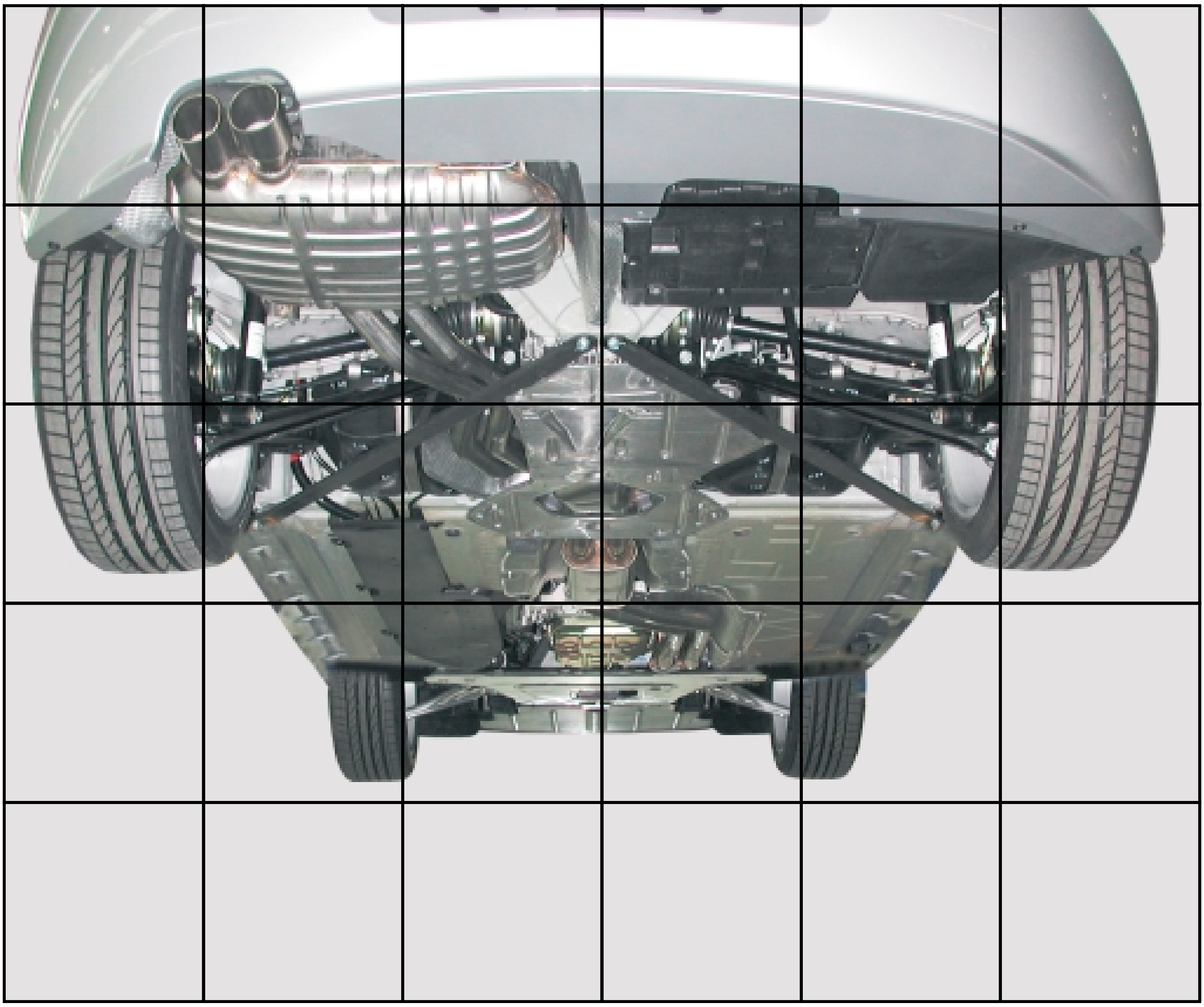
BMW
Service Training

E85 Chassis
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_0400-0460

Contents

E85 Chassis

Introduction

The E85 chassis and suspension is based on the E46 chassis and suspension.

The service brake with pedal assembly, brake hydraulics and brake calipers is essentially the same as the E46 service brake. Because of the widened track, the E85 has been given new brake discs with a different pot depth on the rear axle.

In the USA, the function of Brake Force Display (the brightness of the brake lights is regulated as a function of deceleration) is offered.

Front axle

The front axle for the E85 has been taken over from the E46. Steel transverse control arms are used only in cars fitted with the M54B22 engine and the GS5-20BG manual gearbox.

Rear axle

The rear axle for the E85 is very similar to that of the E46. The roadster-adapted kinematics has resulted in several detail modifications:

- The track width has been widened by 30 mm.

- A reinforcement plate has been introduced to increase rigidity.

- The rubber bearings on the axle bracket and on the trailing-arm bearings have been made harder.

- The brake hoses and the signal cables for the brake-lining wear sensor and for the wheel-speed sensors are now routed on and underneath the trailing arms.

- New mountings have been introduced on the trailing arms to facilitate routing of the brake hoses and the signal cables.

Springing/damping

The spring/damper set is the same in principle as that of the E46.

- On the front axle, spring struts with coil springs and gas-pressure dampers are used.

- On the rear axle, barrel springs and gas-pressure dampers are installed separately.

- Ride levels are 10 mm lower compared with the E46.

- Compared with the E85 standard suspension, ride levels of the sports suspension are a further 15 mm lower.

Steering

BMW is deploying for the first time an EPS steering system (Electric Power Steering), which is described in a separate chapter.

Wheels/tyres

The E85 is fitted as standard with runflat tyres (RFTs) and a Tyre defect indicator (RPA). Both are described in a separate chapter.

Cars with M54B22 and M54B25 engines are fitted as standard with 16 inch wheels. Cars with M54B30 engines are fitted as standard with 17 inch wheels.

In addition to the 2 standard wheels, 5 assorted wheel stylings are available as options:

- 1 optional styling for 16 inch wheels
- 2 optional stylings for 17 inch wheels
- 2 optional stylings for 18 inch wheels

Brakes

Introduction

The service brake (pedal assembly, brake hydraulics and brake calipers) is in principle the same as the service brake of the E46. On the rear axle, the E85 has been given new brake discs with a different pot depth on account of the widened track.

The actuating unit of the parking brake is a new development. A mounting pan flanged to the floorpan accommodates an automatic cable adjuster with right/left cable equalization.

New features

What has been newly designed is the actuating unit of the parking brake with an automatic cable adjuster.
A further innovation is right/left force equalization of both cables.

System overview

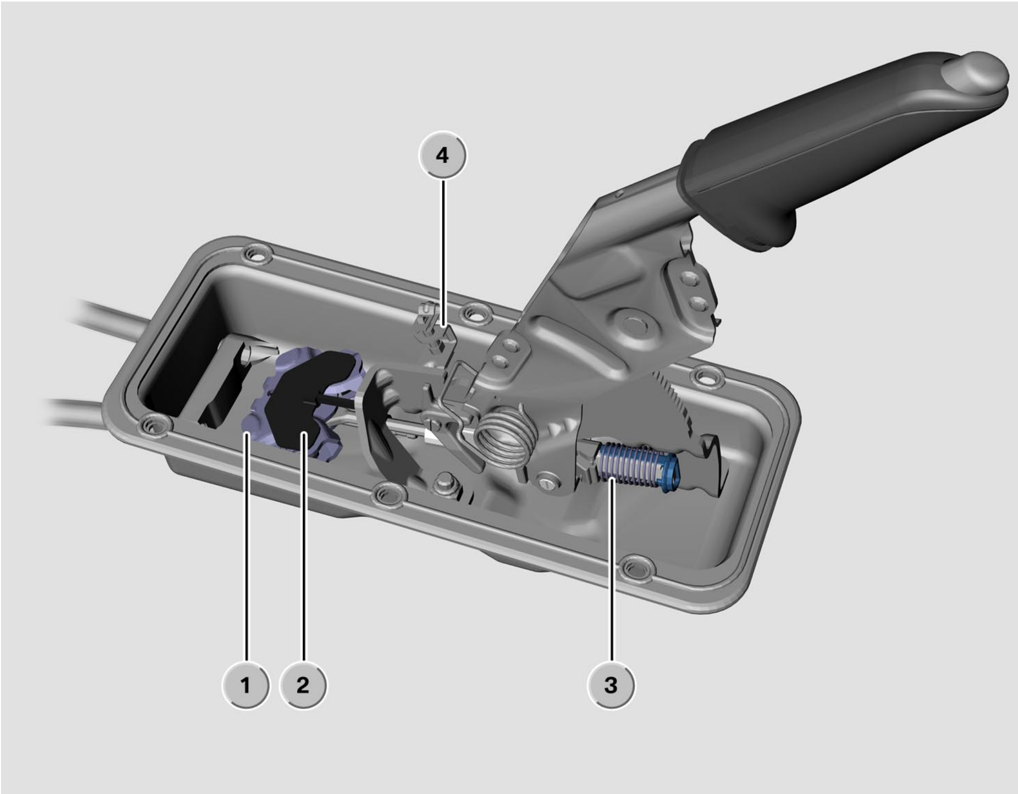


Fig. 1: Parking-brake actuating unit without cables

Index	Explanation	Index	Explanation
1	Balance arm	3	ASZE unit
2	Mounting clip	4	Parking-brake warning witch

Components

The parking-brake actuating unit consists of the following components:

- Mounting pan
- Automatic cable adjuster (ASZE unit)
- Balance arm with mounting clip (cable mount)

Mounting pan

The mounting pan is flanged from below to the reinforcing plate of the parking-brake compartment. The reinforcing plate of the parking-brake compartment is secured to the left and right tunnel end sections.

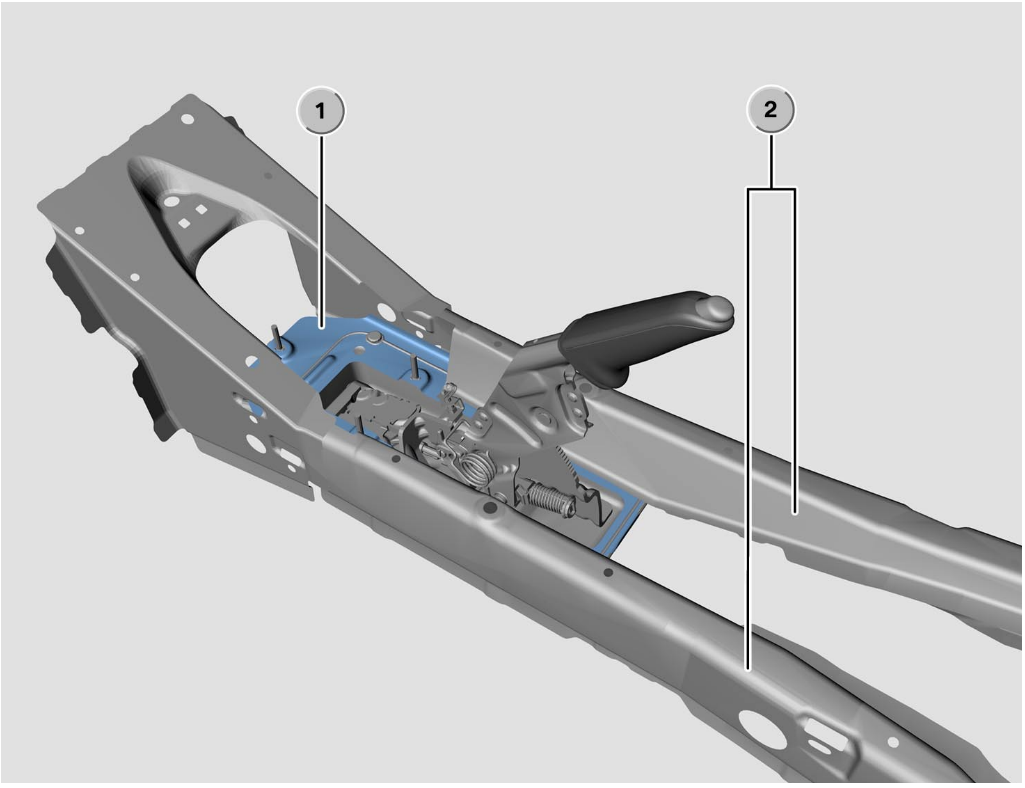


Fig. 2: Location of mounting pan with actuating unit KT-9889

Index	Explanation
1	Reinforcing plate of parking-brake compartment
2	Left and right tunnel end sections

The mounting pan contains all the mechanical components of the parking-brake actuating unit.
The cable guide tubes are permanently connected to the mounting pan. The cables are routed through the guide tubes to the balance arm.

The handle is attached to and locked in place on the parking-brake lever. The handle cannot be removed without it being destroyed.

Automatic cable adjuster (ASZE unit)

The automatic cable adjuster (ASZE unit) is located in the mounting pan.

The ASZE unit consists of:

- Cable tensioning spring
- Rack extension
- Locking clip and hook

The ASZE unit holds both cables under uniform tension via a balance arm. Wearing of the duo-servo brake shoes is not compensated by the ASZE unit!

The possible positions of the automatic cable adjuster are shown in the following illustration.

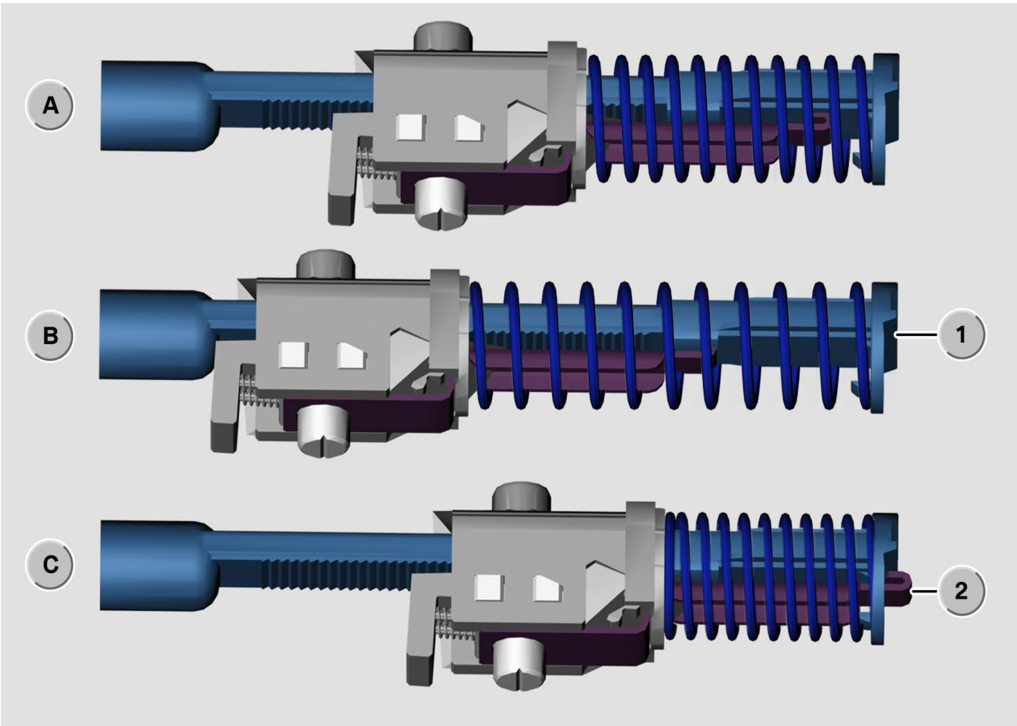


Fig. 3: Positions of ASZE KT-9890

Index	Explanation	Index	Explanation
A	Operating position	1	Locking clip
B	Position in case of a cable break	2	Locking hook
C	Mounting position (locked)		

The operating position of the automatic cable adjuster is represented by position A.

If there is a cable break, the automatic cable adjuster is in position B. The tensioning spring is in the most untensioned position.

Balance arm with mounting clip (cable mount)

The balance arm with the mounting clip is located in the mounting pan of the actuating unit.

The balance arm acts as a force-equalizing device and ensures the uniform distribution of the actuating force to the 2 cables.
The cables no longer have to be adjusted.
The mounting clip locks the cables in the balance arm.

The mounting clip prevents the cable ends from being forced out of the balance arm while the cables are connected to the expander locks in the duo-servo brakes.

- Notes for Service

Removing cables

In order to change the cables, it is necessary for the mounting pan to be removed downwards or detached to such an extent that the balance arm can be reached for disconnecting and connecting the cables. For this purpose, the propeller shaft must be removed beforehand.
The parking-brake lever must be in the released position and the ASZE unit must be locked.

For the cables to be removed, the parking-brake lever **must** be in the released position.

For the cables or the duo-servo brakes shoes to be changed, the ASZE unit must be locked.

A screwdriver must be used to press back the locking clip of the tensioning spring until the locking hook engages the locking clip of the tensioning spring (position C). In position C the tensioning spring is pretensioned to maximum effect and the balance arm with the cables is in the maximum released setting.

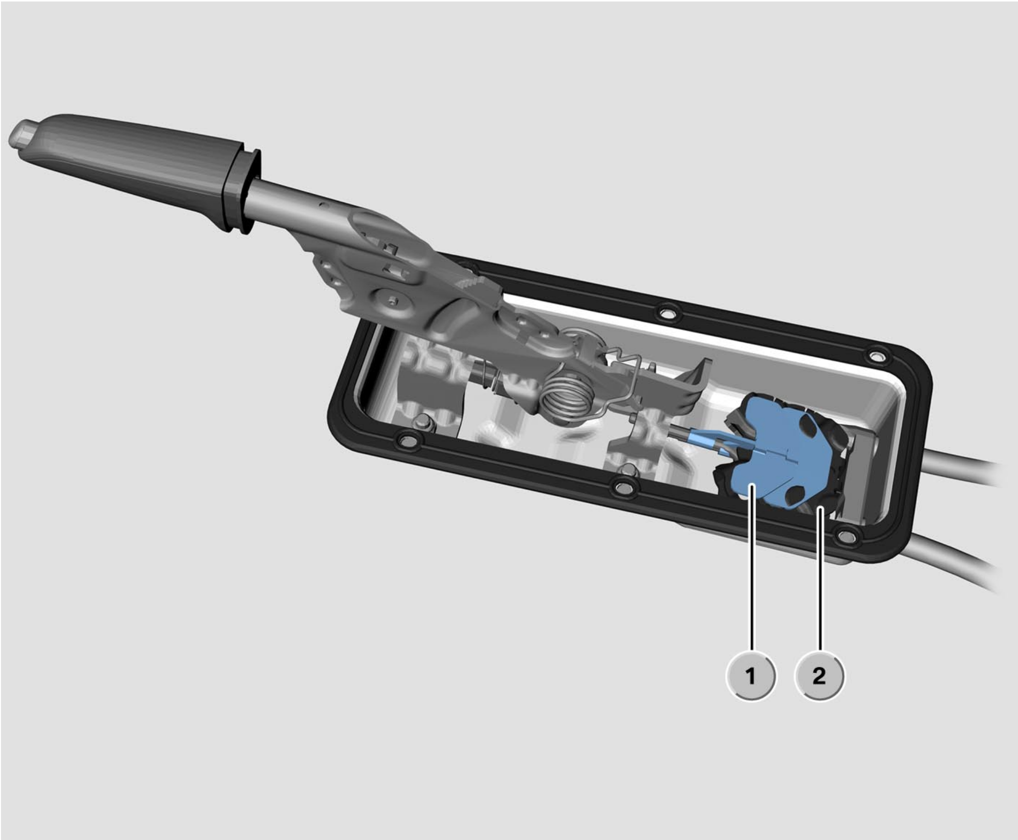


Fig. 4: Balance arm with mounting clip

Index	Explanation	Index	Explanation
1	Mounting clip	2	Balance arm

The cables are disconnected from the balance arm (2) in the actuating unit. To be able to disconnect the cables, it is necessary to remove the mounting clip (1).

The cables can now be disconnected from the duo-servo brakes.

Installing cables

For the cables to be installed, the parking-brake lever must be in the "released" position. The cables do not automatically feed themselves into the balance arm on insertion but rather must be guided with a screwdriver into the correct position.

To secure the cables in the balance arm (2), it is necessary to attach the mounting clip (1).

The mounting pan can be resecured in its installation position.

The cables are connected to the duo-servo brakes.

Adjustment

The basic clearance of the duo-servo brake is adjusted at the adjusting screw of the duo-servo brake shoes.
The parking brake is automatically adjusted when the ASZE unit is unlocked.

The pretension of the tensioning spring is relieved at the automatic cable adjuster with a screwdriver by levering the locking hook out of the locking clip.

The parking-brake lever can be tightened in a low notch setting for this procedure. This makes it easier to access the locking hook. When the locking hook is released, the automatic cable adjuster returns to the operating position. The cables are retensioned.

E85 Electric Power Steering (EPS)

Introduction

Electromechanical "power steering" is being deployed for the first time in the BMW Z4.

The EPS consists of three component groups:

- Upper steering column assembly
  (including electric motor, control unit and worm gear)
- Lower steering spindle
- Steering gear and rack

The crucial component group, the upper steering spindle assembly, together with the electric motor and a worm gear ensure power-assisted steering.

The steering effort is transmitted via the lower steering spindle to a mechanical steering gear, which influences the steering angle by way of the steering track rods.

EPS assists on a speed-dependent basis and performs active steering-wheel resetting.

The EPS in the Z4 is designed as a very direct, sporty form of steering. The driver can also use the driving-dynamics control (FDC) button to select between standard and sport modes, which among others brings influence to bear on the steering characteristic.

EPS operates without hydraulic components (pump, reservoir, cooler, pipes, hydraulic fluid) and is thus a dry, environmentally compatible system.

- Advantages

Improved driving dynamics

- Good steering qualities through direct transmission of steering effort
- Active steering-wheel resetting (centring)
- Switchable steering characteristic (sport mode)
- Use of lightweight sports steering wheels (weight saving of 1 kg compared with other steering wheels)

Increased driving comfort

- Isolation of axle vibrations while retaining the communication of relevant road-surface information (different road-surface conditions) to the driver
- Better screening of road defects, reduced bumping
- Controlled, speed-dependent steering-effort support (e.g. when parking and driving on motorways)

Increased driving safety

- EPS facilitates at high speeds, through lower steering-effort support, an almost direct connection to the steering track rods and conveys directly the road-surface information
- Speed-dependent steering-effort support facilitates active damping of left/right rolling

Reduced environmental pollution

- Fuel economy of approx. 0.23 l/100 km
- No leak problems since the system is "dry"

System overview

- EPS bus overview

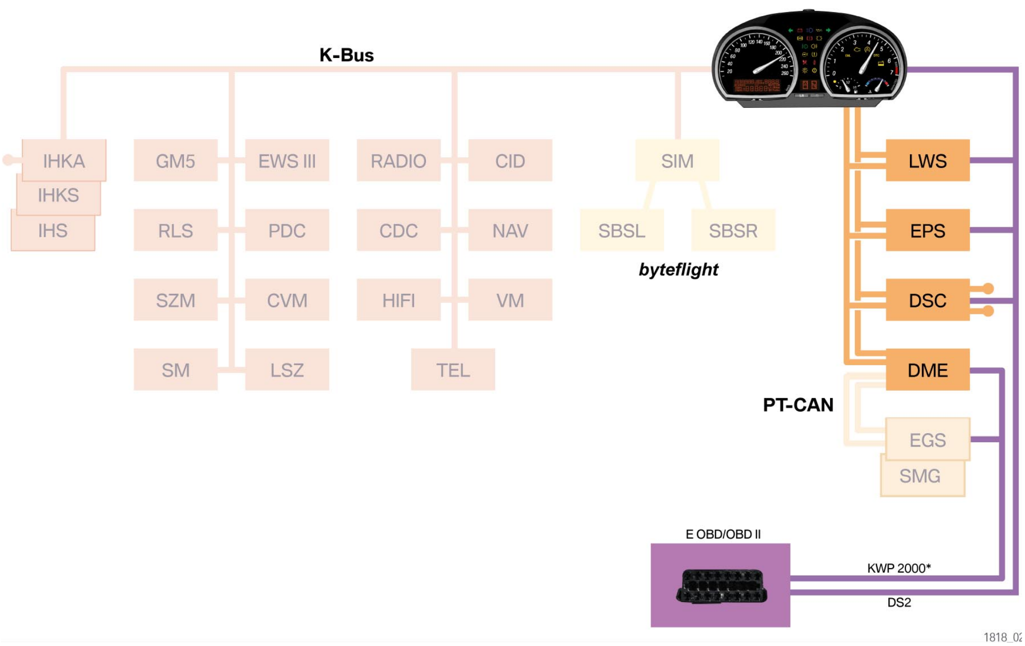


Fig. 5: E85 EPS electrical system

Index	Explanation	Index	Explanation
CDC	CD changer	LWS	Steering-angle sensor
CID	Central Information Display	NAV	Navigation computer
CVM	Soft-top module	PDC	Park Distance Control
DME	Digital Motor Electronics	RADIO	Radio
DSC	Dynamic Stability Control	RLS	Rain/light sensor
EGS	Electronic transmission control	SBSL	Satellite, B-pillar, left
EPS	Electric Power Steering	SBSR	Satellite, B-pillar, right
EWS III	Electronic immobilizer	SIM	Safety and Information Module
GM5	General module 5	SM	Seat module
HiFi	Top hi-fi amplifier (DSP)	SMG	Sequential Manual Gearbox
IHKA	Integrated heating and automatic air conditioning	SZM	Centre-console switch centre
IHKS	Integrated heating and A/C control	TEL	Telephone control unit
IHS	Integrated heating control	VM	Video module
LSZ	Light switch centre		

- EPS input/output signals

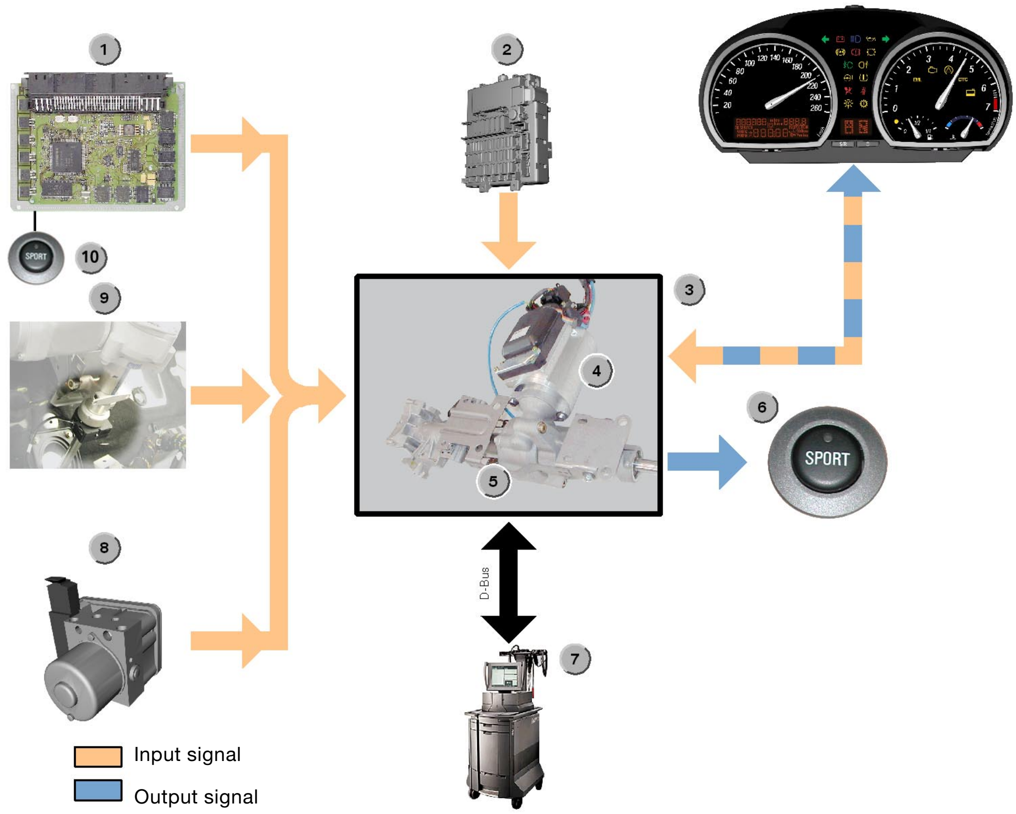


Fig. 6: EPS system overview with input/output signals

Index	Explanation	Index	Explanation
1	MS45.0 engine management	6	FDC button (function lighting)
2	Current distributor	7	DISplus/GT1
3	Upper steering column with servo unit	8	DSC module
4	Internal sensor for electric-motor speed	9	Steering-angle sensor
5	Internal sensor, steering torque	10	FDC button (function request via DME)

- EPS system schematic

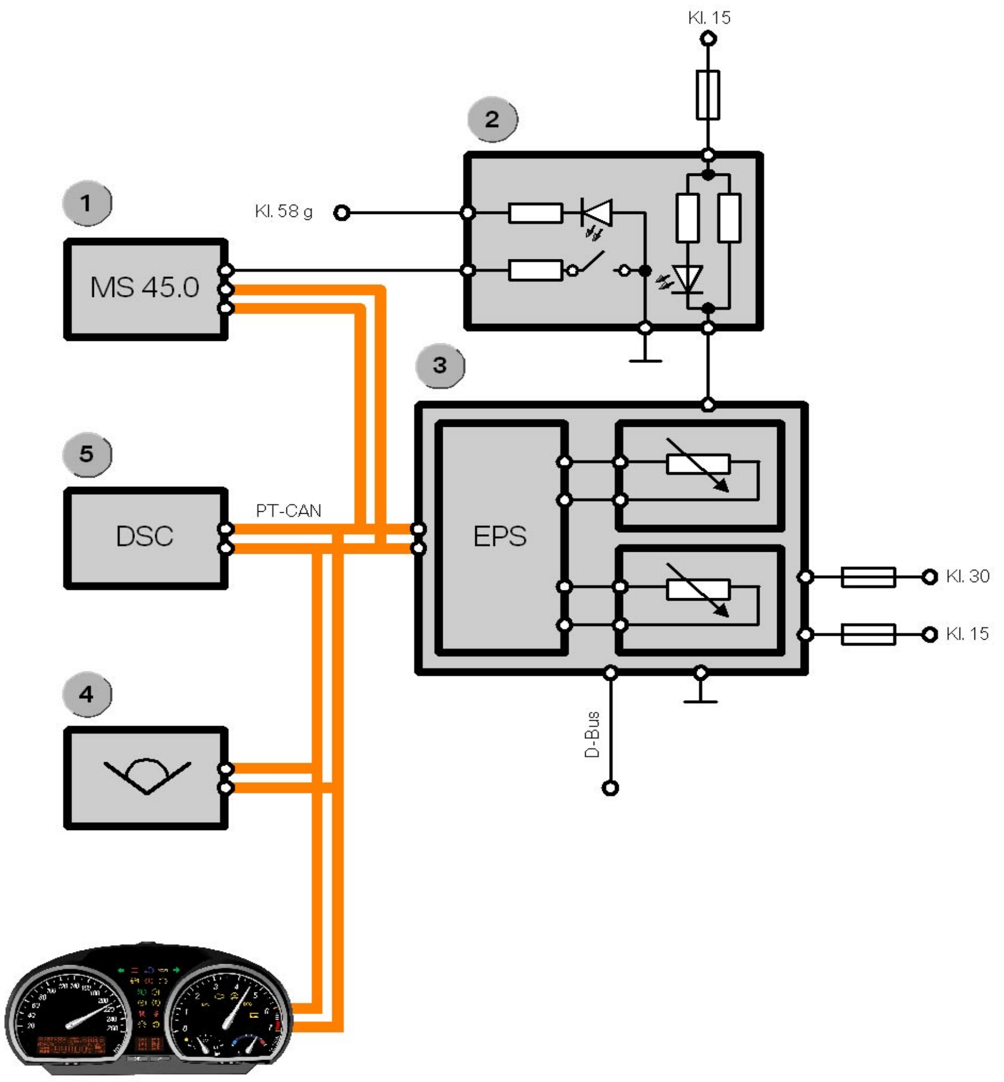


Fig. 7: EPS system schematic

Index	Explanation	Index	Explanation
1	MS45.0 engine management	D-Bus	Diagnosis bus
2	FDC button with function lighting	Kl. 58 g	Locating light
3	EPS servo unit with control unit, steering-torque and EPS engine-speed sensors	Kl. 15	Terminal 15
4	Steering-angle sensor	Kl. 30	Terminal 30
5	DSC control unit	PT-CAN	CAN bus, Powertrain
EPS	EPS control unit		

Components

The EPS system can be divided into 3 component groups:

- Upper steering column assembly
- Lower steering spindle
- Steering gear with rack

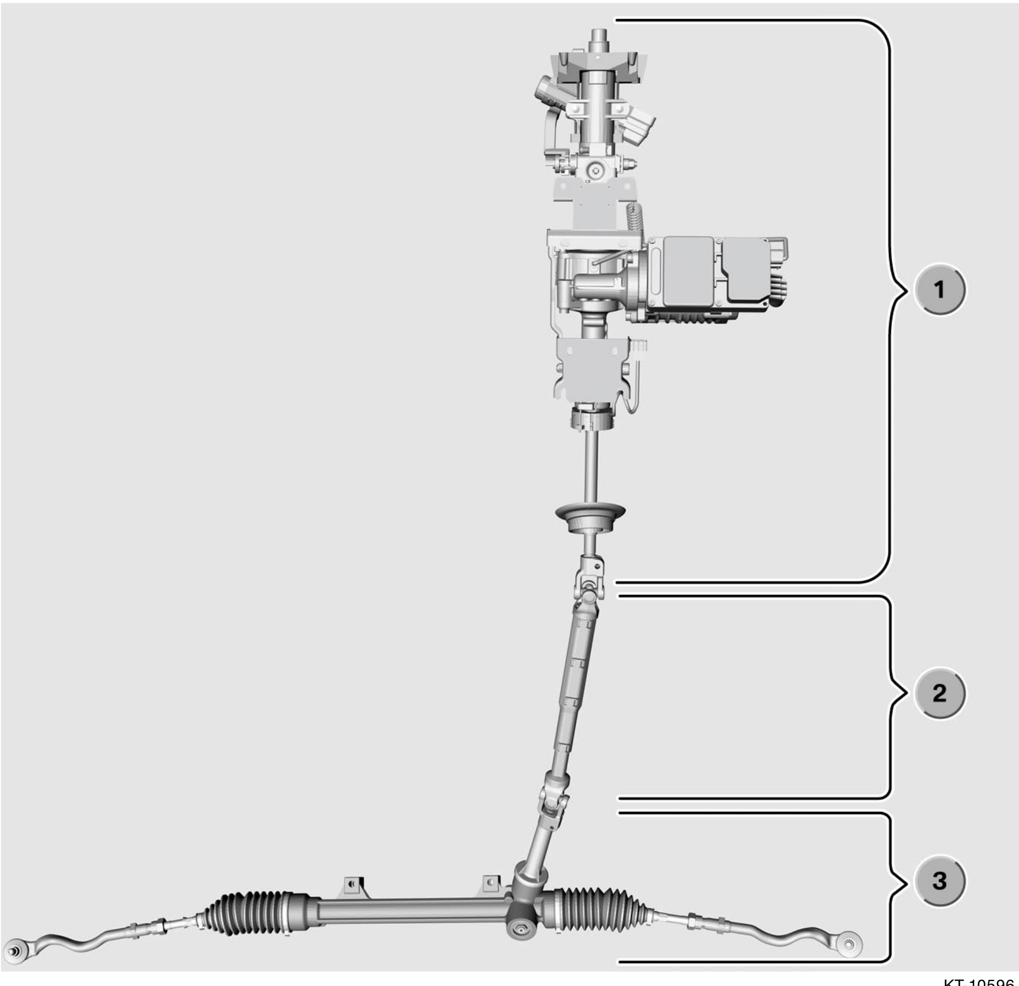


Fig. 8: EPS component groups

Index	Explanation	Index	Explanation
1	Upper steering column assembly	3	Steering gear with rack
2	Lower steering spindle		

- Upper steering column assembly

The upper steering column assembly consists of the mechanical section, the upper steering column, and the electrical section, the servo unit.

Mechanical upper steering column

The mechanical section starts at the steering wheel and ends at the connection to the lower steering spindle.

The upper steering column is secured by 4 screws to a holder, which is welded to the supporting tube of the instrument cluster. The holder of the supporting tube is secured by 4 screws to the body.

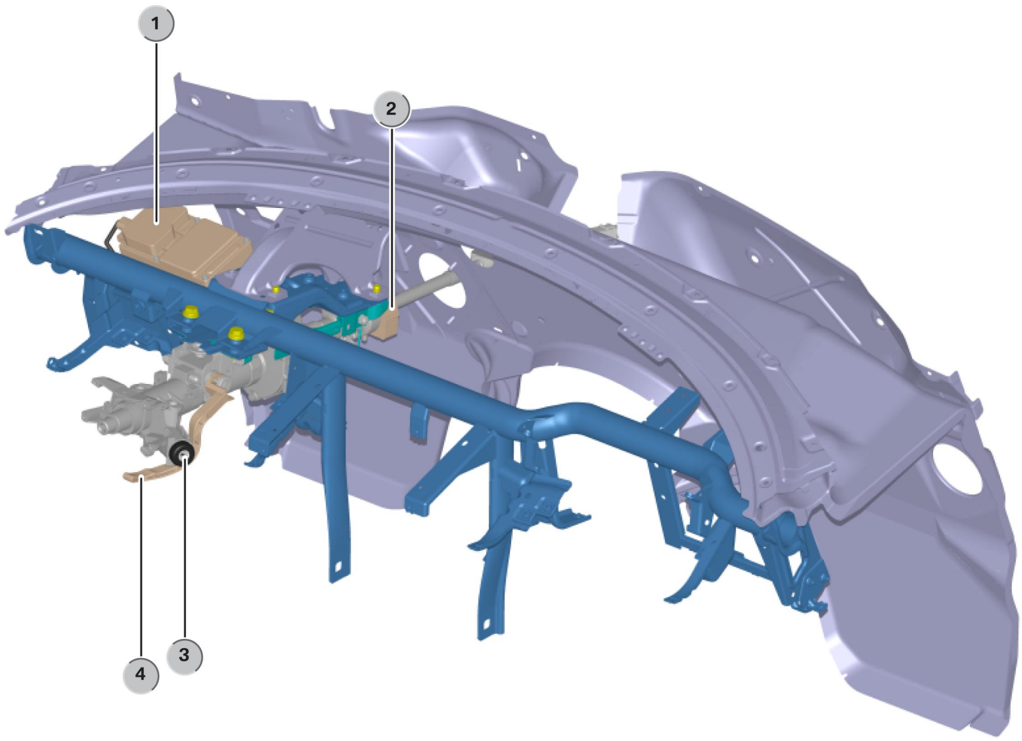


Fig. 9: Mounting of upper steering column on instrument-cluster supporting tube

Index	Explanation	Index	Explanation
1	EPS control unit	3	Steering lock with ignition starter switch
2	Steering-angle sensor	4	Mechanical steering-wheel adjuster

The steering lock with the ignition starter switch, the mechanical steering-wheel adjuster, the electric servo unit and the steering-angle sensor are attached to the upper steering column.

Servo unit

The servo unit serves to provide active steering-effort assistance as a function of the steering effort and the system conditions.

The servo unit consists of:

- Electric motor
- Worm gear
- Control unit
- Assorted internal sensors for recording the speed of the electric motor, the steering torque, the temperature and the system voltage
- Coil-spring cassette for accommodating lead of internal steering-torque sensor

The servo unit is located on the upper steering column and is thus protected in the passenger compartment.

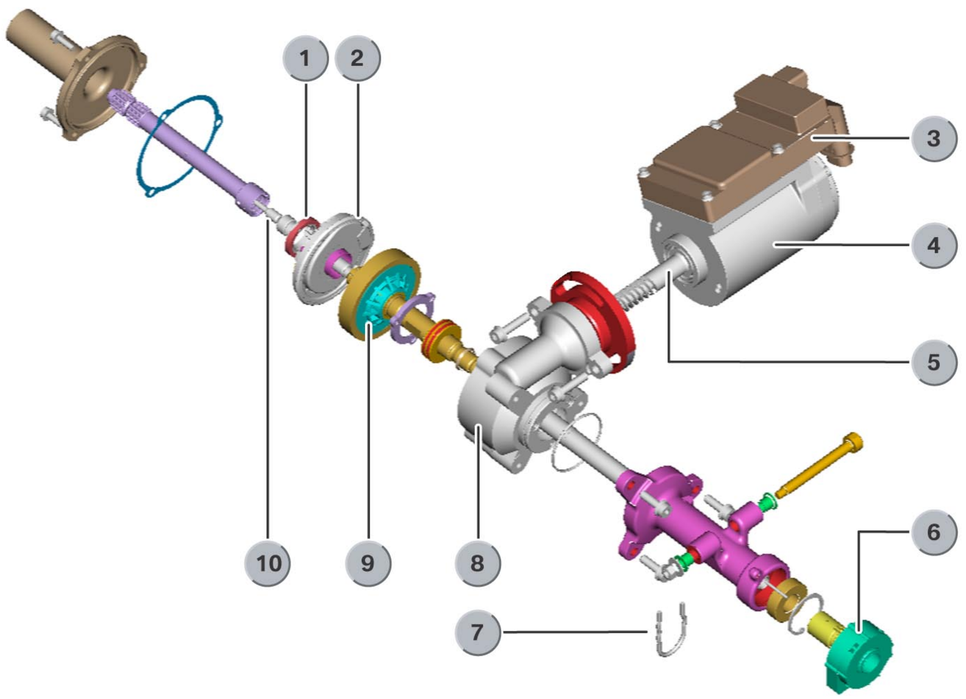


Fig. 10: Servo-unit components

Index	Explanation	Index	Explanation
1	Magnet wheel	6	Steering-angle sensor
2	Steering-torque sensor with coil-spring cassette	7	Turning lock
3	EPS control unit	8	Housing for worm gear and steering-torque sensor
4	Servo-unit electric motor	9	Worm gear
5	Worm-gear shaft	10	Torsion bar

The electric motor and the worm gear in the servo unit produce a new acoustic pattern in the passenger compartment.

The system- and design-necessitated acoustics can be heard in particular situations:

- When the steering wheel is spun round quickly
- When the steering wheel is turned while the car is stationary
- When the steering wheel is turned in a quiet atmosphere (e.g. radio not turned on)

This new noise pattern does not suggest faults in the system!

There are no more conventional noises generated by hydraulic steering systems (pump modulation, limiting valve).

Installation location of servo unit/control unit

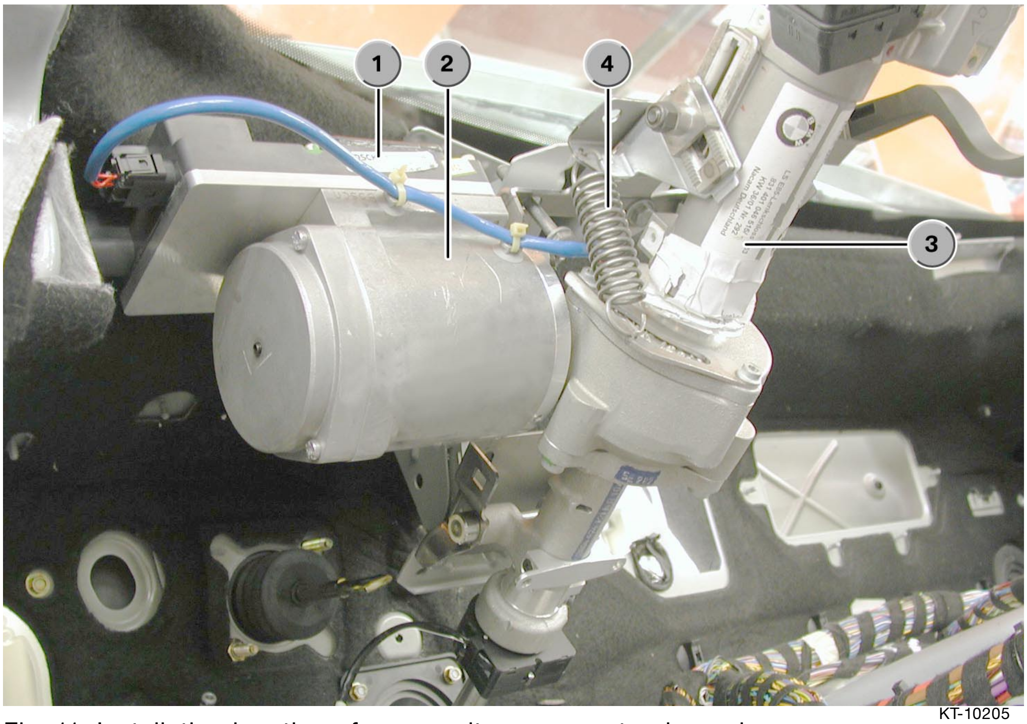


Fig. 11: Installation location of servo unit on upper steering column

Index	Explanation	Index	Explanation
1	EPS control unit	3	Casing tube of upper steering spindle
2	Servo-unit electric motor	4	Mass-balance spring

The control unit is part of the servo unit and is permanently connected to the electric motor.

The control unit cannot be replaced separately.

- Lower steering spindle

The lower steering spindle connects the upper steering column to the steering gear. It runs in the engine compartment from the bulkhead (to which it is screwed to the upper steering column with a universal joint) to the front axle. At this point, the connection to the steering gear is established by means of a universal joint.

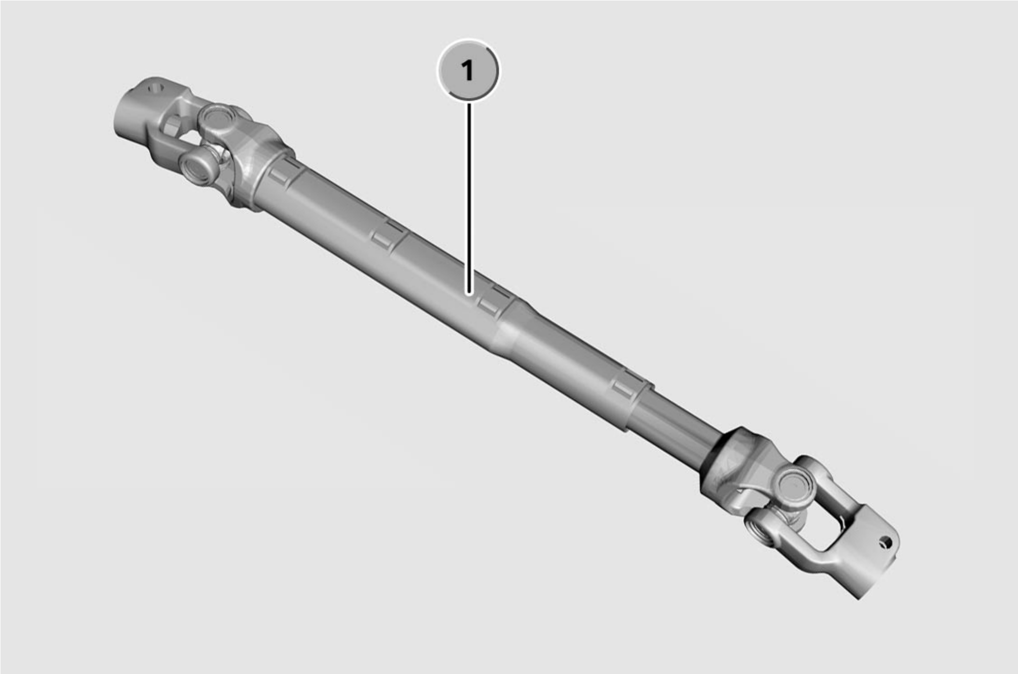


Fig. 12: Lower steering spindle

Index	Explanation
1	Plastic sleeve

The lower steering spindle is encased in a plastic sleeve, which acts as corrosion protection. Because the lower steering spindle runs close to the front exhaust in right-hand drive models, the sleeve is made from high-temperature-resistant plastic.

If the plastic sleeve is damaged during installation, it can be replaced with a new plastic sleeve.

The two parts of the lower steering spindle slide into each other in a ball-bearing mounting.

The ball-bearing mounting is necessary for:

- Mounting equalization
- Equalization during height adjustment of steering wheel
- Telescopic possibility in event of a crash

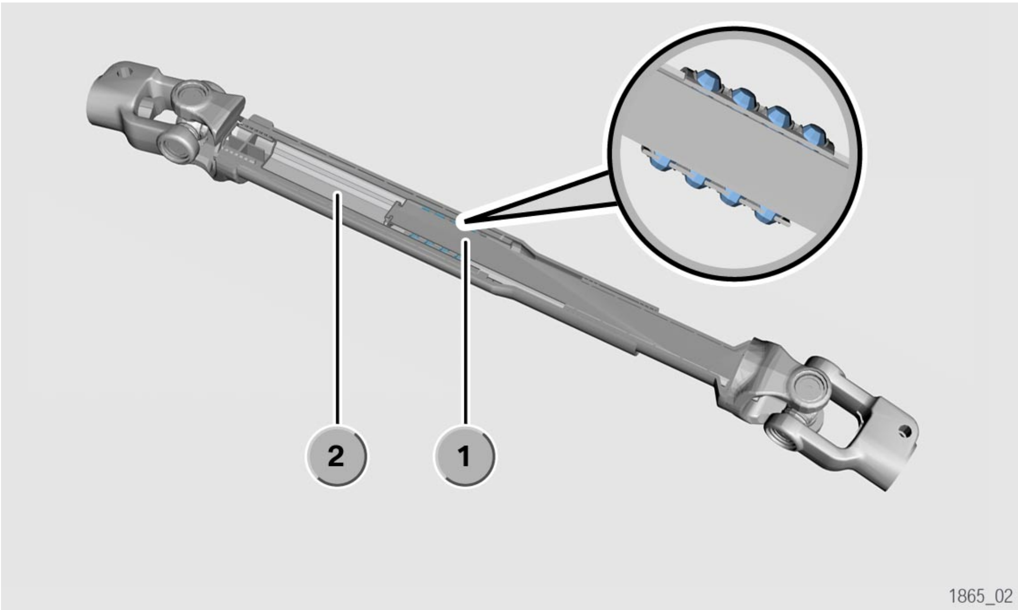


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Fig. 13: Section through lower steering spindle

Index	Explanation	Index	Explanation
1	Ball bearing	2	Telescopic compartment

- Steering gear

The steering gear is a purely mechanical system. The steering effort from the steering column is transmitted via a pinion to the rack.

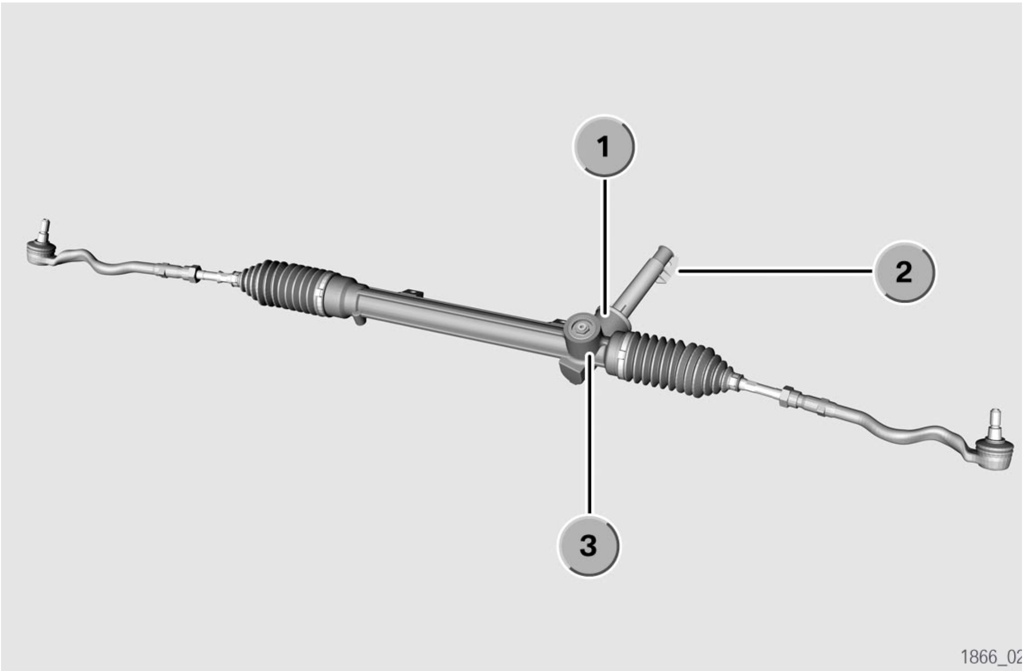


Fig. 14: Steering gear

Index	Explanation	Index	Explanation
1	Steering gear	3	Thrust member
2	Position lug		

Large deflection forces are generated at the rack by the purely mechanical transmission of force from pinion to rack. These deflection forces press the rack away from the pinion. The deflection forces are counteracted by a damped thrust member, which is integrated in the steering gear. The damped thrust member is located behind the rack on the side opposite the pinion.

A new feature of the thrust member is that a damper has been integrated in addition to the spring present in conventional thrust members. In the event of rapid steering movements, the rack cannot be pressed away by the high deflection forces and return at high speed. Without a damped thrust member, the rack would cause noises when returning at high speed. The thrust-member play can no longer be readjusted.

System description

The system effects servo assistance for steering. For this purpose, the driver-side steering torque is measured and together with further input variables such as:

- Vehicle speed
- Steering-angle velocity
- Steering angle
- FDC button
- System temperature

a setpoint assistance is calculated. The electric motor is activated accordingly via the integrated power electronics and the torque is transmitted via a gear to the steering column.

The Servotronic function (vehicle-speed-dependent steering assistance) is integrated.

The corresponding sets of curves for the assistance and damping characteristics are stored in the control unit.

The required assistance torque is gradually increased when the engine is started and reduced with a delay to 0 when the engine is switched off.

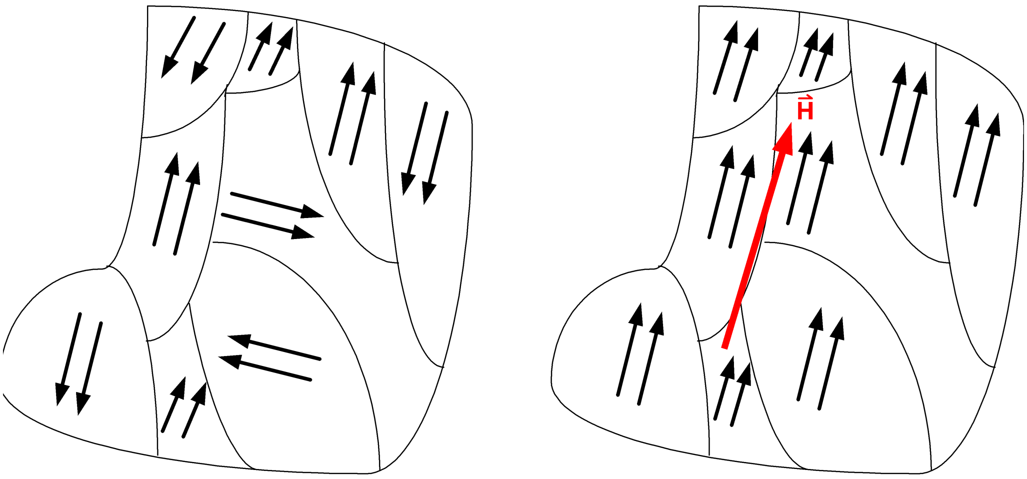
- Steering-torque recording

The driver-side steering torque is recorded by a steering-torque sensor integrated in the servo unit.

The function of the steering-torque sensor is based on the magnetoresistive principle.

Magnetoresitive sensors are already used in BMW vehicles in the form of wheel-speed sensors (DSC III MK60) and crankshaft sensors (M47TÜ). They are characterized by mechanical robustness, insensitivity to assembly tolerances, a wide operating-temperature range and not least high precision at a comparatively low price.

Magnetoresistive elements change their resistance as a function of the magnetic field acting on them. The basic physical principle is based on the fact that non-directional magnetization is predominant in ferromagnetic materials. The inner magnetic field is affected by the creation of an outer magnetic field to such an extent that it is deflected in the direction of the outer magnetic field (see following illustration). The stronger the effect of the outer magnetic field, the greater is the deflection of the inner magnetic field.



a) without outer field

b) with outer field
(H = direction of magnetic field)

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Fig. 15: Magnetization position in ferromagnetic material

Operating principle

The input shaft of the upper steering spindle is connected by way of a torsion bar to the output shaft of the upper steering spindle.

A magnet wheel is mounted on the input shaft. The magnetoresistive element is mounted on the output shaft of the upper steering spindle.

The magnetic-field lines are deflected by the magnet wheel as a result of the rotation of the input shaft with respect to the output shaft.

This deflection generates a resistance change (in one of the resistors) in the bridge circuit.

This resistance change results in a voltage change at the evaluation electronics. On account of the change in resistance at the magnetoresistive elements, 2 output signals (different voltage values) are generated which are subject to constant plausibility monitoring by the EPS control unit.

Based on this voltage change, the EPS control unit can calculate the extent of the driver-side steering torque.

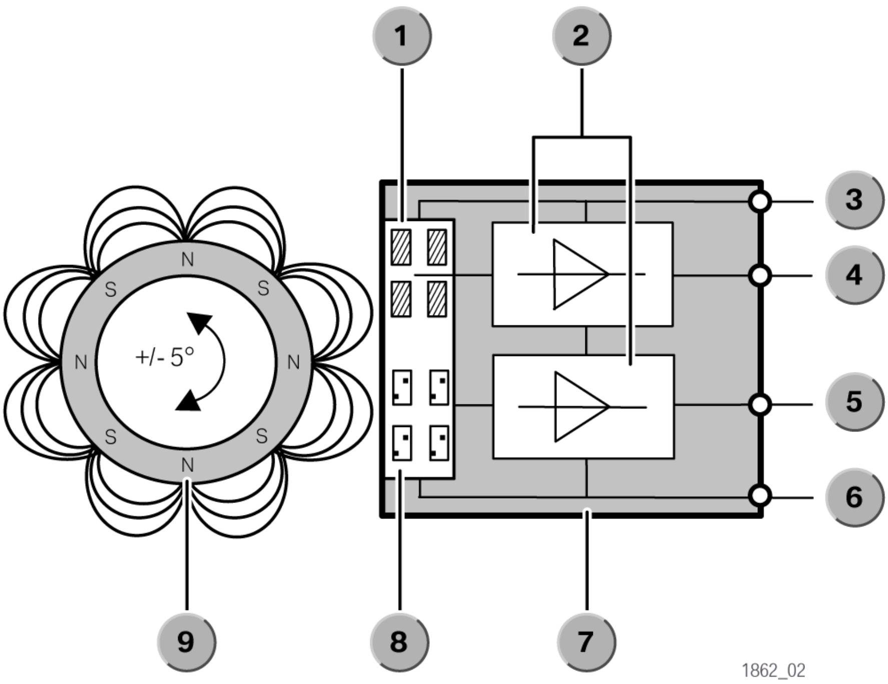

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Fig. 16: Operating principle of steering-torque sensor

Index	Explanation	Index	Explanation
1	Magnetoresistive element 1	6	Ground/earth
2	Signal amplification	7	Ceramic substrate
3	Power supply	8	Magnetoresistive element 2
4	Signal 1	9	Magnet wheel
5	Signal 2		

The leads for signal transmission, power supply and ground run in a coil-spring cassette mounted on the pinion shaft. The spring-coil cassette is located in the housing of the worm gear and the steering-torque sensor.

Steering-angle sensor (LWS)

To be able to perform active steering-wheel resetting, the EPS control unit requires the following information:

1. Steering-wheel centre position
2. Current steering-wheel angle

The above information is delivered to the EPS control unit by the steering-angle sensor, which to date has only been available for the DSC function.

The steering-angle sensor is located on the upper steering column in the passenger compartment.

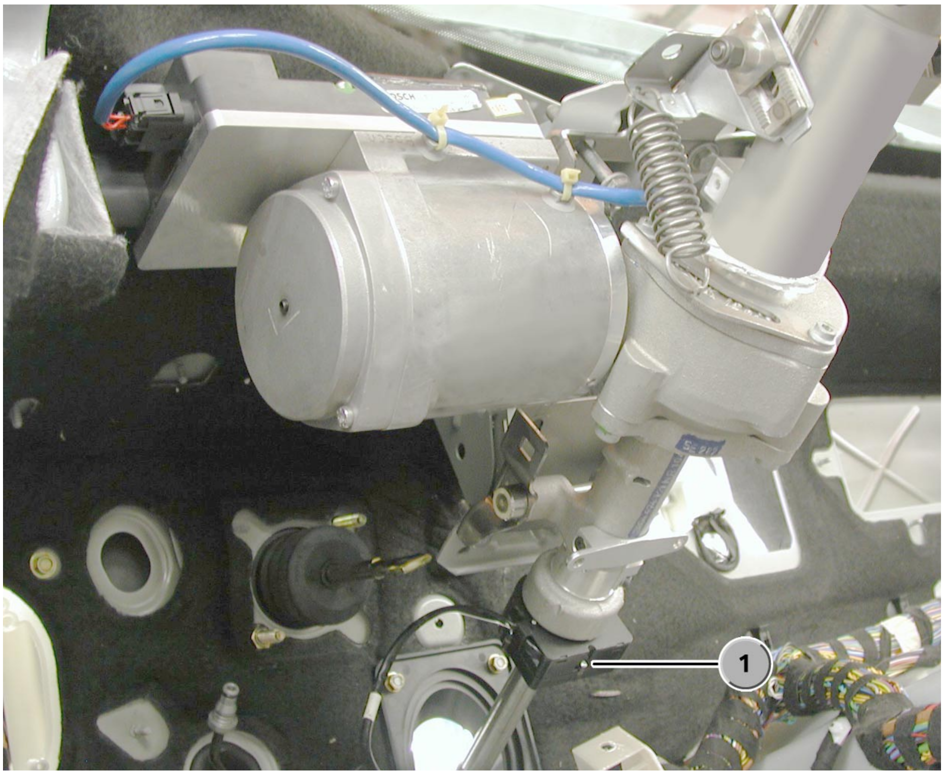

Fig. 17: Installation location of steering-angle sensor

Index	Explanation
1	Steering-angle sensor (LWS)

Note:

The steering-angle sensor has to be calibrated, as in the instances known from the E46 DSC.

System functions

- FDC button

When the sporty-driving function is selected with the FDC button, the engine-management system directs the signal via the PT-CAN to the EPS control unit.

The EPS control unit switches to a set of curves for sporty vehicle handling. The driver must apply a higher steering torque.

- Indicator lamp

The car's instrument cluster contains an indicator lamp for the EPS system.

Fig. 18: Indicator lamp for EPS system in instrument cluster

This lamp alerts the driver to significantly reduced steering-effort assistance or to a complete shutdown of assistance.

This may be caused by:

- Fault in the EPS control unit or an associated control unit
- Undervoltage/overvoltage
- Overloading of EPS

Those control units associated with the EPS system are the DSC control unit and the engine control unit.

Notes for Service

- Changing servo assistance

System shutdown

If the system is overloaded, it protects itself by reducing or shutting down servo assistance. The driver notices the increased steering torques that he has to apply and receives a visual signal from the indicator lamp.

The following causes can give rise to protective measures:

- Servo assistance is reduced/shut down if a fault relevant to EPS is detected in an associated control unit/sensors (engine management, DSC control unit, steering-angle sensor).

  An entry is made in the fault memory. The indicator lamp in the instrument cluster lights up in the event of complete system shutdown.

- Power steering is reduced as system temperature increases (due to overloading). If reduction of the power is not sufficient to cool the system down, servo assistance is reduced down to zero.

  An entry is made in the fault memory. The indicator lamp in the instrument cluster lights up.

  When the temperature drops, servo assistance returns within 2 s to the currently requested value.

- In the event of overvoltage in excess of 17 V, servo assistance shuts down immediately to protect the output stages.

  An entry is made in the fault memory. The indicator lamp in the instrument cluster lights up.

  When the voltage drops again to below 16 V, servo assistance returns within 2 s to the currently requested value.

- If an undervoltage of less than 9 V is detected, servo assistance is immediately reduced down to 0.
  An entry is made in the fault memory. The indicator lamp lights up in the event of complete system shutdown.
  When the voltage returns to a level above 10 V, servo assistance increases again within 2 s to the requested value.

In all cases, the indicator lamp goes out when the fault is no longer present.

- Working on steering column

Turning lock of steering spindles during installation

In all work carried out on the steering column, it is important to ensure that the steering lock is engaged in the zero position!

In addition, the turning lock underneath the servo unit, which holds the steering spindle in position, should be used during repair work.

Engagement of the steering lock and the turning lock prevent the steering spindle from being turned when the upper steering column is reinstalled. If the steering spindle is turned, this would cause the connecting cable of the internal sensors to the control unit to break.

The connecting cable is located in the coil spring. The spring is fitted in the servo-unit sensor housing.

Position marking and protection against incorrect installation

When the lower steering spindle is withdrawn from the steering gear, it is important when reinstalling to ensure that the centre marking on the lower steering spindle is opposite the centre marking on the steering gear.

The upper steering spindle and the steering gear are fitted with plastic lugs which determine the correct installation position of the lower steering spindle.

The plastic lugs also ensure that when the lower steering spindle is screwed to the upper steering spindle and the steering gear the components are inserted in each other with sufficient distance. The connecting screws must be fed through the hole in the lug.

General information

The mass-balance spring should be disconnected when work is carried out on the upper steering column. The pretension of the mass-balance spring is so high that the retainers could be bent.

Only the ignition starter switch, the lock cylinder and the steering-angle sensor can be replaced as mechanical components on the upper steering column.

- Diagnosis

System faults and notes pertaining to vehicle responses are stored in the fault memory and can be read out with DISplus (GT1).

E85 Runflat-tyre technology

Introduction

This technology was offered to the customer for the first time as standard in the BMW Z8 and the MINI Cooper S. This is now extended to the Z4.

The standard runflat-tyre technology in conjunction with a tyre defect indicator (RPA) offers the customer among others the following advantages:

- An enormous plus point in terms of safety, e.g. dynamic driving stability in the event of a slow or sudden pressure loss
- The spare wheel and the jack in the luggage compartment can be omitted

Today's runflat tyres do not differ in external appearance from "normal" tyres.

Runflat tyre (RFT)

To enable the driver to continue driving on an RFT which has developed a slow or sudden pressure loss, the inner walls of the RFT have been reinforced by additional inlay strips made from heat-resistant rubber.

This reinforcement prevents the damaged tyre from collapsing (in the case of a completely flat normal tyre, the rim flanges roll onto the folded sidewalls) and remains stable even under extreme loading in the event of a serious blow-out - also when cornering.

The special rim (EH2) keeps the tyre "runflat-fit;" adequate steering, braking and traction forces can be transmitted by the tyre.

Caution:
It is very difficult to identify a deflated self-supporting tyre by its external appearance!

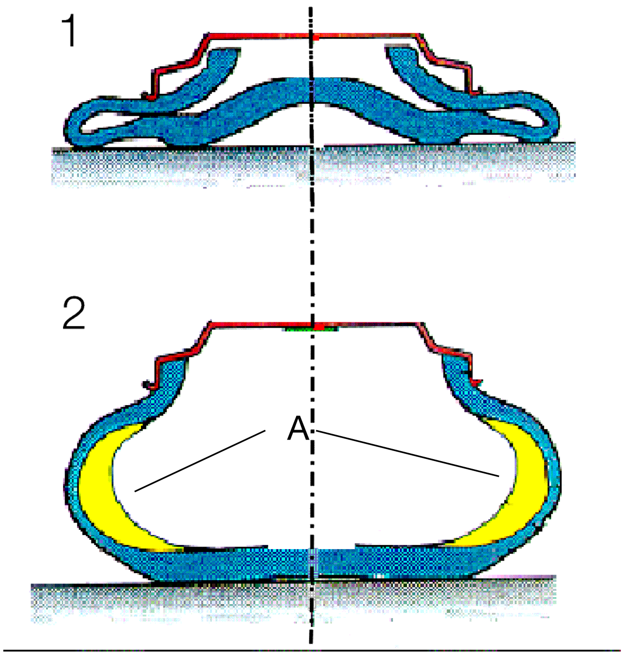

Fig. 19: Comparison of standard tyre / self-supporting tyre

Index	Explanation
1	Deflated standard tyre
2	Deflated self-supporting tyre
A	Inlay strips

- In the event of a sudden pressure loss, the car can be driven at a speed of max. 80 km/h for roughly a further 160 km.
- In the event of a slow pressure loss, the car can be driven at a speed of max. 80 km/h for roughly a further 2000 km.

Runflat winter tyres will also be available shortly.

If an RFT is not available in the event of a serious blow-out, a "normal" tyre can also be fitted as a **makeshift** solution.

Tyre defect indicator

Not all car drivers notice for example the deteriorating handling of their vehicle as it gets spongier as the result of a slow puncture (which makes up approx. 80% of all tyre failures). This defect is also difficult to recognize in a runflat tyre because its sidewalls remain rigid. The warning system is a reliable way of alerting the driver to such a failure but should not exempt the driver from his obligation of checking tyre inflation pressures on a regular basis.

Function

The RPA function is effected by the DSC control unit.

A pressure loss reduces the rolling radius of the tyre and thus also its dynamic rolling circumference. This increases the rotation speed of this wheel. RPA measures the wheel speeds via the sensors of the 4-channel ABS system, makes a comparison of the diagonally opposed wheels and the average speed and thereby detects any pressure loss/puncture.

RPA alerts the driver after a short distance, generally after 1-3 minutes, from a speed of 15 km/h.

Initialization/operation

The system must be reinitialized when tyre inflation pressures are changed or when wheels/tyres are changed.

KT-10410

Fig. 20: RPA button (1) in centre-console switch centre

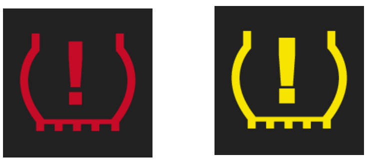

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Fig. 21: RPA indicator lamp (red/yellow) in instrument cluster

Initialization starts when the RPA button is pressed with terminal 15 ON until the RPA indicator lamp in the instrument cluster lights up yellow.

After a brief driving time, from a speed of 15 km/h, the system learns the new reference values and the DDS indicator lamp (yellow) goes out.

The RPA indicator lamp lights up red if a pressure loss is identified by the system.

The driver is alerted to a RPA system failure by the RPA indicator lamp in the instrument cluster lighting up yellow.

Overview of wheels/tyres and styling combinations

Engine	Wheels/tyres (runflat)	Styling number	Styling
Series			
M54B22, M54B25	7 J x 16 EH2 IS47 Tyre 225/50 R16	104	
M54B30	8 J x 17 EH2 IS47 Tyre 225/45 R17	103	

Option			
M54Bxx	7 J x 16 EH2 IS47 Tyre 225/50 R16	102	
M54Bxx	8 J x 17 EH2 IS47 Tyre 225/45 R17; 8.5 Jx 17 EH2 IS50 Tyre 245/40 R17	105	
M54Bxx	8 J x 17 EH2 IS47 Tyre 225/45 R17	106	
M54Bxx	8 J x 18 EH2 IS47 Tyre 225/40 R18; 8.5 J x 18 EH2 IS50 Tyre 255/35 R18	107	
M54Bxx	8 J x 18 EH2 IS47 Tyre 225/40 R18; 8.5 J x 18 EH2 IS50 Tyre 255/35 R18	108