

Maintenance Instructions

F 650 GS

F 650 GS Dakar



**BMW Motorrad
On-board
documentation**

consisting of
Rider's Manual
and Maintenance
Instructions



Please note



Warning:

This symbol indicates precautions and measures which are essential in protecting the rider or other persons from severe or fatal injury.



Attention:

Specific instructions and safety precautions intended to prevent damage to the motorcycle. Disregarding them may render the warranty invalid.



Note:

Specific instructions on how to operate, control, adjust or look after items of equipment on the motorcycle.

For safety reasons and to maintain the value of your motorcycle, regular maintenance intervals have been laid down. Always keep to the specified maintenance intervals. This is the only way to ensure that warranty claims are not invalidated. The contents of the maintenance schedules are subject to change, for reasons of safety, due to modifications in, among other things, materials. Your authorised BMW motorcycle dealer can provide information on the currently specified Service, Inspection and Annual Service work needed.

Important:

BMW refuses to accept liability for damage or consequential damage due to repairs or service work carried out by other than BMW-authorised workshops.

Consequently, we advise you to have service and maintenance work carried out by your authorised BMW motorcycle dealer's specially trained, expert personnel, and confirmed by an entry in the Maintenance Instructions.

Authorised BMW motorcycle dealers are supplied with the latest technical information and have the necessary technical know-how and specially trained staff.

Please do not hesitate to contact your authorised BMW motorcycle dealer on all matters concerning your motorcycle.

Authorised BMW motorcycle dealers are fully informed about all aspects of your motorcycle and will gladly advise and assist you.

Best wishes,

BMW Motorrad

Important safety information

1

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BMW Service

For your own safety, use only genuine BMW spare parts and accessories approved by BMW.

If you choose genuine BMW accessories and spare parts that have been tested and approved, you can be sure that BMW has carried out the appropriate tests to confirm their suitability for use on your motorcycle. BMW accepts product liability only for these products.

Note, however, that BMW is unable to accept liability for spare parts and accessories which it has not approved.

BMW cannot assess every single product of outside origin in order to decide whether it can be used on or with a BMW vehicle without constituting a safety hazard.

Nor is approval by an official technical inspection authority, or even the granting of a general operating permit necessarily a sufficient guarantee, since these test procedures are not always adequate.

Genuine BMW spare parts, accessories and other products which BMW has approved can be obtained from all authorised BMW motorcycle dealers, together with expert advice on their installation and use.

BMW Pre-delivery Check

Your authorised BMW Motorrad dealer conducts the BMW pre-delivery check before handing over the motorcycle to you.

BMW Running-in Check

The BMW running-in check has to be performed when the motorcycle has covered between 500 km and 1,200 km.

BMW Service

The BMW service is carried out once a year; the extent of servicing can vary, depending on the age of the motorcycle and the distance it has covered. Your authorised BMW Motorrad dealer confirms that the service work has been carried out and enters the date when the next service is due.

Riders who cover long distances in a year might have to bring in their motorcycle for annual service before the next scheduled date. It is to allow for these cases that a maximum odometer reading is entered as well in the confirmation of service. Servicing has to be brought forward if this odometer reading is reached before the next scheduled date for the annual service.

Confirmation of maintenance work

1

4

BMW Service

BMW Pre-delivery Check

Completed

on _____

Stamp, Signature

BMW Running-in Check

Completed

on _____

Odometer reading _____

Next service

at the latest

on _____

or, if logged beforehand,

Odometer reading _____

Stamp, Signature

Confirmation of maintenance work

BMW Service

Completed

on _____

Odometer reading _____

Next Service

at the latest

on _____

or, if logged beforehand,

Odometer reading _____

Stamp, Signature

BMW Service

Completed

on _____

Odometer reading _____

Next service

at the latest

on _____

or, if logged beforehand,

Odometer reading _____

Stamp, Signature

1

5

BMW Service

Confirmation of maintenance work

1

6

BMW Service

BMW Service

Completed

on _____

Odometer reading _____

Next Service

at the latest

on _____

or, if logged beforehand,

Odometer reading _____

Stamp, Signature

BMW Service

Completed

on _____

Odometer reading _____

Next service

at the latest

on _____

or, if logged beforehand,

Odometer reading _____

Stamp, Signature

Confirmation of maintenance work

BMW Service

Completed

on _____

Odometer reading _____

Next Service

at the latest

on _____

or, if logged beforehand,

Odometer reading _____

Stamp, Signature

BMW Service

Completed

on _____

Odometer reading _____

Next service

at the latest

on _____

or, if logged beforehand,

Odometer reading _____

Stamp, Signature

Confirmation of maintenance work

1

8

BMW Service

BMW Service

Completed

on _____

Odometer reading _____

Next Service

at the latest

on _____

or, if logged beforehand,

Odometer reading _____

Stamp, Signature

BMW Service

Completed

on _____

Odometer reading _____

Next service

at the latest

on _____

or, if logged beforehand,

Odometer reading _____

Stamp, Signature

Confirmation of maintenance work

BMW Service

Completed

on _____

Odometer reading _____

Next Service

at the latest

on _____

or, if logged beforehand,

Odometer reading _____

Stamp, Signature

BMW Service

Completed

on _____

Odometer reading _____

Next service

at the latest

on _____

or, if logged beforehand,

Odometer reading _____

Stamp, Signature

Confirmation of maintenance work

1

10

BMW Service

BMW Service

Completed

on _____

Odometer reading _____

Next Service

at the latest

on _____

or, if logged beforehand,

Odometer reading _____

Stamp, Signature

BMW Service

Completed

on _____

Odometer reading _____

Next service

at the latest

on _____

or, if logged beforehand,

Odometer reading _____

Stamp, Signature

Confirmations of maintenance work

BMW Service

Completed

on _____

Odometer reading _____

Next Service

at the latest

on _____

or, if logged beforehand,

Odometer reading _____

Stamp, Signature

BMW Service

Completed

on _____

Odometer reading _____

Next service

at the latest

on _____

or, if logged beforehand,

Odometer reading _____

Stamp, Signature

Confirmation of service

This table is intended as a record of maintenance, warranty and repair work, the installation of optional accessories and, if appropriate, special campaign (recall) work.

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BMW Service

[illegible]

Confirmation of service

| Item | Odometer reading | Date |
|------|------------------|------|
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Your motorcycle is equipped with a digital electronic engine management system and a high-power ignition system.



Warning:

When the engine is running or the ignition is switched on, do not touch electrically live components, terminals or wiring.

– Risk of fatal accident

Work on the electrical system only when the circuit has been interrupted (ignition switched off). For greater safety, disconnect and insulate the negative battery lead.

If you intend to perform the maintenance and general care work described in the following section yourself, you must possess the necessary knowledge of technical matters and mechanical skills.

Your motorcycle is built to high technological standards. Special tools and purpose-designed diagnosis and testing equipment, together with the appropriate knowledge, are needed to keep your motorcycle in optimum working order. Your authorised BMW motorcycle dealer possesses the necessary technical know-how and employs company-trained staff. They can guarantee that your motorcycle is always maintained in a fault-free technical condition.

Remember: the safety and reliability of your motorcycle are the most important considerations.

You should therefore not attempt any complex repair or maintenance tasks.

Keep to the specified Inspection and Service intervals. BMW refuses to accept liability for damage or consequential damage due to repairs or service work carried out by other than BMW-authorised work shops.

Technical modifications



Warning:

The data stored in the electronic engine management system is the result of extensive experimental and testing work.

Tampering with the electronic engine management system represents an increased safety risk for the rider.



Note:

Manipulation of the electronic engine management system voids the warranty in all instances of damage consequential to such manipulation.

Technical modifications are only permitted to a limited extent.

Whenever you are planning such modifications, comply with all the legal requirements. The motorcycle must not infringe your national road-vehicle construction and use regulations.

Your authorised BMW motorcycle dealer will gladly advise you on technical requirements, the manufacturer's recommendations and the overall benefit likely to be obtained.

Genuine BMW parts

For reasons of safety, use only genuine BMW parts and accessories.

Genuine BMW parts are identical with those fitted to your motorcycle as original equipment.

BMW Motorrad refuses to accept any liability whatsoever for other-make spare parts and accessories.

Troubleshooting chart

Fault: Engine does not start or is very difficult to start

| Possible cause | Remedy | See ➡ Page |
|--------------------------------------|--------------------------------------|-------------------------------|
| Wrong ignition key position | Operation | Rider's Manual ➡ Chapter 1 |
| Kill switch is off | Operation | Rider's Manual ➡ Chapter 3 |
| Power supply interrupted | Blown fuse | ➡ 41 |
| Gear engaged, clutch not disengaged | Select neutral or pull clutch lever | Rider's Manual ➡ Chapter 3 |
| Side stand extended and gear engaged | Select neutral or retract side stand | Rider's Manual ➡ Chapter 3 |
| No fuel in tank | Refuel | Rider's Manual ➡ Chapter 2 |
| Fuel pump not working | Blown fuse | ➡ 41 |
| Incorrect operation of twistgrip | Operation | Rider's Manual ➡ Chapter 3 |

Troubleshooting chart

Fault: Engine does not start or is very difficult to start

| Possible cause | Remedy | See ➡ Page |
|---|--|----------------------------|
| Blocked air filter element | Replace | ➡ 43 |
| Spark plug defective/wet | Replace | |
| Spark plugs/leads or caps wet | Dry | |
| Insufficient battery charge | Recharge battery | ➡ 49 |
| Electronic engine management system not initialised | Ignition off, wait for 3 seconds, switch ignition on and wait until warning light for coolant temperature stops flashing | Rider's Manual ➡ Chapter 3 |



Note:

It is advisable to have other faults – not described on pages 14 ...58 – attended to by a specialist workshop, preferably an authorised BMW motorcycle dealer.



Note:

More detailed technical information is available in the following publications:

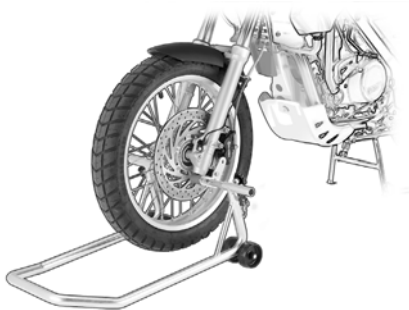
- Repair Manual
- Electrical circuit diagrams

Removing the front wheel

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Maintenance and care



- Place the motorcycle on its main stand (Dakar: use auxiliary stand, BMW special tool number 00 1 610, or some other, suitable auxiliary stand)
 - Make sure the ground is level and firm.
- Raise the front wheel with front wheel stand, BMW special tool No. 36 3 970, or a suitable auxiliary stand



Note:

Make sure that the front-wheel stand is set to the correct width and height.



Attention:

When removing, avoid damage to brake pipes, brake discs, brake pads and the wheel rim (mask off with tape if necessary).

Do not scratch the rim when forcing back the brake pads or removing the calipers (apply masking tape if necessary).

To prevent damage to the brake caliper and possible difficulty when assembling: never pull the brake lever when the brake calipers have been removed.

Motorcycle equipped with ABS^{OE}:

Do not damage the ABS sensor cable, the ABS sensor ring and the ABS sensor.

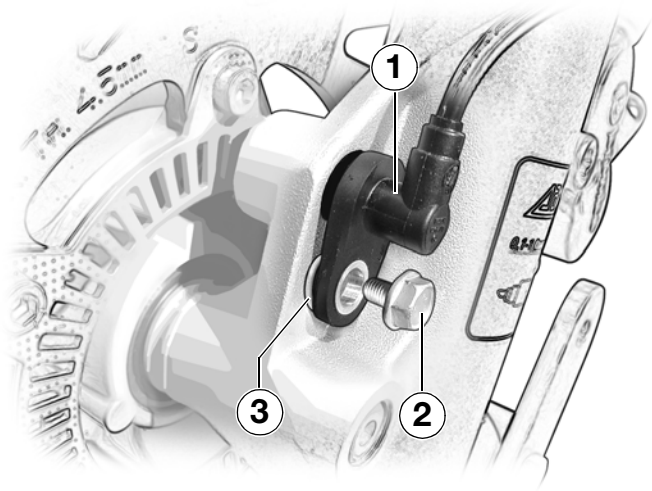
^{OE} Optional extra

Removing the front wheel

2

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Maintenance and care



Warning:

Make sure that the motorcycle is standing firmly and cannot topple forward or to either side.



Attention:

Remove ABS sensor^{OE} **1**, so that it cannot be damaged by the brake disc.

- Remove securing screw **2**

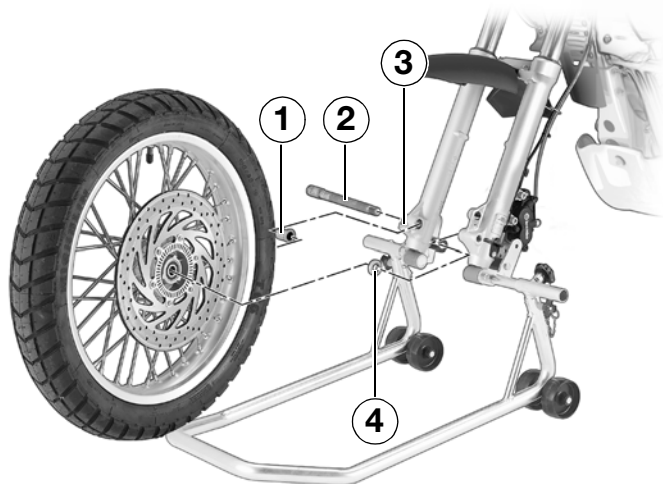


Attention:

If a spacer **3** is installed to compensate component tolerances, make sure that it is reinstalled on reassembly.

- Pull ABS sensor^{OE} **1** out of its bore in the front fork

Removing the front wheel



Warning:

Make sure that the motorcycle is standing firmly and cannot topple forward or to either side.

- Slacken axle clamp screw **3**
- Remove quick-release axle **2**
- Roll the front wheel forward and out
- Remove spacer bushing **1** and spacer **4**



Note:

Check the brake pads (➡ 32) (have them replaced if necessary).



Attention:

When setting down the front wheel, take care not to damage brake discs and the ABS sensor ring^{OE}. Keep dirt and moisture away from the wheel bearings.

^{OE} Optional extra

**Note:**

Note the installed position of the ABS sensor ring^{OE} or the direction-of-rotation arrow on the tyre.

**Attention:**

Do not damage the brake disc or pads when fitting the wheel. Motorcycle equipped with ABS^{OE}:

Do not damage the ABS sensor cable, the ABS sensor ring and the ABS sensor.

- Roll the front wheel between the forks and carefully position the brake disc in the brake caliper.

- Clean and grease spacer bushing **1** and spacer **4** and insert them into the wheel hub.

As viewed in forward direction of travel:

- left: spacer **4** on
right: spacer bushing **1** with collar toward the wheel hub

- Clean quick-release axle **2**, grease it and insert it from the right (raising the wheel slightly as necessary) and hand-tighten

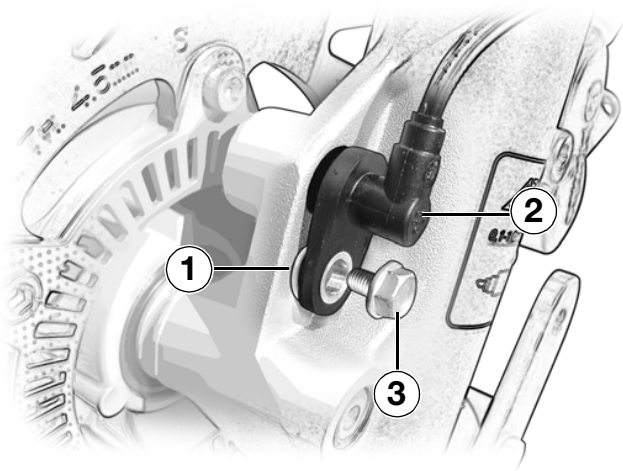
^{OE} Optional extra

Installing the front wheel

2

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Maintenance and care



- Insert ABS sensor^{OE} **2** until approx. 2/3 of its length are inside the bore
- Insert spacer **1** (if originally fitted)
- Install securing screw **3** and tighten to specified torque
- Remove front-wheel stand
- With the handbrake applied, compress the telescopic forks firmly several times

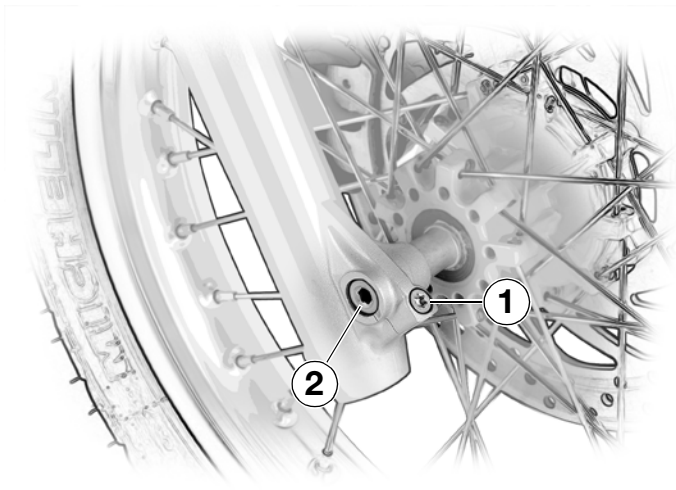
^{OE} Optional extra

Installing the front wheel

2

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Maintenance and care



- Tighten quick-release axle **2** to the specified tightening torque
- Tighten axle clamping screws **1** to the specified tightening torque



Attention:

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



Tightening torques

Quick-release axle **2**..... 45 Nm
Axle clamp screw **1** 23 Nm
Securing screw,
ABS sensor^{OE} 9 Nm



Warning:

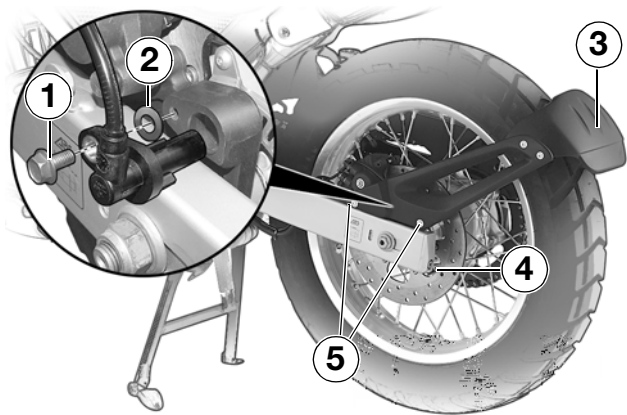
When assembly work has been completed, pull the brake lever firmly several times to check that the front brake is operating correctly.

Removing the rear wheel

2

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Maintenance and care



Warning:

Make sure that the motorcycle is standing firmly and cannot topple forward or to either side.

- Place the motorcycle on its main stand (Dakar: use auxiliary stand, BMW special tool number 00 1 610, or some other, suitable auxiliary stand)
 - Make sure the ground is level and firm.



Attention:

Avoid damage to brake lines, disc and pads when removing the wheel.

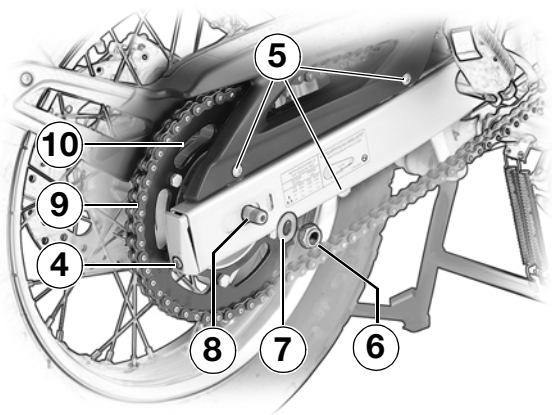
Do not damage the sensor cable and sensor ring.

Do not press the brake pedal down when the wheel is removed.

Keep dirt and moisture away from the wheel bearings.

- Remove 5 retaining screws **5**
- Remove rear wheel cover **3**

Removing the rear wheel



- Remove securing screw **1**



Attention:

If a spacer **2** is installed to compensate component tolerances, make sure that it is reinstalled on reassembly.

- Pull sensor out of its bore
- Remove axle nut **6** with washer **7**
- Back off chain tensioning screws **4** on left and right a few turns

- Pull out quick-release axle **8**
- Lift chain **9** off sprocket **10**
- Hold the brake caliper and roll the wheel out toward the rear



Attention:

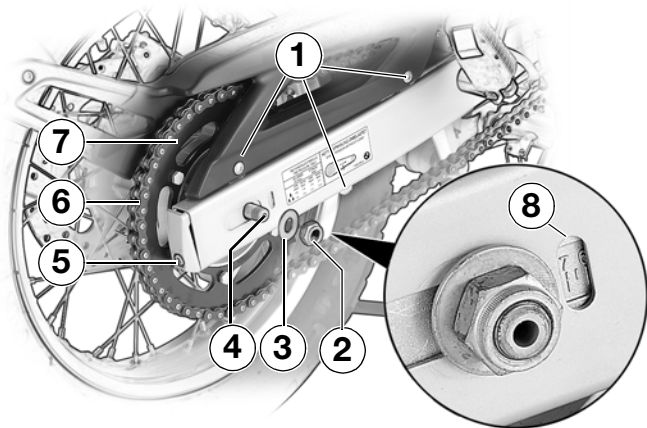
Sprocket **10** sits loosely in the wheel. If the wheel is laid down, make sure that the brake disc and sprocket are not damaged. Do not damage the sensor cable and sensor ring.

Installing the rear wheel

2

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Maintenance and care



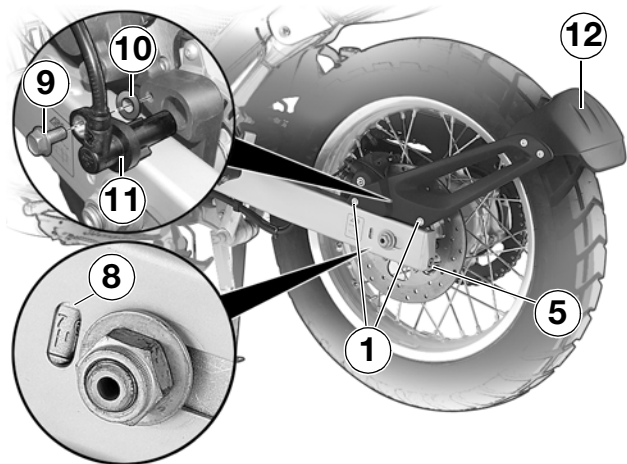
Attention:

When tensioning the chain, note correct wheel alignment (marks on swinging fork arms). To avoid damaging the chain or more extensive damage, always adjust the chain so that it has the correct amount of slack.

Do not damage the brake disc or pads when fitting the wheel. Do not damage the sensor cable and sensor ring.

- Roll the rear wheel between the rear swinging arm forks and carefully position the brake disc in the brake caliper.
- Lift chain **6** onto sprocket **7**
- Grease quick-release axle **4** and insert it
- Install axle nut **2** with washer **3** and hand-tighten
- Set chain tensioning screws **5** on left and right such that chain sag is correct (setting ➡ 30) as stated on label

Installing the rear wheel



- Make sure that the same number of notches has been reached at marking point **8** on the left and right swinging fork arms
- Tighten axle nut **2** to the specified tightening torque
- Tighten chain tensioning screws **5** to the specified tightening torque
- Insert sensor **11** until approx. 2/3 of its length are inside the bore
- Insert spacer **10** (if originally fitted)
- Install securing screw **9** and tighten to specified torque
- Install rear wheel cover **12** with five securing screws **1**
- Tighten securing screws **1** to specified torque

Installing the rear wheel

2

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Maintenance and care



Tightening torque:

| | |
|----------------------------------|--------|
| Axle nut..... | 100 Nm |
| Chain tensioning screws | 10 Nm |
| Rear wheel cover | 3 Nm |
| Securing screw, sensor..... | 4 Nm |



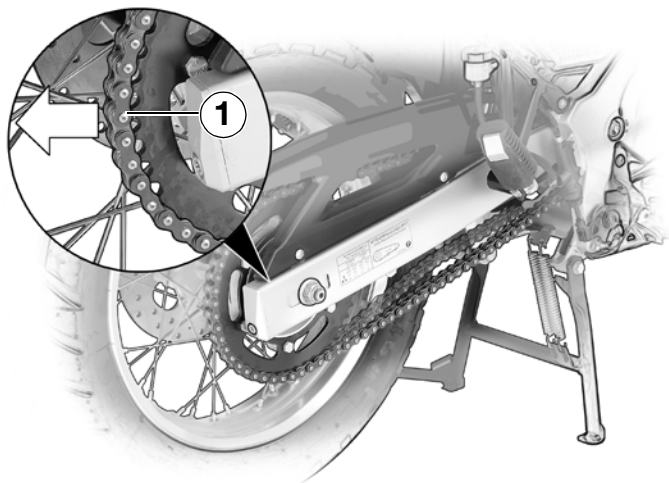
Attention:

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



Warning:

When assembly work has been completed, depress the brake pedal firmly several times to check that the rear brake is operating correctly.



Checking the chain for wear



Attention:

Always replace the chain, chainwheel and sprocket as a complete set.

- Place the motorcycle on its main stand [Dakar: side stand]
 - Make sure the ground is level and firm.
- Grip the chain at the rearmost point of sprocket **1** and pull the chain to the rear, away from the sprocket

- It should not be possible to lift the chain clear of the points of the sprocket teeth
- If the chain can be pulled clear of the points, replace the chain, sprocket and pinion

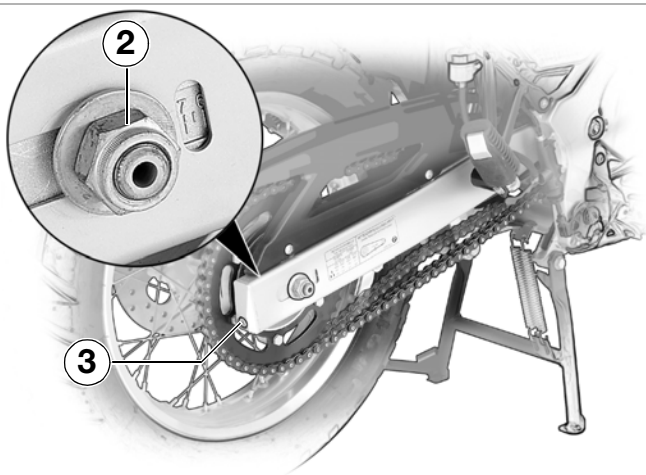
Have the chain, sprocket and pinion replaced by a specialist workshop, preferably an authorised BMW motorcycle dealer.

Adjusting the chain

2

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Maintenance and care



Adjusting the chain



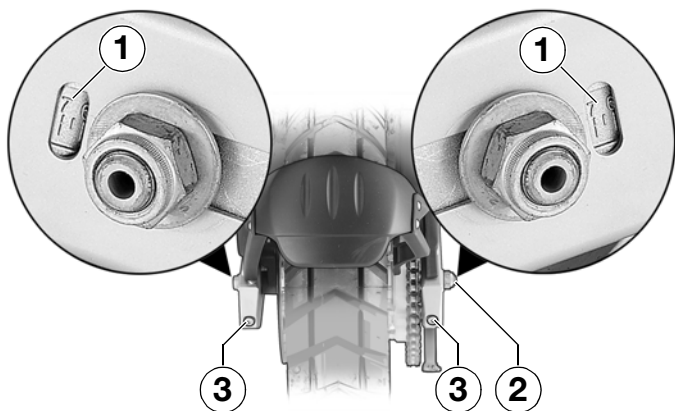
Attention:

When tensioning the chain, note correct wheel alignment (notches in swinging fork arms). To avoid damaging the chain or more extensive damage, always adjust the chain so that it has the correct amount of slack.

Always make sure that there is no load on the motorcycle when you check the chain.

- Place the motorcycle on its main stand [Dakar: side stand]
 - Make sure the ground is level and firm.
- Slacken axle nut **2**
- Set chain tensioning screws **3** on left and right such that chain sag is 1.38...1.78 in (35...45 mm) [Dakar: 1.57...1.97 in (40...50 mm)] as stated on the label

Adjusting the chain



- Make sure that the same number of notches has been reached at marking point **1** on the left and right swinging fork arms
- Tighten axle nut **2**
- Tighten chain tensioning screws **3**



Attention:

Always have the chain tension and the security of the fasteners checked by a specialist workshop, preferably an authorised BMW motorcycle dealer.



Tightening torques

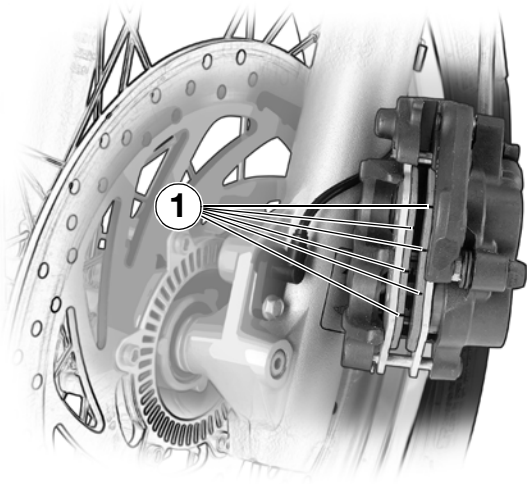
| | |
|--|--------|
| Axle nut 2 | 100 Nm |
| Chain tensioning screws 3 | 10 Nm |

Checking brake pads

2

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Maintenance and care



Front brake



Attention:

Have brake pads replaced before the minimum permitted thickness is reached.



Note:

For your safety, we recommend having work on the brake system performed by a specialist workshop, preferably an authorised BMW motorcycle dealer.

- Visually inspect the brake pads from in front
- Check brake pad thickness

Minimum pad thickness:

Wear indicating marks 1 must be clearly visible on the pads.

– If the wear indicating mark is no longer clearly visible:

have the brake pads replaced by a specialist workshop, preferably an authorised BMW motorcycle dealer.



Rear brake



Attention:

Have brake pads replaced before the minimum permitted thickness is reached.



Note:

For your safety, we recommend having work on the brake system performed by a specialist workshop, preferably an authorised BMW motorcycle dealer.

- Visually inspect from behind and above
- Check brake pad thickness

Minimum pad thickness:
Angled wear indicating mark 1 must be clearly visible on the pads.

- If the wear indicating mark is no longer clearly visible:

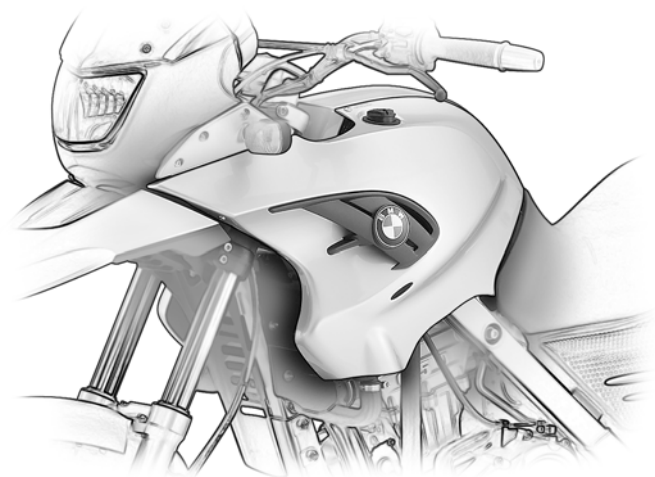
have the brake pads replaced by a specialist workshop, preferably an authorised BMW motorcycle dealer.

Adding coolant

2

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Maintenance and care



Attention:

Use only nitrite-free antifreeze and corrosion inhibitor.

Check coolant level only when the engine is cold.

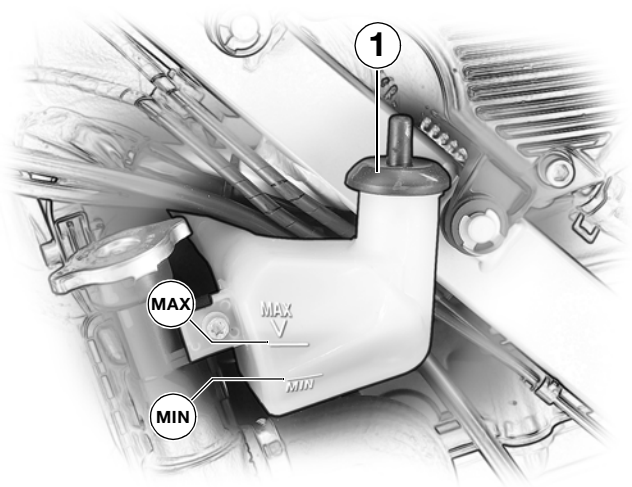
Top up the fluid in the expansion tank only if the loss of coolant is minor.

Mixing ratio:

- 50% antifreeze
- 50% water

Frost protection down to:
-25 °C

- Place the motorcycle on its main stand [Dakar: side stand]
 - Make sure the ground is level and firm.
- Remove the seat (➡ Rider's Manual)
- Remove the left side panel (➡ 44-45)

**Note:**

Engine cold: do not top up the coolant past the **MIN** mark

- Remove cap **1** from filler neck
- Top up coolant to **MIN** mark
- Place motorcycle on main (centre) stand or hold it upright
- Recheck the coolant level; correct if necessary
- Reinstall the cap of the expansion tank

**Note:**

It is advisable to have the coolant changed by a specialist workshop, preferably your authorised BMW motorcycle dealer.

Notes on changing bulbs

2

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Maintenance and care

Your motorcycle is equipped with a digital electronic engine management system and a high-power ignition system.



Warning:

Work on the electrical system only when the circuit has been interrupted (ignition and lights switched off). For greater safety, disconnect and insulate the negative battery lead.

When the engine is running or the ignition is switched on, do not touch electrically live components, terminals or wiring.

– Risk of fatal accident



Attention:

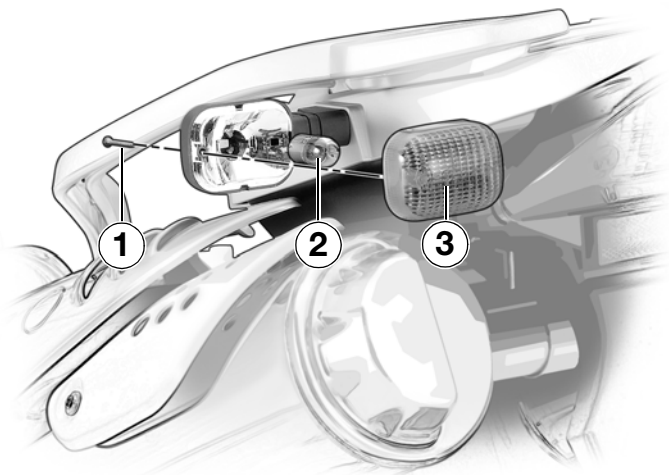
Your motorcycle has one bulb for the low-beam /high-beam headlight, one for the parking light, one for the brake light and one for the rear light, plus four bulbs for the turn indicators. If any of these bulbs should fail, you may have problems in seeing and being seen.

You should therefore always carry spare bulbs on the motorcycle.



Note:

Do not touch the glass of new bulbs with your fingers. Use a clean, dry cloth to hold the bulbs when inserting them. Dirt deposits, in particular oil and grease, interfere with heat radiation from the bulb. This leads to overheating and shortens the bulb's operating life.



Flashing turn indicators



Attention:

Switch off the ignition before changing a bulb.



Note:

Avoid touching the glass of new bulbs with your fingers. Use a clean, dry cloth to hold the bulbs when inserting them.

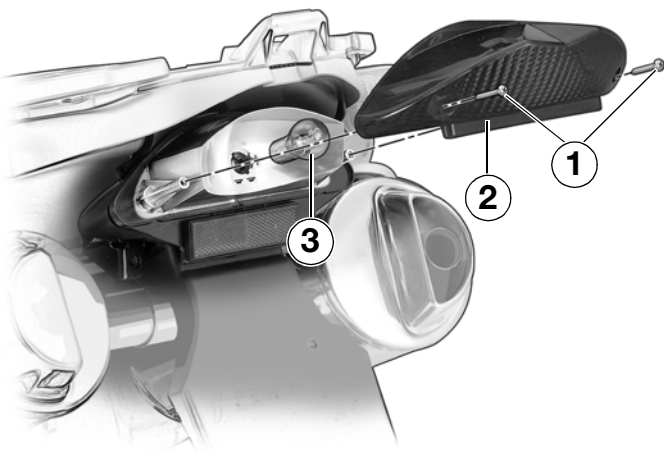
- Place the motorcycle on its main stand [Dakar: side stand]
 - Make sure the ground is level and firm.
- Remove securing screw **1**
- Remove turn indicator glass **3**
- Press bulb **2** back, turn it counter-clockwise to disengage it and remove
- Installation is the reverse of the removal procedure
 - Bulbs for front/rear turn indicators:
12 V 10 W

Changing bulbs

2

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Maintenance and care



Tail light/brake light



Attention:

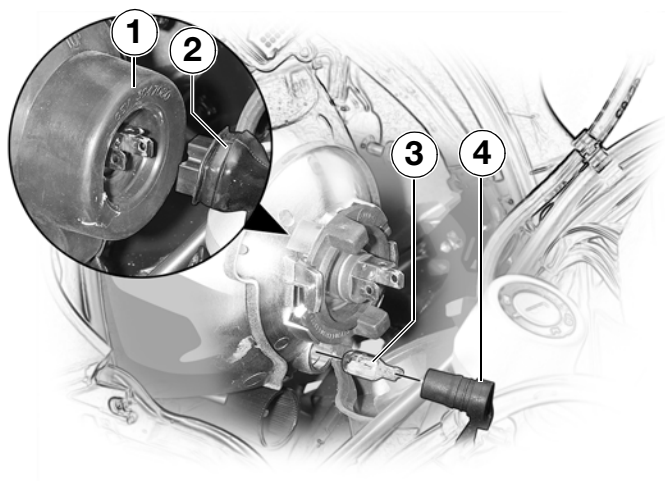
Switch off the ignition before changing a bulb.



Note:

The rear light is also the number-plate light.
Avoid touching the glass of new bulbs with your fingers. Use a clean, dry cloth to hold the bulbs when inserting them.

- Place the motorcycle on its main stand [Dakar: side stand]
 - Make sure the ground is level and firm.
- Remove retaining screws **1**
- Remove rear light glass **2**
- Press bulb **3** back, turn it counter-clockwise to disengage it and remove
- Installation is the reverse of the removal procedure
 - Brake/rear light bulb:
12 V 21/5 W



Parking light



Attention:

Switch off the ignition before changing a bulb.



Note:

Avoid touching the glass of new bulbs with your fingers.
Use a clean, dry cloth to hold the bulbs when inserting them.

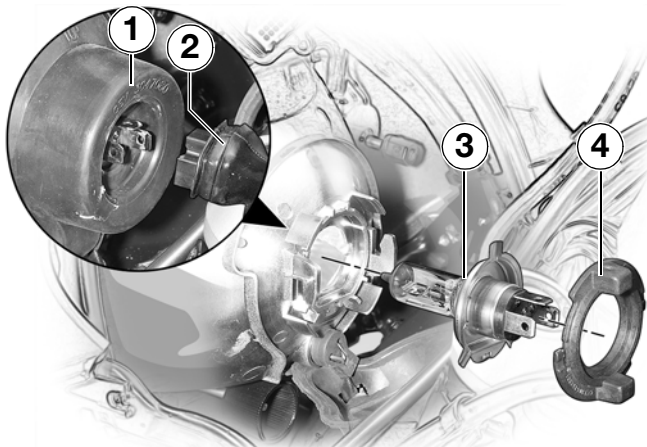
- Place the motorcycle on its main stand [Dakar: side stand]
 - Make sure the ground is level and firm.
- Pull off multi-pin plug **2**
- Pull the rubber sleeve **1** to the rear to remove
- Pull bulb holder to the rear and **4** out of the headlight housing
- Pull bulb **3** out of bulb holder **4**
- Installation is the reverse of the removal procedure
 - Parking light bulb: **12 V 5 W**

Changing bulbs

2

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Maintenance and care



High-beam/low-beam headlight



Attention:

Switch off the ignition before changing a bulb.



Note:

Avoid touching the glass of new bulbs with your fingers. Use a clean, dry cloth to hold the bulbs when inserting them.

- Place the motorcycle on its main stand [Dakar: side stand]
 - Make sure the ground is level and firm.

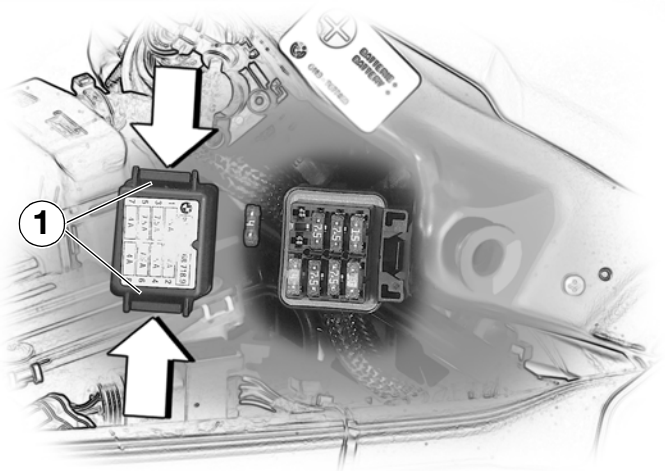
- Pull off multi-pin plug **2**
- Pull rubber sleeve **1** to the rear to remove
- Turn retainer **4** counter-clockwise to disengage
- Remove bulb **3**
- Installation is the reverse of the removal procedure
 - Low/high beam headlight bulb: **H4 12 V 55/60 W**



Note:

The retainer is easy to install if you hold it in the correct position.

| | |
|---------|-----------------------------------|
| Insert: | at approx. 11 o'clock position |
| Lock: | by turning to 12 o'clock position |



Changing fuses

- Place the motorcycle on its main stand [Dakar: side stand]
– Make sure the ground is level and firm.
- Remove the seat
- Squeeze clips **1** together and remove the cover of the fuse box
- Remove the blown fuse from its socket
- Insert a new fuse of the correct rating
- Close the fuse box lid
- Close and lock the seat



Attention:

Before changing a fuse, switch off the ignition.

Never attempt to repair a blown fuse – risk of fire

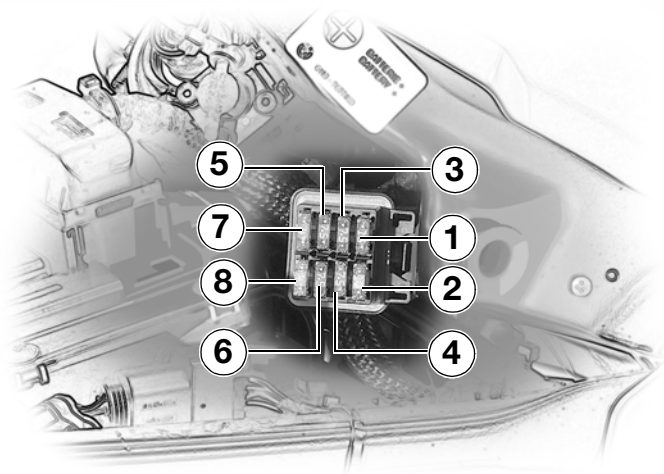
For this reason, always carry a number of spare fuses in the toolkit.

Use only fuses of the specified rating and type.



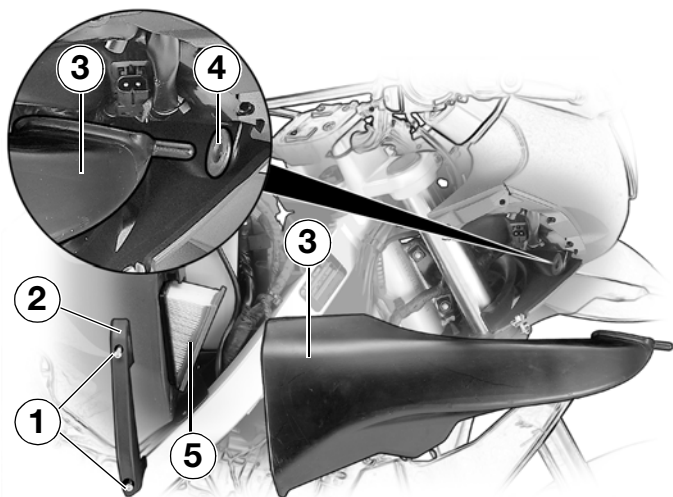
Note:

It is advisable to have the electrical system checked by a specialist workshop, preferably an authorised BMW motorcycle dealer, if fuses blow frequently.



Equipment connected to fuses

- | | |
|--|---|
| 1 Engine electronics..... 15 A | |
| 2 Instrument panel, on-board socket, diagnosis plug, OE plug 10 A | 6 Brake light, flashing turn indicators, instrument panel, instrument lighting, OE plug7.5 A |
| 3 Horn, headlight flasher 7.5 A | 7 Parking light, tail light ... 4 A |
| 4 Low-beam headlight.. 7.5 A | 8 Heated handlebar grips .4 A |
| 5 High-beam headlight 7.5 A | |



- Place the motorcycle on its main stand [Dakar: side stand]
 - Make sure the ground is level and firm.
- Remove the seat
- Remove the right side panel (➡ 44-45)
- Remove two securing screws **1**
- Pull bow **2** of the connecting flange off intake stub **3**
- Pull intake stub **3** out of the connecting flange and front holder **4**
- Pull air filter element **5** out of the air filter housing
- Place the new filter element in position inside the air filter housing
- From this point on, installation is the reverse of the removal procedure



Note:

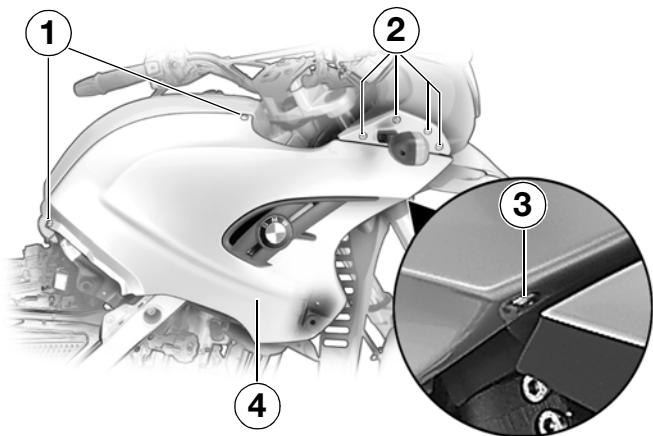
When installing intake stub **3**, begin by slipping the projection into front holder **4**.

Side panel

2

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Maintenance and care



Removing and installing side panel

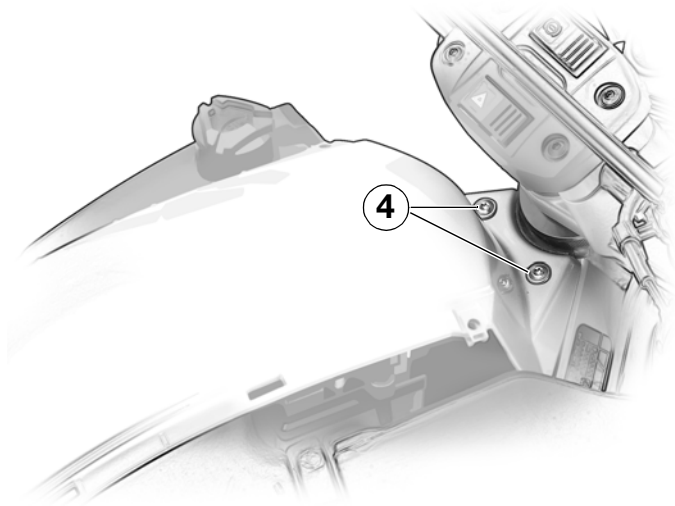
- Place the motorcycle on its main stand [Dakar: side stand]
 - Make sure the ground is level and firm.
- Remove the seat
(➡ Rider's Manual, Chapter 1)

Removing right side panel

- Remove the four securing screws **2** holding the turn indicator
- Remove 2 retaining screws **1**
- Slacken securing screw **3**
- Pull right side panel out of locator **4** at bottom and lift it clear of the centre panel at the top

Installing right side panel

- Installation is the reverse of the removal procedure



Removing and installing left side panel



Note:

The procedure for removing and installing the left side panel is analogous to that for the right side panel.

Remove the oil filler plug before removing the left side panel.

When installing the left side panel, note the air duct of the oil tank.

Removing and installing centre panel

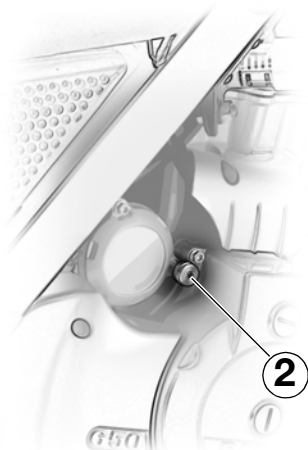
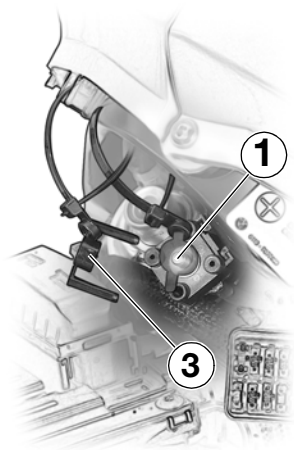
- Remove the remaining two securing screws **4**
- Remove the centre panel
- Installation is the reverse of the removal procedure

Jump starting

2

46

Maintenance and care



Battery adapter points

BMW calls an easily accessible battery positive terminal **1** and a defined earthing point **2** the battery adapter points.

The battery adapter points make it easy to recharge the battery and are also convenient for jump starting.



Attention:

Never establish a direct connection between battery positive terminal **1** and earth (frame/drive).

– Risk of short-circuit

Jump starting

Do not use proprietary start-assist sprays to start the engine.

Use only jump leads fitted with fully insulated crocodile clips at both ends for jump starting.



Attention:

If you switch on the ignition and the telltale lights fail to light up, the battery is completely flat. In this case, do not attempt to jump-start the motorcycle: recharge the battery instead. Risk of damaging the control units.

**Attention:**

Do not attempt to jump-start the motorcycle using the on-board socket

– Risk of fire

The wires leading to the power socket do not have a load-capacity rating adequate for jump-starting the engine.

**Attention:**

Make sure that the battery of the other vehicle has a voltage rating of 12 V.

- Connect one end of a jump lead to positive terminal **1** of the discharged battery, and the other end to the positive terminal of the donor battery
- Connect one end of the second jump lead to the negative terminal/earthing point of the donor battery and the other end to negative terminal/earthing point **2** of the discharged battery
- Start the engine of the donor vehicle and allow it to run at fast idle
- Start the engine of the vehicle with the discharged battery in the usual way
- Allow both engines to idle for a few minutes
- Disconnect the jump leads by reversing the connection sequence, and reinstall cap **3** on the positive terminal
- Switch off the ignition systems of both vehicles
- Switch off all electrical consumers on both vehicles
- On the BMW, battery adapter points **1** and **2** are the connection points for jump starting
- Remove protective cap **3** from the positive terminal

Battery safety instructions

2

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Maintenance and care



Warning:

Battery acid is highly caustic. Do not allow it to contact the eyes, face, hands, clothing or paintwork.

KEEP OUT OF REACH OF CHILDREN

Never create sparks or bring a naked flame or a glowing cigarette near the battery. Batteries generate explosive gases.

Charge batteries only in well-ventilated areas. Be sure to open the plugs of all the battery cells.



Warning:

Always wear protective goggles and protective gloves when performing work associated with the battery.

If anyone comes into contact with battery acid or is exposed to toxic fumes from the battery, have them examined by a physician without delay.

First aid prior to treatment by a physician:

- Contact with skin: rinse with plenty of clean water
- Acid swallowed: victim must drink plenty of water or milk (into which a raw egg should be stirred). Do not cause the victim to vomit.
- Eyes attacked by battery acid or fumes from battery: Rinse the eyes out several times with plenty of clean water. The eyelid should be held open while doing so.
- Thoroughly rinse clothing wetted by battery acid immediately with water

If the motorcycle is to be laid up for a lengthy period:

- Check battery acid level
- Store the battery in a cool, dry room



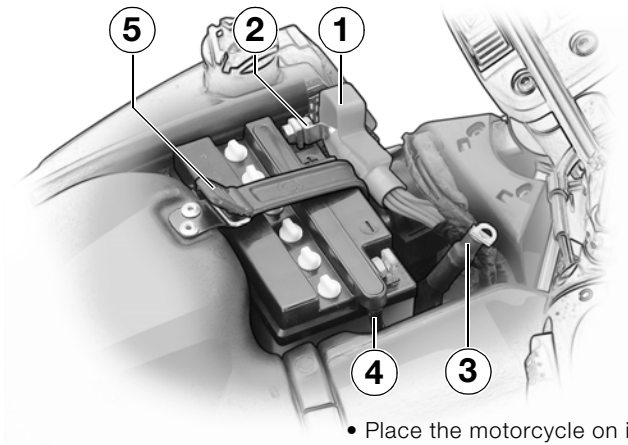
Attention:

If the battery is not recharged at regular intervals while out of use it will self-discharge until it is completely flat, in which case the guarantee is voided.

- Trickle-charge the battery from time to time during the storage period
- The battery can be recharged with the BMW battery trickle charger^{OA}.
- Charge the battery prior to lay-ups and before restoring to use – always comply with the instructions for charging.
- In case of doubt ask a specialist, preferably an authorised BMW motorcycle dealer, to prepare the vehicle for laying up and to carry out the necessary battery maintenance and storage

^{OA} Optional accessory

Removing the battery



Warning:

Do not damage cables and hoses when removing. Before disconnecting the battery, switch off the ignition. To avoid short-circuits:

- Disconnect **negative** battery lead (-) **3** first,
- then **positive** battery lead (+) **2**.



Warning:

Do not, under any circumstances, set the battery on the motorcycle.

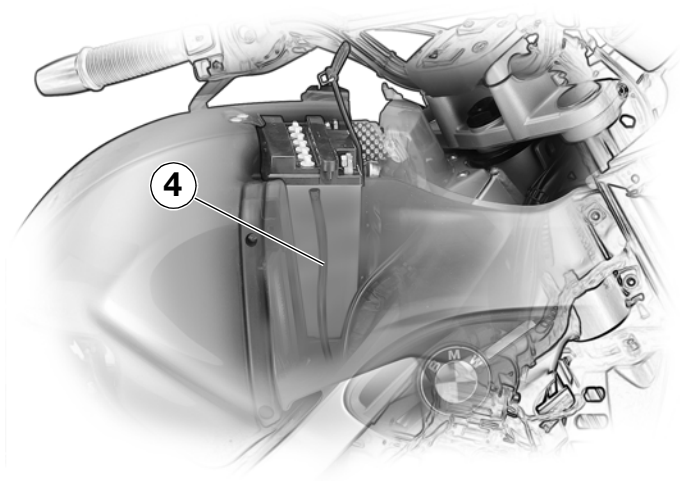
- Place the motorcycle on its main stand [Dakar: side stand]
 - Make sure the ground is level and firm.
- Remove the seat
- Remove the side panel (➡ 44-45)
- Disconnect batt. breather hose **4**
- Disconnect **negative** battery lead **3** and swing it away from the **negative** post of the battery or insulate it
- Push aside protective cap **1** for the positive terminal of the battery
- Disconnect **positive** battery lead **2**
- Release batt. retaining strap **5**
- Take out the battery

Installing the battery

2

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Maintenance and care



Warning:

Before connecting the battery, make sure the ignition is switched off.

To avoid short-circuits:

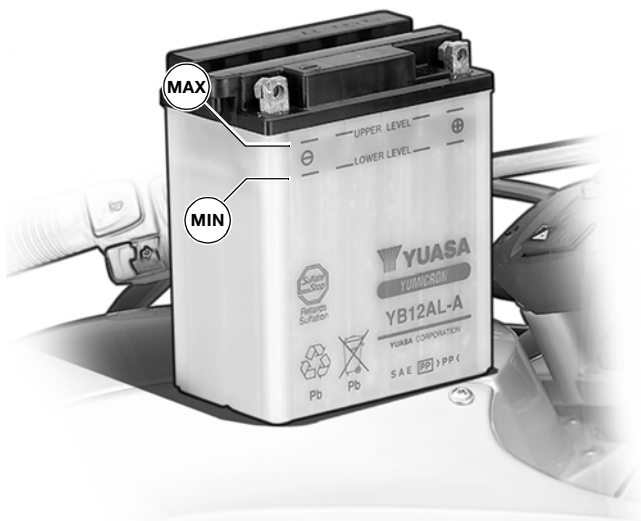
- Connect positive battery lead (+) 2 first
- Seat protective cap 1 on the battery positive terminal
- Never install the battery without the protective cap
- Connect negative battery lead (-) 3



Attention:

Make sure that breather hose 4 for the battery is routed free of kinks and is not clogged.

- Grease the battery posts
- Installation is the reverse of the removal procedure
- Install the side panel (➡ 44-45)
- Install the seat



- Check the acid level at the MIN/MAX marks
MAX UPPER mark
MIN LOWER mark
- Top up with distilled water only as far as the **MAX** (UPPER) mark

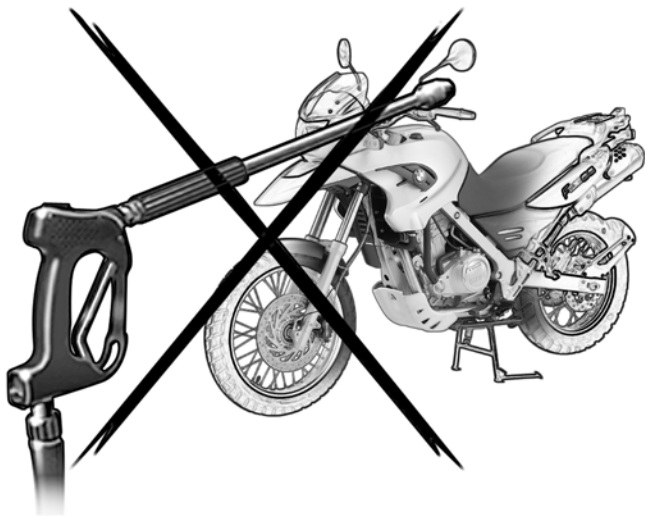
Checking battery acid level

- Check the level of acid in the battery every three months or more frequently if ambient temperatures are high
- Remove the side panel (➡ 44-45)



Attention:

Do not set the battery on the motorcycle when you are toping up the acid level. Use only distilled water: do not top up with battery acid.

**Attention:**

Do not use aggressive or penetrating cleaning agents or solvents, as they would cause damage to rubber and plastic parts.

Do not use a steam jet or high-pressure cleaning equipment. High water pressure can damage seals, the hydraulic brake system or the complete electrical system.

**Note:**

Correct and regular cleaning is an important factor in maintaining the value of your motorcycle.

It also ensures that safety-relevant parts remain in full working order.



Washing the motorcycle



Warning:

After cleaning and before starting a journey, always test the brakes.

- Place the motorcycle on its main stand [Dakar: side stand]
 - Make sure the ground is level and firm.
- Apply a mild cleaning agent to the wheels, engine block and swinging arm, in accordance with the manufacturer's instructions
- Thoroughly dry all wet surfaces
- Do not use solvents or cleaning products on the instrument cluster, switches or windscreen
- Do not scratch the windscreen.
- Remove tar splashes only with an approved product – rinse thoroughly with water afterwards.
- Clean dead flies and other insects or similar dirt deposits off the fork stanchions.
- Treat painted and chrome-plated surfaces regularly with the approved care products.



Removing road salt

- Wash the motorcycle down immediately with cold water at the end of the journey.



Note:

Do not use warm water – this aggravates the effect of the salt.

- Thoroughly dry the motorcycle.
- Apply a wax-based corrosion inhibiting product to chrome-plated parts.
- After cleaning and drying the fairing and trim panels, apply a recommended wax polish.

Cleaning the windscreen

- Remove dirt and dead insects with a soft sponge and plenty of water



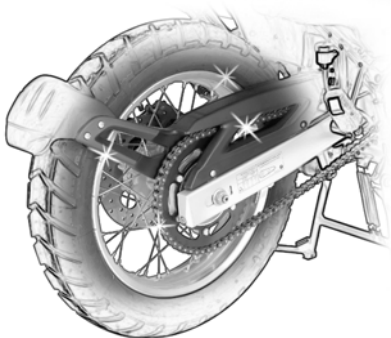
Note:

Soften stubborn dirt or insects by soaking with a wet kitchen tissue.



Attention:

Do not use cleaning agents. Fuel or chemical solvents attack the windscreen material.



Repairing damage to the paintwork

- Minor damage caused by stones striking the painted surface can be touched up with a BMW touch-up pencil of the correct colour

Care of the chain

- Regularly apply a spray lubricant to the chain; spray lubricants are available from your authorised BMW motorcycle dealer.



Attention:

Comply with the manufacturer's working instructions and safety precautions.

Care of exhaust silencer

- Changes in the appearance of the exhaust system during operation or as a result of environmental influences can be treated with a polish available from your authorised BMW motorcycle dealer.



Note:

The correct colour is stated on a label under the seat. It is advisable to have more extensive paint damage repaired by your authorised BMW motorcycle dealer.



Laying up

- Clean the motorcycle (➡ 54)
- Remove the battery (➡ 50) comply with the maintenance instructions (➡ 49).
- Spray the brake and clutch lever pivots and the main and side stand pivots with a suitable lubricant
- Coat bright metal/chrome-plated parts with an acid-free grease (e.g. Vaseline)
- Place the motorcycle on its centre stand in a dry place
- Support it under the engine so that both wheels are clear of the ground.



Note:

Before laying the motorcycle up out of use, it is advisable to have the engine oil changed by your authorised BMW motorcycle dealer.

Work needed in conjunction with laying up or restoring to use can best be combined with the Service or Inspection work performed when due by the authorised BMW motorcycle dealer.



Restoring to use

- If necessary, remove protective wax coating
- Clean the motorcycle (➡ 54)
- Install a charged battery (➡ 51)
- Coat the battery terminals with grease suitable for battery posts
- Check/correct tyre pressures (➡ Rider's Manual, Chapter 2)
- Check brakes (➡ Rider's Manual, Chapter 2)
- Run all safety checks (➡ Rider's Manual, Chapter 2)

| | F 650 GS [37 kW] | F 650 GS [25 kW] |
|--|--|---------------------|
| Type | Liquid-cooled single-cylinder four-stroke engine with 4 valves with bucket tappets, 2 overhead camshafts, dry-sump lubrication | |
| Displacement | 652 cc | 652 cc |
| Maximum rated output in accordance with DIN 70 020 | | |
| | 37 kW | 25 kW |
| | 50 hp | 34 hp |
| - at engine speed | 6,500 rpm | 5,500 rpm |
| Maximum torque | 60 Nm | 51 Nm |
| - at engine speed | 4,800 rpm | 4,000 rpm |
| Permitted speeds | | |
| Maximum engine speed | 7,400 rpm | 7,400 rpm |
| Idle speed | 1,500 rpm | 1,500 rpm |
| Bore/stroke | 100/83 mm | 100/83 mm |
| Compression ratio | 11.5 : 1 | 11.5 : 1 |
| F 650 GS | | |
| Fuel grade | Regular unleaded fuel to DIN 51607 or equivalent standard, min. octane number 91 (RON) or 81 (MON) | |
| Tank capacity (usable) | 17.3 l , including 4 l reserve | |
| Fuel consumption | | |
| constant 90 km/h | 3.2 l/100 km | |
| constant 120 km/h | 4.3 l/100 km | |

Power train

3

60

Technical data

F 650 GS

| | |
|--|---|
| Clutch | Multi-plate clutch running in oil bath |
| Primary transmission | $37/72 = 1:1.946$ |
| Gearbox | 5-speed, with claw-action shift, integrated into engine block |
| Gear ratios in the gearbox | 1st gear = 2.75 2nd gear = 1.75 3rd gear = 1.31 4th gear = 1.05 5th gear = 0.88 |
| Transmission from gearbox to rear wheel drive | Secondary drive with O-ring chain $5/8 \times 1/4$ |
| Number of chain links | 112 |
| Rear wheel drive | |
| Final drive ratio (pinion/sprocket) | $16/47 = 1:2.938$ |

Frame and suspension

F 650 GS

Frame

Bridge-type frame with bottom rail

Location
of type plate

On top rail of main frame, right

Location
of vehicle identification
number (VIN)

On right of steering head

Front brake

Hydraulically actuated single-disc
brake with 2-piston floating caliper

Rear brake

Hydraulic disc brake with
1-piston floating caliper

Frame and suspension

F 650 GS

Suspension

| | |
|--------------------------------------|--|
| Front | Telescopic fork with stabiliser |
| Total suspension travel | 170 mm |
| Dakar version | 210 mm |
| Fixed tube diameter | 41 mm |
| Rear | Central suspension strut pivoted to lever system. Spring base point and rebound-phase damping continuously adjustable. |
| Total suspension travel (at wheel) | 165 mm |
| Dakar version | 210 mm |
| Swinging fork | Box swinging fork on each side. |
| Swinging arm length | 564 mm |
| Steering lock angle | 40° |
| Front wheel castor | |
| in normal-load position (with rider) | 113 mm |

Frame and suspension

Wheels and tyres

F 650 GS

Spoked wheel

F 650 Dakar



Note:

You can obtain detailed information on approved tyre sizes and makes from your authorised BMW motorcycle dealer or by visiting www.bmw-motorrad.com on the Internet

Front wheel

| | | |
|----------------------|----------------|------------|
| Size and designation | 2.50" x 19" MT | 1.6" x 21" |
|----------------------|----------------|------------|

| | | |
|---------------------------|-----------|----------|
| Tyre size and designation | 100/90-19 | 90/90-21 |
|---------------------------|-----------|----------|

Rear wheel

| | |
|----------------------|----------------|
| Size and designation | 3.00" x 17" MT |
|----------------------|----------------|

| | | |
|---------------------------|-------------|-----------|
| Tyre size and designation | 130/80 R 17 | 130/80-17 |
|---------------------------|-------------|-----------|

Tyre pressures (tyres cold)

| | | |
|--------|-------|---------|
| One-up | Front | 1.9 bar |
|--------|-------|---------|

| | |
|------|---------|
| Rear | 2.1 bar |
|------|---------|

| | | |
|--------------|-------|---------|
| Fully loaded | Front | 2.1 bar |
|--------------|-------|---------|

| | |
|------|---------|
| Rear | 2.3 bar |
|------|---------|

Recommended minimum tyre tread depth

| | |
|-------------|------|
| Front wheel | 2 mm |
|-------------|------|

| | |
|------------|------|
| Rear wheel | 3 mm |
|------------|------|



Warning:

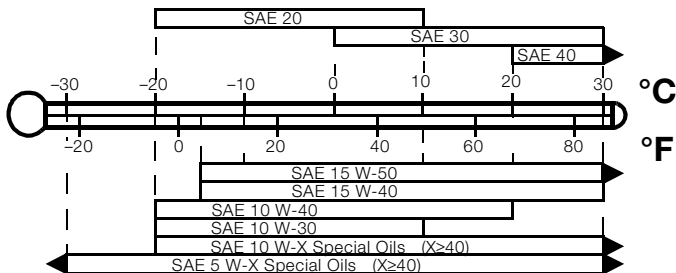
Comply with local legal requirements concerning minimum tread depth.

Fuel and lubricants

F 650 GS

Engine oil

Brand-name HD oil of API classification SF, SG or SH; CD or CE amendments are permissible;
or brand-name HD oil of CCMC classification G4 or G5; amendment PD2 is permissible.



The viscosity class depends on outside temperatures. Temperatures above or below the limits quoted for the individual SAE classifications are permitted for brief periods only. All engine oils supplied by BMW are subject to regular BMW quality assurance checks. BMW does not approve the use of any upper-cylinder lubricants or similar oil additives.

Engine capacities

With filter change 2.3 l

Maximum oil consumption 1 l/1000 km



Attention:

Do not use synthetic oils.

F 650 GS

Telescopic fork oil

| | |
|--------------------------|-------------------------|
| Approved grades | BMW telescopic fork oil |
| Refill after disassembly | 0.61 l |
| Dakar version | 0.56 l |
| Oil change | 0.60 l |
| Dakar version | 0.55 l |

Battery terminal corrosion protection

Acid-free grease,
e.g. Vaseline

Bearing lubrication and lubricating points

Brand-name anti-friction bearing
grease, usable temperature range
-30 °C...+140 °C ,
drip point 150 °C...230 °C
high corrosion protection,
good resistance to water
and oxidation;
e.g. Staburags NBU 30 PTM

Fuel and lubricants

3

66

Technical data

Brake fluid

F 650 GS

DOT 4

We recommend BMW brake fluids



Attention:

Use only new brake fluid to DOT 4 specification.

Coolant

Brand-name long-life antifreeze and corrosion inhibitor



Attention:

Use only nitrite-free antifreeze and corrosion inhibitor.

Capacity

1.3 l

(0.1 l in expansion tank)

F 650 GS

Spark plugs

| | |
|----------------------|--------------|
| Approved makes/types | NGK DR8 EB |
| Electrode gap | 0.6 - 0.7 mm |
| Wear limit | 0.9 mm |

Fuses

| | |
|---------|---------------------------------|
| | "Minifuse" flat-socket fuses |
| Ratings | 4 A, 7.5 A, 10 A and 15 A |

Headlights

| | |
|--|-------------------|
| | Halogen headlight |
|--|-------------------|

Bulbs

| | |
|---|--------------------------------|
| High-beam/low-beam headlight | H4 halogen bulb, 12 V, 60/55 W |
| Parking light | 12 V 5 W |
| Rear light | |
| Brake/tail light | 12 V 21/5 W |
| Flashing turn indicators | 12 V 10 W |
| Other warning/telltale lights and instrument lighting | 12 V 1.2 W |

Dimensions and weights

3

68

Technical data

F 650 GS

Overall length

Dakar version

2,185 mm

2,189 mm

Width

across mirrors

910 mm

acr. handlebars
(with weights)

805 mm

Dakar version

895 mm

across front footrests

568 mm

Dakar version

588 mm

across rear footrests

664 mm

Overall height

(without mirr.,
at unlad. weight)

1,320 mm

Dakar version

1,395 mm

Seat height, unladen weight

780 mm

Dakar version

870 mm

Lowered suspension

750 mm

Wheelbase

- in normal-load position

1,500 mm

Ground clearance

at unladen weight

146 mm

Dakar version

196 mm

Lowered suspension

116 mm

in normal-load position

130 mm

Dakar version

180 mm

Lowered suspension

100 mm

Dimensions and weights

F 650 GS

Unladen weight

| | |
|----------------------------|--------|
| (ready to ride, tank full) | 194 kg |
|----------------------------|--------|

Maximum permitted weight

| |
|--------|
| 380 kg |
|--------|

Permitted wheel loads

| | |
|-------|--------|
| Front | 124 kg |
|-------|--------|

| | |
|------|--------|
| Rear | 256 kg |
|------|--------|

Performance data

3

70

Technical data

| | F 650 GS [37 kW] | F 650 GS [25 kW] |
|----------------------------------|---------------------|---------------------|
| Maximum speed | | |
| acc. to type approval test | 170 km/h | 145 km/h |
| two-up | 162 km/h | 135 km/h |
| Power/weight ratio | | |
| ready for road +rider (75 kg) | 7.24 kg/kW | 10.72 kg/kW |
| at gross weight limit | 10.27 kg/kW | 15.20 kg/kW |
| Flexibility | | |
| 4th gear 80-120 km/h | 5.4 s | 7.9 s |
| 5th gear 80 -120 km/h | 6.9 s | 10.2 s |
| 4th gear 60-140 km/h | 12.6 s | – |
| 5th gear 60 -140 km/h | 16.6 s | – |
| Ride-past noise level | | |
| to 97/24-9/EC | 79 dB (A) | 79 dB (A) |
| Stationary noise level | | |
| to 97/24-9/EC | 86 dB (A) | 86 dB (A) |

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Motorcycle data

Model

Frame No.

Colour No.

First registered on

Registration No.**Dealer data**

Person to contact for Service work

Ms./Mr.

Tel. No.

Dealer's address with telephone No. (company stamp)

Details described or illustrated in this booklet may differ from the motorcycle's actual specification as purchased, the accessories fitted or the national-market specification.

No claims will be entertained as a result of such discrepancies. Dimensions, weights, fuel consumption and performance data are quoted to the customary tolerances.

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