Engineering details

General instructions

To find out more about engineering, go to:
bmw-motorrad.com/technology

Anti-lock brake system (ABS)

Partially integral brakes

Your motorcycle is equipped with partially integral brakes. Both front and rear brakes are applied when you pull the handbrake lever. The footbrake lever acts only on the rear brake.
While the brakes are slowing the motorcycle with ABS actively intervening, the BMW Motorrad Integral ABS adapts braking-force distribution between front and rear brakes to suit the load on the motorcycle.

ATTENTION

Attempted burn-out despite Integral braking function
Damage to rear brake and clutch
• Do not burn out tyres.◀

How does ABS work?

The amount of braking force that can be transferred to the road depends on factors that include the coefficient of friction of the road surface. Loose stones, ice and snow or a wet road all have much lower coefficients of friction than a clean and dry asphalt surface. The lower the coefficient of friction, the longer the braking distance.
If the rider increases braking pressure to the extent that braking force exceeds the maximum transferable limit, the wheels start to lock and the vehicle loses its directional stability; a fall is imminent. Before this situation occurs the ABS will be activated and the brake pressure adapted to the maximally transferable braking force. The wheels continue to turn and the driving stability is retained irrespective of the road condition.

What are the effects of surface irregularities?

Humps and surface irregularities can cause the wheels to lose contact temporarily with the road surface; if this happens the braking force that can be transmitted to the road can drop to zero. If the rider brakes in this situation, the ABS has to reduce the brake pressure in order to ensure driving stability when resuming contact with the road. Up to this point, BMW Motorrad Integral ABS assumes an extremely low coefficient of friction (gravel, ice, snow) so that the road wheels turn in every conceivable situ-

ation and so ensure driving stability. As soon as is registers the actual circumstances, the system reacts instantly and adjusts braking force accordingly to achieve optimum braking.

What feedback does the rider receive from the BMW Motorrad Integral ABS?

If the ABS system has to reduce braking force on account of the circumstances described above, vibration is perceptible through the handbrake lever.
When the handbrake lever is pulled, brake pressure is also built up at the rear wheel by the integral function. If the brake pedal is depressed after the handbrake lever is pulled, the brake pressure built up beforehand is perceptible as counter-pressure sooner than is the case when the brake pedal is depressed either before or at the same time as the brake lever is pulled.

Rear wheel lift

Under very severe and sudden deceleration, however, under certain circumstances it is possible that the BMW Motorrad Integral ABS will be unable to prevent the rear wheel from lifting clear of the ground. If this happens the outcome can be a highsiding situation in which the motorcycle can flip over.

⚠ WARNING

Rear wheel lift due to severe braking

Risk of falling

- When you brake sharply, bear in mind that ABS control cannot always be relied on to prevent the rear wheel from lifting clear of the ground.◀

What is the design baseline for BMW Motorrad Integral ABS?

Within the limits imposed by physics, the BMW Motorrad Integral ABS ensures directional stability on any surface. The system is not optimised for special requirements that apply under extreme competitive situations off-road or on the track. The driving behaviour should be adapted to actual driving skills and the road conditions.

Special situations

The speeds of the front and rear wheels are compared as one means of detecting a wheel's incipient tendency to lock. If the system registers implausible values for a lengthy period the ABS function is deactivated for safety reasons and an ABS fault message is issued. Self-dia-

gnosis has to complete before fault messages can be issued. In addition to problems with the BMW Motorrad ABS, exceptional riding conditions can also cause a fault message to be issued:

– Heating up with the motorcycle on the centre stand or an auxiliary stand, engine idling or with a gear engaged.
– Rear wheel locked by the engine brake for a lengthy period, for example while descending on a loose or slippery surface.

If a fault message is issued on account of exceptional riding conditions, you can reactivate the ABS function by switching the ignition off and on again.

What significance devolves on regular maintenance?

⚠ WARNING

Brake system not regularly serviced.

Risk of accident

- In order to ensure that the ABS is always maintained in optimum condition, it is essential for you to comply strictly with the specified inspection intervals.◀

Reserves for safety

The potentially shorter braking distances which BMW Motorrad Integral ABS permits must not be used as an excuse for careless riding. ABS is primarily a means of ensuring a safety margin in genuine emergencies.

⚠ WARNING

Braking when cornering

Risk of accident despite ABS

- Invariably, the rider bears responsibility for assessing road and traffic conditions and adopting his or her style of riding accordingly.
- Do not take risks that would negate the additional margin of safety offered by this system.◀

Evolution of ABS to ABS Pro

– with ABS Pro^{OE}

Until now, the BMW Motorrad ABS helped ensure a very high degree of safety for braking with the motorcycle upright and travelling in a straight line. Now ABS Pro offers enhanced safety for braking in corners as well. ABS Pro prevents the wheels from locking even under

sharp braking. ABS Pro reduces abrupt changes in steering force, particularly in panic-braking situations, counteracting the vehicle's otherwise natural but undesirable tendency to straighten up.

ABS intervention

Technically speaking, depending on the riding situation ABS Pro adapts ABS intervention to the motorcycle's bank angle. Signals for rate of roll and rate of yaw and lateral acceleration are used to calculate bank angle.
As the motorcycle is heeled over more and more as it banks into a corner, an increasingly strict limit is imposed on the brake-pressure gradient for the start of brake application. This slows the build-up of brake pressure to a corresponding degree. Additionally, pressure modulation is more uniform across the range of ABS intervention.

Advantages for the rider

The advantages of ABS Pro for the rider are sensitive response and high braking and directional stability combined with best-case deceleration of the motorcycle, even when cornering.

Automatic Stability Control (ASC)

How does ASC work?

BMW Motorrad ASC compares the speed of rotation of the front wheel and the rear wheel. The differential is used to compute slip as a measure of the reserves of stability available at the rear wheel. If slip exceeds a certain limit, the engine control intervenes and adapts the engine torque accordingly.

What is the design baseline for BMW Motorrad ASC?

BMW Motorrad ASC is designed as an assistant system for the rider and for use on public roads. The extent to which the rider affects ASC control can be considerable (weight shifts when cornering, items of luggage loose on the motorcycle), especially when the style of riding takes rider and machine close to the limits imposed by physics.
The system is not optimised for special requirements that apply under extreme competitive situations off-road or on the track. The BMW Motorrad ASC can be deactivated in these cases.

⚠ WARNING

Risky riding

Risk of accident despite ASC

- Invariably, the rider bears responsibility for assessing road and traffic conditions and adopting his or her style of riding accordingly.
- Do not take risks that would negate the additional safety offered by this system.◀

Dynamic Traction Control (DTC)

How does traction control work?

Traction control is available in two versions

– **without** provision for the bank angle: Automatic Stability Control ASC
– ASC is a rudimentary function intended to prevent falls.
– **with** provision for bank angle: Dynamic Traction Control DTC
– DTC regulation is more delicate and more comfortable thanks to the additional bank angle and acceleration information.

The traction control system compares the speed of rotation at the circumferences of the front wheel and the rear wheel. The differential is used to compute slip as a measure of the reserves of stability available at the rear wheel. If slip exceeds a certain limit, the engine management system intervenes and adapts engine torque accordingly.

⚠ WARNING

Risky riding

Risk of accident despite DTC

- Invariably, the rider bears responsibility for assessing road and traffic conditions and adopting his or her style of riding accordingly.
- Do not take risks that would negate the additional safety offered by this system.◀

Special situations

In accordance with the laws of physics, the ability to accelerate is restricted more and more as the angle of heel increases. Consequently, there can be a perceptible reduction in acceleration out of very tight bends.

The speeds of the front and rear wheels are compared and DTC, unlike ASC, also takes the bank angle into account in processing data to detect the rear wheel's incipient tendency to spin or slip sideways.

– with riding modes Pro[OE]

If the electronic processor receives values for the bank angle that it considers implausible over a lengthy period, a dummy value is used for the bank angle or the DTC function is switched off. Under these circumstances the indicator for a DTC fault shows. Self-diagnosis has to complete before fault messages can be issued.

The BMW Motorrad Traction Control can shut down automatically under the exceptional riding conditions outlined below.

Exceptional riding conditions:

– Riding for a lengthy period with the front wheel lifted off the ground (wheelie).
– Rear wheel rotating with the vehicle held stationary by applying the front brake (burnout).
– Heating up with the motorcycle on an auxiliary stand, in neutral or with a gear engaged.

If the encoding plug is not inserted, the DTC is reactivated after a fault has occurred by switching the ignition off and on and then by continuing to drive at a low speed.

 Minimum speed for activation of DTC
min 5 km/h

If the front wheel lifts clear of the ground under severe acceleration, the ASC or DTC reduces engine torque in the RAIN and ROAD riding modes until the front wheel regains contact with the ground.

The ENDURO and ENDURO PRO riding modes are designed for off-road operation and not for on-road operation.

In DYNAMIC, DYNAMIC PRO and ENDURO riding modes, the front wheel lift-oft detection allows for short wheelies.

In ENDURO PRO riding mode, the front wheel lift-off detection is switched off.

BMW Motorrad recommends turning the throttle grip back slightly when lifting the front wheel in order to reach a stable driving condition again as soon as possible.

When riding on a slippery surface, never snap the throttle grip fully closed without pulling the clutch at the same time. Engine braking torque can cause the rear wheel to skid, with a corresponding loss of stability. The BMW Motorrad DTC is unable to control a situation of this nature.

Dynamic ESA

– with Dynamic ESA OE

Riding position equaliser

The electronic chassis and suspension adjustment Dynamic ESA is able to adjust your motorcycle automatically to the load. If the spring preload is set to Auto, the rider does not have to change the load settings. When driving off and when riding, the system monitors the suspension on the rear wheel and corrects the spring preload in order to set the riding position correctly. The damping is also adjusted automatically to the load.
Via ride height sensors, Dynamic ESA detects the movements in the chassis and suspension and responds by adjusting the EDC valves. The chassis and suspension will thus be adapted to the characteristics of the terrain.
Dynamic ESA calibrates itself at regular intervals to ensure the system functions correctly.

Possible settings

Damping modes

– Road: Damping for comfortable on-road mode
– Dyna.: Damping for dynamic on-road mode
– Enduro: Damping for off-road mode

Load settings

– Auto: Active riding position equaliser with automatic adjustment of the spring preload and damping
– Min: Minimum spring preload (recommended for better ground accessibility)
– Max: Maximum spring preload (recommended for off-roading)
– The Min and Max spring preloads can be selected by the rider but not changed. The riding position equaliser is inactive when set to Min and Max.

Riding mode

Selection

To adjust the motorcycle to the road condition and the desired driving experience, the following riding modes can be selected:
– RAIN
– ROAD (Standard mode)

– with riding modes Pro OE
– DYNAMIC
– ENDURO

When an encoding plug is installed, the DYNAMIC PRO and ENDURO PRO riding modes replace DYNAMIC and ENDURO.

For each of these riding modes there is a calibrated setting for theABS, ASC and DTC systems as well as for the throttle response.

– with Dynamic ESA OE

The adjustment of the Dynamic ESA also depends on the riding mode selected.

ABS and/or ASC/DTC can be switched off in every riding mode. The following explanations always refer to the driving safety systems that are switched on.

Throttle response

– In RAIN and ENDURO riding modes: restrained
– In ROAD and ENDURO PRO riding modes: direct
– In DYNAMIC and DYNAMIC PRO riding modes: dynamic

ABS

– The rear wheel lift-off detection is activated in all riding modes.
– In RAIN, ROAD, DYNAMIC and DYNAMIC PRO riding modes, the ABS is set to on-road mode.
– In ENDURO riding mode the ABS is set to off-road mode with road tyres.

– with riding modes Pro OE

– In ENDURO PRO riding mode, there is no ABS control at the rear wheel when the footbrake lever is operated. The ABS has been adjusted to off-road operation using studded tyres.
– In RAIN, ROAD, DYNAMIC and DYNAMIC PRO riding mode, ABS Pro is fully available. The tendency of the motorcycle to straighten up when the brakes are applied with the machine banked for cornering is reduced to a minimum.
– In ENDURO riding mode ABS Pro is available only in conditions with a good coefficient of friction. Support is reduced compared with ROAD riding mode and instead, it is configured to generate a maximum braking effect.
– ABS Pro is not available in ENDURO PRO riding mode.

– without riding modes Pro OE

ASC

– The front wheel lift-off detection is activated in all riding modes.
– ASC has been calibrated for on-road operation.
– ASC provides high driving stability in ROAD riding mode and maximum driving stability in RAIN riding mode.

– with riding modes Pro[OE]

DTC

Tyres

– In RAIN, ROAD, DYNAMIC and DYNAMIC PRO riding modes, DTC is calibrated to on-road operation with road tyres.
– In ENDURO riding mode, DTC is calibrated to off-road operation with road tyres.
– In ENDURO PRO riding mode, DTC is calibrated to off-road operation with studded tyres.

Driving stability

– In RAIN riding mode, DTC intervenes early enough to achieve maximum driving stability.
– In ROAD riding mode, DTC intervenes later than in RAIN riding mode. This prevents the rear wheel from spinning whenever possible.
– In RAIN and ROAD riding modes, the front wheel is prevented from lifting.
– In DYNAMIC and DYNAMIC PRO riding modes, DTC intervenes later than in ROAD riding mode meaning that the motorcycle may drift slightly when coming out of the corner or do short wheelies.
– In the ENDURO riding mode, DTC intervenes again later and calibrated to off-road operation so that longer drifts and short wheelies are possible when coming out of the curve.
– In ENDURO PRO riding mode, DTC control assumes that studded tyres are used when off road. Longer wheelies and wheelies in slight lean angles are permitted. The front wheel lift-off detection is switched off which may cause rollover to the rear in extreme cases!

Mode changes

The riding mode can be changed while the vehicle is stationary with the ignition on. It is possible to change it while driving under the following conditions:
– No drive torque on the rear wheel.
– No brake pressure in the brake system.

The following steps must be taken to change the riding mode:
– Close the throttle twistgrip.
– Release the brake levers.

The desired riding mode is initially preselected. The mode change does not take place until the systems in question are all in the appropriate state.
The selection menu does not disappear from the display until the mode change has taken place.

Tyre pressure monitoring (RDC)

– with tyre pressure control (RDC)[OE]

Function

A sensor integrated into each tyre measures the air temperature and the air pressure inside the tyre and transmits this information to the control unit. The sensors are fitted with a centrifugal-force tripswitch which allows the measured values to be transmitted after the minimum speed is exceeded the first time.

 Minimum speed for transmission of the RDC measured values:
min 30 km/h

The display shows – – for each tyre until the tyre-pressure signal is received for the first time. The sensors continue to transmit the measured-value signals for some time after the vehicle comes to a stop.

 Transmission duration of the measured values after vehicle standstill:
min 15 min

An error message is issued if wheels without sensors are fitted to a vehicle equipped with an RDC control unit.

Tyre-pressure ranges

The RDC control unit differentiates between three tyre-pressure ranges, all of which are parameterised for the motorcycle:

– Tyre pressure within permitted tolerance.
– Tyre pressure close to limit of permitted tolerance.
– Tyre pressure outside permitted tolerance.

Temperature compensation

Tyre pressure is a temperature-sensitive variable: pressure increases as tyre-air temperature rises and decreases as tyre-air temperature drops. Tyre-air temperature depends on ambient temperature as well as on the style of riding and the duration of the ride.

 The tyre pressures are shown in the multifunction display as compensating for the temperature and always refer to the following tyre air temperature:
20 °C

The air lines available to the public in petrol stations and motorway service areas have gauges that do not compensate for temperature; the reading shown by a gauge of this nature is the temperature-dependent tyre-air

pressure. As a result, the values displayed there usually do not correspond to the values displayed in the TFT display.

Pressure adaptation

Compare the RDC value on the TFT display with the value in the table on the back cover of the Rider's Manual. Then use the air-line gauge at a service station to compensate for the difference between the RDC reading and the value in the table.

 Example
According to the rider's manual, the tyre pressure should be the following value:
2.5 bar
The following value appears in the multifunction display:
2.3 bar

 Example
Missing:
0.2 bar
The tester on the filling station shows:
2.4 bar
The tyre pressure must be increased to the following value to reach the correct tyre pressure:
2.6 bar

Shift assistant

– with riding modes Pro [OE]

Shift assistant Pro

Your vehicle is equipped with the shift assistant Pro, which was initially developed for racing and has been adapted for touring. It permits upshifts and downshifts without declutching or closing the throttle in virtually all load and rpm ranges.

Advantages

– 70-80 % of all gearshifts on a trip can be done without using the clutch.
– Less relative movement between rider and passenger because the shift pauses are shorter.
– It is not necessary to close the throttle valve when shifting under acceleration.
– When braking and downshifting (throttle valve closed), engine speed is adjusted by blipping the throttle.
– Shift time is shorter than a gearshift with clutch actuation.

In order for the system to identify a request for a gearshift, the rider has to move the shift lever from its idle position in the desired direction against the force of the

spring through a certain "overtravel" at ordinary speed or rapidly and keep the shift lever in this position until the gearshift is completed. It is not necessary to increase the force applied to the shift lever while shifting is in progress. Once the gearshift has completed the shift lever has to be fully released before another gearshift with the Pro shift assistant can take place. Keep the corresponding load condition (throttle grip position) constant before and during the gear shift for gear shifts using the shift assistant Pro. A change in the position of the throttle twistgrip during a gearshift can cause the function to abort and/or lead to a missed shift. The shift assistant Pro provides no assistance for the gear change if the rider declutches.

Downshifting

– Downshifting is assisted until maximum rpm for the target gear to be selected is reached. This prevents overrevving.

 Maximum engine speed
max 9000 min^{-1}

Upshifting

– Upshifting is assisted until idle rpm for the target gear to be selected is reached.
– This prevents the engine from dropping below idle speed.

 Idle speed
1150 min^{-1} (Engine at regular operating temperature)

Hill Start Control

– with riding modes Pro[OE]

Hill Start Control function

Hill Start Control assistant prevents the motorcycle from rolling backwards uncontrolled on gradients by intervening specifically with the ABS brake system without the driver having to constantly operate the brake lever. Pressure in the rear brake system is built up when Hill Start Control is activated in order to keep the motorcycle stationary on a steep surface.

Influence of the holding pressure on the driving off behaviour

– If the motorcycle is stopped by applying little brake pressure, only low pressure is built up. In this case, the brakes are quickly released when driving off. The motorcycle can be moved off more gently. It

is not necessary to turn the throttle grip again.
– If the motorcycle is stopped by applying high brake pressure, high pressure is built up. In this case, the brakes take longer to release when driving off. More torque is required for driving off which also requires the rider to turn the throttle grip again.

Behaviour when the motorcycle rolls or slips

– If the motorcycle rolls when Hill Start Control is activated, the holding pressure is increased.
– If the rear wheel slips, the brake is released again after approx. 1 m. This prevents, for example, slipping due to a blocked rear wheel.

Releasing the brake when stopping the engine

Hill Start Control is deactivated when the engine is stopped using the emergency stop switch or when the side stand is folded out.

In addition to the indicator and warning lights, the rider should be made aware that Hill Start Control has been deactivated by the following behaviour:

Brake warning jolt

– The brake is released briefly and reactivated immediately.
– This creates a jolt which the rider feels.
– The brake is released slowly.
– The motorcycle is not braked.
– The rider must brake the motorcycle manually.

NOTICE

The holding pressure is released immediately without a brake warning jolt as soon as the ignition is switched off.◀

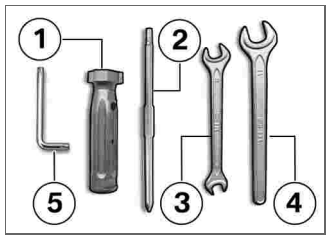
Maintenance

General instructions

The "Maintenance" chapter describes straightforward procedures for checking and replacing certain wear parts.
Special tightening torques are listed as applicable. The tightening torques for the threaded fasteners on your vehicle are listed in the section entitled "Technical data".
Further information on maintenance and repair work is available from your BMW Motorrad authorised dealer in the form of a DVD.

Some of the work requires special tools and a thorough knowledge of the technology involved. If you are in doubt, consult a specialist workshop, preferably your authorised BMW Motorrad dealer.

Tool kit



1 Screwdriver handle
- Use with screwdriver insert.
- Top up the engine oil (➠ 163).

2 Reversible screwdriver blade
Phillips PH1 and Torx T25
- Removing bulbs for front and rear turn indicators (➠ 182).
- Removing battery cover (➠ 187).
- Top up coolant (➠ 169).

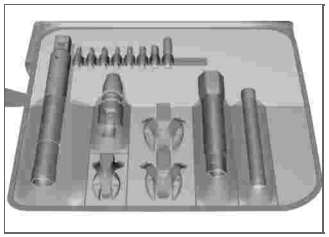
3 Open-ended spanner
Width across flats 8/10
- Removing battery (➠ 187).

4 Open-ended spanner
Width across flats 14
- Adjusting mirror arm (➠ 118).

5 Torx wrench, T30
- Adjusting the lower gearshift lever.

Service toolkit

– with service tool kit OA



BMW Motorrad has assembled a service toolkit that is ideal for carrying out extended service work (e.g. removing and installing wheels) on this motorcycle. You can obtain the tools set from your authorised BMW Motorrad dealer.

Front-wheel stand

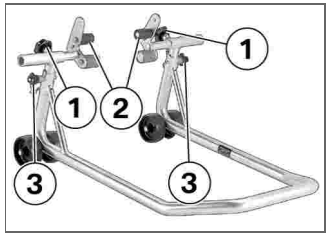
Install the front-wheel stand

ATTENTION

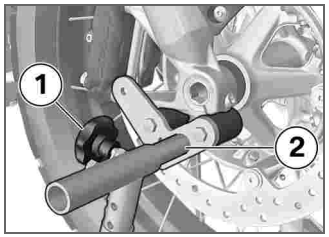
Use of the BMW Motorrad front wheel stand without accompanying use of centre stand or auxiliary stand

Risk of damage to parts if vehicle topples

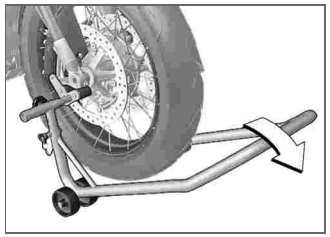
- Place the motorcycle on its centre stand or another auxiliary stand before lifting the front wheel with the BMW Motorrad front-wheel stand.◀
- Make sure the ground is level and firm and place the motorcycle on its centre stand.
- Use basic stand with front-wheel adapter. The basic stand and its accessory parts are available from your BMW Motorrad dealer.



- Remove screws **1**.
- Push the two adapters **2** apart until the front forks fit between them.
- Use locating pins **3** to set the front-wheel stand to the desired height.
- Centre the front-wheel stand relative to the front wheel and push it against the front axle.



- Align the two adapters **2** so that the front forks are securely seated.
- Tighten screws **1**.



ATTENTION

Centre stand retracts if motorcycle is lifted too high

Risk of damage to parts if vehicle topples

- When raising the vehicle, make sure that the centre stand remains on the ground.◀
- Apply uniform pressure to push the front-wheel stand down and raise the motorcycle.

Engine oil

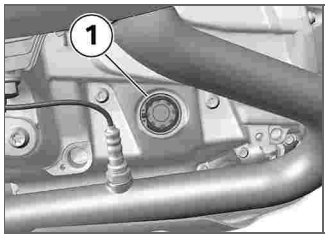
Checking engine oil level

ATTENTION

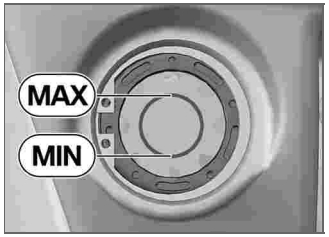
Misinterpretation of oil level reading, because oil level is temperature-dependent (the higher the temperature, the higher the oil level)

Engine damage

- Check the oil level only after a lengthy ride or when the engine is at operating temperature.◀
- Switch off the engine when it is at operating temperature.
- Make sure the ground is level and firm and place the motorcycle on its centre stand.
- Wait five minutes for the oil to drain into the oil pan.



- Check the oil level in oil-level indicator **1**.



Engine oil, specified level	
between MIN and MAX marks	

If the oil level is below the MIN mark:

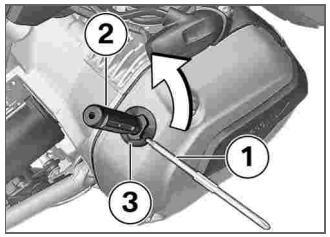
- Top up the engine oil (➠ 163).

If the oil level is above the MAX mark:

- Have the oil level corrected by a specialist workshop, preferably an authorised BMW Motorrad dealer.

Top up the engine oil

- Make sure the ground is level and firm and place the motorcycle on its stand.



- Wipe the area around the oil filler neck clean.
- Insert Torx end of reversible screwdriver insert **1** into screwdriver handle **2** (on-board toolkit) for additional leverage.
- Engage this tool in cap **3** of the oil filler neck and turn counter-clockwise to remove.
- Checking engine oil level (➠ 162).

ATTENTION

Use of insufficient engine oil or too much engine oil
Engine damage

- Always make sure that the oil level is correct.◀
- Top up the engine oil to the specified level.

Engine oil, quantity for topping up
max 0.95 l (Difference between MIN and MAX)

- Checking engine oil level (➠ 162).
- Install the cap in the oil filler neck.

Brake system

Checking function of brakes

- Pull the front brake lever.
» The pressure point must be clearly perceptible.
- Press the footbrake lever.
» The pressure point must be clearly perceptible.

If pressure points are not clearly perceptible:

ATTENTION

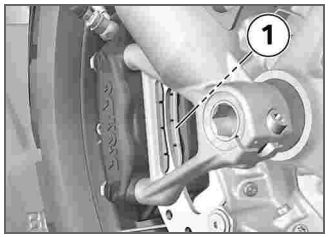
Work on brake system not in compliance with correct procedure

Risk to operational reliability of the brake system

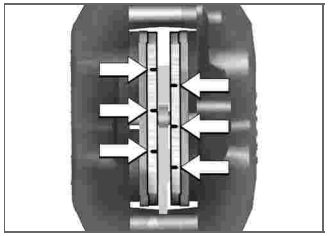
- Have all work on the brake system undertaken by trained and qualified specialists.◀
- Have the brakes checked by a specialist workshop, preferably an authorised BMW Motorrad dealer.

Checking front brake pad thickness

- Make sure the ground is level and firm and place the motorcycle on its stand.



- Visually inspect the left and right brake pads to ascertain their thickness. Viewing direction: between wheel and front suspension toward brake pads **1**.



Brake-pad wear limit, front
1.0 mm (Friction pad only, without backing plate. The wear indicators (grooves) must be clearly visible.)

If the wear indicating marks are no longer clearly visible:

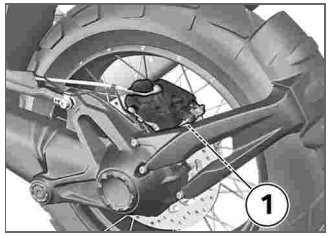
⚠ WARNING

Brake-pad thickness less than permissible minimum
Diminished braking effect, damage to the brakes

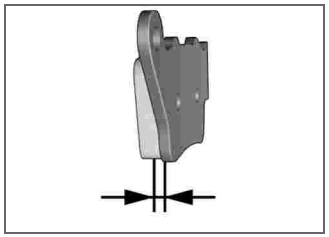
- In order to ensure the dependability of the brake system, do not permit the brake pads to wear past the minimum permissible thickness.◀
- Have the brake pads replaced by a specialist workshop, preferably an authorised BMW Motorrad dealer.

Check the rear brake pad thickness

- Make sure the ground is level and firm and place the motorcycle on its stand.



- Visually inspect the brake pads to ascertain their thickness. Viewing direction: between spray guard and rear wheel toward brake pads **1**.



Brake-pad wear limit, rear
1.0 mm (Friction pad only, without backing plate.)

If the wear limit has been reached:

WARNING

Brake-pad thickness less than permissible minimum

Diminished braking effect, damage to the brakes

- In order to ensure the dependability of the brake system, do not permit the brake pads to wear past the minimum permissible thickness.◀
- Have the brake pads replaced by a specialist workshop, preferably an authorised BMW Motorrad dealer.

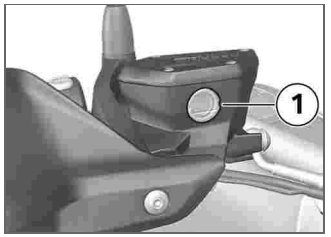
Checking brake-fluid level, front brakes

WARNING

Not enough brake fluid in brake fluid tank

Considerably reduced braking power due to air in the brake system

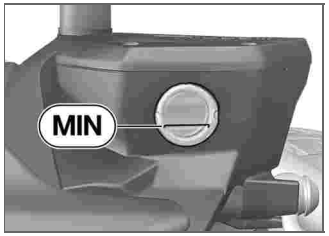
- Adjust the riding mode immediately until the fault is rectified.
- Check the brake-fluid level at regular intervals.◀
- Make sure the ground is level and firm and place the motorcycle on its centre stand.
- Move the handlebars to the straight-ahead position.



- Check the brake fluid level in front reservoir **1**.

NOTICE

Wear of the brake pads causes the brake fluid level in the reservoir to sink.◀



Brake fluid level, front
Brake fluid, DOT4
It is impermissible for the brake fluid level to drop below the MIN mark. (Brake-fluid reservoir horizontal, motorcycle upright)

If the brake fluid level drops below the permitted level:

- Have the defect rectified as quickly as possible by a specialist workshop, preferably an authorised BMW Motorrad dealer.

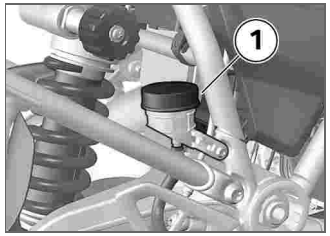
Checking the brake-fluid level, rear brakes

WARNING

Not enough brake fluid in brake fluid tank

Considerably reduced braking power due to air in the brake system

- Adjust the riding mode immediately until the fault is rectified.
- Check the brake-fluid level at regular intervals.◀
- Make sure the ground is level and firm and place the motorcycle on its centre stand.



- Check the brake fluid level in rear reservoir **1**.

NOTICE

Wear of the brake pads causes the brake fluid level in the reservoir to sink.◀

Brake fluid level, rear
Brake fluid, DOT4
It is impermissible for the brake fluid level to drop below the MIN mark. (Brake-fluid reservoir horizontal, motorcycle upright)

If the brake fluid level drops below the permitted level:

- Have the defect rectified as quickly as possible by a specialist workshop, preferably an authorised BMW Motorrad dealer.

Clutch

Checking clutch function

- Pull the clutch lever.

» The pressure point must be clearly perceptible.

If the pressure point is not clearly perceptible:

- Have the clutch checked by a specialist workshop, preferably an authorised BMW Motorrad dealer.

Coolant

Check coolant level

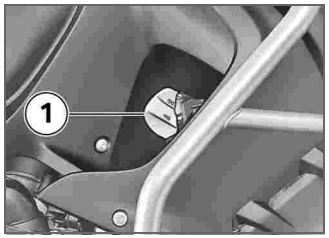
⚠ CAUTION

Working on hot cooling system

Risk of burn injury

- Always allow the cooling system to cool down before starting work.◀

- Make sure the ground is level and firm and place the motorcycle on its stand.

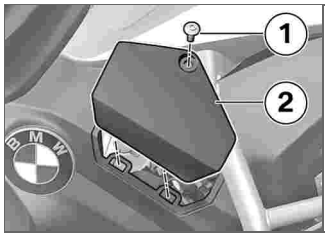


- Check the coolant level in expansion tank **1**.

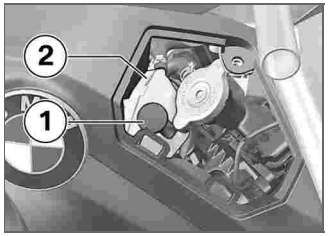
If the coolant drops below the permitted level:

- Top up the coolant.

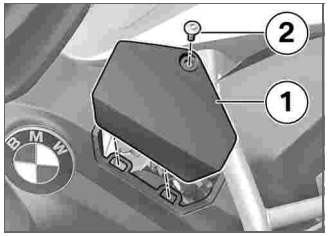
Top up coolant



- Remove screw **1** and remove cover **2**.



- Open cap **1** of coolant expansion tank **2** and top up the coolant to the specified level.
- Check coolant level (➠ 168).
- Close the cap of the coolant expansion tank.



- Place cover **1** in position.
- Install screw **2**.

Tyres

Checking tyre pressure

⚠ WARNING

Incorrect tyre pressure
Impaired handling characteristics of the motorcycle, shorter useful tyre life

- Always check that the tyre pressures are correct.◀

⚠ WARNING

Tendency of valve inserts installed vertically to open by themselves at high riding speeds
Sudden loss of tyre pressure

- Install valve caps fitted with rubber sealing rings and tighten firmly.◀
- Make sure the ground is level and firm and place the motorcycle on its stand.
- Check tyre pressures against the data below.

Tyre pressure, front
2.5 bar (tyre cold)

Tyre pressure, rear
2.9 bar (tyre cold)

If tyre pressure is too low:
- Correct tyre pressure.

Wheel rims and tyres

Checking rims

- Make sure the ground is level and firm and place the motorcycle on its stand.
- Visually inspect the rims for defects.
- Have any damaged rims inspected by a specialist workshop and replaced if necessary, preferably by an authorised BMW Motorrad dealer.

Checking tyre tread depth

WARNING

Riding with badly worn tyres

Risk of accident due to impaired handling
- If applicable, have the tyres changed in good time before they wear to the minimum tread depth permitted by law.◀
- Make sure the ground is level and firm and place the motorcycle on its stand.
- Measure the tyre tread depth in the main tread grooves with wear marks.

NOTICE

Wear indicators are built into the main profile grooves on each tyre. The tyre is worn out when the tyre tread has worn down to the level of the marks. The locations of the marks are indicated on the edge of the tyre, e.g. by the letters TI, TWI or by an arrow.◀

If the tyre tread is worn to minimum:
- Replace tyre or tyres, as applicable.

Check spokes

- Make sure the ground is level and firm and place the motorcycle on its stand.
- Draw the handle of a screwdriver or a similar instrument across the spokes and listen to the notes of the individual spokes.

If the notes vary:
- Have the spokes checked by a specialist workshop, preferably an authorised BMW Motorrad dealer.

Wheels

Effect of wheel size on chassis and suspension control systems

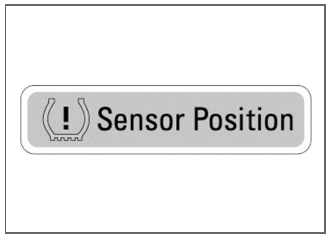
Wheel size is very important as a parameter for the chassis and suspension control systems ABS and ASC. In particular, the diameter and the width of a vehicle's wheels are programmed into the control unit and are fundamental to all calculations. Any change in these influencing variables, caused for example by a switch to wheels other than those installed ex-works, can have serious effects on the performance of the control systems.

The sensor rings are essential for correct road-speed calculation, and they too must match the motorcycle's control systems and consequently cannot be changed.

If you decide that you would like to fit non-standard wheels to your motorcycle, it is very important to consult a specialist workshop beforehand, preferably an authorised BMW Motorrad dealer. In some cases, the data programmed into the control units can be changed to suit the new wheel sizes.

RDC label

– with tyre pressure control (RDC)[OE]



ATTENTION

Tyre removal not in compliance with correct procedure

Damage to RDC sensors

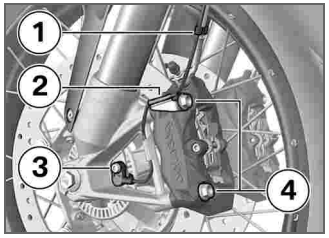
- Be sure to explain to the specialist workshop or authorised BMW Motorrad dealer that the wheel is fitted with an RDC sensor.◀

If the motorcycle is equipped with RDC, each wheel rim bears an adhesive label indicating the position of the RDC sensor. When changing the tyre, take care not to damage the RDC

sensor. Be sure to draw the attention of the authorised BMW Motorrad dealer or specialist workshop to the fact that the wheel is fitted with an RDC sensor.

Removing front wheel

- Make sure the ground is level and firm and place the motorcycle on its centre stand.



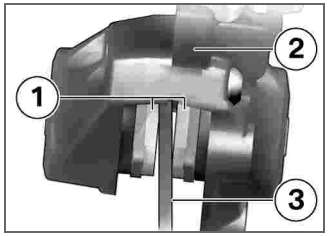
- Disengage the cable for the wheel-speed sensor from retaining clips **1** and **2**.
- Remove screw **3** and remove the wheel-speed sensor from its bore.
- Mask off the parts of the wheel rim that could be scratched in the process of removing the brake callipers.

ATTENTION

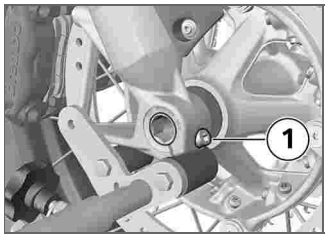
Unwanted inward movement of the brake pads

Component damage on attempt to install the brake caliper or because brake pads have to be forced apart

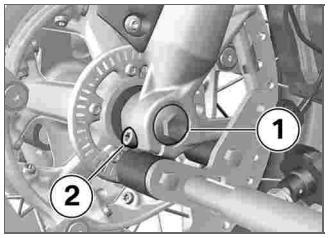
- Do not operate the brakes with a brake caliper not correctly secured.◀
- Remove securing screws **4** of the left and right brake callipers.



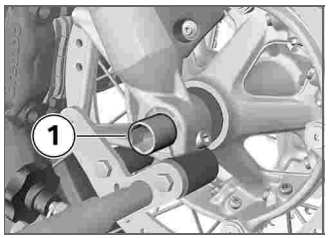
- Force the brake pads **1** slightly apart by rotational movement of the brake caliper **2** against brake disc **3**.
- Carefully pull the brake callipers back and out until clear of the brake discs.
- Lift the front of the motorcycle until the front wheel is clear of the ground, preferably using a BMW Motorrad front-wheel stand.
- Install the front-wheel stand (➠ 161).



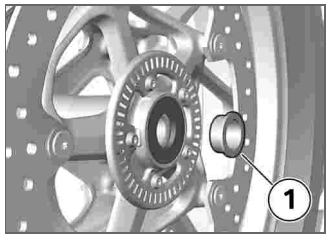
- Remove right-hand axle clamping screw **1**.



- Remove screw **1**.
- Remove left-hand axle clamping screw **2**.
- Press quick-release axle slightly toward the inside, so as to be better able to grip it on the right-hand side.



- Withdraw quick-release axle **1**, support the front wheel when doing this.
- Set down front wheel and roll forwards out of the front suspension.



- Remove spacer bush **1** from the wheel hub.

Installing front wheel

⚠ WARNING

Use of a non-standard wheel
Malfunctions during ABS and ASC/DTC intervention

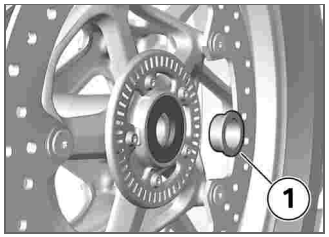
- See the information on the effect of wheel size on the ABS and ASC/DTC systems at the start of this chapter.◀

ATTENTION

Tightening threaded fasteners to incorrect tightening torque

Damage, or threaded fasteners work loose

- Always have the security of the fasteners checked by a specialist workshop, preferably an authorised BMW Motorrad dealer.◀



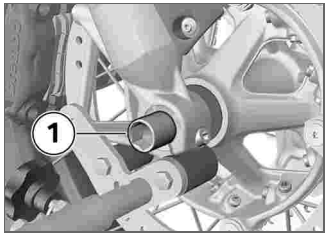
- Slip spacing bushing **1** into the wheel hub on the left-hand side.

ATTENTION

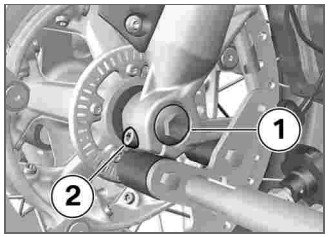
Front wheel installed wrong way round

Risk of accident

- Note direction-of-rotation arrows on tyre or rim.◀
- Roll the front wheel into position between the front forks.



- Lift front wheel and fit quick-release axle **1**.
- Remove front-wheel stand and firmly compress front forks several times. Do not operate front break lever.
- Install the front-wheel stand (➠ 161).

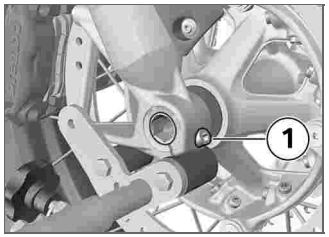


- Install screw **1** and tighten to specified torque. Counter-hold quick-release axle on the right-hand side.

Quick-release axle in telescopic forks	
30 Nm	

- Tighten left-hand axle clamping screw **2** to the specified torque.

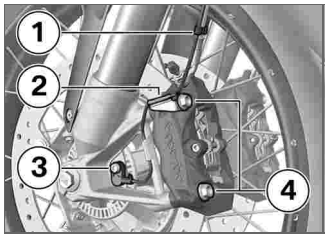
Clamping screw for quick-release axle in telescopic fork
19 Nm



- Tighten right axle clamping screw **1** to the specified torque.

Clamping screw for quick-release axle in telescopic fork
19 Nm

- Removing the front-wheel stand.
- Position left and right brake calipers on the brake discs.



- Install securing screws **4** on left and right and tighten to specified tightening torque.

Brake caliper on telescopic fork
38 Nm

- Remove the adhesive tape from the wheel rim.

⚠ WARNING

Brake pads not lying against the brake disc

Risk of accident due to delayed braking effect.

- Before driving, check that the brakes respond without delay.◀
- Operate the brake several times until the brake pads are bedded.
- Seat the cable for the wheel-speed sensor in retaining clips **1** and **2**.
- Insert the wheel-speed sensor into the bore and install screw **3**.

Wheel-speed sensor to fork leg
Joining compound: Micro-encapsulated or medium-strength thread-locking compound
8 Nm

Removing rear wheel

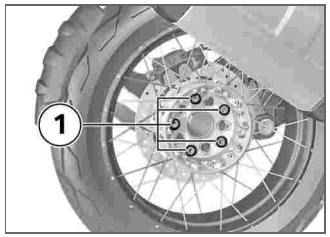
- Make sure the ground is level and firm and place the motorcycle on its centre stand.
- Engage first gear.

CAUTION

Hot exhaust system

Risk of burn injury

- Do not touch a hot exhaust system.◀
- Allow rear silencer to cool down.



- Remove studs **1** from the rear wheel, while supporting the wheel.
- Roll the rear wheel out toward the rear.

Installing the rear wheel

WARNING

Use of a non-standard wheel

Malfunctions during ABS and ASC/DTC intervention

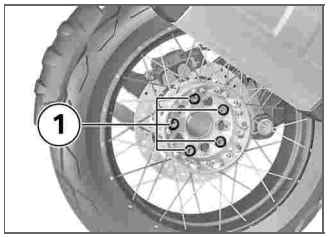
- See the information on the effect of wheel size on the ABS and ASC/DTC systems at the start of this chapter.◀

ATTENTION

Tightening threaded fasteners to incorrect tightening torque

Damage, or threaded fasteners work loose

- Always have the security of the fasteners checked by a specialist workshop, preferably an authorised BMW Motorrad dealer.◀
- Seat the rear wheel on the rear-wheel adapter.



⚠ WARNING

Mixed installation of wheel studs for spoked wheel and cast wheel

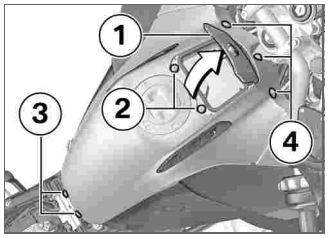
Risk of accident

- Use only wheel studs with the same, approved length code.
- Do not lubricate the wheel studs.◀
- Install wheel studs **1** and tighten to specified torque.

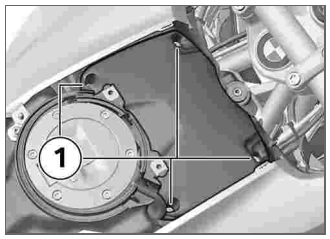
	Rear wheel to wheel flange
Tightening sequence: tighten in diagonally opposite sequence	
60 Nm	

Air filter

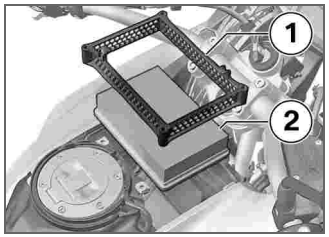
Replacing air-filter element



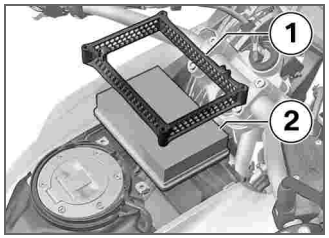
- Remove front seat (➠ 91).
- Open the storage compartment cover **1**.
- Remove the screws **2**, **3** and **4**.
- Remove the tank cover.



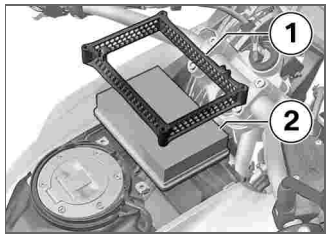
- Remove the screws **1**.
- Remove the air filter body cover.



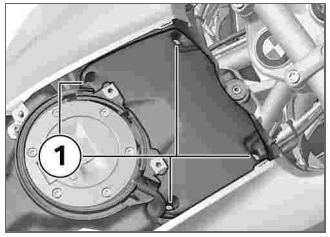
- Remove the frame **1**.
- Remove the air filter insert**2**.



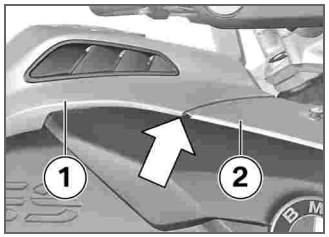
- Remove frame **1** and air filter element **2**.
- Insert new air filter element **2** and frame **1**.



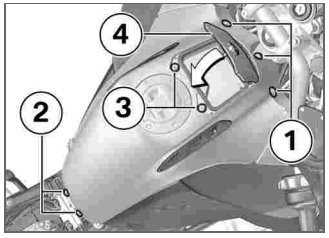
- Clean the air filter insert**2** or replace if necessary.
- Insert the air filter insert**2** and frame **1**.



- Place the air filter body cover.
- Install screws **1**.



- Position the tank cover **1**; when fitting it make sure that the guide (**arrow**) is below the front-wheel cover above **2**.



- Install screws **1**, **2** and **3**.

- Open the storage compartment cover **4**.
- Installing front seat (➠ 92).

Light source

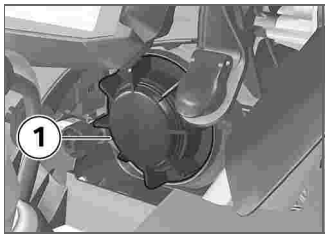
Replacing bulbs for low-beam and high-beam headlight

– without LED headlight[OE]

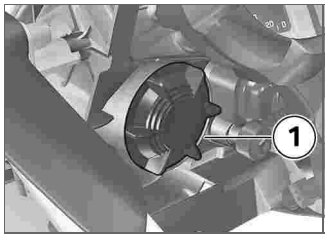
NOTICE

The positions of the plug, the spring wire retainer and the bulb might not be as illustrated below.◀

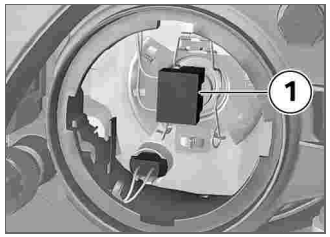
- Make sure the ground is level and firm and place the motorcycle on its stand.
- Switch off the ignition.



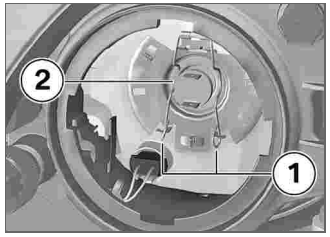
- Remove cover **1** by turning it counter-clockwise to replace the bulb for the low-beam headlight.



- Remove cover **1** by turning it counter-clockwise to replace the bulb for the high-beam headlight.



- Disconnect plug **1**.



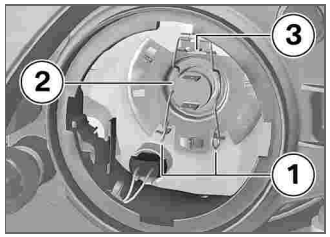
- Disengage spring clip **1** and swing it aside.
- Remove bulb **2**.

- Replace the defective bulb.

Bulbs for the low-beam headlight
H7 / 12 V / 55 W
– with LED headlight[OE]
LED◁

Bulb for high-beam headlight
H7 / 12 V / 55 W
– with LED headlight[OE]
LED◁

- Hold the new bulb by the base only, in order to keep the glass free of foreign matter.

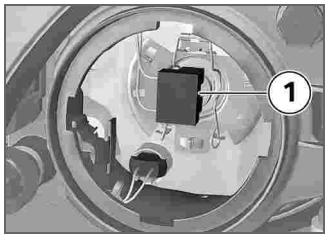


- Insert bulb **2**, making sure that tab **3** is correctly positioned.

NOTICE

The bulb might face in a direction other than that shown here.◀

- Engage spring clip **1** in the catch.

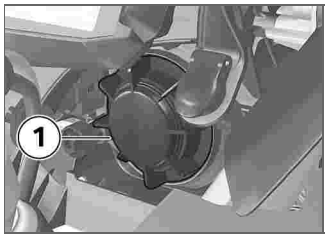


- Connect plug **1**.
- Place cover in position and fit by turning clockwise.

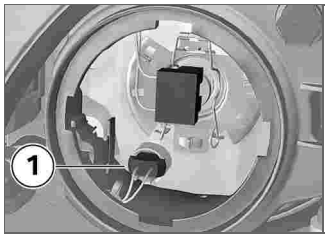
Replacing bulb for parking light

– without LED headlight[OE]

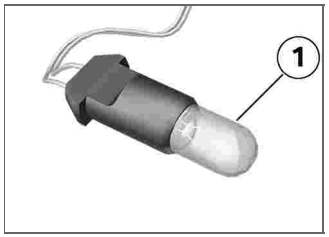
- Make sure the ground is level and firm and place the motorcycle on its stand.
- Switch off the ignition.



- Remove cover **1** by turning it counter-clockwise.



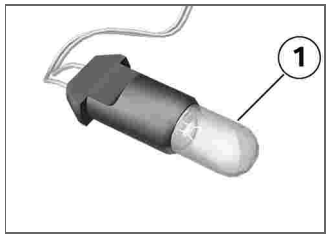
- Pull socket **1** out of the headlight housing.



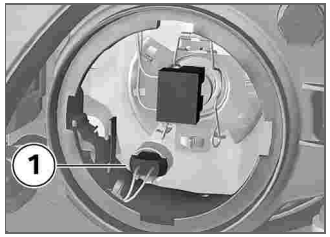
- Remove bulb **1** from the socket.
- Replace the defective bulb.

Bulb for parking light
W5W / 12 V / 5 W
– with LED headlight[OE]
LED◁

- Use a clean, dry cloth to hold the new bulb in order to keep the glass free of foreign matter.



- Insert bulb **1** into the socket.

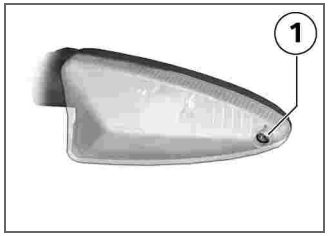


- Insert socket **1** into the headlight housing.
- Place cover in position and fit by turning clockwise.

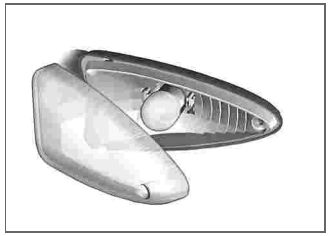
Replacing bulbs for front and rear turn indicators

– without LED flashing turn indicators [OE]

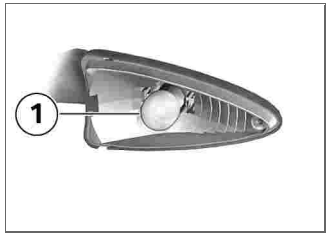
- Place the motorcycle on its stand on firm, even ground.
- Switch off the ignition.



- Remove the bolt **1**.



- Pull the glass out of the reflector housing at the threaded-fastener side.

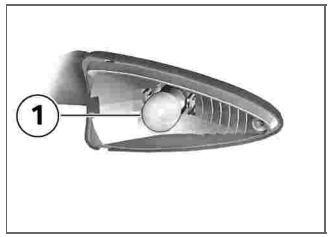


- Remove bulb **1** by turning anti-clockwise from the mirror housing.◁
- Replace the defective bulb.

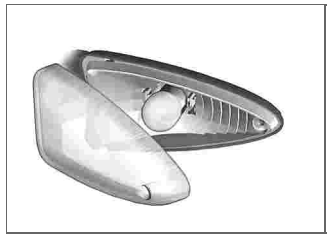
Bulbs for flashing turn indicators, front
RY10W / 12 V / 10 W
– with LED flashing turn indicators [OE]
LED◁

Bulbs for flashing turn indicators, rear
RY10W / 12 V / 10 W
– with LED flashing turn indicators [OE]
LED◁

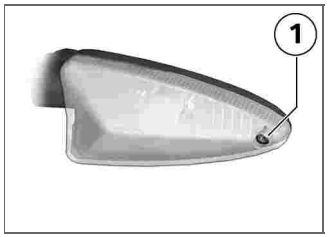
- Use a clean, dry cloth to hold the new bulb in order to keep the glass free of foreign matter.



- Turn bulb **1** clockwise to install it in the mirror housing.



- Working from the inboard side, insert the glass into the mirror housing and close the housing.



- Install screw **1**.

Replacing LED rear light

The LED rear light can be replaced only as a complete unit.

- Consult a specialist workshop, preferably an authorised BMW Motorrad dealer.

Replace LED flashing turn indicators

– with LED flashing turn indicators OE

- LED flashing turn indicators can only be replaced as a complete unit. Consult a specialist workshop, preferably an authorised BMW Motorrad dealer.

LED headlight, replacing

– with LED headlight OE

- LED headlights can be replaced only as a complete unit. Consult a specialist workshop, preferably an authorised BMW Motorrad dealer.◁

Replacing LED auxiliary headlights

– with LED auxiliary headlights OA

The LED auxiliary headlights can only be replaced as a unit; it is not possible to replace individual LEDs.
Consult a specialist workshop, preferably an authorised BMW Motorrad dealer.

Jump-starting

ATTENTION

Excessive current flowing when the motorcycle is jump-started

Wiring smoulders/ignites or damage to the on-board electronics

- If the motorcycle has to be jump-started connect the leads to the battery terminals; never attempt to jump-start the engine by connecting leads to the on-board socket.◀

ATTENTION

Contact between crocodile clips of jump leads and vehicle

Risk of short-circuit

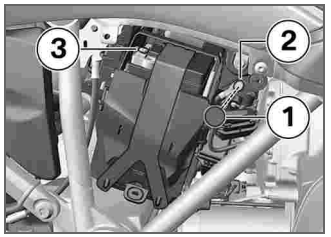
- Use jump leads fitted with fully insulated crocodile clips at both ends.◀

ATTENTION

Jump-starting with a voltage greater than 12 V

Damage to the on-board electronics

- Make sure that the battery of the donor vehicle has a voltage rating of 12 V.◀
- Place the motorcycle on its stand on firm, even ground.
- Removing battery cover (➠ 187).
- When jump-starting the engine, do not disconnect the battery from the on-board electrical system.



- Remove the protective cap **1**.
- Use the red jump lead to connect the positive battery connection point **2** of the drained battery to the positive terminal of the donor battery.
- Then connect one end of the black jump lead to the negative terminal of the donor battery, and the other end to the negative terminal **3** of the drained battery.
- Run the engine of the donor vehicle during jump-starting.
- Start the engine of the vehicle with the discharged battery in the usual way; if the en-

gine does not start, wait a few minutes before repeating the attempt in order to protect the starter motor and the donor battery.

- Allow both engines to idle for a few minutes before disconnecting the jump leads.
- Disconnect the jump lead from the negative terminals first, then disconnect the second lead from the positive terminals.

NOTICE

Do not use proprietary start-assist sprays or other products to start the engine.◀

- Install the protective cap.
- Fitting battery cover (➠ 188).

Battery

Maintenance instructions

Correct upkeep, recharging and storage will prolong the life of the battery and are essential if warranty claims are to be considered.

Compliance with the points below is important in order to maximise battery life:

– Keep the surface of the battery clean and dry.
– Do not open the battery.
– Do not top up with water.
– Be sure to read and comply with the instructions for charging the battery on the following pages.
– Do not turn the battery upside down.

ATTENTION

On-board electronics (e.g. clock) draining connected battery

Battery is deep-discharged; this voids the guarantee

- Connect a float charger to the battery if the motorcycle is to remain out of use for more than four weeks.◀

NOTICE

BMW Motorrad has developed a float charger specially designed for compatibility with the electronics of your motorcycle. Using this charger, you can keep the battery charged during long periods of disuse, without having to disconnect the battery from the motorcycle's on-board systems. You can obtain additional information from your authorised BMW Motorrad dealer.◀

Charge battery when connected

ATTENTION

Charging the battery that is connected to the vehicle via the battery terminals

Damage to the on-board electronics

- Disconnect the battery at the battery terminals before charging.◀

ATTENTION

Charging a fully discharged battery via the socket or the extra socket

Damage to the on-board electronics

- If a battery has discharged to the extent that it is completely flat (battery voltage less than 9 V, status-indicator lights and multifunction display remain off when the ignition is switched on) **it has to be disconnected from the on-board circuits** and re-charged with the charger connected directly to the battery posts.◀

ATTENTION

Unsuitable chargers connected to a socket

Damage to charger and vehicle electronics

- Use suitable BMW chargers. The suitable charger is available from your authorised BMW Motorrad dealer.◀
- Charge via the charging socket, with the battery connected to the motorcycle's on-board electrical system.

NOTICE

The motorcycle's on-board electronics know when the battery is fully charged. The on-board socket is switched off when this happens.◀

- Comply with the operating instructions of the charger.

NOTICE

If you are unable to charge the battery through the on-board socket, you may be using a charger that is not compatible with your motorcycle's electronics. If this happens, charge the battery directly at the terminals of the battery that is disconnected from the vehicle.◀

Charging battery when disconnected

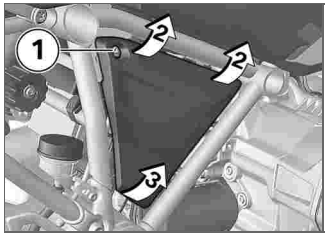
- Charge the battery using a suitable charger.
- Comply with the operating instructions of the charger.
- Once the battery is fully charged, disconnect the

charger's terminal clips from the battery terminals.

NOTICE

The battery has to be recharged at regular intervals in the course of a lengthy period of disuse. See the instructions for caring for your battery. Always fully recharge the battery before restoring it to use.◀

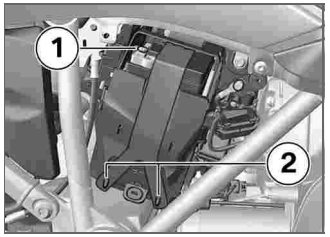
Removing battery



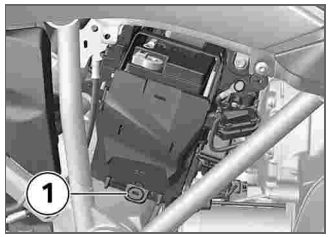
- Switch off the ignition.
- Remove screw **1**.
- Each battery cover slightly forward at the top at positions **2**.
- In order not to damage the battery cover or the mount, work the battery cover up at position **3** to remove.

– with alarm system (DWA) OE

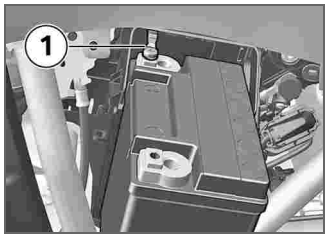
- If applicable, switch off the anti-theft alarm.◁



- Disconnect battery earth lead **1** and disengage rubber strap **2**.



- Pull retaining panel in position **1** outwards and remove in an upward direction.
- Slightly lift the battery and ease it clear of the holder until the battery positive terminal is accessible.

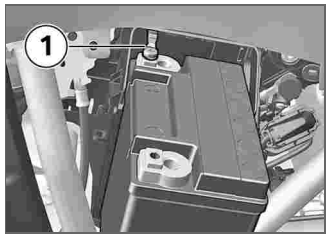


- Disconnect battery negative lead **1** and remove the battery.

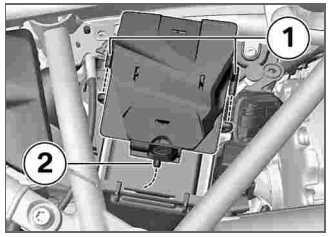
Installing battery

NOTICE

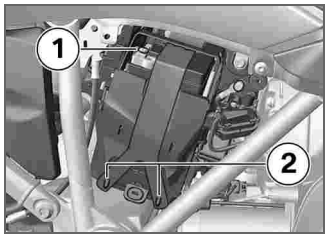
If the 12 V battery is not correctly installed or if the polarity of the terminals is reversed (e.g. in an attempt to jump-start the vehicle), this can cause the fuse for the alternator regulator to blow.◀



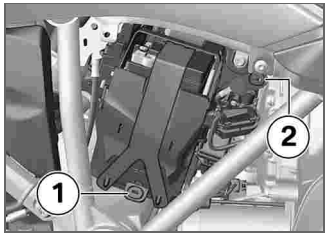
- Secure battery positive lead **1**.
- Push battery into the mounting.



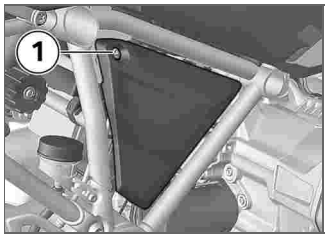
- First insert retaining plate into the mountings **1** and then push under the battery in position **2**.



- Secure battery negative lead **1**.
- Secure the battery with rubber strap **2**.



- Position the battery cover in the mounting **1** and press it into the mounting **2**.

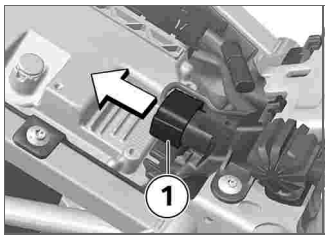


- Install screw **1**.

- Setting the clock (➠ 105).
- Setting the date (➠ 105).

Fuses

Replace fuses



- Switch off the ignition.
- Remove front seat (➠ 91).
- Disconnect plug **1**.

ATTENTION

Jumpering of blown fuses
Risk of short-circuit and fire
- Never attempt to jumper a blown fuse.
- Always replace a defective fuse with a new fuse of the same amperage.◀

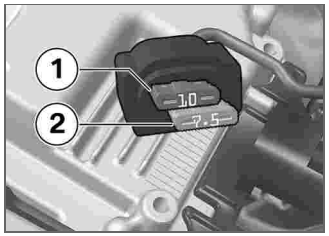
- Replace faulty fuse in accordance with the fuse allocation diagram.

NOTICE

If fuse defects recur frequently have the electric circuits checked by a specialist workshop, preferably an authorised BMW Motorrad dealer.◀

- Install plug **1**.
- Installing front seat (➠ 92).

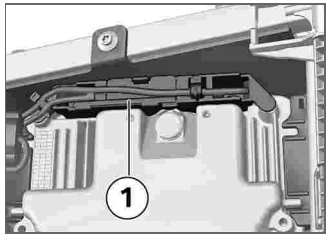
Fuse assignment



1 10 A
Instrument panel
Anti-theft alarm (DWA)
Ignition switch
Diagnostic socket

2 7.5 A
Multifunction switch, left
Tyre pressure monitoring (RDC)

Fuse for the alternator regulator



1 50 A
Alternator regulator

Diagnostic connector

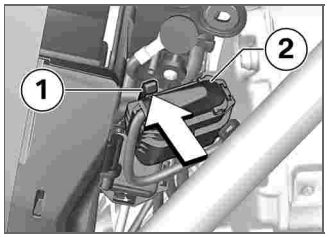
Disengaging diagnostic connector

CAUTION

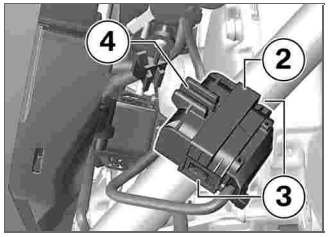
Incorrect procedure followed when loosening the diagnostic connector for the on-board diagnosis

Motorcycle experiences malfunctions

- Only have the diagnostic connector loosened by a specialist workshop or other authorised persons during your next BMW Service appointment.
- Have the work performed by appropriately trained staff.
- Refer to the vehicle manufacturer specifications.◀
- Removing battery cover (➠ 187).



- Press the hook **1** and pull the diagnostic connector **2** out upwards.

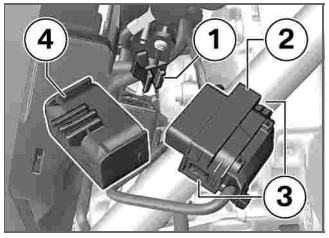


- Press the latches **3** on both sides.
- Disengage diagnostic connector **2** from holder **4**.

» The interface to the diagnosis and information system can be connected to diagnostic connector **2**.

Securing the diagnostic connector

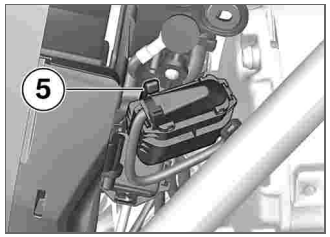
- Disconnect the interface for the diagnosis and information system.



- Seat diagnostic connector **2** in bracket **4**.

» The locks **3** engage on both sides.

- Seat the bracket **4** on the mounting **1**.



- Make sure the hook **5** has engaged.
- Fitting battery cover (➠ 188).

Accessories

General instructions

CAUTION

Use of other-make products

Safety risk

- BMW Motorrad cannot examine or test each product of outside origin to ensure that it can be used on or in connection with BMW vehicles without constituting a safety hazard. Country-specific official authorisation does not suffice as assurance. Tests conducted by these instances cannot make provision for all operating conditions experienced by BMW vehicles and, consequently, they are not sufficient in some circumstances.
- Use only parts and accessories approved by BMW for your vehicle.◀

BMW has conducted extensive testing of the parts and accessory products to establish that they are safe, functional and suitable. Consequently, BMW accepts product liability. BMW accepts no liability whatsoever for parts and accessories that it has not approved.

Whenever you are planning modifications, comply with all the legal requirements. Make sure that the vehicle does not infringe the national road-vehicle construction and use regulations applicable in your country.

Your BMW Motorrad dealer can offer expert advice on the choice of genuine BMW parts, accessories and other products.

To find out more about accessories go to:
bmw-motorrad.com/accessories

Power sockets

Connection of electrical devices

– You can start using electrical devices connected to the motorcycle's sockets only when the ignition is switched on.

Cable routing

– The cables from the power sockets to the auxiliary devices must be routed in such a way that they do not impede the rider.
– The cable routing should not restrict the steering angle or obstruct handling.
– The cables must not be trapped.

Automatic shutdown

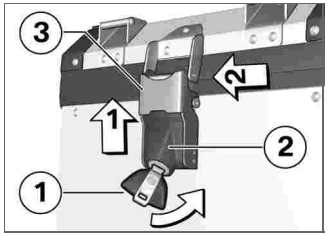
– The sockets will be automatically switched off during the start procedure.

– The power supply to the sockets is switched off no more than 15 minutes after the ignition is switched off, in order to prevent overloading of the on-board electrics. Low-wattage electrical accessories might not be recognised by the vehicle's electronics. In such cases, power sockets are switched off very shortly after the ignition is turned off.
– If the battery charge state is too low to maintain the motorcycle's start capability, the power sockets are switched off.
– The power sockets are also switched off when the maximum load capability as stated in the technical data is exceeded.

Cases

Open cases

– with aluminium cases[OA]



- Turn key **1** counter-clockwise.

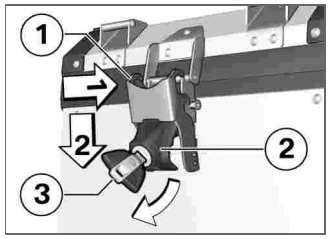
NOTICE

The case lid can be opened at either the left or the right latch.◀

- Push lock housing **2** upwards in order to release the catch **3**.
- Pull the latch **3** to one side and open the lid.

Closing cases

– with aluminium cases[OA]

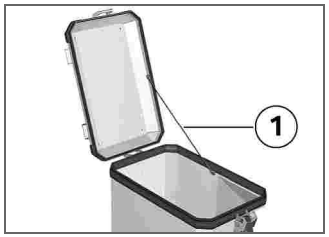


- Close the case lid.
- Set the latch **1** on the lid.
- Push lock housing **2** down, making sure that the latch toggle grips firmly in the lid.
- To lock the lock, turn key **3** clockwise and remove it.

Remove case lid

– with aluminium cases[OA]

- Open cases (➠ 195).

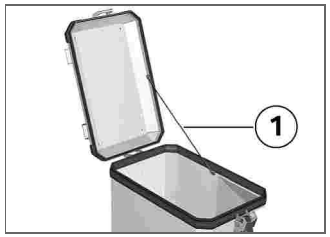


- Disengage retainer **1**.
- Close the case lid.
- Open the second catch of the case lid.
- Remove the case lid.

Install case lid

– with aluminium cases OA

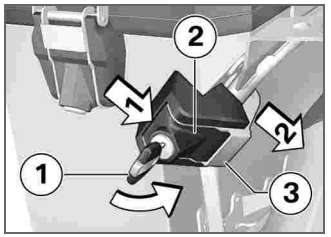
- Place the case lid on the case.
- Close one latch of the case lid.
- Using the locked side as a hinge, open the case lid.



- Engage retainer **1**.
- Close the case lid.
- Close the second latch of the case lid.

Removing cases

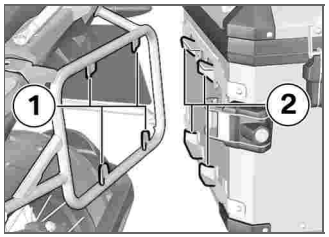
– with aluminium cases OA



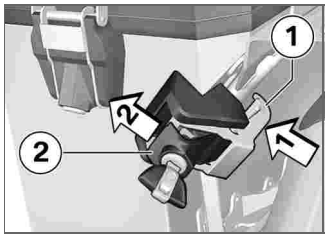
- Turn key **1** counter-clockwise.
- Push lock housing **2** to one side in order to release the catch **3**.
- Push the latch **3** to one side while holding the case.
- Pull the case forward as far as it will go and then to the side to remove.

Install cases

– with aluminium cases OA



- Set the case on the case carrier and push it to the rear in such a way that mounts on case carrier **1** and on case **2** engage each other.



- Place the latch **1** on the case holder while holding the case.
- Push lock housing **2** to the side, making sure that the latch toggle grips firmly on the carrier.
- Turn the key clockwise and remove.

Maximum payload and maximum permissible speed

Note the maximum permissible payload and the speed limit for riding with cases fitted, as stated on the label inside the case.

Contact your authorised BMW Motorrad dealer if you cannot find your combination of vehicle and cases on the label. The values for the combination described here are as follows:

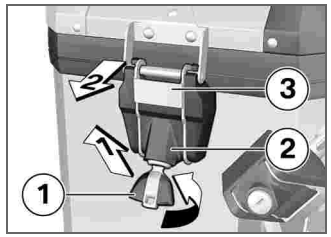
Maximum permissible speed for riding with aluminium cases fitted to the motorcycle
max 180 km/h

Payload per aluminium case
max 10 kg

Topcase

Opening topcase

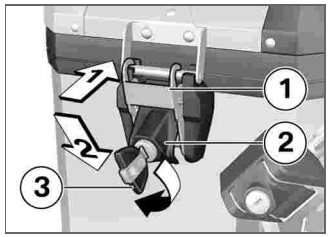
– with aluminium topcase[OA]



- Turn key **1** counter-clockwise.
- Push lock housing **2** upwards in order to release the catch **3**.
- Pull the latch **3** backwards and open the lid.

Closing topcase

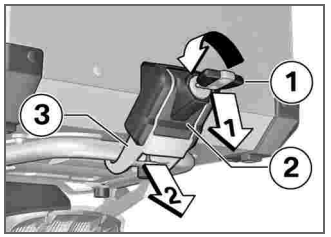
– with aluminium topcase[OA]



- Close the topcase lid.
- Set the latch **1** on the lid.
- Push lock housing **2** down, making sure that the latch toggle grips firmly in the lid.
- To lock the lock, turn key **3** clockwise and remove it.

Removing the topcase

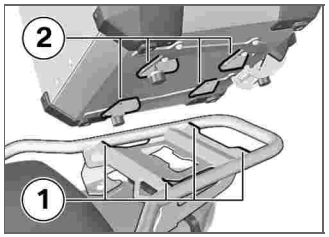
– with aluminium topcase[OA]



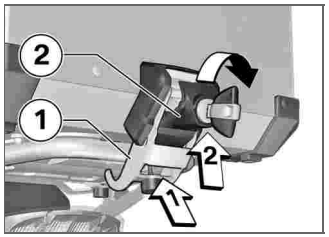
- Turn key **1** counter-clockwise.
- Push lock housing **2** downwards in order to release the catch **3**.
- Pull the latch **3** backwards.
- Pull the topcase to the rear and then lift it up to remove.

Installing topcase

– with aluminium topcase[OA]



- Set the topcase on the topcase rack and push it forward in such a way that mounts on topcase rack **1** and on topcase **2** engage each other.



- Set the latch **1** on the topcase carrier.
- Push lock housing **2** up, making sure that the latch toggle grips firmly on the carrier.
- To secure the lock, turn the key clockwise and remove.

Maximum payload and maximum permissible speed

Note the maximum permissible payload and the speed limit for riding with topcase fitted, as stated on the label inside the topcase.

Contact your authorised BMW Motorrad dealer if you cannot find your combination of vehicle and topcase on the label.
The values for the combination described here are as follows:

Maximum permissible speed for riding with aluminium topcase fitted to the motorcycle
max 180 km/h

Payload of aluminium topcase
max 5 kg

Navigation system

– with preparation for navigation system OE

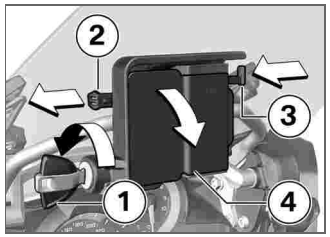
Securing navigation device

NOTICE

The navigation preparation option is compatible with the BMW Motorrad Navigator IV and the BMW Motorrad Navigator V.◀

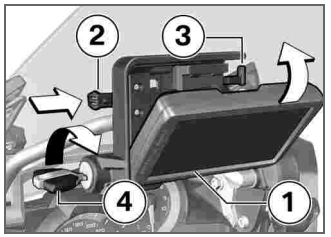
NOTICE

The latching system of the Mount Cradle is not designed to protect against theft.
Always remove the navigation system and stow it away safely as soon as you finish your ride.◀



- Turn ignition key **1** counter-clockwise.
- Pull retainer **2** to the **left**.
- Press in lock **3**.

» The Mount Cradle is released and cover **4** can be pivoted forward and removed.



- Insert navigation device **1** at bottom and pivot it toward the rear.

» The navigation device engages with an audible click.

- Push retainer **2** fully to the **right**.

» Lock **3** is engaged.

- Turn ignition key **4** clockwise.

» The navigation device is secured and the ignition key can be removed.

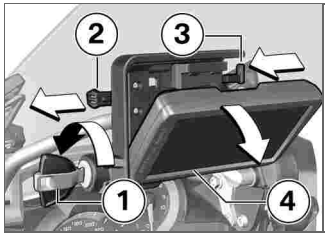
Removing navigation device and installing cover

ATTENTION

Dust and dirt on the Mount Cradle contacts

Damaged contacts

- Always reinstall the cover as soon as you finish your ride.◀



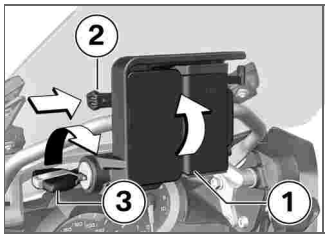
- Turn vehicle key **1** counter-clockwise.
- Pull retainer **2** fully to the **left**.

» Lock **3** is disengaged.

- Push lock **3** fully to the **left**.

» Navigation device **4** is unlocked.

- Tilt navigation device **4** and work it downward to remove.



- Insert cover **1** at bottom and pivot it up.

» The cover engages with an audible click.

- Push retainer **2** to the **right**.
- Turn vehicle key **3** clockwise.

» Cover **1** is secured.

Operating navigation system

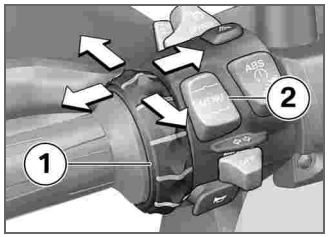
NOTICE

The description below is based on the Navigator V. The Navigator IV does not support all the possibilities described here.◀

NOTICE

Only the latest version of the BMW Motorrad communication system is supported. A software update of the BMW Motorrad communication system may be necessary. If this is the case, consult your authorised BMW Motorrad dealer.◀

If the BMW Motorrad Navigator is installed and the operating focus is switched to the Navigator (➠ 101), some of its functions can be operated directly from the handlebars.



The navigation system is operated via the multi-controller **1** and the MENU rocker button **2**.

Turn the multi-controller 1 up and down

On the compass and Mediaplayer page: increase or decrease the volume of a BMW Motorrad communication system connected via Bluetooth.
In the BMW special menu: select menu items.

Briefly tilt the multi-controller 1 to the left and right

Switch between the Navigator's main pages:
– Map view
– Compass
– Mediaplayer
– BMW special menu
– My Motorcycle page

Hold the multi-controller 1 to the left and right

Activate certain functions on the Navigator display. An arrow to the right or to the left above the corresponding button area on the display indicates a function that can be activated in this way.

Long-push to the right to activate this function.

Long-push to the left to activate this function.

Press down MENU rocker button 2

Switch the operating focus to Pure Ride view.

In detail, the following functions can be controlled:

Map view

– Turn up: Enlarge map section (Zoom in).
– Turn down: Reduce map section (Zoom out).

Compass page

– Turning increases or decreases the volume of a BMW Motorrad communication system connected via Bluetooth.

BMW special menu

– Speak: Repeat most recent navigation announcement.

– Waypoint: Save current location as a favourite.
– Home: Starts navigation to home address (greyed if no home address has been defined).
– Mute: Switch automatic navigation announcements off or on (off: a crossed-out lips symbol appears in the top line of the display). "Speak" will still activate navigation announcements. All other acoustic outputs remain switched on.
– Switch off display: Deactivate the display.
– Dial home number: Dials the home phone number saved in the Navigator (not shown unless a telephone is connected).
– Diversion: Activates the diversion function (not shown unless a route is active).
– Skip: Skips the next waypoint (not shown unless the route has waypoints).

My Motorcycle

– Turn: Changes the number of data shown.
– Touch a data field on the display to open the menu for selecting data.
– The values available fr selection depend on the optional extras installed on the vehicle.

NOTICE

The Mediaplayer function is only available when using an A2DP-standard Bluetooth device, for example a BMW Motorrad communication system.◀

Mediaplayer

– Long-push to the left: Play preceding track.
– Long-push to the right: Play next track.
– Turning increases or decreases the volume of a BMW Motorrad communication system connected via Bluetooth.

Warnings and status messages

Warning and status messages from the motorcycle are indicated by a symbol **1** appearing at the top left in the map view.

NOTICE

If a BMW Motorrad communication system is connected, warnings are accompanied by an acoustic signal.◀

If there are two or more active warnings the number appears below the warning triangle.
Touching the warning triangle when more than one warning is active opens a list of all the warnings.
Additional information appears as soon as a message is selected.

NOTICE

Detailed information cannot be displayed for all warnings.◀

Special functions

Integration of the BMW Motorrad Navigator has produced a number of deviations from the descriptions in the operating instructions for the Navigator.

Reserve fuel level warning

The settings for the fuel gauge are not available, because the reserve fuel level warning is sent by the vehicle to the Navigator.

Touch the message when it is active to view the locations of the nearest filling stations.

Time and date

The Navigator sends the time and date to the motorcycle. The transfer of these data into the instrument cluster must be activated in the SETUP menu of the instrument cluster.

Security settings

The BMW Motorrad Navigator V can be secured against unauthorised use with a four-digit PIN (Garmin Lock). If this function is activated, while the Navigator is cradled on the motorcycle and the ignition is switched on you are prompted to add the motorcycle to the list of secured vehicles. If you answer "Yes" at this prompt the Navigator saves the VIN of this vehicle in its internal memory.

A maximum of five VINs can be saved in this way.
Subsequently, the PIN does not have to be entered when the Navigator is switched on by ignition ON while cradled in any of these vehicles.
If the Navigator is removed from the vehicle while switched on, a security prompt asking for the PIN to be entered is issued.

Screen brightness

Screen brightness is adjusted by the motorcycle while the unit is cradled. No manual input is necessary.
If you prefer, you can switch off automatic adjustment n the Navigator display settings.

Care

Care products

BMW Motorrad recommends that you use the cleaning and care products you can obtain from your authorised BMW Motorrad dealer.
The substances in BMW Care Products have been tested in laboratories and in practice; they provide optimised care and protection for the materials used in your vehicle.

ATTENTION

Use of unsuitable cleaning and care products
Damage to vehicle parts
- Do not use solvents such as cellulose thinners, cold cleaners, fuel or the like, and do not use cleaning products that contain alcohol.◀

Washing the vehicle

BMW Motorrad recommends that you use BMW insect remover to soften and wash off insects and stubborn dirt on painted parts prior to washing the vehicle.
To prevent stains, do not wash the vehicle immediately after it has been exposed to strong sunlight and do not wash it in the sun.
Make sure that the vehicle is washed frequently, especially during the winter months.
To remove road salt, clean the motorcycle with cold water immediately after every trip.

WARNING

Wet brake discs and brake pads after vehicle wash, after riding through water and in rainy conditions
Diminished braking effect, risk of accident
- Apply the brakes in good time to allow the friction and heat to dry the brake discs and brake pads.◀

ATTENTION

Effect of road salt intensified by warm water
Corrosion
- Use only cold water to wash off road salt.◀

ATTENTION

Damage due to high water pressure from high pressure cleaners or steam cleaners
Corrosion or short circuit, damage to labels, seals, hydraulic brake system, electrical system and the motorcycle seat

- Exercise restraint when using a steam jet or high pressure cleaning equipment.◀

NOTICE

Aluminium cases and topcases do not have a surface coating. Care in accordance with the instructions set out below will help ensure the best possible appearance:
Remove road salt and corrosive deposits by cleaning with cold water immediately after every trip.◀

Cleaning easily damaged components

Plastics

ATTENTION

Use of unsuitable cleaning agents
Damage to plastic surfaces

- Do not use cleaning agents that contain alcohol, solvents or abrasives.
- Do not use insect-remover pads or cleaning pads with hard, scouring surfaces.◀

Body panels
Clean the trim panels with water and BMW plastic care emulsion.

Windscreens and lenses made of plastic
Clean off dirt and insects with a soft sponge and plenty of water.

NOTICE

Soften stubborn dirt and insects by covering the affected areas with a wet cloth.◀

Clean with water and sponge only.

Do not use any chemical cleaning agents.

Chrome

Use plenty of water and BMW shampoo to clean chrome, particularly if it has been exposed to road salt. Use chrome polish for additional treatment.

Radiator

Clean the radiator regularly to prevent overheating of the engine due to inadequate cooling. For example, use a garden hose with low water pressure.

ATTENTION

Bending of radiator fins
Damage to radiator fins

- Take care not to bend the radiator fins when cleaning.◀

Rubber components

Treat rubber components with water or BMW rubber-care products.

ATTENTION

Application of silicone sprays to rubber seals

Damage to the rubber seals

- Do not use silicone sprays or care products that contain silicon.◀

Paint care

Washing the vehicle regularly will help counteract the long-term effects of substances that damage the paint, especially if your vehicle is ridden in areas with high air pollution or natural sources of dirt, for example tree resin or pollen.

Remove particularly aggressive substances immediately, however, as otherwise the paint can be affected or become discoloured. Substances of this nature include spilt fuel, oil, grease, brake fluid and bird droppings. We recommend BMW vehicle polish or BMW paint cleaner for this purpose.

Marks on the paintwork are particularly easy to see after the vehicle has been washed. Remove stains of this kind immediately, using cleaning-grade benzine or petroleum spirit on a clean cloth or ball of cotton. BMW Motorrad recommends using BMW tar remover for removing specks of tar. Remember to wax the parts treated in this way.

Protective wax coating

If water is no longer forming beads on the paint surface, it must be waxed.

BMW Motorrad recommends applying only BMW car wax or products containing carnauba wax or synthetic wax.

Laying up the motorcycle

- Clean the motorcycle.
- Fill the motorcycle's fuel tank with fuel.
- Removing battery (➠ 187).
- Spray the brake and clutch lever pivots and the main and side stand pivots with a suitable lubricant.
- Coat bright metal and chrome-plated parts with an acid-free grease (e.g. Vaseline).
- Stand the motorcycle in a dry room in such a way that there is no load on either wheel (preferably using the front-wheel and rear-wheel stands from BMW Motorrad).

Restoring motorcycle to use

- Remove the protective wax coating.
- Clean the motorcycle.

- Installing battery (➠ 188).
- Comply with checklist (➠ 128).

Technical data

Troubleshooting chart

The engine does not start.

Possible cause	Rectification
Kill switch activated	Set emergency-off switch (kill switch) to operating position.
Side stand extended and gear engaged	Retract the side stand.
Gear engaged and clutch not disengaged	Select neutral or pull the clutch lever.
No fuel in tank	Refuelling (➠ 138).
Battery flat	Charge battery when connected (➠ 186).
Overheating protection for starter motor has been activated. Starter motor can only be operated for a limited period of time.	Allow the starter motor to cool down for approx. 1 minute before using it again.

The Bluetooth connection is not established.

Possible cause	Rectification
The steps required for pairing were not carried out.	Check the necessary steps for pairing in the operating instructions for the communication system.
The communication system was not connected automatically despite successful pairing.	Switch off the helmet's communication system and reconnect it after a minute or two.
Too many Bluetooth devices are saved on the helmet.	All pairing entries on the helmet are deleted (see the communication system operating instructions).
There are other vehicles with Bluetooth-capable devices in the vicinity.	Avoid simultaneously pairing with more vehicles.

Bluetooth connection is interrupted.

Possible cause	Rectification
The Bluetooth connection to the mobile end device is interrupted.	Switch off energy saving mode.
The Bluetooth connection to the helmet is interrupted.	Switch off the helmet's communication system and reconnect it after a minute or two.
The volume in the helmet cannot be adjusted.	Switch off the helmet's communication system and reconnect it after a minute or two.

The telephone book is not displayed in the TFT display.

Possible cause	Rectification
The phone book was not transmitted to the vehicle.	When pairing the mobile end device, confirm transmission of the phone data (➠ 116).

Active route guidance is not displayed in the TFT display.

Possible cause	Rectification
Navigation from the BMW Motorrad Connected App was not transmitted.	The BMW Motorrad Connected App is opened on the connected mobile end device prior to departure.
The route guidance cannot be started.	Secure the mobile device's data connection and check the map data on the mobile end device.

Screw connections

Front wheel	Value	Valid
Quick-release axle in telescopic forks		
M12 x 20	30 Nm	
Clamping screw for quick-release axle in telescopic fork		
M8 x 35	19 Nm	
Brake caliper on telescopic fork		
M10 x 65	38 Nm	
Wheel-speed sensor to fork leg		
M6 x 16 Micro-encapsulated or medium-strength thread-locking compound	8 Nm	

Rear wheel	Value	Valid
Rear wheel to wheel flange		
M10 x 1.25 x 40	**Tightening sequence: tighten in diagonally opposite sequence**	
	60 Nm	

Mirrors	Value	Valid
Mirror (locknut) to adapter		
M10 x 1.25	Left-hand thread, 22 Nm	
Adapter to clamping block		
M10 x 14 - 4.8	25 Nm	

Handlebars	Value	Valid
Clamping block (handlebar clamp) on fork bridge		
M8 x 35	**Tightening sequence: Tighten in riding direction at the front of the block**	
	19 Nm	

Fuel

Recommended fuel grade	Super unleaded (max. 10 % ethanol, E10) 95 ROZ/RON 89 AKI
Alternative fuel grade	Regular unleaded (Power- and consumption-related restrictions. Have the motorcycle programmed beforehand at your authorised BMW Motorrad Retailer.) (max. 10 % ethanol, E10) 91 ROZ/RON 87 AKI
Usable fuel capacity	approx. 30 l
Reserve fuel	approx. 4 l
Exhaust emissions standard	EU4