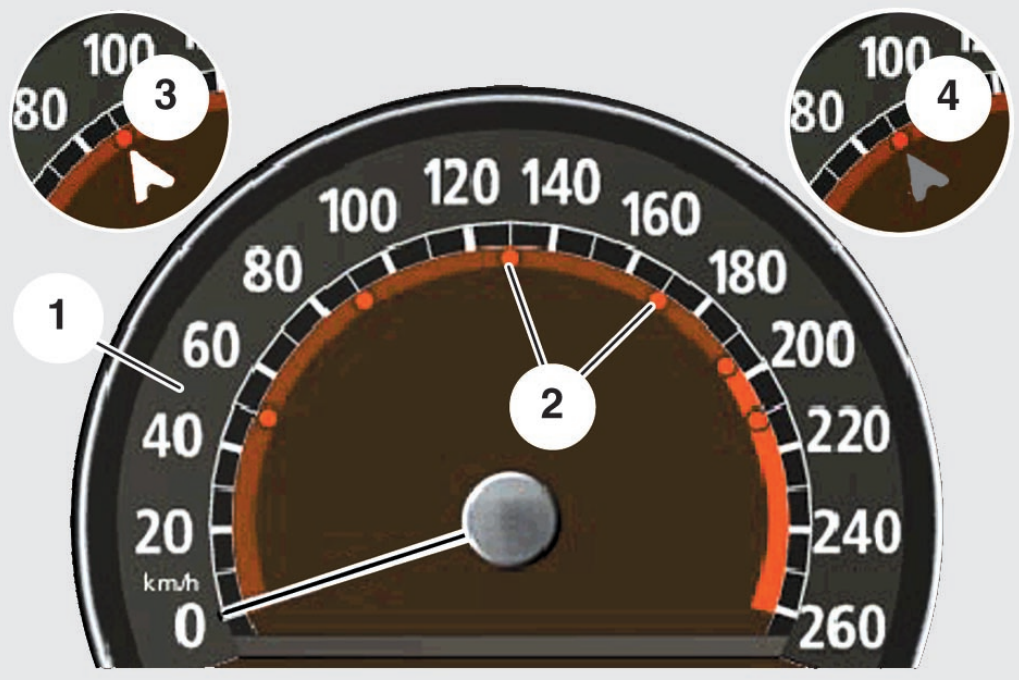

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Fig. 11: Speedometer on instrument cluster

Index	Description	Index	Description
1	Speedometer on instrument cluster	3	FGR active control procedure bright red pointer
2	Preset speeds	4	FGR interrupted control procedure dark red pointer

The memory can store up to 6 preset speeds. If the driver attempts to store more than six speeds, the speed setting markers on the instrument cluster start flashing.

If the FGR is switched on and the target speed is currently being set, the pointer is shown in bright red. It marks the target speed. If the FGR is switched on but the control operation has been interrupted by, for example, braking, the pointer is shown in dark red. It marks the speed that was last set.

The cruise control is operated exclusively by the left lower steering column stalk.

The cruise control can be activated at any speed from 30 km/h upwards.

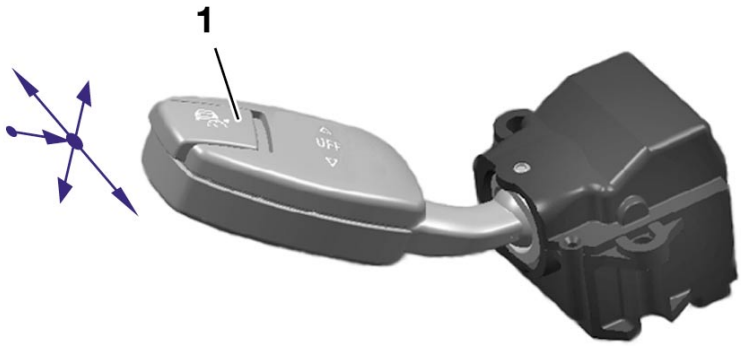

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Fig. 12: Cruise control lever

Index	Description
1	Axial switch

When the ignition is switched OFF, the cruise control is switched off at the same time.

The cruise control is interrupted on braking, when position "N" is engaged, if the vehicle moves at below the minimum speed of 30 km/h and in the event of a DSC feedback control operation.

Function	Operation
Activate cruise control Accelerate/set	Touching lever forwards
Decelerate/set	Touching stalk backwards
Activate multi-speed function	Pressing lever forwards past point of resistance
Select next higher preset speed	Pressing lever forwards past point of resistance
Select next lower preset speed	Pressing lever backwards past point of resistance
Cancel cruise control	Touching lever up/down
Recall/set/delete preset speeds while cruise control active	Touching lever inwards

If the steering-column lever is pressed forwards **up to** the pressure point, the speed currently being driven is kept and stored. Each further touching up to the pressure point in the direction of travel increases the vehicle speed by approx. 1 km/h. If the steering column lever is pressed and held, the vehicle accelerates. When the stalk is then released, the speed is stored and maintained.
On deceleration, each further touching up to the pressure point against the direction of travel decreases the vehicle speed by approx. 1 km/h.

When the multi-speed function is activated, the preset speed markers on the speedometer can be hidden.
This is done by pressing and holding the cruise control lever up or down for more than 3 seconds.

Programming/deleting preset speeds

Programming of preset speeds should be carried out while the vehicle is stationary with Terminal 15 active.
It is also generally possible to program the preset speeds while driving.
However, it should be noted that in that case, altering the preset speed also alters the speed currently being maintained.

To progam a requested speed, the FGR switch is pressed forwards or backwards **beyond** pressure point.

A pointer then appears on the speedometer. This serves to indicate the preset speed.

To increase the request speed, the FGR switch must be pressed forwards up to the pressure point (adjustment by 1 km/h).
To reduce the preset speed, the cruise control lever must be pressed backwards as far as the point of resistance.
Pressing/pulling beyond the pressure point increases/decreases the request speed in 10 km/h steps.

To store the preset speed the axial switch must be pressed and held for at least 3 seconds. The stored preset speed is indicated by a marker on the speedometer.

In the case of stored speed marks, to jump from one speed mark to the next speed mark you have to press the FGR switch forwards beyond the pressure point or pull it backwards, as the case may be.

To delete a speed mark, it must be selected using the FGR switch, then the axial button is pressed for at least 3 seconds. The speed marker then disappears.

Steering wheel adjustment

The E65 offers fully electric steering column adjustment.

The operating switch of the fully electric steering column adjustment is located on the left-hand side of the steering-column casing.

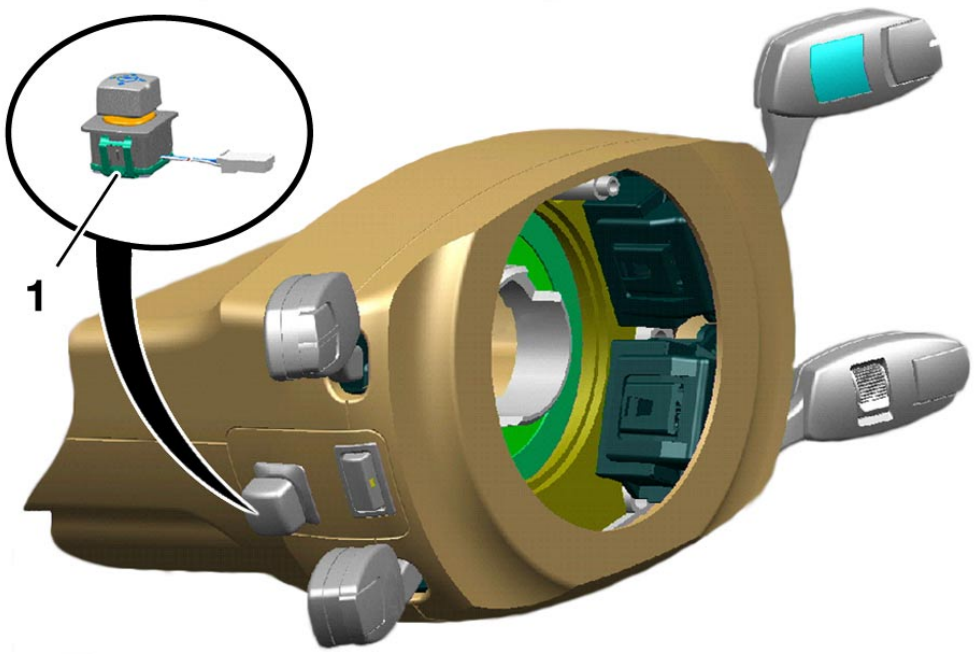

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Fig. 13: Operating the fully electrical steering wheel adjustment

Index	Description
1	Adjuster button for fully electrical steering wheel adjustment

With fully electrical steering wheel adjustment incorporating easy entry function, the steering wheel can be adjusted fore and aft and vertically to suit the driving position.
The steering wheel position is a car memory function and is memorised together with the driver's seat position.
When the ignition is switched off and the door opened, the steering wheel is moved to its highest and most forward position to as to make getting in and out of the car easier.

The adjuster button has four possible directions of movement. These enable the steering wheel to be moved up, down, forwards or backwards.

Notes

Steering wheel heater switch

The steering wheel heater is switched on by a switch on the left-hand side of the steering column between the two steering column stalks.
It can be switched on provided the electrical system status is at least Terminal 15.

An LED on the switch indicates when the steering wheel heater is on.

The steering wheel heater consists of a coil in the steering wheel rim.

A temperature sensor (PTC sensor) in the steering wheel rim sends the temperature signal back to the steering wheel module.
This allows the temperature to be set to approx. 36 degrees Celsius.

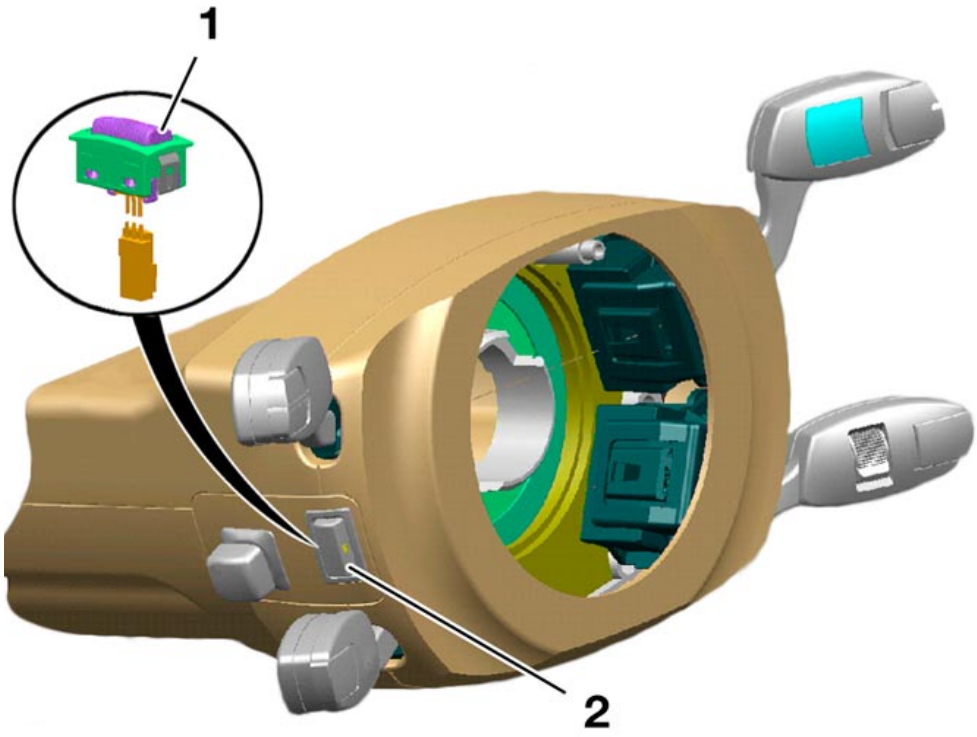

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Fig. 14: Steering wheel heater switch

Index	Description	Index	Description
1	Steering wheel heater switch	2	LED function indicator in switch

Parking brake button

The parking brake is an automated electromechanical parking brake system (EMF) introduced for the first time on the E65. When the engine is running, the parking brake system operates the front and rear disc brakes via the brake hydraulics.
When the engine is switched off, the parking brake is operated by an electromechanical system. Two cables are then used to actuate the rear brake drums.

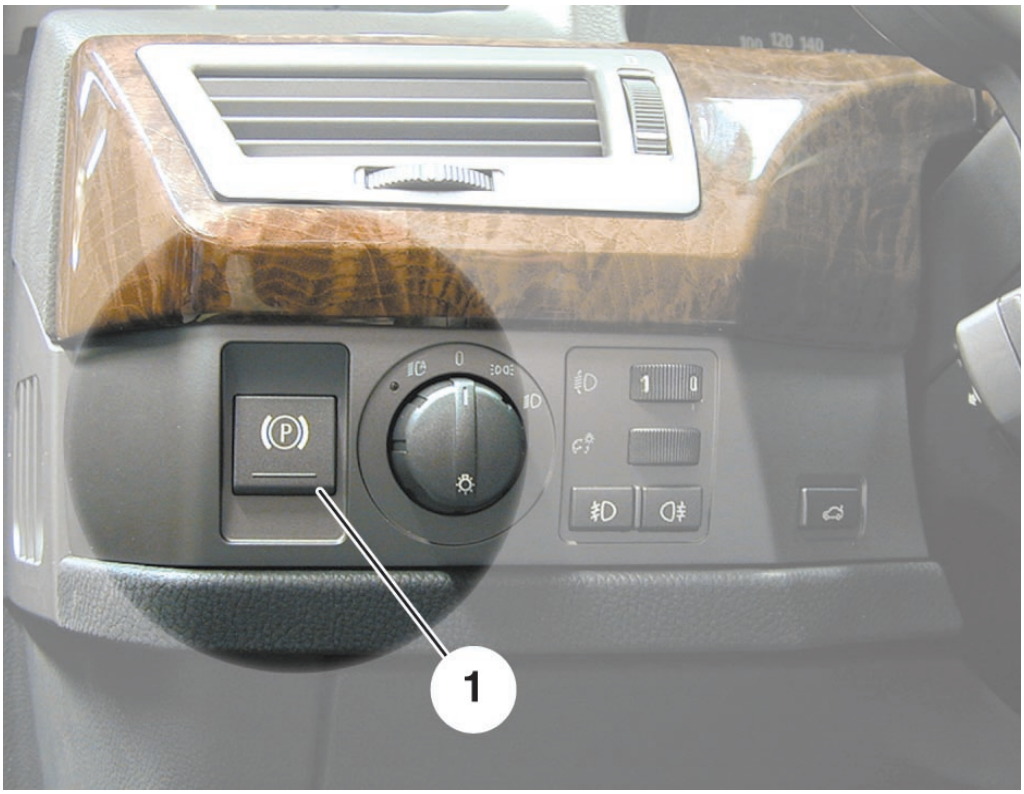

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Fig. 15: Parking brake (EMF)

Index	Description
1	Parking brake button

Operation

When the vehicle is stationary with the ignition switched on, the parking brake is applied or released by pressing the button.

The parking brake can also be applied with the ignition switched off. The indicator lamp on the instrument cluster lights up briefly.

The parking brake can only be released when the ignition is switched on.

In an emergency, e.g. if the brake pedal is jammed by an object, the parking brake can also be used as a dynamic emergency brake when the vehicle is in motion.
The vehicle is then braked by means of the brake hydraulics and the front and rear disc brakes as long as the parking brake button is pressed.

Automatic application of the parking brake, e.g. in stop-and-go traffic or when performing a hill start (Automatic Hold), can be activated/deactivated on the Control Display ("Settings" menu) using the controller.
Automatic application of the parking brake is a key memory function.
If automatic application is activated, "Auto P" appears on the instrument cluster.

If the parking brake is released by pressing the button when the engine is running, this also deactivates the automatic application function.

Comfort Area

Control Display and Controller

Overview

Improved display systems and digital technology enable new control functions and the corresponding display options.

In addition, the number of vehicle functions is increasing.
This growth is likely to be concentrated in the area of convenience and communication functions such as multimedia applications and information services.

In order to be able to make use this abundance of functions without at the same time having an unmanageable array of controls and displays, the following concept has been developed:

1. Combination of user interfaces into a **single** multifunctional display in the form of the **Control Display** offering centralised screen-based control of functions.
2. Screen-based control of functions performed by means of a central operating control element, the **controller**.

The Control Display and the controller set new standards in driver-vehicle interface design.
This is a logical progression from the on-board monitor first introduced on the E38.

The centralised control and display concept achieves individual adaptation of technical functions to the particular needs of the user.

The fundamental component of the Comfort Area is the Control Display and its associated operating control, the controller.

The Control Display is built into the centre of the dashboard. The controller is on the centre console, positioned ergonomically in front of the centre armrest.

All convenience functions are thus within easy reach of the driver and front passenger.

Specifically, the following controls are within the Comfort Area:

- Control Display and Controller
- Air conditioning control panel incorporating switches for hazard warning lights and centre lock
- Control panel for radio and audio cassette/MD (mini disc)/ CD (compact disc) player
- Phone board (retractable telephone key pad)

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Fig. 16: Comfort Area

Index	Description
1	Control Display
2	Air conditioning control panel with switch for hazard warning lights and centre lock
3	Control panel for radio and cassette/MD/CD player
4	Controller
5	Phone board (retractable telephone key pad)

- Controller

The controller is a development of the rotary push button principle used on the E38.

This is the central control element for all convenience functions and partial vehicle functions such as the parking brake (EMF) that are shown on the Control Display.

The controller is located in the most comfortable and ergonomic position for the user (driver or front passenger).
It is on the front end of the armrest between the driver and front passenger seats.

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Fig. 17: Controller

Development of the practice-proven rotary push button principle has provided the controller with an additional linear movement capability in the horizontal plane.

This allows the controller to be moved horizontally from its resting position (centre position), to which it always returns when released.

The 8 main menus around the edge of the Control Display are arranged in a pattern resembling the points of a compass.

This means there are 8 main directions in which the controller is moved in the horizontal plane in order to select the main menus.

Fig. 18: Control Display and Controller

Index	Description
1	Control Display (basic menu)
2	Controller directions of movement

The 8 main directions of movement of the controller are queried by an integrated switch unit. That switch unit consists of 8 individual switches. They are positioned at 45 degrees to each other.

If the controller is moved to one of the main menus (option panels) and released at that point/moved back to its centre position, the selected menu opens.

Principle of operation and connection of controller

As there is a wide variety of ways in which the controller can be held and moved, only the key movements are signalled to the user by tactile (i.e. tangible) feedback.

The positions/movements for which there is tactile feedback are:

- Centre position
- 8 main directions of movement in horizontal plane
- Clockwise/anti-clockwise rotation (with incremental divisions for selection function)
- Pressed position (confirmation function)

The tactile feedback for the centre position, the main horizontal directions of movement and the pressed position is created by mechanical means.

Only the tactile feedback for the controller rotation is generated electrically.

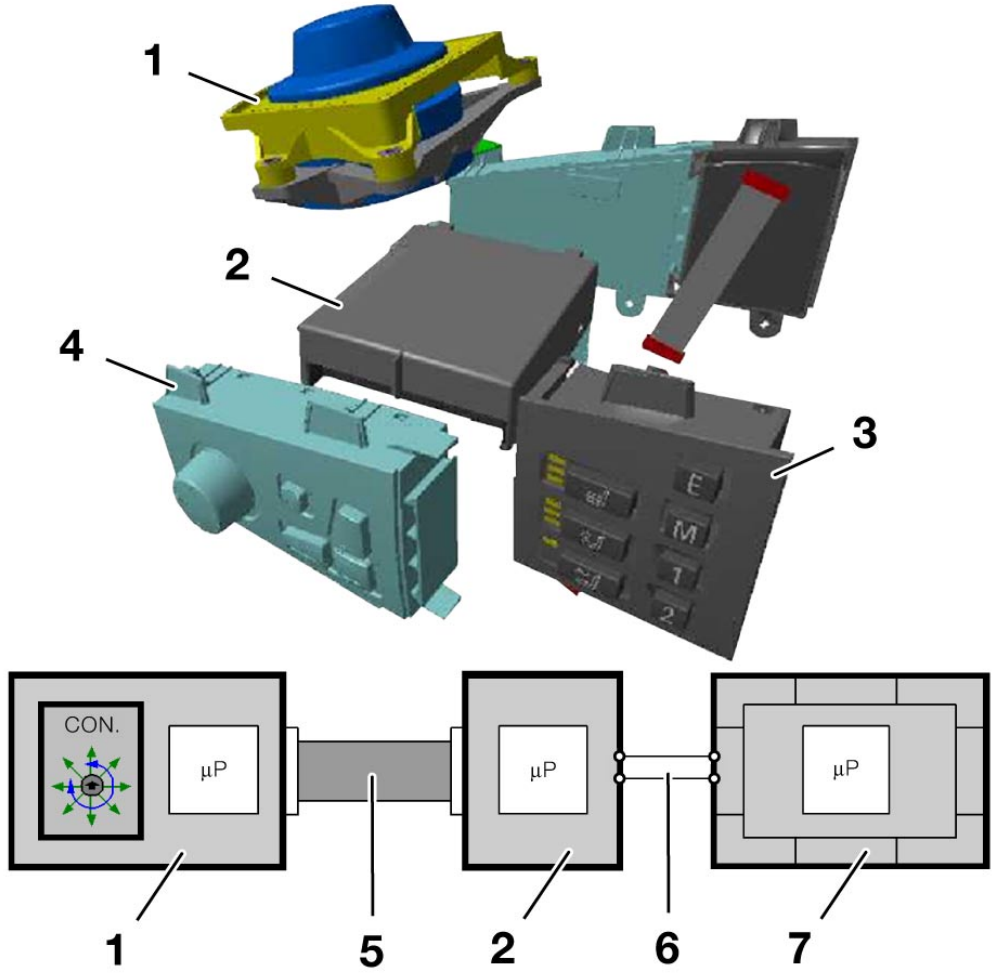

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Fig. 19: Controller connection

Index	Description	Index	Description
1	Controller	5	16-core ribbon cable
2	Centre console control panel module (BZM)	6	System K-CAN
3	Control panel unit for supplementary seat functions	7	Control Display
4	Control panel unit for seat adjustment		

The controller is connected directly to the centre console control panel module (BZM) by a 16-core ribbon cable.

The bus leads from the System K-CAN to the controller are simply looped through the centre console control panel module.

The positive and earth connections to the controller are split between three separate leads in order to keep the continuous current load at the connector within the permissible limits.

Generation of tactile feedback for controller rotation

When the controller is rotated for the purposes of selection functions it provides tactile (i.e. tangible) feedback for the user.

This is created by electrically simulating the familiar mechanical stops of a conventional rotary control.
When the Control Display is switched off, the controller rotates freely without any incremental stops.

Inside the controller there is a DC motor which is controlled by pulse-width modulation (PWM) signals.
That motor generates a rotational force opposite to the direction of rotation. That opposing force or torque is perceived by the user as a mechanical resistance.

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Fig. 20: Controller top and underside

Index	Description	Index	Description
1	Controller	3	Connector
2	16-core ribbon cable	4	Circuit board

When items on the Control Display screen are selected, there is a difference between the strength of the tactile feedback for items such as lists, function blocks or screen areas, and for end stops.

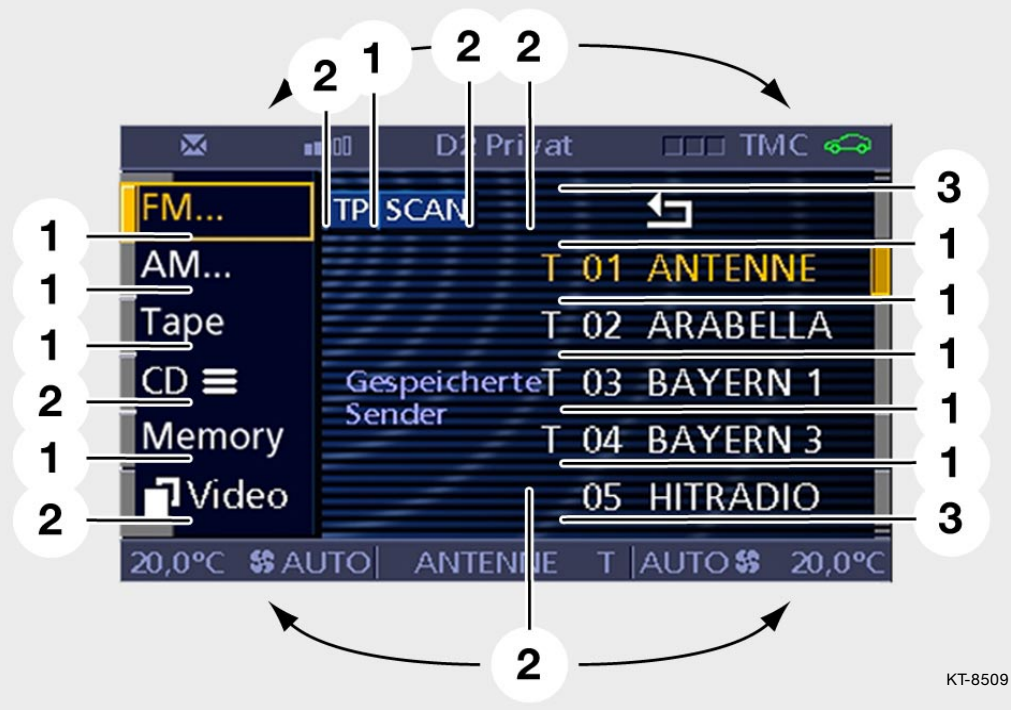


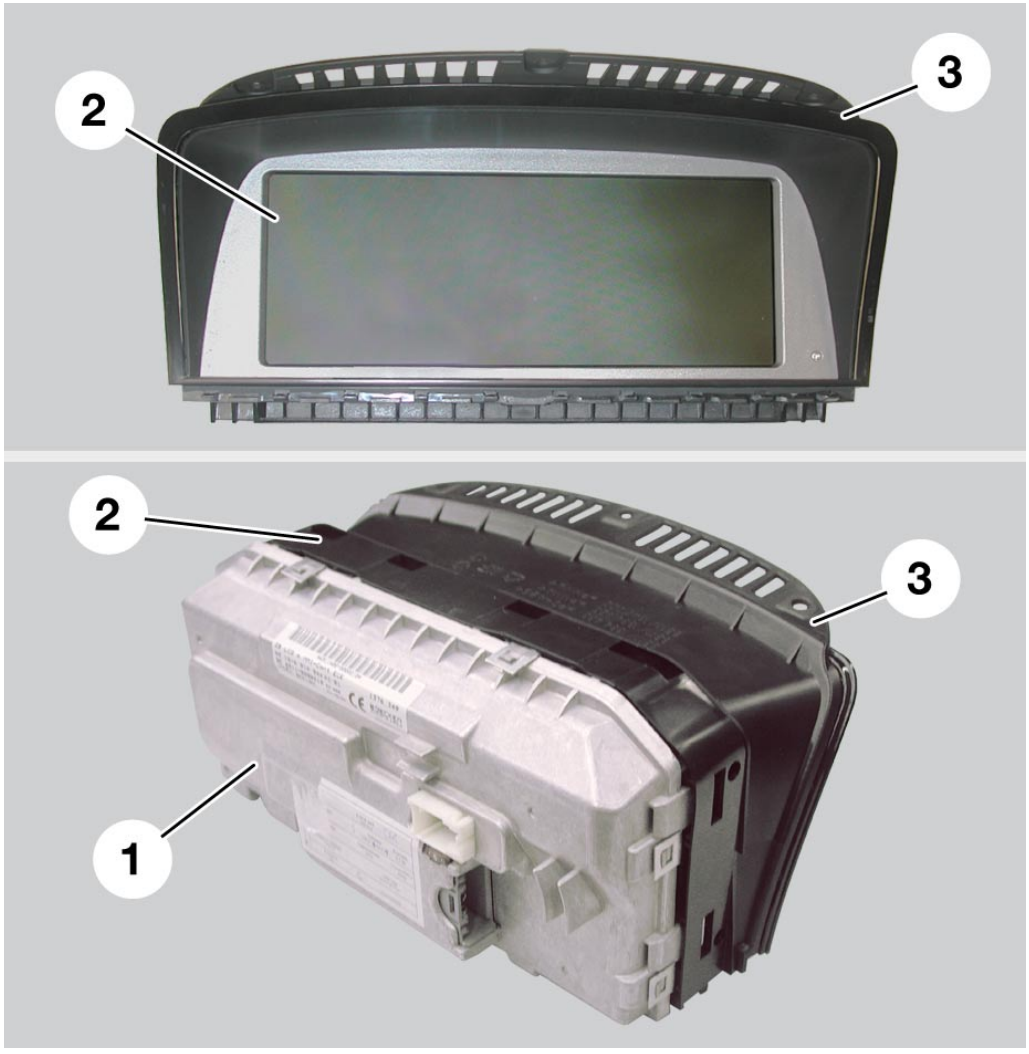
Fig. 21: Example of tactile feedback for Entertainment function

Index	Description	Index	Description
1	Normal-strength tactile feedback when moving between equivalent options	3	Maximum-strength tactile feedback when reaching the limit of a list or range of adjustment
2	Higher-strength tactile feedback when moving between function blocks or screen areas		

- Control Display

The Control Display consists of

- the metal casing with integral electronic module,
- the LCD display
- and the screen cowl with glass front.



KT-8503

Fig. 22: Control Display

Index	Description
1	Metal casing
2	LCD display
3	Screen cowl

A 16-bit processor is responsible for communication (gateway function) between the MOST and System K-CAN bus systems. It also performs the tasks of diagnosis processing and illumination dimming.

A 32-bit processor with 16 MB of RAM and a 16 MB graphics memory is responsible for display output and user guidance.

The Control Display is equipped with a Flash memory module. This means that software can be downloaded/updated via the diagnosis interface at any time.
The text and character sets for the language-specific elements of the user interface (country coded) are stored in the Flash memory.

The size of the LCD display is 8.8 inches (diagonal). A 6.5-inch display is planned as a future option.

The complete Control Display assembly is fixed to the dashboard by three screws.

The LCD display plus the screen cowl and glass cover form a detachable unit.

Notes

On the rear of the metal casing there are cooling fins.

Next to them is a 5-ampere fuse. This protects the Control Display against damage from excessive current.

Brightness control

Two cathode ray tubes built into the display casing are used for the screen backlighting.

There is also a photoelectric cell on the front of the LCD to the right of the screen for detecting the ambient light so that the screen brightness can be adjusted accordingly.

The screen brightness also responds to manual adjustment of the instrument lighting dimmer control.
To that end, the Control Display analyses a data message from the light module (LM).

KT-8504

Fig. 23: Photoelectric cell in LCD display unit

Pin assignment

The Control Display has a 12-pin and a 14-pin connector.

The 14-pin connector incorporates the connections for the MOST (fibre-optic) and System K-CAN bus systems.

The 12-pin connector provides the RGB-format (RGB = red, green, blue) video input.
The Control Display is capable of digitising analogue video signals and displaying them on the LCD screen in full-screen or split-screen mode.

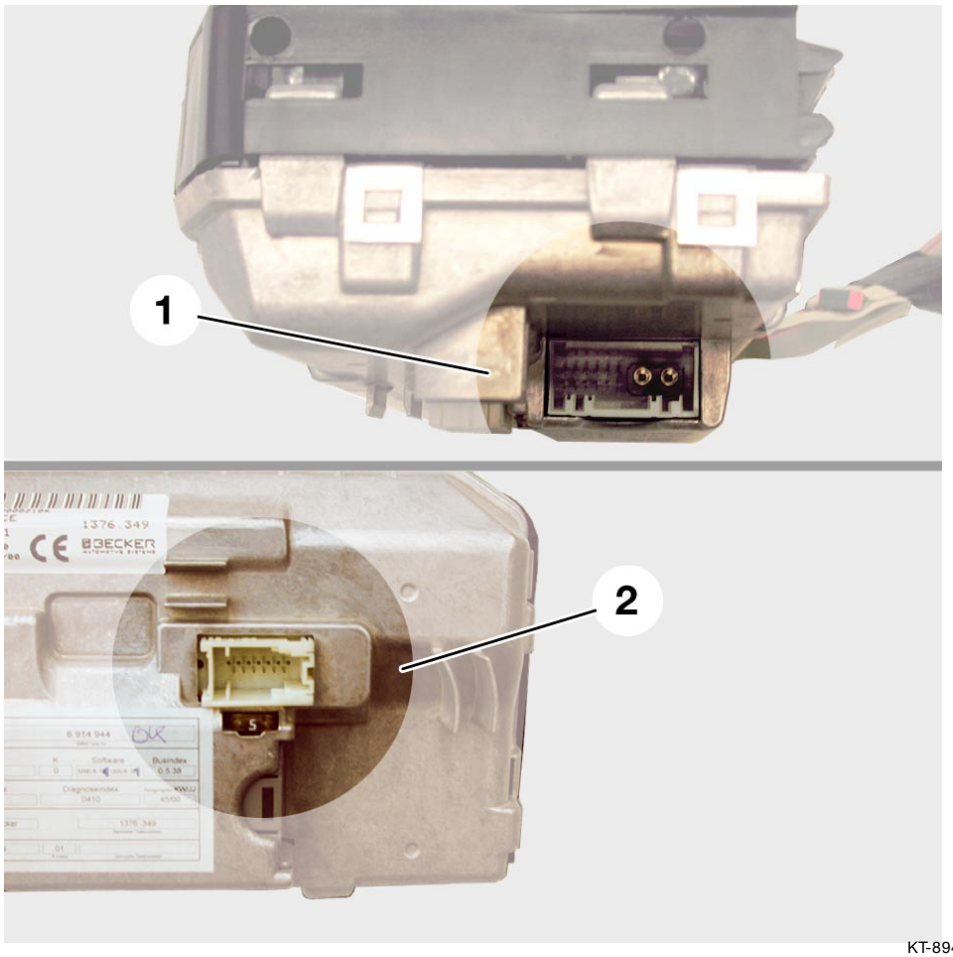


Fig. 24: Control Display connectors

Index	Description
1	14-pin connector
2	12-pin connector

Overview of bus network

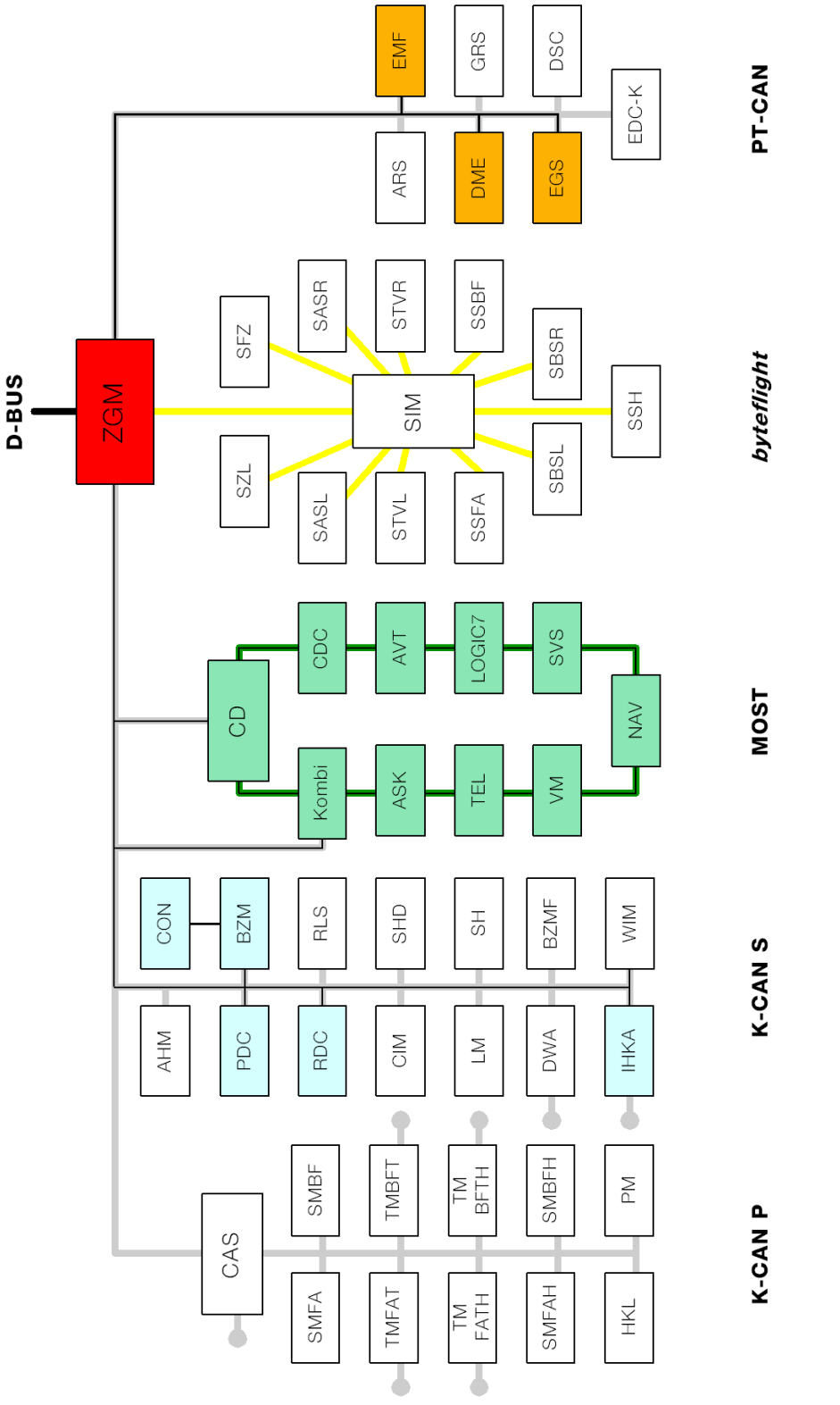


Fig. 25: Bus network

Index	Description	Index	Description
BZM	Control panel module, centre console	TEL	Telephone
CON	Controller	SVS	Voice processing system
CD	Control Display	CDC	CD changer
Kombi	Instrument cluster	ASK	Audio system controller
ZGM	Central gateway module	PDC	Park Distance Control
NAV	Navigation system	RDC	Tyre pressure checking system
AVT	Aerial amplifier/tuner	IHKA	Integrated automatic heating and air conditioning
VM	Video module	EMF	Parking brake
LOGIC7	Amplifiers	DSC	Digital stability control

The Control Display communicates via the MOST fibre-optic bus system with all other nodes on the MOST bus.

Tasks in the MOST framework

The Control Display is the so-called system master for the MOST bus. The system master holds the knowledge of the complete system and links up the individual modules into a system.

The Control Display also performs the function of power master within the MOST network.

That means that the Control Display wakes up all MOST nodes (control units). They then register with the audio system controller (= connection master, control function for establishing connection).
Once all nodes (MOST control units) have registered their presence, a message to that effect is sent to the Control Display by the ASK.
Conversely, the Control Display is also responsible for sending the MOST nodes to sleep.

The MOST bus is networked to the remaining bus systems via the System K-CAN.

In that regard, the Control Display is the gateway (interface) between the MOST and System K-CAN busses.

The instrument cluster is an exception. For safety reasons, it has a separate (redundant back-up) connection to the System K-CAN.
This ensures that in the event of failure of the MOST network, the information essential for vehicle safety such as warning lamps and speedometer reading can continue to be displayed.

The central operating control for the Control Display is the controller. The controller is connected by the System K-CAN via the centre console control panel module (BZM) to the Control Display.

The diagnosis interface for the Control Display is the central gateway module (ZGM) via the diagnosis bus.

It is possible to display selected options for various systems such as IHKA, PDC and RDC on the Control Display.

Functions

The Control Display serves as the central display unit on the E65's audio/communications network.

The controller and the Control Display can be used to operate the following functions/display the following information:

Function	information
Help	Help topics relating to the selected menu item
Entertainment	Audio, e.g. radio, cassette/CD player Video, e.g. TV (in the future DVD, teletext)
Settings	Personalised settings, e.g. car and key memory functions Local settings for time/date and units, Language for the display text Various selected options for vehicle functions, e.g. dynamic stability control (DSC), Park Distance Control (PDC)
Air conditioning	Selected options for heating and air conditioning, e.g. air distribution, auxiliary heating, auxiliary ventilation, seat heater layering
BMW Assist	BMW information service, e.g. BMW breakdown assistance, BMW information about technical offers, traffic news, online services
Communication	Telephone, e.g. phone book, SMS
Vehicle data	Vehicle-related information, e.g. on-board computer, Condition Based Service (CBS), selected Check-Control options
Navigation	Navigation system, e.g. entry of destination, route directions, utilities, route selection
Service only	Service mode, e.g. information about hardware/software versions of Control Display/MOST control units

- Control Display layout

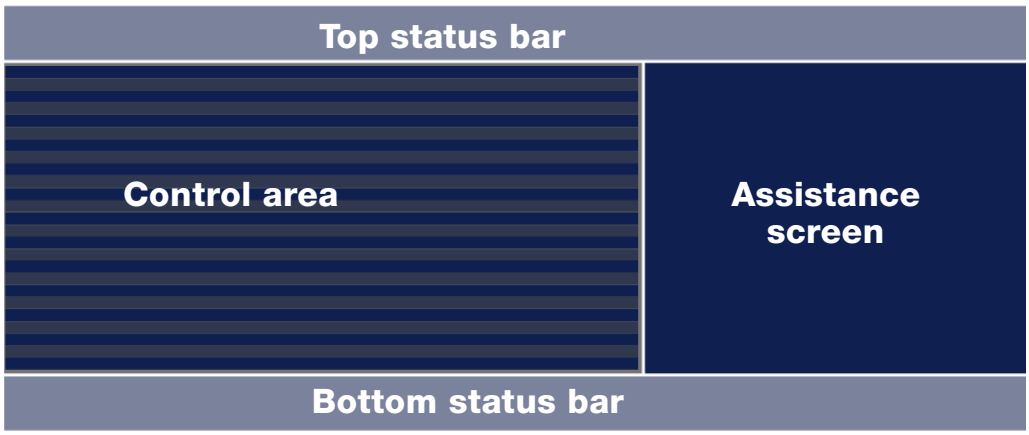
The 8.8" screen with a resolution of 640 x 240 pixels (width x height) can be subdivided into four areas.

The area on the left between the two status bars is the control area in which the options of the selected main menu (e.g. Entertainment) are displayed and selected.

The area on the right is the assistance screen. This is where individually selected functions from the "Vehicle Data" menu such as check control messages,
or the route display for the navigation system,
or the Quick Info Help topics
are displayed.

The two status bars permanently display the status of the most important functions such as outside temperature or time.

The top and bottom status bars extend across the assistance screen.

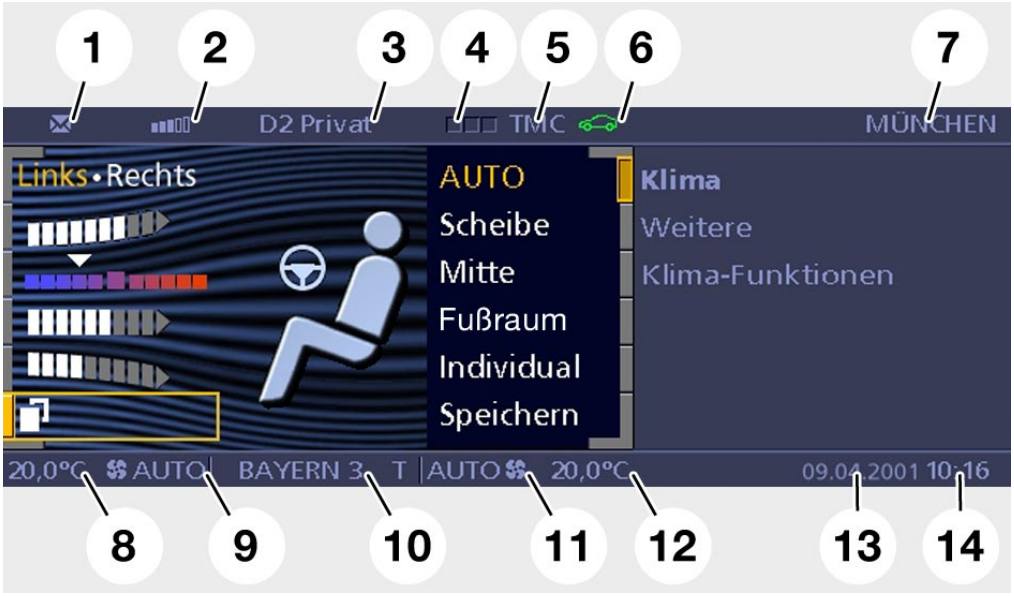


KT-8510

Fig. 26: Control Display areas

The status bars

The status of the most important functions operated by means of the Control Display are indicated permanently on the top and bottom status bars once the ignition is ON.



KT-8522

Fig. 27: Top and bottom status bars

Index	Description	Index	Description
1	Unread text message (SMS)	8	Set temperature for left interior zone
2	Telephone signal strength	9	Ventilation for left interior zone
3	Name of telephone network or phone number dialled or phone number of incoming call	10	Entertainment system status (radio, cassette, CD, MD, TV)
4	Telephone status, e.g. green = On or outgoing call, red = No network	11	Ventilation for right interior zone
5	TMC (Traffic Message Channel) or VI+ (traffic news) activated	12	Set temperature for right interior zone
6	Vehicle status (Check Control and Condition Based Service)	13	Date
7	Destination when route directions active	14	Time

The basic menu

Whenever the electrical system status is at least Terminal 15, the basic menu is activated.
It is also always displayed when the electrical system status changes.

The basic menu shows a graphical representation of the controller in the centre with arrows indicating its directions of horizontal movement for selecting any of the 8 main menus arranged around the edge.
To the right is the assistance screen.

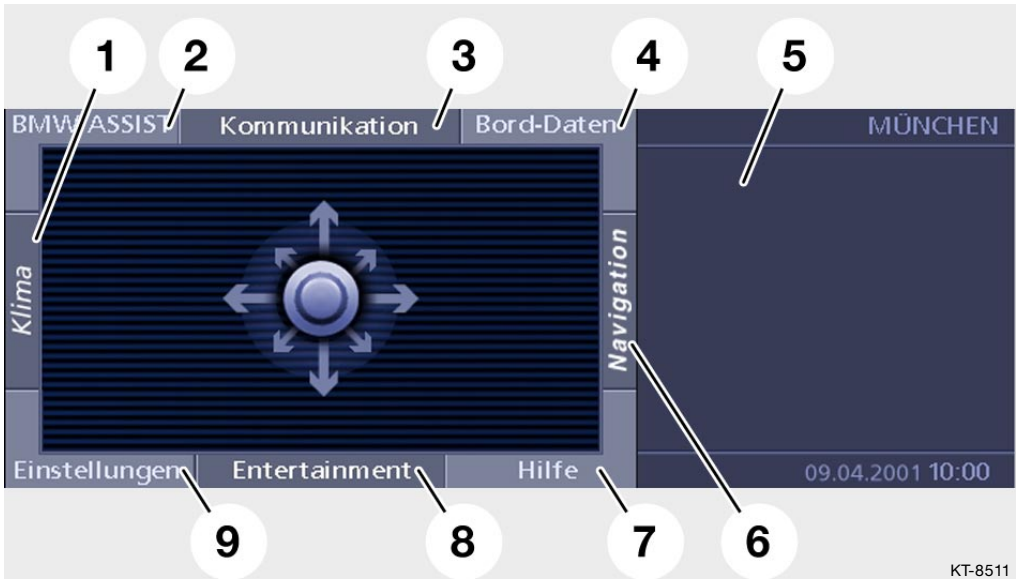


Fig. 28: Basic menu

Index	Description	Index	Description
1	Air conditioning	6	Navigation
2	BMW Assist	7	Help
3	Communication	8	Entertainment
4	Vehicle data	9	Settings
5	Assistance screen		

The basic menu is located behind the currently selected menu as the 9th menu and it is reached by shifting the controller again towards the current main menu.

Pressing the controller when the basic menu is active switches off the Control Display. However, the bottom status bar showing the status of the air conditioning, entertainment system, time and date remains visible.

When the Control Display is switched off, pressing the controller or moving it horizontally switches the Control Display on.
If the controller is moved in the direction of one of the main menus, this not only switches the Control Display on, it also opens the menu concerned.

The following actions also cause the Control Display to switch on:

- Display of a high-priority message box, e.g. a check control message such as "Engine oil pressure too low"
- Operation of the PDC (Park Distance Control) switch
- An incoming/outgoing telephone call or operation of the Send/End button on the MFL/Phone Board.

Note:

All Control Display screenshots are from a simulation and represent the stage of development at the time of going to print. Subsequent alterations to content and layout are possible.

Help system

There is a help system for using the 8.8" Control Display. It is activated by moving the controller towards the bottom right ("south west") to the "Help" menu.

The help is in the form of quick information.
The help provides explanations of the selected menu options.
When the help is activated, context-related explanations appear on the assistance screen according to the position of the highlight (yellow selection border).
The help is activated by selecting the "Quick Info" button with the controller and then pressing the controller to confirm the selection.

If the on-board computer or the navigation system road map is displayed on the assistance screen, the Quick Info is automatically deactivated.
It can be reactivated via the menu "Help."

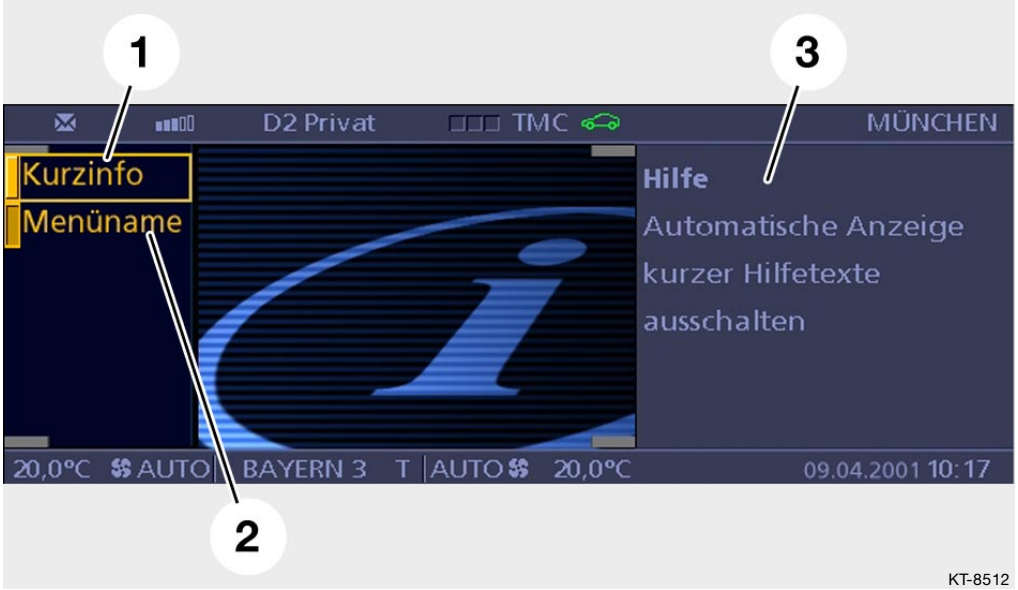


Fig. 29: Help

Index	Description	Index	Description
1	Quick Info	3	Help text on assistance screen
2	Menu name		

If "Menu name" is deactivated, touching the controller briefly in a horizontal direction no longer highlights the menu button but instead switches directly to the menu (does not happen if the controller is held in deflected position for more than 1 second).

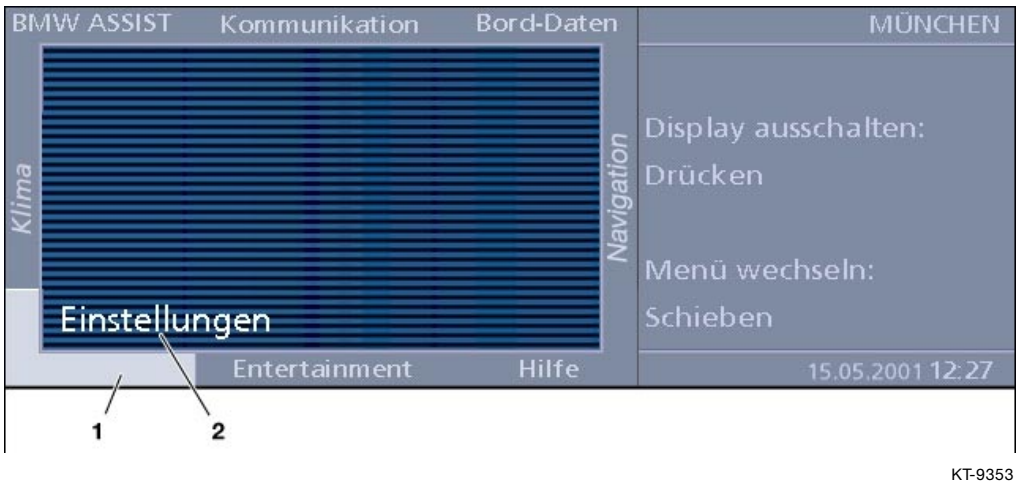
Menu selection with "Settings" as an example

(bottom left = south-west)

KT-8961

Fig. 30:

As soon as a certain degree of deflection of the controller in a particular direction is detected, a graphical indication of the movement is displayed.



KT-9353

Fig. 31: Selected main menu, example "Settings"

Index	Description	Index	Description
1	Visual highlight	2	Name of main menu

The button for the selected menu is visually highlighted and the menu name displayed in the control area. This applies only if the function Menu Name has been activated in the Help system or if the controller is held in the deflected position for more than 1 second.
For the practised user, the no-highlight setting can be selected. In the basic menu, the highlight setting always applies.

Releasing the controller or returning it to the centre position executes the menu selection and the selected menu is then displayed on the Control Display.

Note:

If a menu is selected unintentionally (e.g. "BMW ASSIST" instead of "Settings"), this can be corrected very easily.
Since the movement of the controller is not restricted by a rigid "gate", the individual menus can be selected successively by moving the controller around in a circle.

If the controller is in the centre position, the menu corresponding to the last direction it was moved in is displayed.
In our example, "Settings."

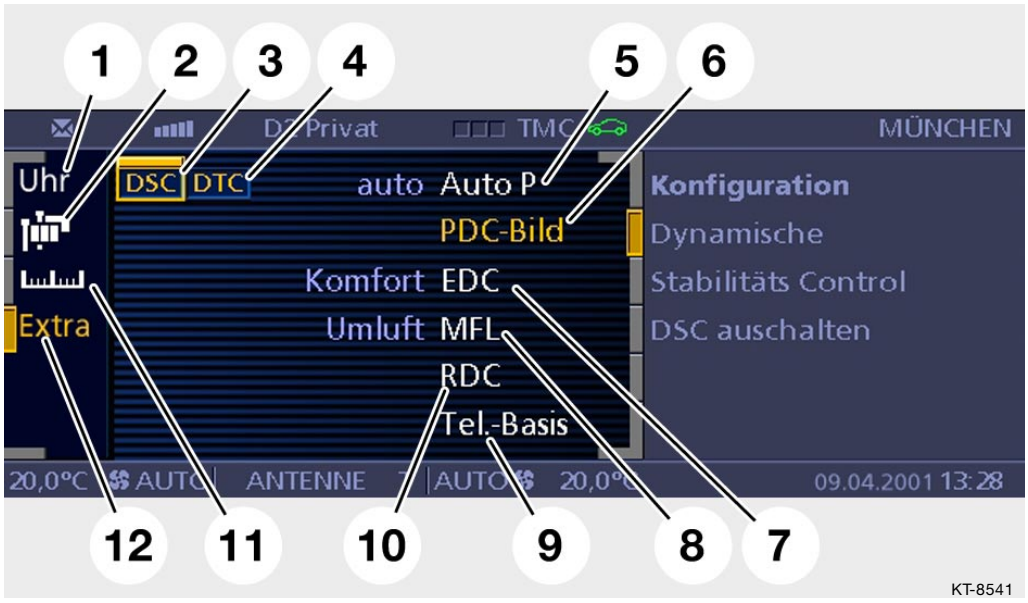


Fig. 32: "Settings" menu

Index	Description	Index	Description
1	Time/date/reminder settings	7	Electronic Damping Control options "Sport" and "Comfort"
2	Display language setting	8	Assign function to programmable-function button on MFL
3	Activate/deactivate DSC	9	Activate/deactivate phone (cordless handset)
4	Activate/deactivate DTC	10	Activate RDC (tyre pressure control)

Index	Description	Index	Description
5	Activate/deactivate automatic application of parking brake (EMF)	11	Display units setting
6	Activate/deactivate PDC (Park Distance Control) graphic	12	Extra settings (see right hand side of current screen display, items 5 to 10)

Notes

- Service mode

The controller can be used to gain access to Service mode functions.

Service mode is a special facility which provides information about the status of the display and user control system.
It is designed for use by service technicians and is not intended to be accessible to vehicle owners.

Service mode provides access to details of the hardware/ software versions for the control display and the control units in the MOST network, for example.

As an addition to the comprehensive facilities of the diagnosis system, Service mode acts as a a simple means of quickly accessing diagnostic data without the need for a diagnosis tester.

Starting Service mode

- In the basic menu display, press and hold the controller (this generates the tactile feedback)
- Turn controller 3 increments clockwise
- Turn controller 3 increments anti-clockwise
- Turn controller 1 increment clockwise
- Turn controller 1 increment anti-clockwise
- Turn controller 1 increment clockwise
- Press controller to confirm

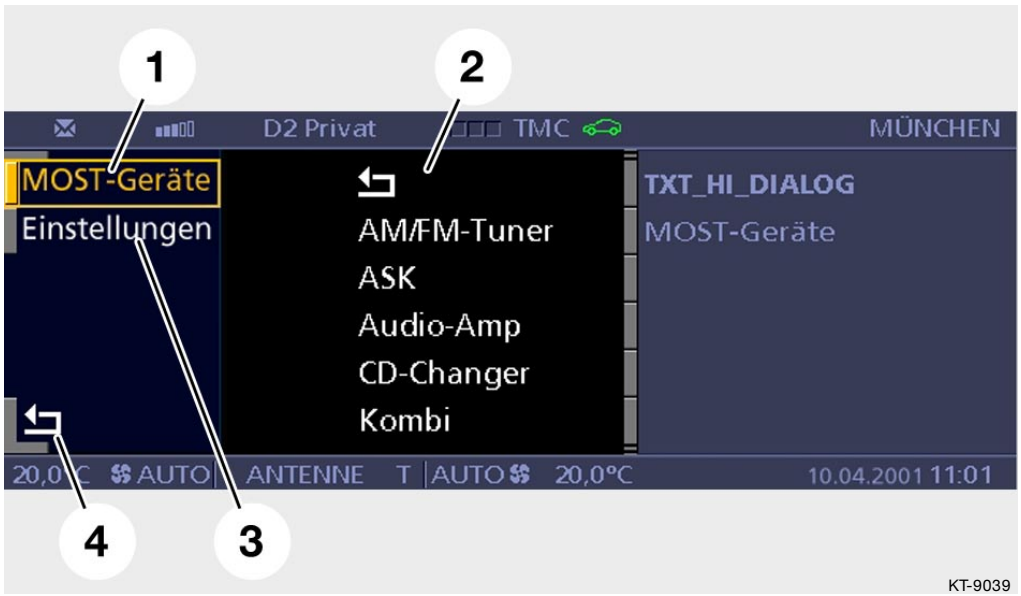


Fig. 33: "Service mode" menu

Index	Description	Index	Description
1	MOST devices	3	Settings
2	List of MOST network nodes, e.g. AM/FM tuner, ASK, audio amp, CD changer, instrument cluster	4	"Back" button

Note:

The Control Display knows how many MOST nodes there are, i.e. how many MOST chips there are on the MOST ring bus. When retrieving the list of MOST control units fitted, the Control Display waits for a response from each MOST node. Normally, every control unit on the MOST bus contains a MOST chip. However, the navigation system control unit has two internal MOST chips. The query which produces the list of MOST control units is answered by only one of the MOST chips in the navigation system control unit. The responding MOST chip is represented as "Navigation" and the other MOST chip as "wait." This entry is not an error, but conversely cannot be suppressed.

The function "MOST devices" provides a list of all nodes on the MOST network.
When a control unit is selected, a scrollable list detailing the following information appears:

information
Part number
Hardware number
Coding index
Diagnosis index
Variant index
Date of manufacture
Manufacturer number
Message catalogue version
Software version
Operating system version

The function "Settings" provides access to the following service settings:

- Reset all car and key memory functions to default settings (Master default)
- Activate/deactivate audio system RDS (Radio Data System) function
- Register/deregister cordless handset (SBDH)

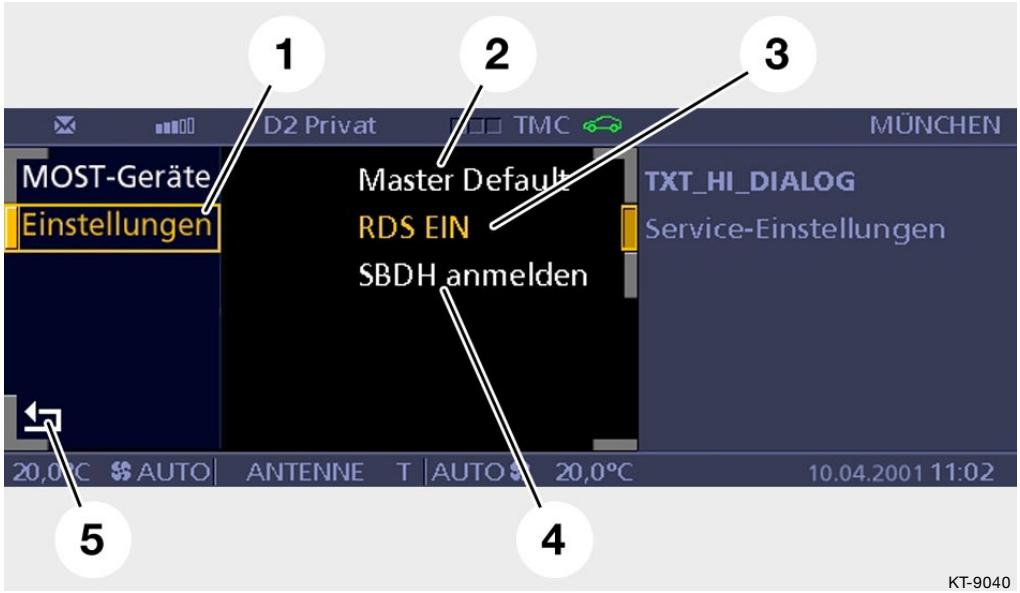


Fig. 34:

Index	Description	Index	Description
1	Settings	3	Activate/deactivate RDS
2	Master default	4	Register/deregister SBDH

Service mode is exited by selecting the "Back" button (arrow symbol) at the bottom left of the display or by moving the controller horizontally.