

## 790 Adventure R

Art. no. 3206373en



**KTM**



Read this repair manual carefully and thoroughly before beginning work.

The vehicle will only be able to meet the demands placed on it if the specified service work is performed regularly and properly.

This repair manual was written to correspond to the latest state of this model series. We reserve the right to make changes in the interest of technical advancement without updating this repair manual at the same time. We shall not provide a description of general workshop methods. Likewise, safety rules that apply in a workshop are not specified here. It is assumed that the repair work will be performed by a fully trained mechanic.

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790 Adventure R US (F9675S3)



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# 1 MEANS OF REPRESENTATION

## 1.1 Symbols used

The meaning of specific symbols is described below.



Indicates an expected reaction (e.g. of a work step or a function).



Indicates an unexpected reaction (e.g. of a work step or a function).



Indicates a page reference (more information is provided on the specified page).



Indicates information with more details or tips.



Indicates the result of a testing step.



Indicates a voltage measurement.



Indicates a current measurement.



Indicates a resistance measurement.



Indicates the end of an activity including potential rework.

## 1.2 Formats used

The typographical formats used in this document are explained below.

**Proprietary name**

Indicates a proprietary name.

**Name®**

Indicates a protected name.

**Brand™**

Indicates a brand available on the open market.

**Underlined terms**

Refer to technical details of the vehicle or indicate technical terms, which are explained in the glossary.

## 2.1 Repair Manual

Read this Repair Manual carefully and thoroughly before beginning work. It contains useful information and tips to help you repair and service your vehicle.

This manual assumes that the necessary special KTM tools and KTM workplace and workshop equipment are available.

## 2.2 Safety advice

A number of safety instructions need to be followed to operate the product described safely. Therefore read this instruction and all further instructions included carefully. The safety instructions are highlighted in the text and are referred to at the relevant passages.



### Info

Various information and warning labels are attached in prominent locations on the product described. Do not remove any information or warning labels. If they are missing, you or others may not recognize dangers and may therefore be injured.

## 2.3 Degrees of risk and symbols



### Danger

Identifies a danger that will immediately and invariably lead to fatal or serious permanent injury if the appropriate measures are not taken.



### Warning

Identifies a danger that is likely to lead to fatal or serious injury if the appropriate measures are not taken.



### Caution

Identifies a danger that may lead to minor injuries if the appropriate measures are not taken.

### Note

Identifies a danger that will lead to considerable machine and material damage if the appropriate measures are not taken.



### Note

Indicates a danger that will lead to environmental damage if the appropriate measures are not taken.

## 2.4 Work rules

Special tools are necessary for certain tasks. The tools are not a component of the vehicle, but can be ordered using the number in parentheses. Example: bearing puller (15112017000)

During assembly, use new parts to replace parts which cannot be reused (e.g. self-locking screws and nuts, seals, sealing rings, O-rings, pins, and lock washers).

In the case of certain screws, a screw adhesive (e.g. **Loctite®**) is required. Observe the manufacturer's instructions.

After disassembly, clean the parts that are to be reused and check them for damage and wear. Change damaged or worn parts.

After completing a repair or service work, check the operating safety of the vehicle.

## 3 IMPORTANT NOTES

### 3.1 Manufacturer and implied warranty

The work specified in the service schedule may only be performed in an authorized KTM workshop and must be recorded in both the Service & Warranty Booklet and in the **KTM Dealer.net**, otherwise any warranty coverage will become void. Damage or secondary damage caused by tampering with and/or conversions on the vehicle is not covered by the manufacturer warranty.

Additional information on the manufacturer or manufacturer warranty and the procedures involved can be found in the Service & Warranty Booklet.

### 3.2 Fuel, auxiliary substances



#### Note

**Environmental hazard** Improper handling of fuel is a danger to the environment.

- Do not allow fuel to enter the groundwater, the soil, or the sewage system.

Use the operating and auxiliary substances (such as fuel and lubricants) specified in the manual.

### 3.3 Spare parts, accessories

Only use spare parts and accessories approved and/or recommended by KTM. KTM accepts no liability for other products and any resulting damage or loss.

The current **KTM PowerParts** for your vehicle can be found on the KTM website.

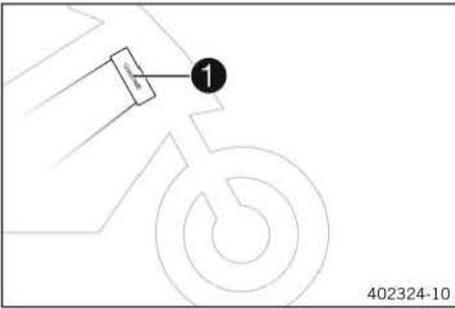
International KTM Website: <http://www.ktm.com>

### 3.4 Figures

The figures contained in the manual may depict special equipment.

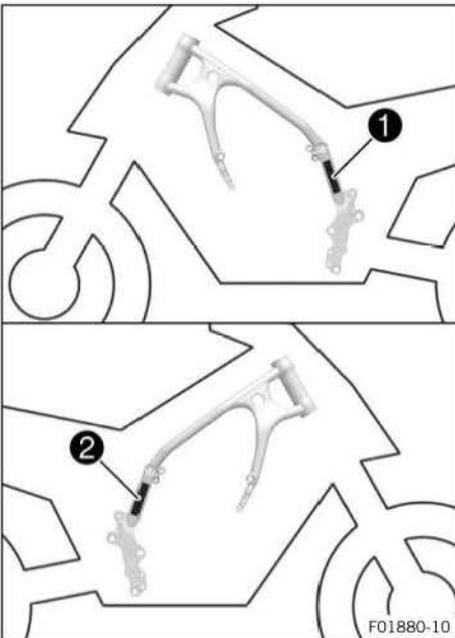
In the interest of clarity, some components may be shown disassembled or may not be shown at all. It is not always necessary to disassemble the component to perform the activity in question. Please follow the instructions in the text.

**4.1 Vehicle identification number**



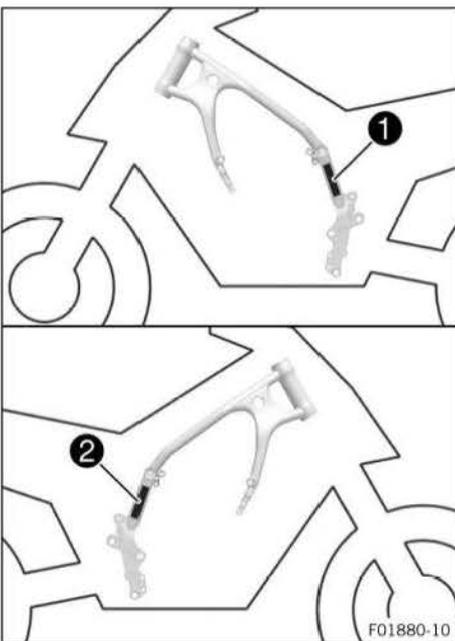
The vehicle identification number **1** is stamped on the right side of the steering head.

**4.2 Type label**



**(EU)**

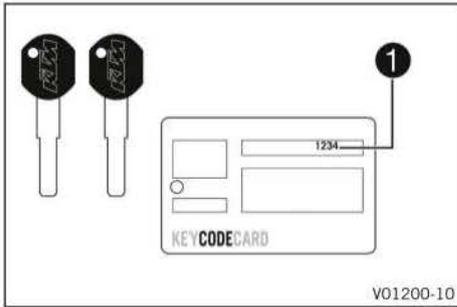
The type label **1** is located on the frame on the left.  
The type label for Australia **2** is located on the frame on the right.



**(US)**

The USA type label **1** is located on the frame on the left.  
The Canada type label **2** is located on the frame on the right.

## 4.3 Key number



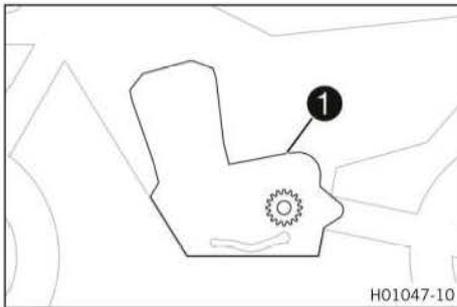
The key number **1** can be found on the **KEYCODECARD**.



### Info

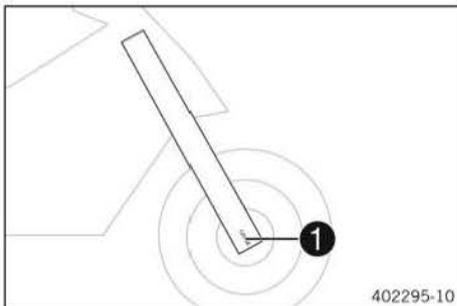
You need the key number to order a spare key. Keep the **KEYCODECARD** in a safe place.

## 4.4 Engine number



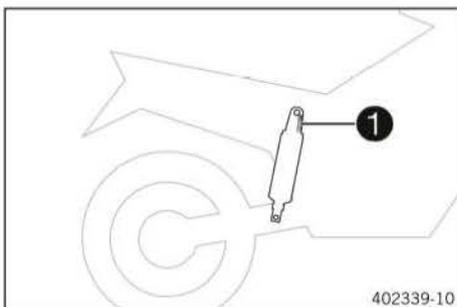
The engine number **1** is stamped onto the engine case at the top.

## 4.5 Fork part number

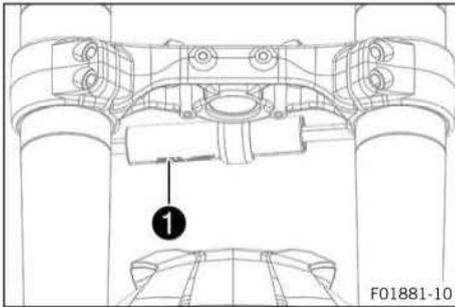


The fork part number **1** is stamped on the inner side of the fork stub.

## 4.6 Shock absorber article number



Shock absorber article number **1** is attached the top of the shock absorber.

**4.7 Steering damper article number**

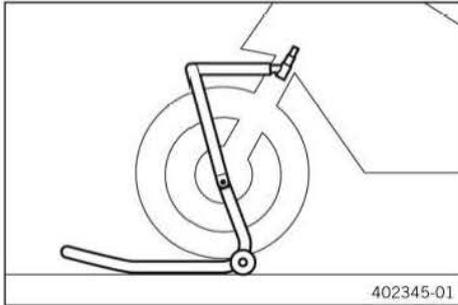
Steering damper article number **1** is embossed on the underside of the steering damper.

## 5.1 Lifting the motorcycle with the front lifting gear

### Note

**Danger of damage** The parked vehicle can roll away or fall over.

- Park the vehicle on a firm and level surface.



### Preparatory work

- Raise motorcycle with rear lifting gear. (📖 p. 15)
- Remove the front fender. (📖 p. 140)

### Main work

- Move the handlebar to the straight-ahead position.
- Attach the front lifting gear with the adapters on the steering stem.

Mounting pin (69329965040) (📖 p. 477)

Front wheel work stand, large (69329965100) (📖 p. 477)

- Align the front lifting gear with the fork legs.



### Info

Always raise the motorcycle at the rear first.

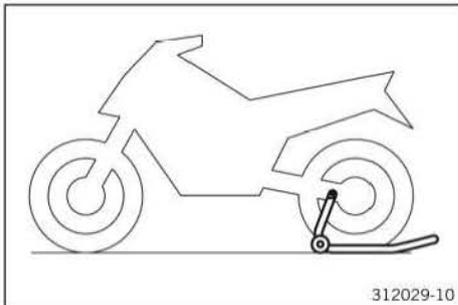
- Lift the motorcycle at the front.

## 5.2 Taking the motorcycle off the front lifting gear

### Note

**Danger of damage** The parked vehicle can roll away or fall over.

- Park the vehicle on a firm and level surface.



### Main work

- Secure the motorcycle against falling over.
- Remove the front lifting gear.

### Finishing work

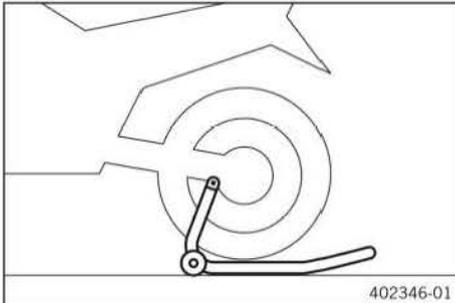
- Install the front fender. (📖 p. 140)

**5.3 Raising the motorcycle with rear lifting gear**

**Note**

**Danger of damage** The parked vehicle can roll away or fall over.

- Park the vehicle on a firm and level surface.



- Mount retaining adapter on the link fork.
- Insert adapter in the rear lifting gear.

Retaining adapter (61029955144) (📖 p. 473)
Rear wheel work stand (69329955000) (📖 p. 477)

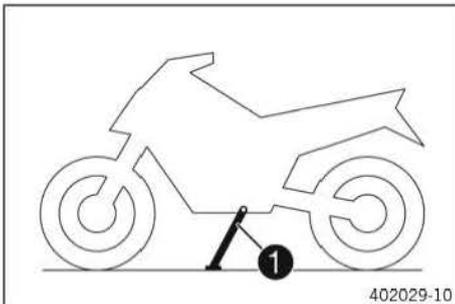
- Stand motorcycle upright, align lifting gear to the link fork with the adapters, and raise motorcycle.

**5.4 Removing the rear of the motorcycle from the lifting gear**

**Note**

**Danger of damage** The parked vehicle can roll away or fall over.

- Park the vehicle on a firm and level surface.



- Secure the motorcycle against falling over.
- Remove the rear lifting gear and lean the vehicle on side stand ①.
- Remove the retaining adapter from the link fork.

**5.5 Raising the motorcycle at the rear using the work stand**

**Note**

**Danger of damage** The parked vehicle can roll away or fall over.

- Park the vehicle on a firm and level surface.

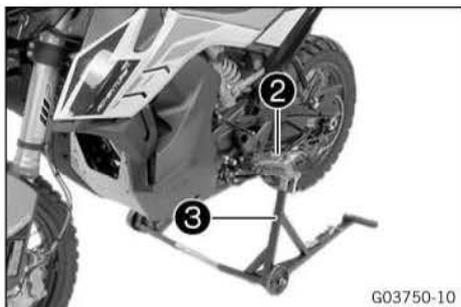
**Preparatory work**

- Remove the main silencer. (📖 p. 100)

**Main work**

- Remove nut ①.
- Take off footrest rubber and holder.





- Mount special tool **2**.

Work stand attachments (75029036000) (p. 478)

- Repeat these steps on the opposite side.
- Mount special tool **3**.

Work stand (62529055200) (p. 475)

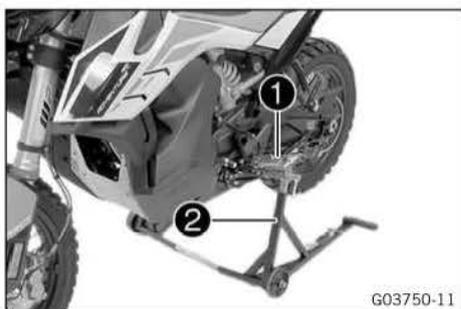
- Position motorcycle upright, align special tool, and raise motorcycle.

## 5.6 Removing the motorcycle from the work stand at the rear

### Note

**Danger of damage** The parked vehicle can roll away or fall over.

- Park the vehicle on a firm and level surface.



### Main work

- Secure the motorcycle against falling over.
- Remove special tool **1** and **2**.

Work stand (62529055200) (p. 475)

Work stand attachments (75029036000) (p. 478)



- Position footrest rubber with holder.
- Mount and tighten nut **3**.

### Guideline

Remaining nuts, chassis	M6	10 Nm (7.4 lbf ft)
-------------------------	----	--------------------

- Repeat these steps on the opposite side.

### Finishing work

- Install the main silencer. (p. 100)

## 5.7 Raising the motorcycle at the front using the work stand

### Note

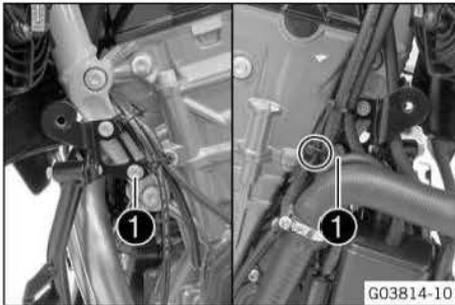
**Danger of damage** The parked vehicle can roll away or fall over.

- Park the vehicle on a firm and level surface.

### Preparatory work

- Remove the seat. (p. 114)
- Remove the left side cover. (p. 130)
- Remove the battery cover. (p. 131)
- Remove left fuel tank spoiler. (p. 132)
- Remove the right side cover. (p. 130)

- Remove right fuel tank spoiler. (📖 p. 134)
- Remove engine guard. (📖 p. 138)
- Remove the fuel tank. (📖 p. 114)



**Main work**

- Remove the cable ties.
- Remove screws ❶.



- Mount the special tool.
- |                                     |
|-------------------------------------|
| Work stand (62529055200) (📖 p. 475) |
|-------------------------------------|
- Stand the motorcycle upright, align the special tool, and raise the motorcycle.

**5.8 Removing the motorcycle from the work stand at the front**

**Note**

**Danger of damage** The parked vehicle can roll away or fall over.

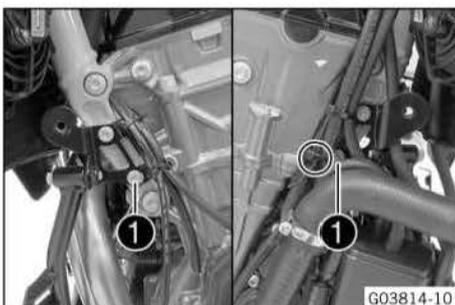
- Park the vehicle on a firm and level surface.



**Main work**

- Secure the motorcycle against falling over.
- Remove the special tool.

Work stand (62529055200) (📖 p. 475)
-------------------------------------



- Mount and tighten screws ❶.

**Guideline**

Remaining screws, chassis	M8	25 Nm (18.4 lbf ft)
---------------------------	----	---------------------

- Mount the cable ties.

**Finishing work**

- Install the fuel tank. (📖 p. 117)
- Install the engine guard. (📖 p. 138)
- Install the right fuel tank spoiler. (📖 p. 135)

- Install the right side cover. (📖 p. 131)
- Install the left fuel tank spoiler. (📖 p. 133)
- Install the battery cover. (📖 p. 132)
- Install the left side cover. (📖 p. 130)
- Mount the seat. (📖 p. 114)

## 5.9 Starting the vehicle



### Danger

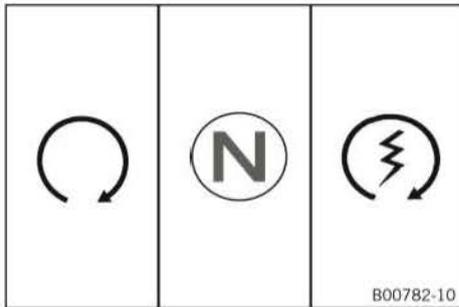
**Danger of poisoning** Exhaust gases are toxic and inhaling them may result in unconsciousness and death.

- Always make sure there is sufficient ventilation when running the engine.
- Use effective exhaust extraction when starting or running the engine in an enclosed space.

### Note

**Engine damage** High revving speed with a cold engine negatively impacts the lifespan of the engine.

- Always run the engine warm at a low speed.



- Take the motorcycle off the side stand and sit on the motorcycle.
- Make sure that the emergency OFF switch/electric starter button is in the middle position ○.
- Switch on the ignition by turning the ignition key to the position ○.
  - ✓ After you switch on the ignition, you can hear the fuel pump working for about two seconds. The function check of the combination instrument is run at the same time.
  - ✓ The ABS warning lamp lights up and goes back out after starting off.
- Shift the transmission into neutral **N**.
  - ✓ The green idle indicator lamp **N** lights up.
- Turn emergency OFF switch/electric starter button to the lower position ③.

### i Info

Do not press the emergency off switch/electric starter button into the lower position ③ until the combination instrument function check has been completed. When starting, **DO NOT** open the throttle. If you open the throttle during the starting procedure, fuel is not injected by the engine management system and the engine cannot start. Press the emergency OFF switch/electric starter button into the lower position ③ for a maximum of 5 seconds. Wait for a least 5 seconds before trying again. This motorcycle is equipped with a safety starting system. You can only start the engine if the transmission is in neutral or if the clutch lever is pulled when a gear is engaged. If the side stand is folded out and you shift into gear and release the clutch lever, the engine stops.

## 5.10 Starting the motorcycle to check the function



### Danger

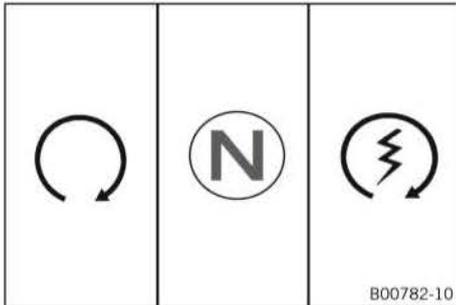
**Danger of poisoning** Exhaust gases are toxic and inhaling them may result in unconsciousness and death.

- Always make sure there is sufficient ventilation when running the engine.
- Use effective exhaust extraction when starting or running the engine in an enclosed space.



### Info

Press the starter for a maximum of 5 seconds. Wait for a least 5 seconds before trying again.



- Make sure that the emergency OFF switch/electric starter button is in the middle position ①.
- Switch on the ignition by turning the ignition key to the position ②.
- Shift the transmission into neutral **N**.
- Turn emergency OFF switch/electric starter button to the lower position ③.



### Info

Only press the emergency off switch/electric starter button into the lower position ③ when the combination instrument function check has been completed.

When starting, **DO NOT** open the throttle. If you open the throttle during the starting procedure, fuel is not injected by the engine management system and the engine cannot start.

## 6.1 Cleaning the dust boots of the fork legs



### Preparatory work

- Raise motorcycle with rear lifting gear. (p. 15)
- Remove the front fender. (p. 140)
- Lift the motorcycle with the front lifting gear. (p. 14)

### Main work

- Push dust boots ① of both fork legs downward.



### Info

The dust boots remove dust and coarse dirt particles from the inside fork tubes. Over time, dirt can accumulate behind the dust boots. If this dirt is not removed, the oil seals behind can start to leak.



### Warning

**Danger of accidents** Oil or grease on the brake discs reduces the braking effect.

- Always keep the brake discs free of oil and grease.
- Clean the brake discs with brake cleaner when necessary.

- Clean and oil the dust boots and inner fork tubes of both fork legs.

Universal oil spray (p. 467)

- Press the dust boots back into the installation position.
- Remove the excess oil.

### Finishing work

- Take the motorcycle off the front lifting gear. (p. 14)
- Install the front fender. (p. 140)
- Remove the rear of the motorcycle from the lifting gear. (p. 15)

## 6.2 Adjusting the compression damping of the fork



### Info

The hydraulic compression damping determines the fork suspension behavior.



- Turn white adjuster ① clockwise as far as it will go.



### Info

Adjuster ① is located at the upper end of the left fork leg.

The compression damping is located in left fork leg **COMP** (white adjuster). The rebound damping is located in right fork leg **REB** (red adjuster).

- Turn counterclockwise by the number of clicks corresponding to the fork type.

## Guideline

Compression damping	
Comfort	20 clicks
Standard	15 clicks
Sport	10 clicks
Full payload	15 clicks



### Info

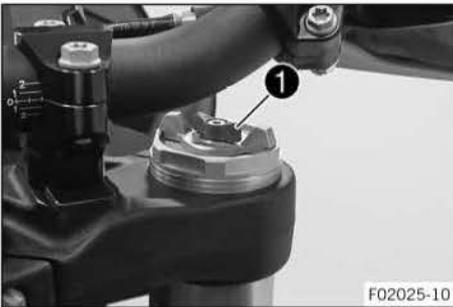
Turn clockwise to increase damping; turn counterclockwise to reduce damping.

## 6.3 Adjusting the rebound damping of the fork



### Info

The hydraulic rebound damping determines the fork suspension behavior.



- Turn red adjuster **1** clockwise as far as it will go.



### Info

Adjuster **1** is located at the upper end of the right fork leg. The rebound damping is located in right fork leg **REB** (red adjuster). The compression damping is located in left fork leg **COMP** (white adjuster).

- Turn counterclockwise by the number of clicks corresponding to the fork type.

## Guideline

Rebound damping	
Comfort	18 clicks
Standard	15 clicks
Sport	10 clicks
Full payload	15 clicks



### Info

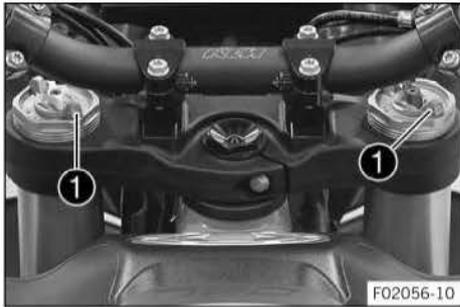
Turn clockwise to increase damping; turn counterclockwise to reduce damping.

## 6.4 Adjusting the spring pretension of the fork

### Preparatory work

- Raise motorcycle with rear lifting gear. (📖 p. 15)
- Remove the front fender. (📖 p. 140)
- Lift the motorcycle with the front lifting gear. (📖 p. 14)

## 6 FORK, TRIPLE CLAMP



### Main work

- Turn the adjusting wings **1** counterclockwise all the way.  
✓ The marking **+0** aligns with the right wing.



### Info

Make the adjustment by hand only. Do not use a tool. Make the same adjustment on both fork legs.

- Turn the adjusting wings clockwise.

### Guideline

Spring preload - <b>Preload Adjuster</b>	
Comfort	<b>+0</b>
Standard	<b>+0</b>
Sport	<b>+0</b>
Full payload	<b>+3</b>

- ✓ The adjusting wings engage noticeably at the numerical values.



### Info

Adjust the spring preload to the numerical values only as the preload will not engage between the numerical values.

Turn clockwise to increase the spring preload; turn counterclockwise to reduce the spring preload.

Adjusting the spring preload has no influence on the absorption setting of the rebound.

Basically, however, you should set the rebound damping higher with a higher spring preload.

### Finishing work

- Take the motorcycle off the front lifting gear. (📖 p. 14)
- Install the front fender. (📖 p. 140)
- Remove the rear of the motorcycle from the lifting gear. (📖 p. 15)

### 6.5 Removing fork protector



- Remove screws **1**.
- Remove screw **2**.
- Take off the fork protector at the front.
- Repeat these steps on the opposite side.

## 6.6 Installing the fork protector



- Position the fork protector. Mount screw ❶, but do not tighten yet.

Guideline

Screw, fork protector	M5x12	5 Nm (3.7 lbf ft)
-----------------------	-------	-------------------

- Mount screws ❷, but do not tighten yet.

Guideline

Screw, fork protector	M5x17	5 Nm (3.7 lbf ft)
-----------------------	-------	-------------------

- ✓ The fork protector is evenly aligned to the front.

- Tighten all screws of the fork protector.

Guideline

Screw, fork protector	M5x12	5 Nm (3.7 lbf ft)
Screw, fork protector	M5x17	5 Nm (3.7 lbf ft)

- Repeat these steps on the opposite side.



## 6.7 Removing the fork legs

### Preparatory work

- Remove the main silencer. (📖 p. 100)
- Raise the motorcycle at the rear using the work stand. (📖 p. 15)
- Remove fork protector. (📖 p. 22)
- Place a load on the rear of the vehicle.
- ✓ The front wheel is not in contact with the ground.

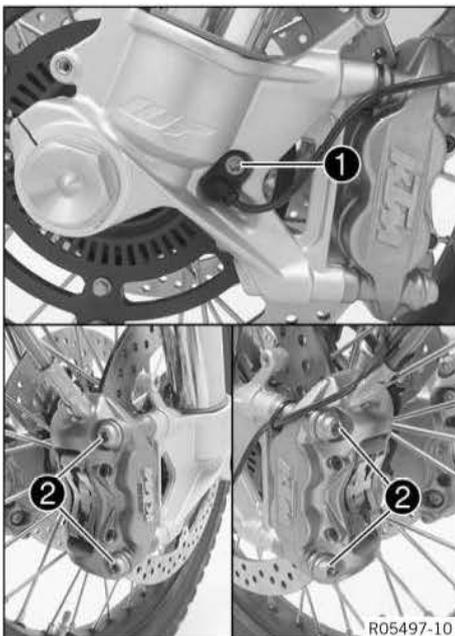
### Main work

- Remove screw ❶.
- Hang the wheel speed sensor to the side.
- Remove screws ❷.
- Press back the brake linings by slightly tilting the brake calipers laterally on to the brake discs. Pull brake calipers carefully back from the brake discs and hang to the side.

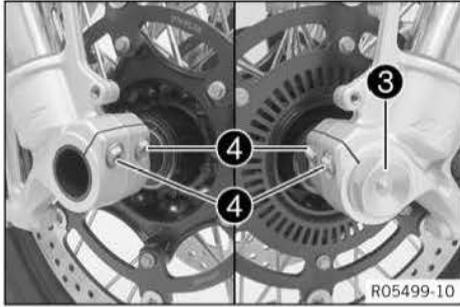


### Info

Do not operate the hand brake lever if the brake calipers have been removed.



## 6 FORK, TRIPLE CLAMP



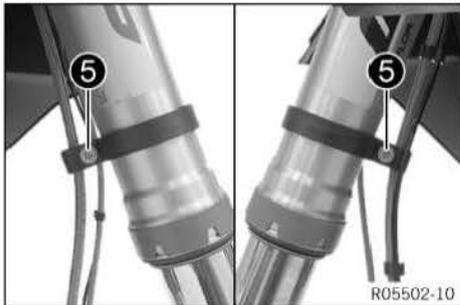
- Loosen screw ③ by several rotations.
- Loosen screws ④.
- Press on screw ③ to push the wheel spindle out of the axle clamp.
- Remove screw ③.



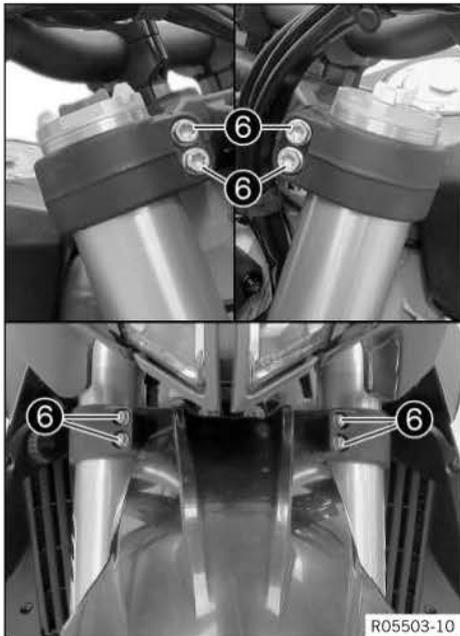
### Warning

**Danger of accidents** Damaged brake discs reduce the braking effect.

- Always lay the wheel down in such a way that the brake discs are not damaged.



- Hold the front wheel and remove the wheel spindle. Take the front wheel out of the fork.
- Loosen screws ⑤.
- Take the brake lines out of the clamps and hang to the side.



- Loosen screws ⑥.
- Remove the fork legs downwards.

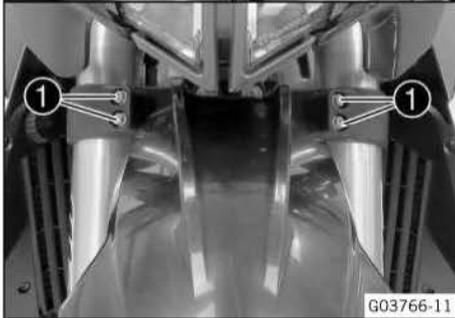
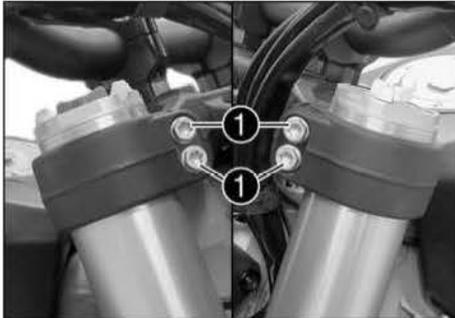
## 6.8 Installing the fork legs



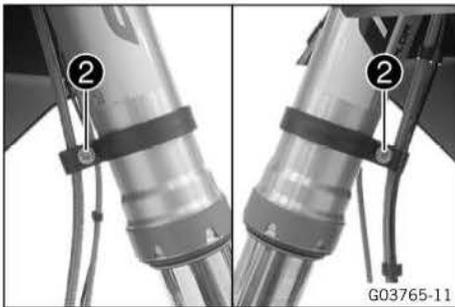
### Warning

**Danger of accidents** Modifications to the suspension setting may seriously alter the handling characteristic.

- Ride slowly to start with after making adjustments to get the feel of the new handling characteristic.



G03766-11



G03765-11

### Main work

- Push the fork legs into the triple clamps.
  - ✓ The bleeder screws face forward
  - ✓ The left-hand fork leg has a white adjuster; the right-hand fork leg has a red adjuster.
- Align the fork legs in the required position using the fork rings.
- Tighten screws ❶.

### Guideline

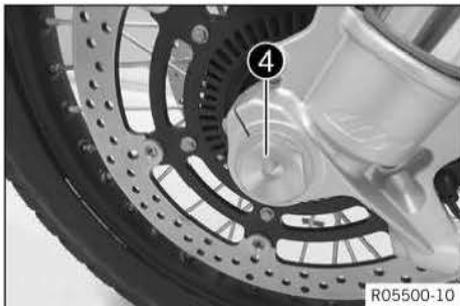
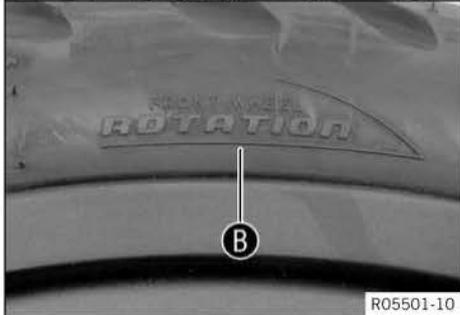
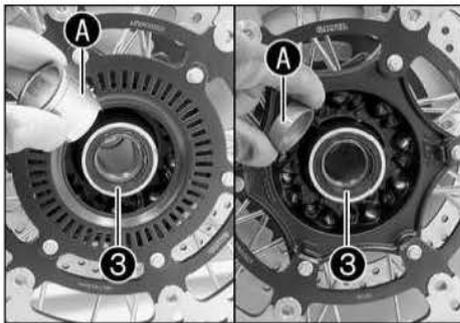
Screw, top triple clamp	M8	15 Nm (11.1 lbf ft)
Screw, bottom triple clamp	M8	12 Nm (8.9 lbf ft)

- Position the brake lines in the clamps.
- Tighten screws ❷.

### Guideline

Screw, brake line holder on link fork	M5	1 Nm (0.7 lbf ft)
---------------------------------------	----	-------------------

## 6 FORK, TRIPLE CLAMP



- Check the wheel bearing for damage and wear.
  - » If the wheel bearing is damaged or worn:
    - Change front wheel bearing. (📖 p. 149)
- Remove the spacers.
- Clean and grease shaft seal rings **3** and contact surfaces **A** of the spacers.

Long-life grease (📖 p. 466)

- Insert wide spacer on the left in the direction of travel.
- Insert narrow spacer on the right in the direction of travel.

### **i** Info

Arrow **B** indicates the direction of travel of the front wheel.  
The ABS sensor wheel is on the left viewed in the direction of travel.

### **!** Warning

**Danger of accidents** Oil or grease on the brake discs reduces the braking effect.

- Always keep the brake discs free of oil and grease.
- Clean the brake discs with brake cleaner when necessary.

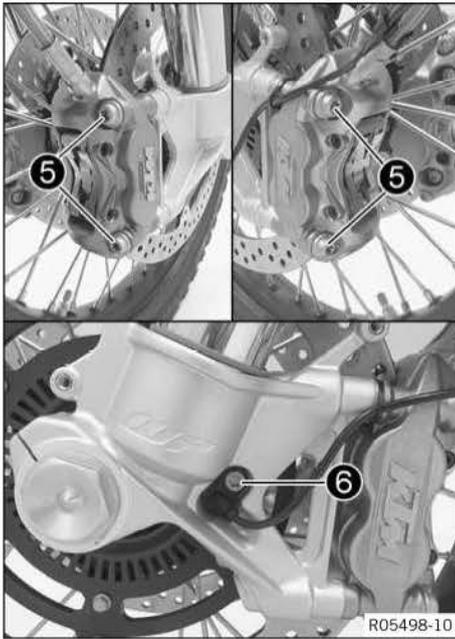
- Clean screw **4** and the wheel spindle.
- Grease wheel spindle lightly.

Long-life grease (📖 p. 466)

- Jack up the front wheel into the fork, position it, and insert the wheel spindle.
- Mount and tighten screw **4**.

### Guideline

Screw, front wheel spindle	M25x1.5	45 Nm (33.2 lbf ft) Thread greased
----------------------------	---------	---------------------------------------



- Position brake calipers.
- ✓ The brake linings are correctly positioned.
- Mount screws **5**, but do not tighten yet.

Guideline

Screw, front brake caliper	M10x1.25	45 Nm (33.2 lbf ft) <b>Loctite®243™</b>
----------------------------	----------	--------------------------------------------

- Operate the hand brake lever repeatedly until the brake linings are in contact with the brake disc and there is a pressure point. Secure the hand brake lever in the activated position.
- ✓ The brake calipers straighten.
- Tighten screws **5**.

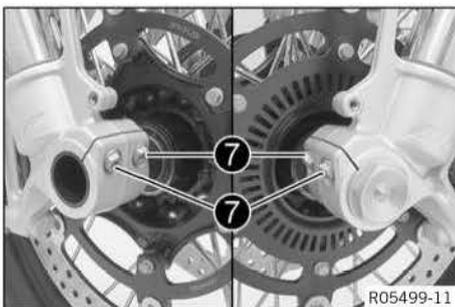
Guideline

Screw, front brake caliper	M10x1.25	45 Nm (33.2 lbf ft) <b>Loctite®243™</b>
----------------------------	----------	--------------------------------------------

- Remove the locking piece of the hand brake lever.
- Remove the load from the rear of the vehicle.
- Position the wheel speed sensor in the hole.
- Mount and tighten screw **6**.

Guideline

Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
---------------------------	----	--------------------



- Operate the front brake and compress the fork a few times firmly.
- ✓ The fork legs straighten.
- Tighten screws **7**.

Guideline

Screw, fork stub	M8	15 Nm (11.1 lbf ft)
------------------	----	---------------------

**Finishing work**

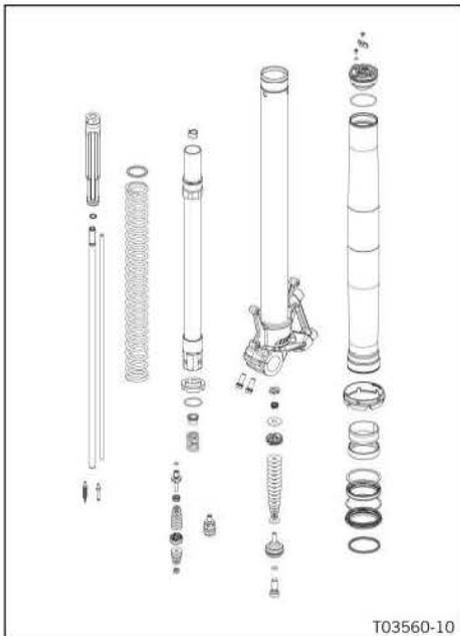
- Install the front fender. (📖 p. 140)
- Remove the motorcycle from the work stand at the rear. (📖 p. 16)
- Install the main silencer. (📖 p. 100)
- Install the fork protector. (📖 p. 23)

## 6.9 Servicing the fork

**Condition**

The fork legs have been removed.

## 6 FORK, TRIPLE CLAMP



- Disassemble the fork legs. (📖 p. 28)
- Disassemble the cartridge. (📖 p. 31)
- Disassemble the tap compression. (📖 p. 34)
- Check the fork legs. (📖 p. 35)
- Assemble the tap compression. (📖 p. 36)
- Assemble the cartridge. (📖 p. 37)
- Assemble the fork legs. (📖 p. 41)

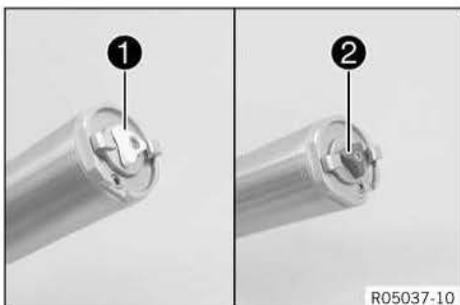
### 6.10 Disassembling the fork legs

#### **i** Info

The operations are the same on both fork legs.

#### **Condition**

The fork legs have been removed.



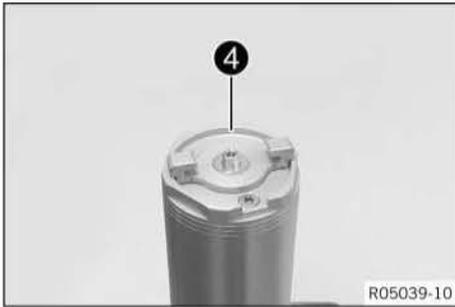
- Note down the current state of compression damping **1 COMP** (white adjuster on the left fork leg).
- Note down the current state of rebound damping **2 REB** (red adjuster on the right fork leg).
- Open the adjusters of the rebound and compression damping completely.



- Clamp the fork leg in the area of the lower triple clamp.

Clamping stand (T1403S) (📖 p. 484)

- Remove screw **3**. Remove the adjuster.



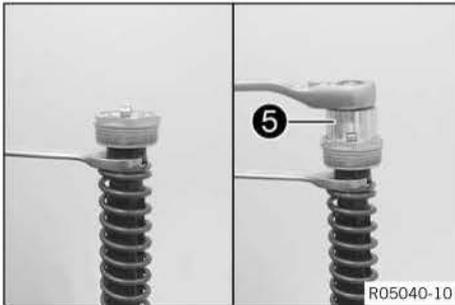
- Loosen screw cap 4.

Ring wrench (T14017) (p. 483)



**Info**

The screw cover cannot be removed yet.

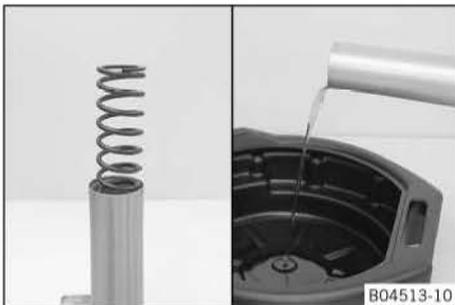


- Extract the fork leg and push the outside fork tube downward.
- Pull the spring downward and push the open end wrench onto the hexagonal part.
- Hold the hexagonal part and loosen the Preload Adjuster with special tool 5, but do not take it off yet.

Special socket (T14087) (p. 485)



- Pull the spring downward. Remove the open end wrench.
- Remove the screw cap.

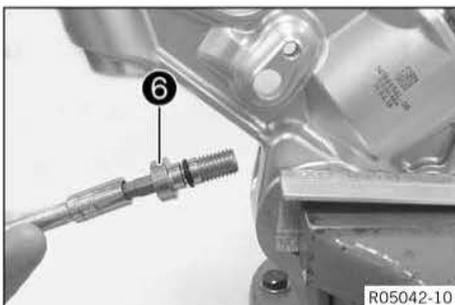


- Remove the spring.
- Drain the fork oil.



**Info**

Pull out and push in the piston rod a few times to pump the cartridge empty.



- Clamp the fork leg with the axle clamp.

**Guideline**

Use soft jaws.

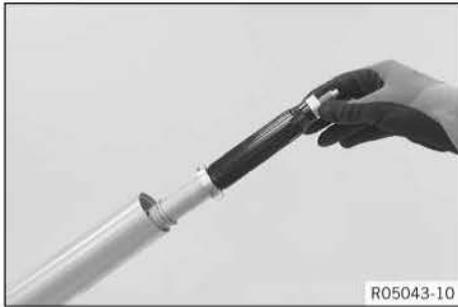
- Loosen screw 6 with O-ring and remove.



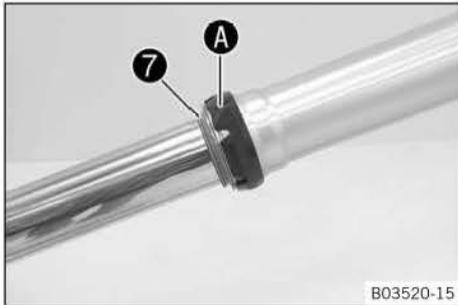
**Info**

Place a collecting container underneath as some oil will usually still run out.

## 6 FORK, TRIPLE CLAMP



- Remove the cartridge.

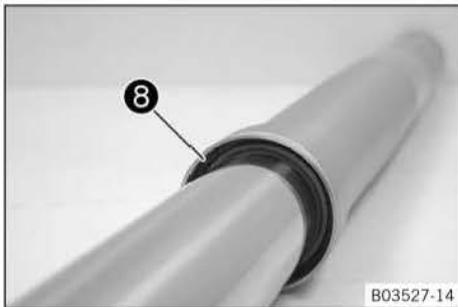


- Remove dust boot 7.
- Remove fork protector ring A.



### Info

The fork protector ring does not necessarily need to be removed for repair work.

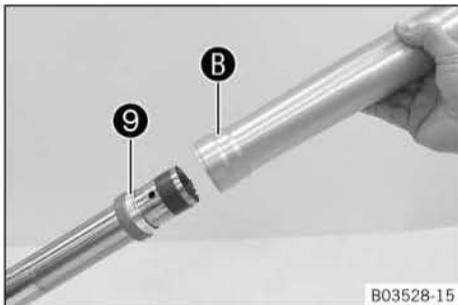


- Remove lock ring 8.



### Info

The lock ring has a beveled end where a screwdriver can be applied.



- Warm up the outside fork tube in area B of the lower sliding bushing.

### Guideline

50 °C (122 °F)

- Pull the outside fork tube off the inside fork tube with a jerk.



### Info

Lower sliding bushing 9 must be drawn from its bearing seat.



- Remove upper sliding bushing 10.



### Info

Without using a tool, pull the stack slightly apart by hand.

- Take off lower sliding bushing 9.
- Take off support ring 11.
- Take off seal ring 12.
- Take off lock ring 8.
- Take off dust boot 7.
- Take off lift indicator 13.

- Unclamp the fork leg.



## 6.11 Disassembling the cartridge

### Preparatory work

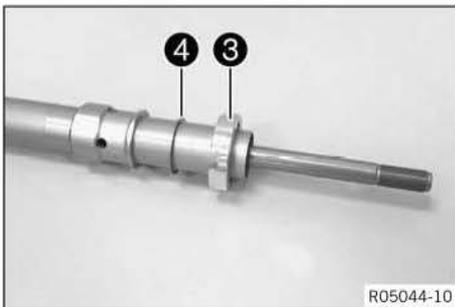
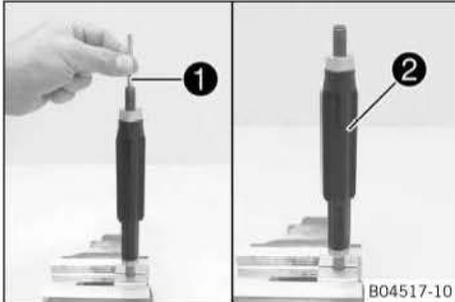
- Disassemble the fork legs. (p. 28)

### Right cartridge

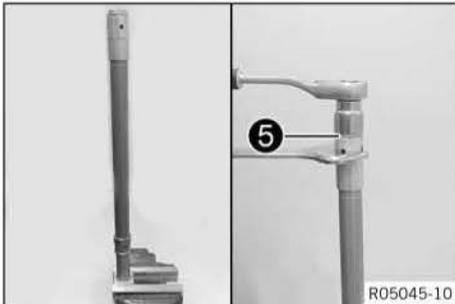
- Clamp the piston rod using the special tool.

Clamping stand (T14016S) (p. 483)

- Remove adjusting tube ①.
- Remove fluid barrier ② from the piston rod.



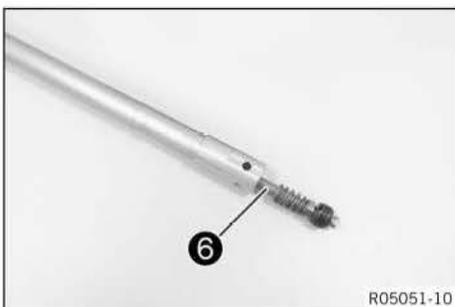
- Take spring seat ③ and washer ④ off of the cartridge.



- Clamp the piston rod as shown.

Clamping stand (T14016S) (p. 483)

- Unscrew and remove compression holder ⑤.



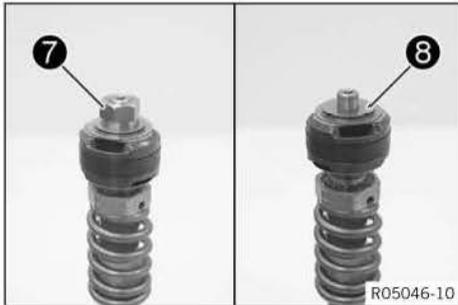
- Take piston rod ⑥ out of the cartridge.

## 6 FORK, TRIPLE CLAMP



- Degrease the piston rod.
- Clamp the piston rod using the special tool.

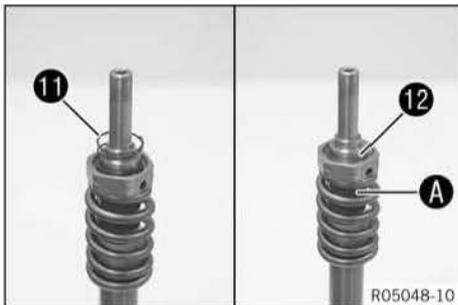
Clamping stand (T14016S) ( p. 483)



- Remove nut 7.
- Completely remove shim stack 8.



- Remove piston 9.
- Completely remove shim stack 10.

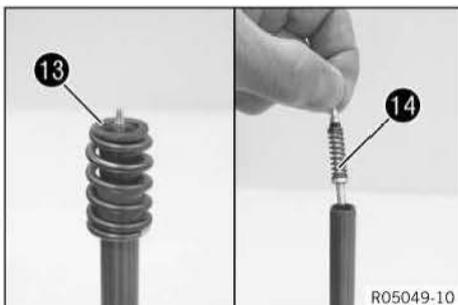


- Remove spring 11.
- Warm up the piston rod in area A.

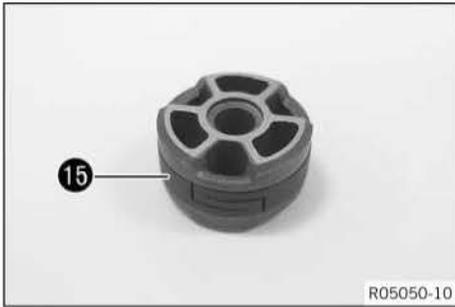
Guideline

50 °C (122 °F)

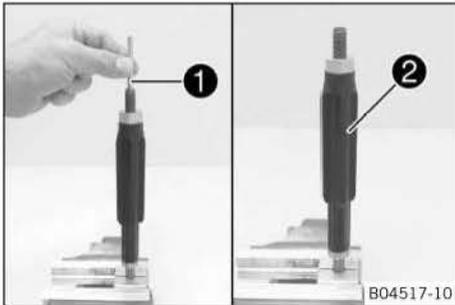
- Remove tap rebound 12.



- Remove spring 13.
- Remove valve 14 of the rebound damping with the spring.
- Unclamp the piston rod.



- Remove piston ring **15**.

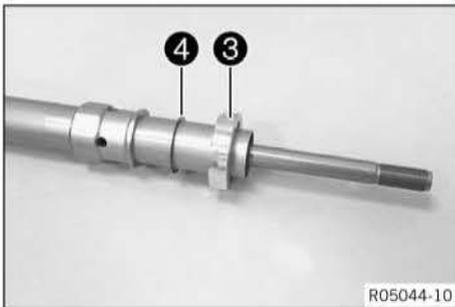


### Left cartridge

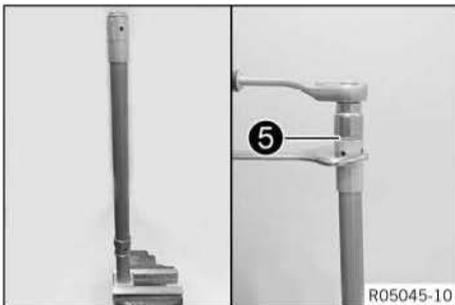
- Clamp the piston rod using the special tool.

Clamping stand (T14016S) (p. 483)

- Remove adjusting tube **1**.
- Remove fluid barrier **2** from the piston rod.



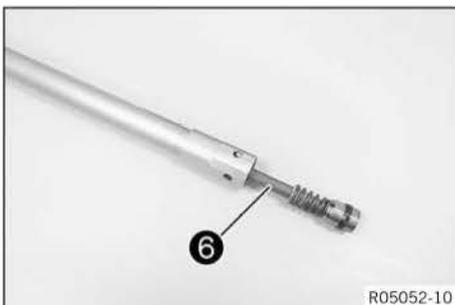
- Take spring seat **3** and washer **4** off of the cartridge.



- Clamp the piston rod as shown.

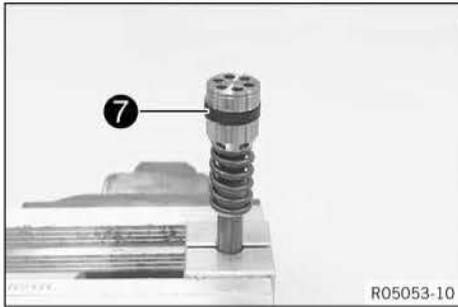
Clamping stand (T14016S) (p. 483)

- Unscrew and remove compression holder **5**.



- Take piston rod **6** out of the cartridge.

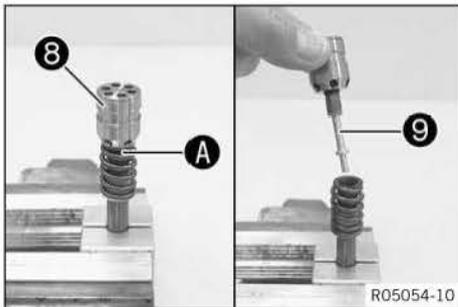
## 6 FORK, TRIPLE CLAMP



- Degrease the piston rod.
- Clamp the piston rod using the special tool.

Clamping stand (T14016S) ( p. 483)

- Remove piston ring 7.

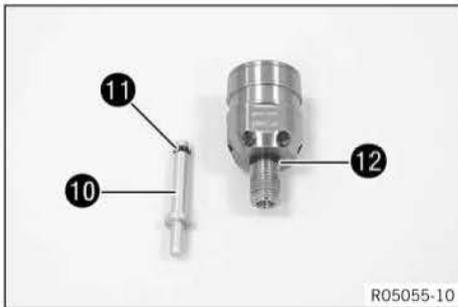


- Warm up the piston rod in area A.

Guideline

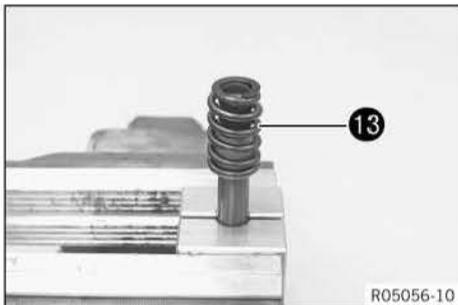
50 °C (122 °F)

- Remove piston 8 with setting needle 9.



- Pull setting needle 10 out of the piston.

- Remove O-rings 11 and 12.



- Remove spring 13.

- Unclamp the piston rod.

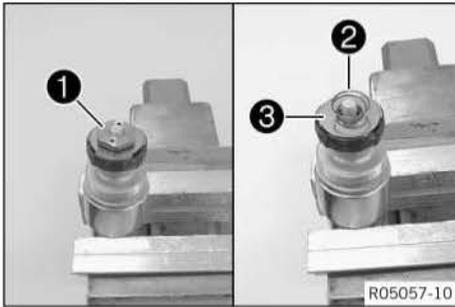
### 6.12 Disassembling the tap compression

#### **i** Info

The operations are the same on both fork legs.

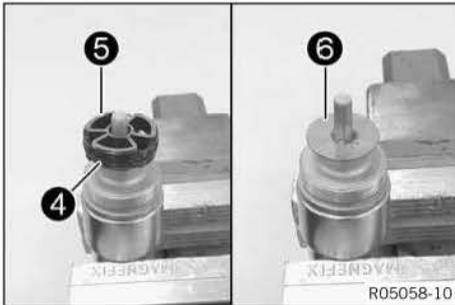
#### **Preparatory work**

- Disassemble the fork legs. ( p. 28)



### Main work

- Mount the tap compression on a suitable hexagon socket and clamp into a vise.
- Remove nut ①.
- Remove spring ②.
- Remove washer ③.



- Remove O-ring ④.
- Remove piston ⑤.
- Remove shim stack ⑥.
- Extract the tap compression.

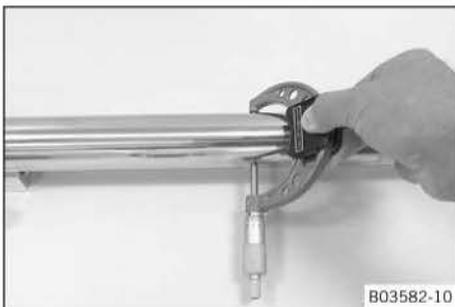
## 6.13 Checking the fork legs

### Condition

The fork legs have been disassembled.



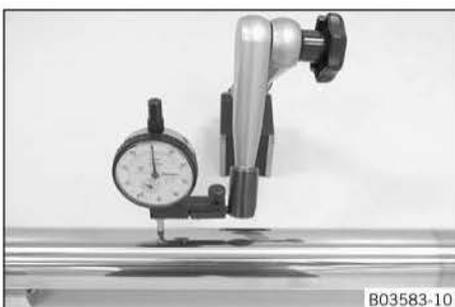
- Check the inside fork tube and the axle clamp for damage.
  - » If damage is found:
    - Change the inside fork tube.



- Measure the outside diameter of the inside fork tube at several places.

Outside diameter of the inside fork tube	47.975 ... 48.005 mm (1.88878 ... 1.88996 in)
------------------------------------------	--------------------------------------------------

- » If the measured value is less than the specified value:
  - Change the inside fork tube.



- Measure the run-out of the inside fork tube.

Run-out of the inside fork tube	≤ 0.20 mm (≤ 0.0079 in)
---------------------------------	-------------------------

- » If the measured value is greater than the specified value:
  - Change the inside fork tube.

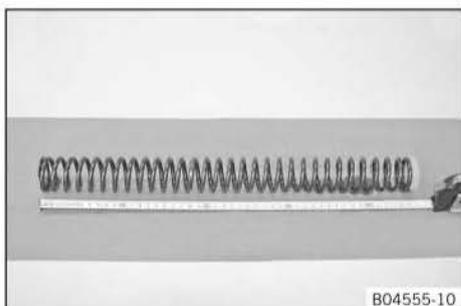
## 6 FORK, TRIPLE CLAMP



- Check the outside fork tube for damage.
  - » If damage is found:
    - Change the outside fork tube.



- Check the surface of the sliding bushings.
  - » When bronze-colored layer **A** becomes visible under gliding layer **B**:
    - Change the sliding bushings.



- Check the spring length.

### Guideline

Spring length with preload spacer(s)	464 mm (18.27 in)
--------------------------------------	-------------------

- » If the measured value is greater than the specified value:
  - Reduce the thickness of the preload spacers.
- » If the measured value is less than the specified value:
  - Increase the thickness of the preload spacers.



### Info

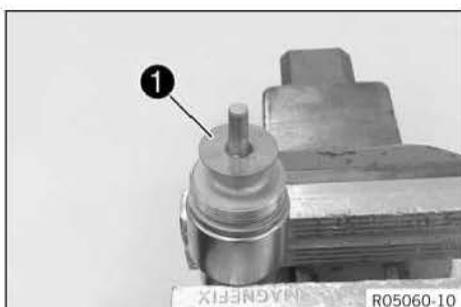
There may only be one preload spacer installed, or none at all.

### 6.14 Assembling the tap compression



### Info

The operations are the same on both fork legs.

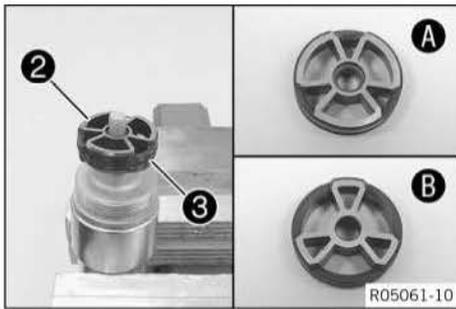


- Mount the tap compression on a suitable hexagonal part and clamp into a vise.
- Mount shim stack **1**.



### Info

Mount the smaller shims at the bottom.



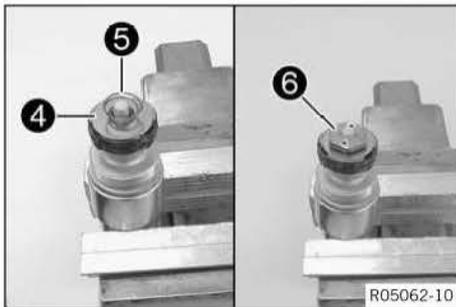
- Mount piston **2**.

Guideline

View <b>A</b>	of piston from above
View <b>B</b>	of piston from below

- Mount O-ring **3**.
- Grease the piston O-ring.

Fork oil (SAE 4) (48601166S1) (p. 465)



- Mount washer **4**.
- Mount spring **5** with the tighter coil facing downward.
- Mount and tighten nut **6**.

Guideline

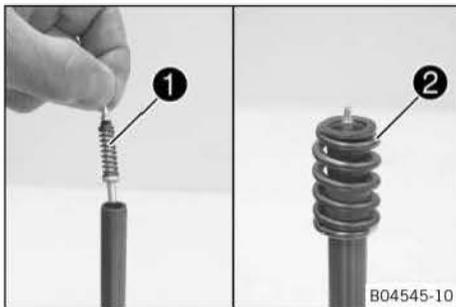
Nut, tap compression	M6x0.5	5 Nm (3.7 lbf ft)
----------------------	--------	-------------------

**i** Info

Washer **4** must be free to move against the spring force.

- Extract the tap compression.

## 6.15 Assembling the cartridge



### Right cartridge

- Clamp in the piston rod.

Clamping stand (T14016S) (p. 483)

- Mount valve **1** of the rebound damping with the spring and O-ring.
- Grease the O-ring.

Lubricant (T158) (p. 466)

- Mount spring **2**.

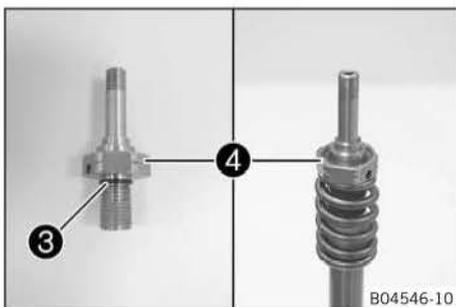
- Mount and grease O-ring **3** in tap rebound **4**.

Lubricant (T158) (p. 466)

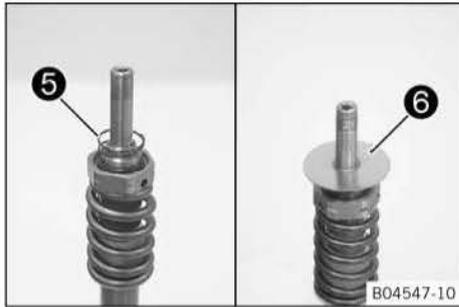
- Mount and tighten the tap rebound.

Guideline

Tap rebound	M9x1	18 Nm (13.3 lbf ft) <b>Loctite®2701™</b>
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## 6 FORK, TRIPLE CLAMP



- Position spring **5**.
- Mount shim stack **6**.

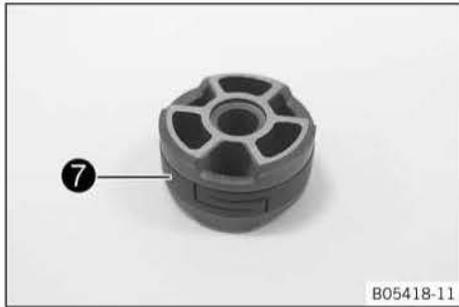
**i Info**  
Mount the smaller shims at the bottom.

- Press the shim stack downward against the spring force.

**i Info**  
The shim stack must be pressed downward over the collar.

- Mount and lubricate piston ring **7**.

Fork oil (SAE 4) (48601166S1) (☞ p. 465)
------------------------------------------



- Mount piston **8** with the piston ring.

Guideline

View <b>A</b>	of piston from above
View <b>B</b>	of piston from below



- Mount shim stack **9**.

**i Info**  
Align the triangular plate exactly with the piston opening.

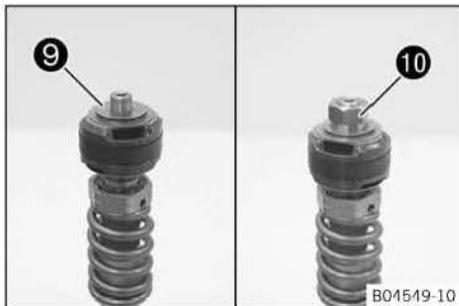
- Mount and tighten nut **10** with the collar facing downward.

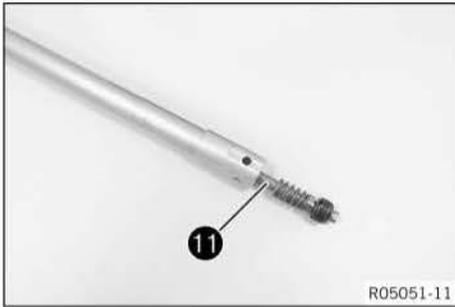
Guideline

Tap rebound nut	M6x0.5	5 Nm (3.7 lbf ft)
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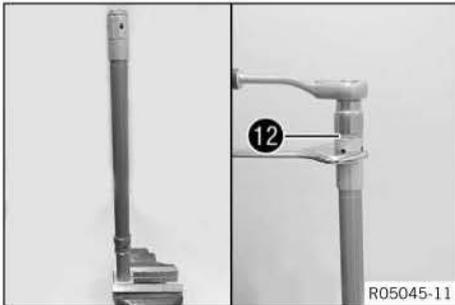
- ✓ The lower shim stack is free to move against the spring force.

- Lock the nut by center punching it.





- Slide piston rod **11** into the cartridge.



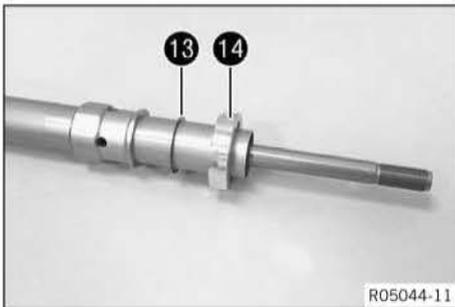
- Clamp the piston rod as shown.

Clamping stand (T14016S) (📖 p. 483)

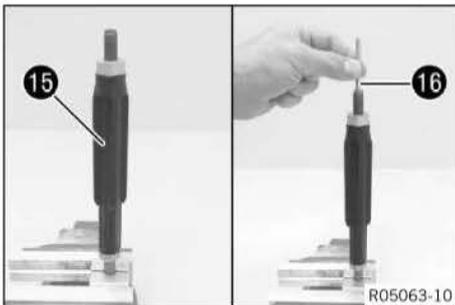
- Mount and tighten tap compression **12**.

Guideline

Tap compression	M29x1	46 Nm (33.9 lbf ft)
-----------------	-------	------------------------



- Mount washer **13** and spring seat **14**.



- Mount fluid barrier **15** all the way on.



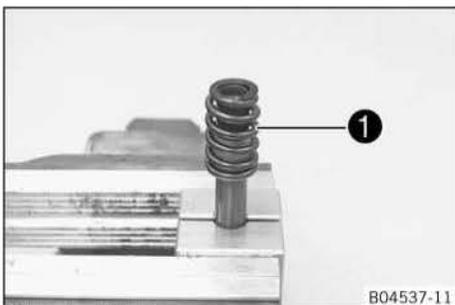
### Info

The fluid barrier must be tightened all the way. Do not use a tool.

- Mount adjusting tube **16** for the rebound damping in the cartridge.

✓ The adjusting tube protrudes approx. 5 mm (0.197 in) out of the cartridge and can be pressed in against the spring force.

✗ The adjusting tube protrudes more than 7 mm (0.275 in) from the cartridge and cannot be pressed in against the spring force.



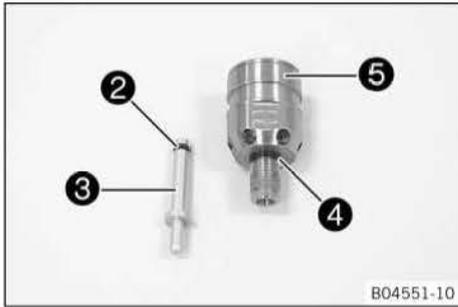
### Left cartridge

- Clamp in the piston rod.

Clamping stand (T14016S) (📖 p. 483)

- Mount spring **1**.

## 6 FORK, TRIPLE CLAMP

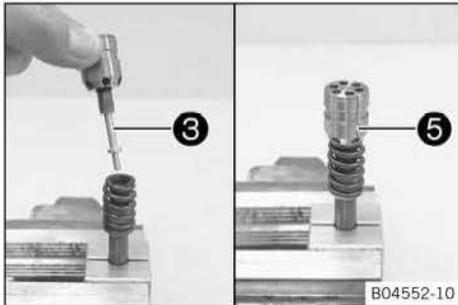


- Mount and lubricate O-ring ② for setting needle ③.

Lubricant (T158) (☞ p. 466)

- Mount and lubricate O-ring ④ for piston ⑤.

Lubricant (T158) (☞ p. 466)

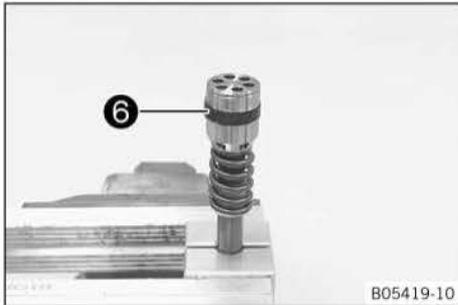


- Insert setting needle ③ in the piston.

- Mount and tighten piston ⑤.

Guideline

Rebound piston	M9x1	18 Nm (13.3 lbf ft) <b>Loctite®2701™</b>
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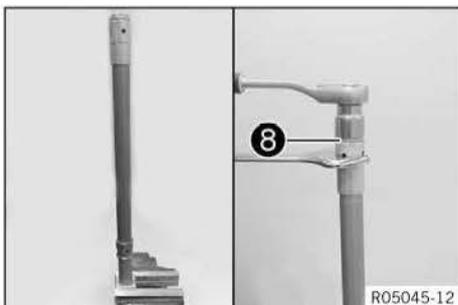


- Mount and lubricate piston ring ⑥.

Fork oil (SAE 4) (48601166S1) (☞ p. 465)



- Slide piston rod ⑦ into the cartridge.



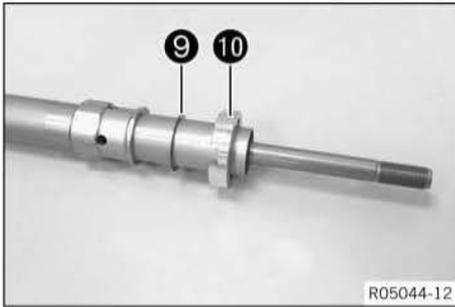
- Clamp the piston rod as shown.

Clamping stand (T14016S) (☞ p. 483)

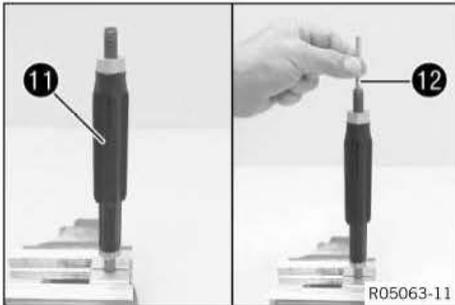
- Mount and tighten tap compression ⑧.

Guideline

Tap compression	M29x1	46 Nm (33.9 lbf ft)
-----------------	-------	------------------------



- Mount washer 9 and spring seat 10.



- Mount fluid barrier 11 all the way on.



### Info

The fluid barrier must be tightened all the way. Do not use a tool.

- Mount adjusting tube 12 for the rebound damping in the cartridge.
  - ✓ The adjusting tube protrudes approx. 3 mm (0.197 in) out of the cartridge and can be pressed in against the spring force.
  - ✗ The adjusting tube protrudes more than 5 mm (0.275 in) from the cartridge and cannot be pressed in against the spring force.

## 6.16 Assembling the fork legs



### Info

The operations are the same on both fork legs.

### Preparatory work

- Check the fork legs. (p. 35)
- Assemble the cartridge. (p. 37)
- Assemble the tap compression. (p. 36)

### Main work

- Clamp the inside fork tube using an axle clamp.

#### Guideline

Use soft jaws.

- Mount the special tool.

Protecting sleeve (T1401) (p. 483)

- Push on lift indicator 1.
- Grease and push on dust boot 2.

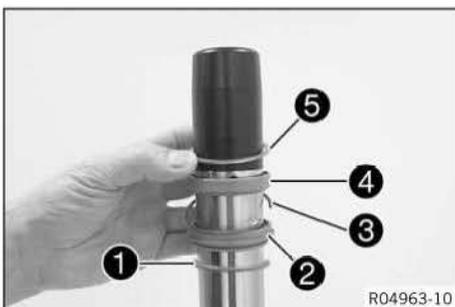
Lubricant (T14034) (p. 466)



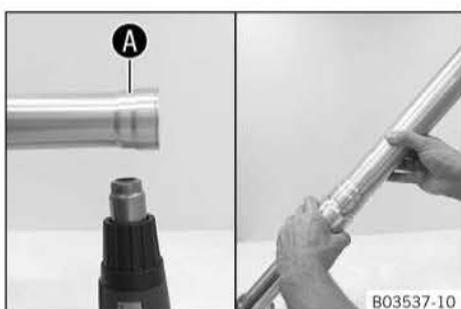
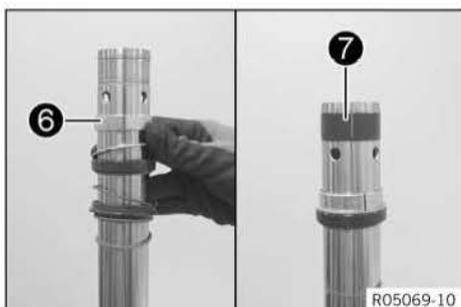
### Info

Always change the dust boot, seal ring, lock ring, and support ring.  
Mount sealing lip with the spring expander facing down.

- Push on lock ring 3.



## 6 FORK, TRIPLE CLAMP



- Grease and push on seal ring ④.

Lubricant (T14034) (📖 p. 466)



### Info

Sealing lip downward, open side upward.

- Push on support ring ⑤.
- Remove the special tool.
- Push on lower sliding bushing ⑥.
- Mount upper sliding bushing ⑦.



### Info

Without using a tool, pull the stack slightly apart by hand.

- Warm up the outside fork tube in area A of the lower sliding bushing.

### Guideline

50 °C (122 °F)

- Slide on the outside fork tube.
- Hold the lower sliding bushing with longer side of the special tool.

Mounting tool (T14040S) (📖 p. 484)

- Press the outside fork tube all the way in.
- Position the support ring.
- Hold the seal ring with shorter side of the special tool.

Mounting tool (T14040S) (📖 p. 484)

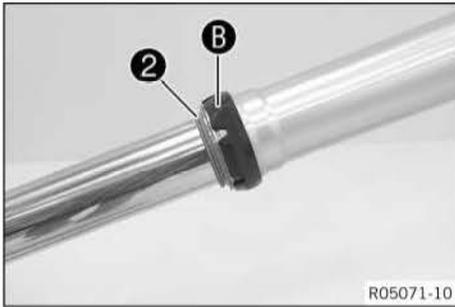
- Press the outside fork tube all the way in.

- Mount lock ring ③.

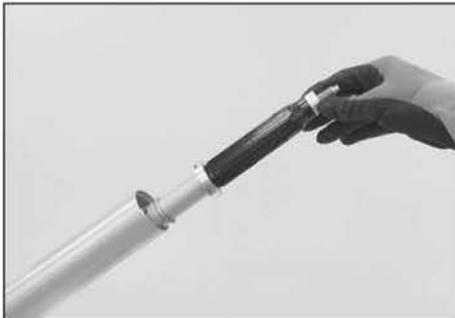


### Info

The lock ring must engage audibly.

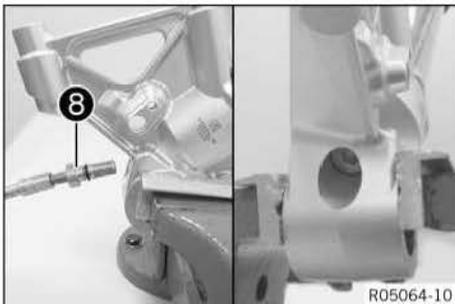


- Mount dust boot **2**.
- Mount fork protector ring **B**.



- Slide the cartridge all the way into the inside fork tube.
- ✓ The hexagonal part of the cartridge engages in the inside fork tube guide.

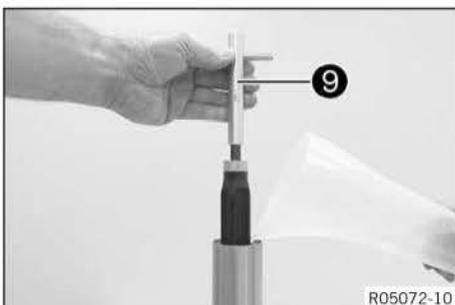
**i Info**  
When assembling, ensure that the cartridges are not mixed up. The cartridges with the holes are installed on the left. The cartridge without the hole is installed on the right.



- Mount screw **8** with the O-ring and tighten.

Guideline

Screw, cartridge	M10x25	25 Nm (18.4 lbf ft)
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- Mount special tool **9** on the piston rod.

Support tool (T14026S1) (📄 p. 484)
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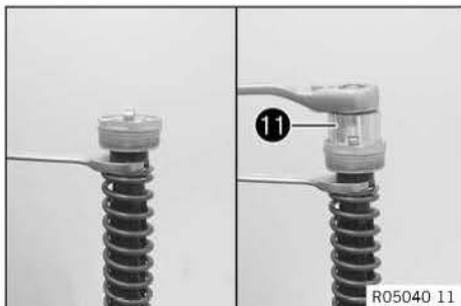
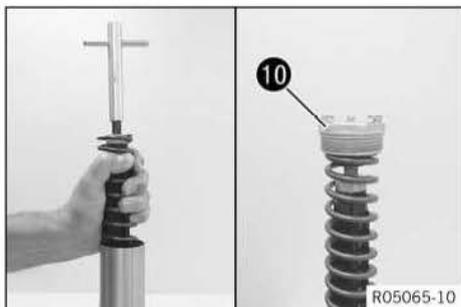
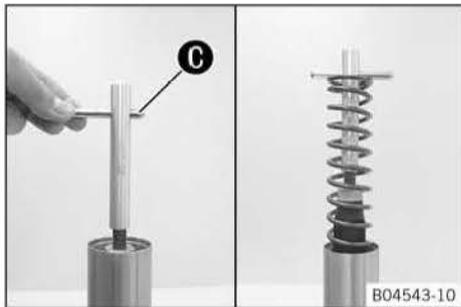
**i Info**  
The special tool must be used to prevent the adjusting tube from being lifted and thus to prevent oil from reaching the piston rod.

- Clamp the fork vertically.

Clamping stand (T1403S) (📄 p. 484)
------------------------------------

- Fill with fork oil.

## 6 FORK, TRIPLE CLAMP



Fork oil per fork leg	630 ± 5 ml (21.3 ± 0.17 fl. oz.)	Fork oil (SAE 4) (48601166S1) (p. 465)
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### **i** Info

Pull out the piston rod and push back in a number of times to bleed the cartridge.

- Remove pin **C** of the special tool.

Support tool (T14026S1) (p. 484)

- Pull out the piston rod. Mount the spring. Mount the pin again.  
Guideline

Spring rate

Weight of rider: 75 ... 85 kg (165 ... 187 lb.)	6.7 N/mm (38.3 lb/in)
----------------------------------------------------	-----------------------

- Pull the spring downward.
- Remove the special tool.

Support tool (T14026S1) (p. 484)

- Mount screw cap **10**.

### **i** Info

When assembling, ensure that the screw caps are mounted correctly.

Rebound damping side – right fork leg, screw cap with marking **REB**, red adjuster.

Compression damping side – left fork leg, screw cap with marking **COMP**, white adjuster.

- Pull the spring downward.
- Mount the open end wrench on the hexagonal part.
- Hold the open end wrench. Tighten the Preload Adjuster with special tool **11**.

Guideline

Screw cap on piston rod	M12x1	25 Nm (18.4 lbf ft)
-------------------------	-------	---------------------

Special socket (T14087) (p. 485)

- Push the outside fork tube upward.
- Clamp the outside fork tube in the area of the lower triple clamp.

Clamping stand (T1403S) (p. 484)

- Grease the O-ring of the screw cover.

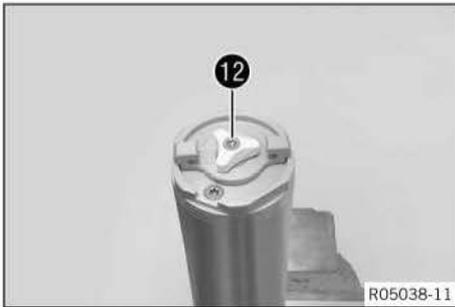
Lubricant (T158) (p. 466)

- Mount and tighten screw cap **10**.

Guideline

Screw cap on the outside fork tube	M5x1.5	40 Nm (29.5 lbf ft)
------------------------------------	--------	---------------------

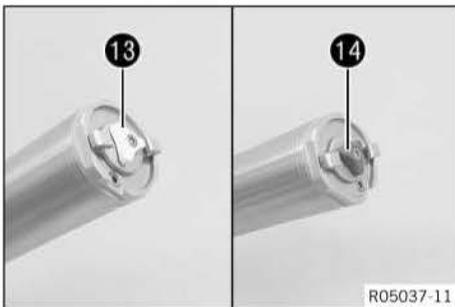
Ring wrench (T14017) (📖 p. 483)		
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- Mount the adjuster.
- Mount and tighten screw 12.

Guideline

Screw, adjuster	M4x0.5	2.5 Nm (1.84 lbf ft)
-----------------	--------	----------------------



Alternative 1

- Turn compression adjuster 13 and rebound adjuster 14 clockwise all the way.
- Turn counterclockwise by the number of clicks corresponding to the fork type.

Guideline

Rebound damping	
Comfort	18 clicks
Standard	15 clicks
Sport	10 clicks
Full payload	15 clicks
Compression damping	
Comfort	20 clicks
Standard	15 clicks
Sport	10 clicks
Full payload	15 clicks

Alternative 2



**Warning**

**Danger of accident** Modifications to the suspension setting may seriously alter the handling characteristic.

Extreme modifications to the suspension setting may cause a serious deterioration in the handling characteristic and overload components.

- Only make adjustments within the recommended range.
- Ride slowly to start with after making adjustments to get the feel of the new handling characteristic.

- Set the adjusters to the positions determined upon removal.

## 6.17 Checking the steering head bearing play



### Warning

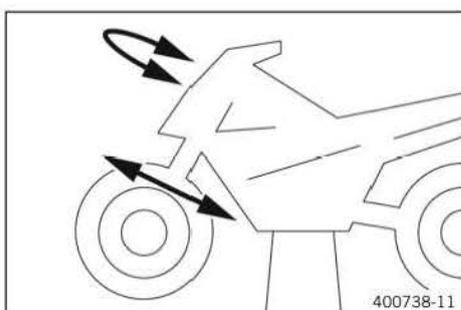
**Danger of accidents** Incorrect steering head bearing play impairs the handling characteristic and damages components.

- Correct incorrect steering head bearing play immediately.



### Info

If the vehicle is operated for a lengthy period with play in the steering head bearing, the bearings and the bearing seats in the frame can become damaged over time.



### Preparatory work

- Remove the main silencer. (📖 p. 100)
- Raise the motorcycle at the rear using the work stand. (📖 p. 15)

### Main work

- Place a load on the rear of the vehicle.
  - ✓ The front wheel is not in contact with the ground.
- Move the handlebar to the straight-ahead position. Move the fork legs back and forth in the direction of travel.

Play should not be detectable on the steering head bearing.

- » If there is detectable play:
  - Adjust the steering head bearing play. (📖 p. 46)

- Move the handlebar back and forth over the entire steering range.

It must be possible to move the handlebar easily over the entire steering range. There should be no detectable detent positions.

- » If detent positions are detected:
  - Adjust the steering head bearing play. (📖 p. 46)
  - Check the steering head bearing and adjust if necessary.

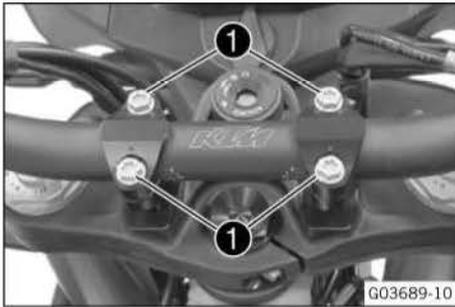
### Finishing work

- Remove the motorcycle from the work stand at the rear. (📖 p. 16)
- Install the main silencer. (📖 p. 100)

## 6.18 Adjusting the steering head bearing play

### Preparatory work

- Remove the main silencer. (📖 p. 100)
- Raise the motorcycle at the rear using the work stand. (📖 p. 15)
- Place a load on the rear of the vehicle.
  - ✓ The front wheel is not in contact with the ground.



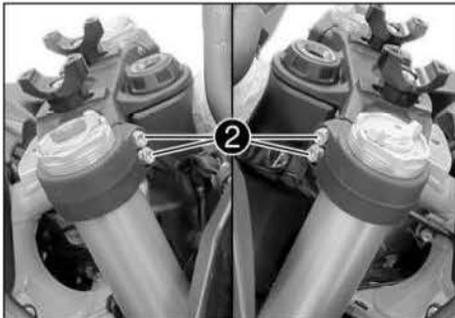
### Main work

- Remove screws ①.
- Take off the handlebar clamps.
- Take off the handlebar and place it at the front.



### Info

Cover the components to protect them against damage. Do not kink the cables and lines.



- Loosen screws ②.
- Remove screw ③.
- Loosen and retighten screw ④.

### Guideline

Screw, steering head	M25x1.5	18 Nm (13.3 lbf ft)
----------------------	---------	---------------------

- Using a plastic hammer, tap lightly on the upper triple clamp to avoid stresses.

- Tighten screws ②.

### Guideline

Screw, top triple clamp	M8	15 Nm (11.1 lbf ft)
-------------------------	----	---------------------

- Mount and tighten screw ③.

### Guideline

Screw, steering stem	M8	20 Nm (14.8 lbf ft) <b>Loctite®243™</b>
----------------------	----	--------------------------------------------



- Position the handlebar.



### Info

Make sure the cables and wiring are positioned correctly.

- Position the handlebar clamps. Mount screws, but do not tighten them yet.

✓ Markings **A** face backwards.

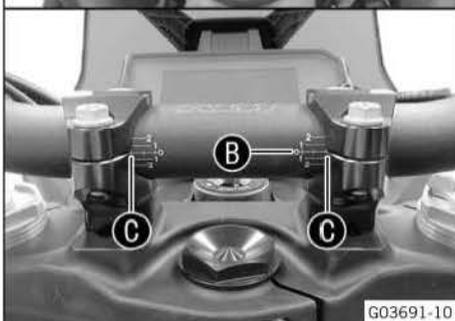
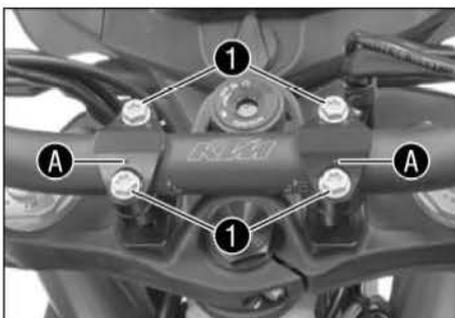
✓ The horizontal marking **B** on the handlebar scale is aligned with the center of the handlebar clamp.

✓ The vertical markings **C** on the handlebar scale are aligned equally on both sides.

- Tighten screws ① evenly.

### Guideline

Screw, handlebar clamp	M8	20 Nm (14.8 lbf ft)
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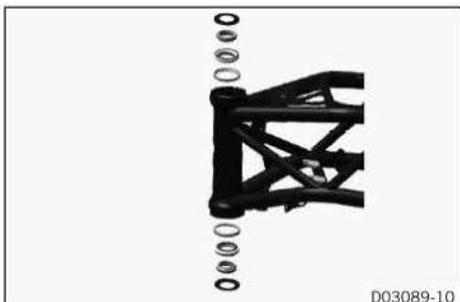


### Finishing work

- Check the steering head bearing play. (📖 p. 46)

- Remove the motorcycle from the work stand at the rear. (📖 p. 16)
- Install the main silencer. (📖 p. 100)

### 6.19 Lubricating the steering head bearing



- Remove the lower triple clamp. (📖 p. 48)
- Install the lower triple clamp. (📖 p. 50)

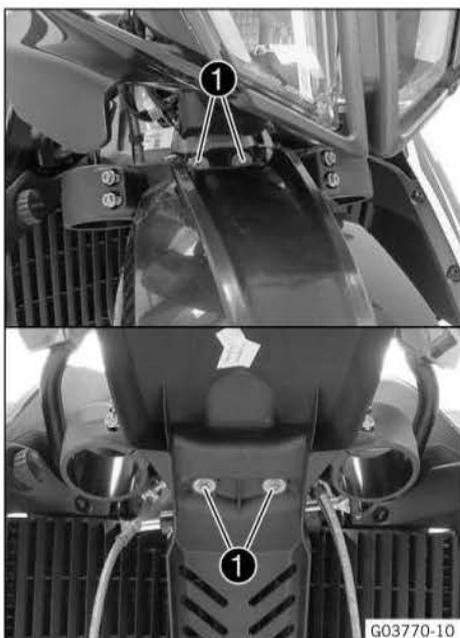
### 6.20 Removing the lower triple clamp

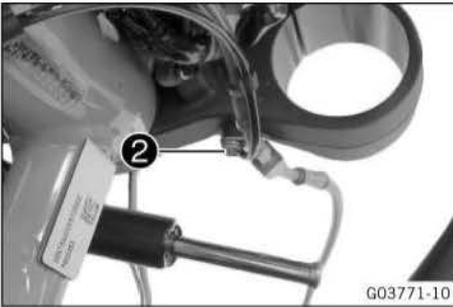
#### Preparatory work

- Remove the main silencer. (📖 p. 100)
- Raise the motorcycle at the rear using the work stand. (📖 p. 15)
- Remove fork protector. (📖 p. 22)
- Place a load on the rear of the vehicle.
  - ✓ The front wheel is not in contact with the ground.
- Remove the fork legs. (📖 p. 23)

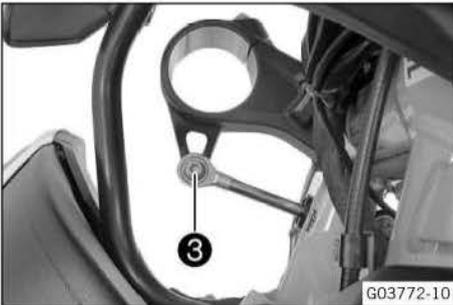
#### Main work

- Remove screws ①.
- Take off the fender.

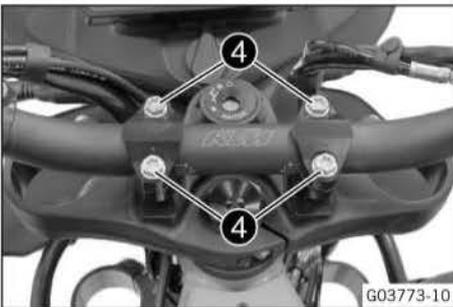




- Remove screw 2.
- Hang the brake line to the side.



- Remove screw 3.

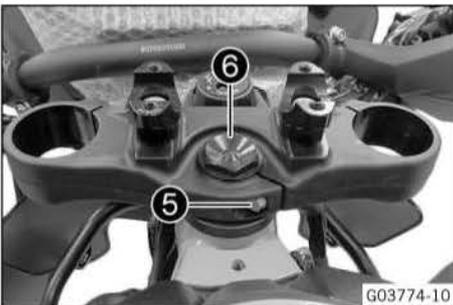


- Remove screws 4.
- Take off the handlebar clamps.
- Take off the handlebar and place it at the front.

---

**i Info**  
Cover the components to protect them against damage.  
Do not kink the cables and lines.

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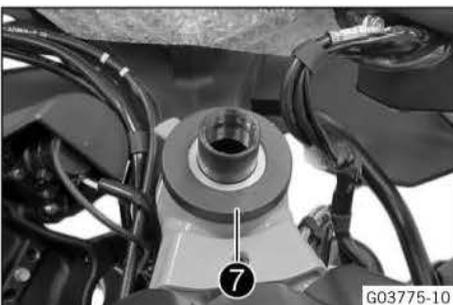


- Remove screw 5.
- Remove screw 6 with the washer.
- Loosen the upper triple clamp and place it to one side.

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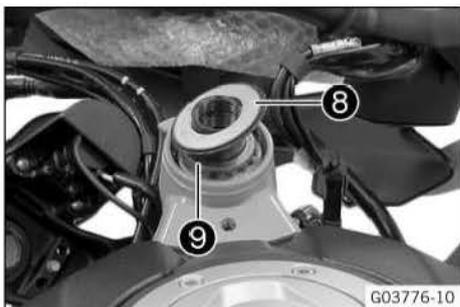
**i Info**  
Hold lower triple clamp.

---



- Remove protective ring 7.

## 6 FORK, TRIPLE CLAMP



- Remove the lower triple clamp with the steering stem.
- Remove seal ring retainer **8**.
- Remove upper steering head bearing **9**.

### 6.21 Installing the lower triple clamp

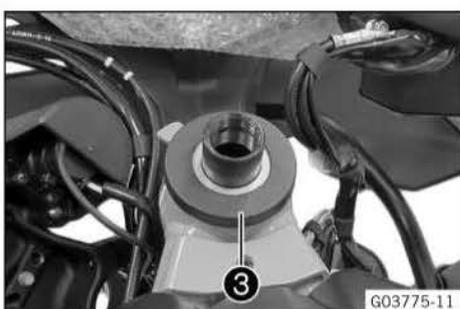


#### Main work

- Grease the bearing, clean the sealing elements, and check for damage.

High viscosity grease (見 p. 466)
----------------------------------

- Insert the lower triple clamp with the steering stem.
- Mount upper steering head bearing **1**.
- Mount seal ring retainer **2**.



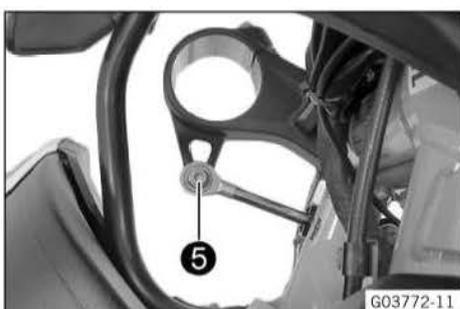
- Mount protective ring **3**.



- Position upper triple clamp.
- Mount screw **4** with the washer, but do not tighten yet.

#### Guideline

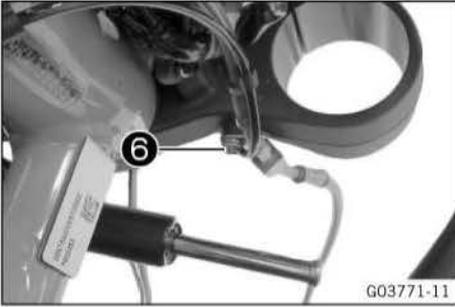
Screw, steering head	M25x1.5	18 Nm (13.3 lbf ft)
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- Position the steering damper.
- Mount and tighten screw **5**.

#### Guideline

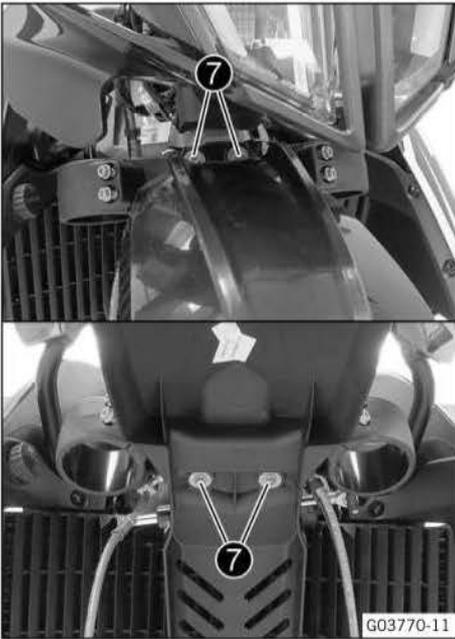
Screw, steering damper on triple clamp	M8	8 Nm (5.9 lbf ft) <b>Loctite®243™</b>
----------------------------------------	----	------------------------------------------



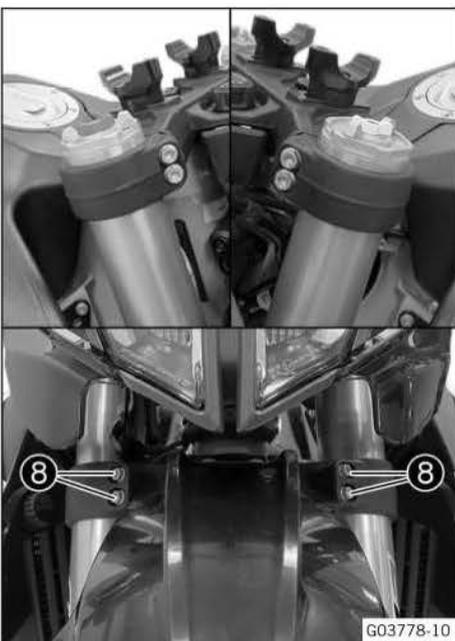
- Position the brake line.
- Mount and tighten screw ⑥.

Guideline

Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
---------------------------	----	--------------------



- Position the fender.
- Mount and tighten screws ⑦.

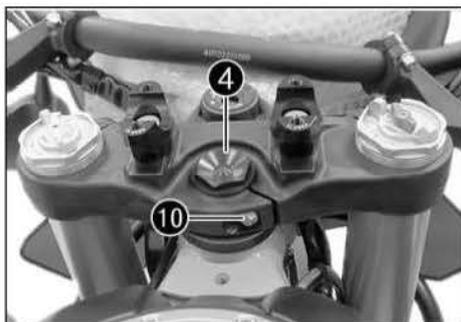


- Push the fork legs into the triple clamp.
- Align the fork legs in the required position using the fork rings.
- Tighten screws ⑧ of the lower triple clamp.

Guideline

Screw, bottom triple clamp	M8	12 Nm (8.9 lbf ft)
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## 6 FORK, TRIPLE CLAMP



- Tighten screw 4.

Guideline

Screw, steering head	M25x1.5	18 Nm (13.3 lbf ft)
----------------------	---------	---------------------

- Using a plastic hammer, tap lightly on the upper triple clamp to avoid stresses.

- Tighten screws 9 of the upper triple clamp.

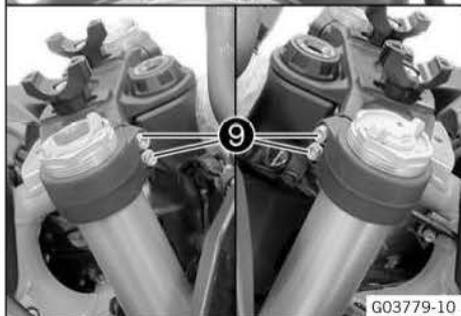
Guideline

Screw, top triple clamp	M8	15 Nm (11.1 lbf ft)
-------------------------	----	---------------------

- Mount and tighten screw 10.

Guideline

Screw, steering stem	M8	20 Nm (14.8 lbf ft) <b>Loctite®243™</b>
----------------------	----	--------------------------------------------



- Position the handlebar.



### Info

Make sure the cables and wiring are positioned correctly.

- Position the handlebar clamps. Mount screws, but do not tighten them yet.

✓ Markings A face backward.

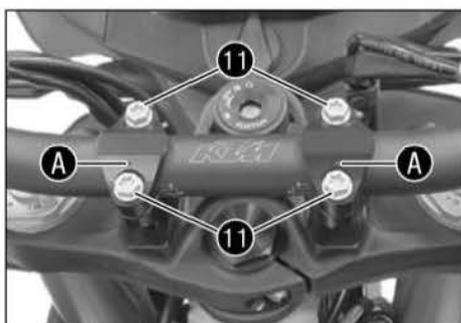
✓ The horizontal marking B on the handlebar scale is aligned with the center of the handlebar clamp.

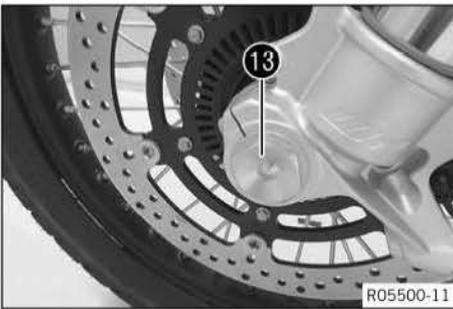
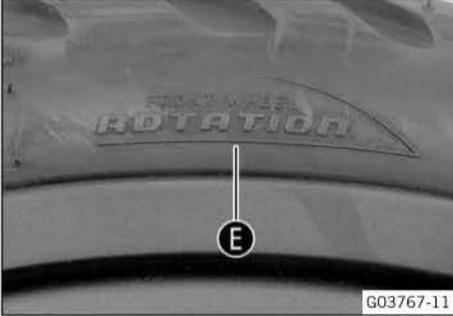
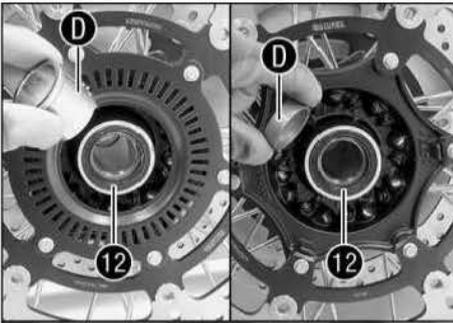
✓ The vertical markings C on the handlebar scale are aligned equally on both sides.

- Tighten screws 11 evenly.

Guideline

Screw, handlebar clamp	M8	20 Nm (14.8 lbf ft)
------------------------	----	---------------------





- Check the wheel bearing for damage and wear.
  - » If the wheel bearing is damaged or worn:
    - Change front wheel bearing. (📖 p. 149)
- Remove the spacers.
- Clean and grease shaft seal rings **12** and contact surfaces **D** of the spacers.

Long-life grease (📖 p. 466)

- Insert wide spacer on the left in the direction of travel.
- Insert narrow spacer on the right in the direction of travel.

**i Info**  
 Arrow **E** indicates the direction of travel of the front wheel.  
 The ABS sensor wheel is on the left viewed in the direction of travel.

**⚠ Warning**  
**Danger of accidents** Oil or grease on the brake discs reduces the braking effect.

- Always keep the brake discs free of oil and grease.
- Clean the brake discs with brake cleaner when necessary.

- Clean screw **13** and the wheel spindle.
- Grease wheel spindle lightly.

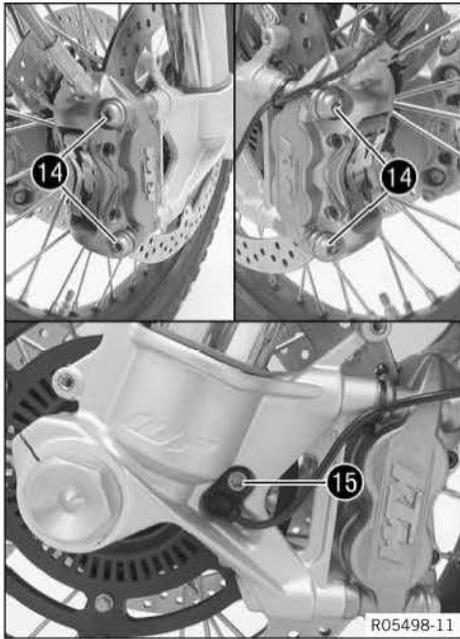
Long-life grease (📖 p. 466)

- Jack up the front wheel into the fork, position it, and insert the wheel spindle.
- Mount and tighten screw **13**.

Guideline

Screw, front wheel spindle	M25x1.5	45 Nm (33.2 lbf ft) Thread greased
----------------------------	---------	---------------------------------------

## 6 FORK, TRIPLE CLAMP



- Position brake calipers.  
✓ The brake linings are correctly positioned.
- Mount screws 14, but do not tighten yet.

### Guideline

Screw, front brake caliper	M10x1.25	45 Nm (33.2 lbf ft) <b>Loctite®243™</b>
----------------------------	----------	--------------------------------------------

- Operate the hand brake lever repeatedly until the brake linings are in contact with the brake disc and there is a pressure point. Secure the hand brake lever in the activated position.  
✓ The brake calipers straighten.
- Tighten screws 14.

### Guideline

Screw, front brake caliper	M10x1.25	45 Nm (33.2 lbf ft) <b>Loctite®243™</b>
----------------------------	----------	--------------------------------------------

- Remove the locking piece of the hand brake lever.
- Remove the load from the rear of the vehicle.
- Position the wheel speed sensor in the hole.
- Mount and tighten screw 15.

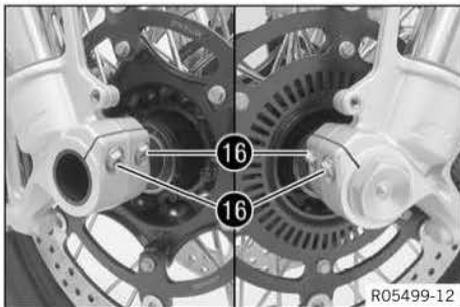
### Guideline

Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
---------------------------	----	--------------------

- Operate the front brake and compress the fork a few times firmly.  
✓ The fork legs straighten.
- Tighten screws 16.

### Guideline

Screw, fork stub	M8	15 Nm (11.1 lbf ft)
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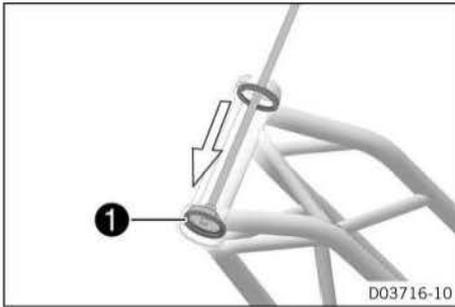
### Finishing work

- Check the steering head bearing play. (🔧 p. 46)
- Remove the motorcycle from the work stand at the rear. (🔧 p. 16)
- Install the main silencer. (🔧 p. 100)
- Install the fork protector. (🔧 p. 23)

## 6.22 Changing the steering head bearing

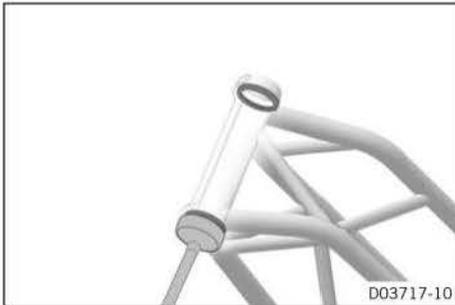
### Preparatory work

- Remove the main silencer. (🔧 p. 100)
- Raise the motorcycle at the rear using the work stand. (🔧 p. 15)
- Remove fork protector. (🔧 p. 22)
- Place a load on the rear of the vehicle.  
✓ The front wheel is not in contact with the ground.
- Remove the fork legs. (🔧 p. 23)
- Remove the lower triple clamp. (🔧 p. 48)

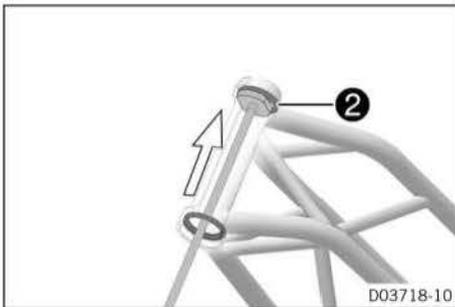


### Main work

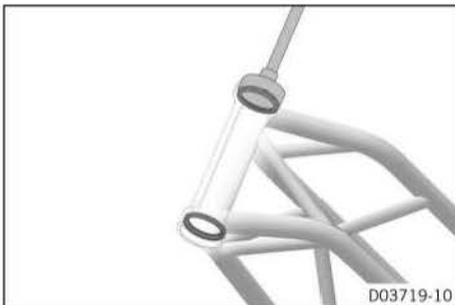
- Remove lower bearing ring **1** using a suitable tool.



- Press in the new bearing ring all the way using a suitable tool.



- Remove upper bearing ring **2** using a suitable tool.



- Press in the new bearing ring all the way using a suitable tool.



- Remove lower steering head bearing **3**.
- Remove the seal ring.
- Grease and mount the new seal ring.
- Mount a new bearing.

### Finishing work

- Install the lower triple clamp. (📖 p. 50)
- Check the steering head bearing play. (📖 p. 46)

- Remove the motorcycle from the work stand at the rear. (📖 p. 16)
- Install the main silencer. (📖 p. 100)
- Install the fork protector. (📖 p. 23)

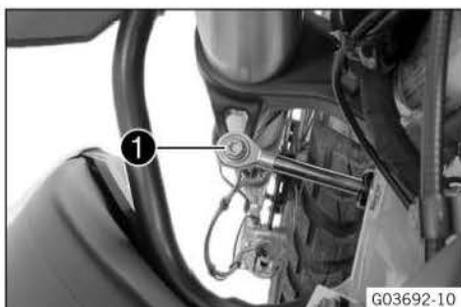
## 6.23 Changing the steering damper

### Preparatory work

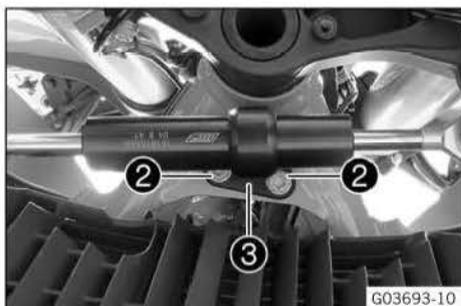
- Remove the front fender. (📖 p. 140)

### Main work

- Remove screw ❶.



- Remove screws ❷.
- Take off bracket ❸ with steering damper.
- Position bracket with new steering damper.
- Mount and tighten the screws.



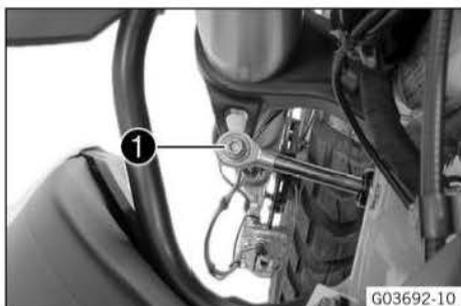
### Guideline

Screw, steering damper on holder	M8	8 Nm (5.9 lbf ft) <b>Loctite®243™</b>
----------------------------------	----	------------------------------------------

- Mount and tighten screw ❶.

### Guideline

Screw, steering damper on triple clamp	M8	8 Nm (5.9 lbf ft) <b>Loctite®243™</b>
----------------------------------------	----	------------------------------------------



### Finishing work

- Install the front fender. (📖 p. 140)

### 7.1 Adjusting the basic position of the clutch lever



- Push clutch lever forward.
- Adjust the basic position of the clutch lever to your hand size by turning adjusting screw ①.



#### Info

When the adjusting screw is turned clockwise, the clutch lever moves closer to the handlebar. When the adjusting screw is turned counterclockwise, the clutch lever moves away from the handlebar. The range of adjustment is limited. Only turn the adjusting screw by hand, and do not use force. Do not make any adjustments while riding.

### 7.2 Checking the free travel of the clutch lever

#### Note

**Clutch damage** If there is no free travel by the clutch lever, the clutch will begin to slip.

- Check the free travel of the clutch lever each time before using the motorcycle.
- Adjust the free travel of the clutch lever when necessary in accordance with the specification.



- Check the clutch lever for smooth operation.
- Move the handlebar to the straight-ahead position.
- Pull the clutch lever until resistance is perceptible, and determine the free travel ①.

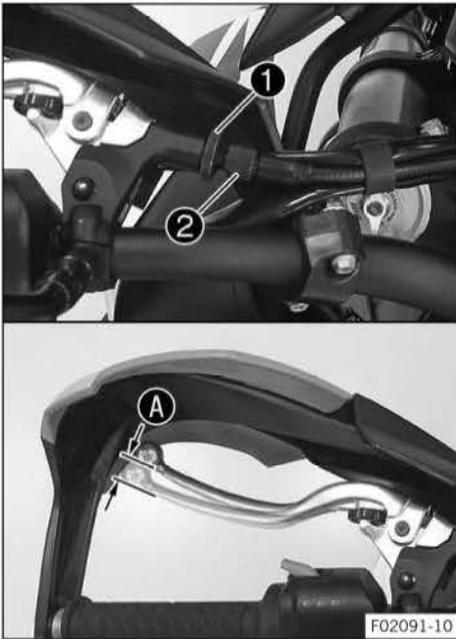
Free travel ① of clutch lever	5 mm (0.2 in)
-------------------------------	---------------

- » If the free travel of the clutch lever does not meet specifications:
  - Set the free travel of the clutch lever. (📖 p. 58)
- Move the handlebar to and fro over the entire steering range.

The free travel of the clutch lever must not change.
------------------------------------------------------

- » If the free travel of the clutch lever changes:
  - Check the routing of the clutch cable.

## 7.3 Setting the free travel of the clutch lever



- Move the handlebar to the straight-ahead position.
- Loosen lock nut ①.
- Adjust the free travel A by turning adjusting screw ②.

Guideline

Free travel A of clutch lever	5 mm (0.2 in)
-------------------------------	---------------

- Tighten lock nut ①.

## 7.4 Adjusting the handlebar position

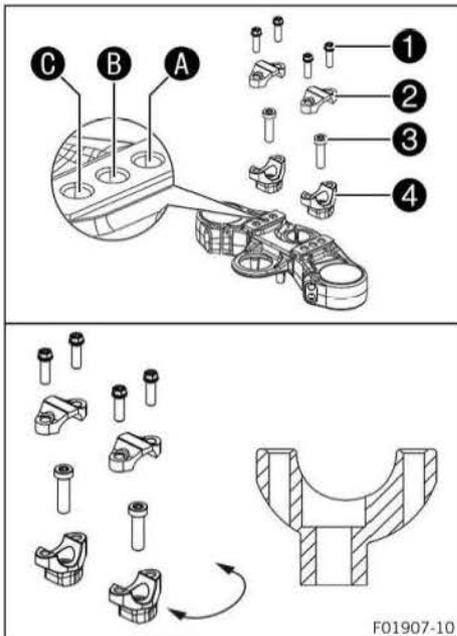


### Warning

**Danger of accidents** A repaired handlebar poses a safety risk.

If the handlebar is bent or straightened, the material becomes fatigued. The handlebar may break as a result.

- Change the handlebar if the handlebar is damaged or bent.



- Remove screws ①. Take off the handlebar clamps ②. Position the handlebar so that screws ③ are accessible.

### Info

Cover the components to protect them against damage. Do not kink the cables and lines.

- Remove screws ③. Take off handlebar supports ④.
- Move the handlebar supports into the desired position B, A or C. Mount and tighten screws ③.

Guideline

Mount the left and right handlebar supports in the same position.

Screw, handlebar support	M10	45 Nm (33.2 lbf ft) <b>Loctite®243™</b>
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- Position the handlebar.

### Info

Make sure the cables and wiring are positioned correctly.

- Position handlebar clamp. Mount screws ❶ and tighten evenly.

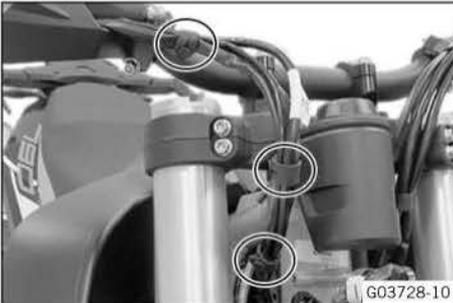
Guideline

Screw, handlebar clamp	M8	20 Nm (14.8 lbf ft)
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## 7.5 Changing the throttle grip

### Preparatory work

- Switch off the ignition by turning the ignition key to the position ☒.
- Remove the headlight mask with the headlight. (☞ p. 207)



### Main work

- Remove the cable ties.

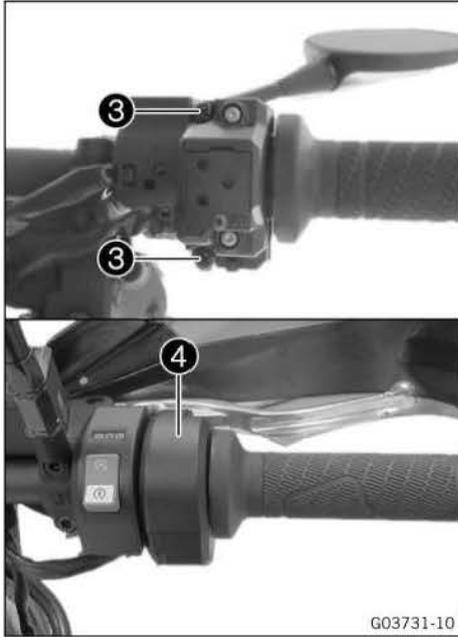


- Remove the cable ties.
- Remove plug-in connector ❶ from the holder and disconnect.

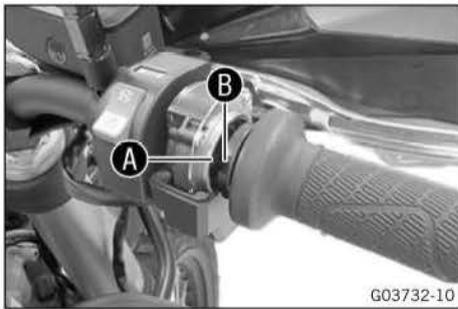


- Loosen screw ❷.
- Push the hand guard slightly to the side.

## 7 HANDLEBAR, CONTROLS



- Remove screws **3**.
- Take off cover **4**.
- Take off the throttle grip with the sensor unit.



- Position a new throttle grip with a sensor unit.
- ✓ Holding lug **A** engages in recess **B**.



- Position cover **4**.
- Mount and tighten screws **3**.

### Guideline

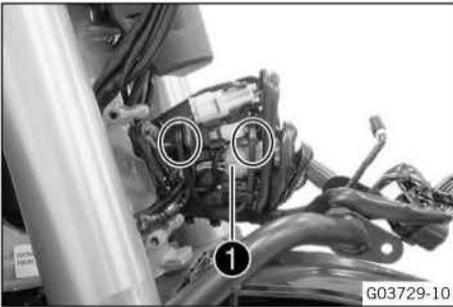
Remaining screws, chassis	M5	5 Nm (3.7 lbf ft)
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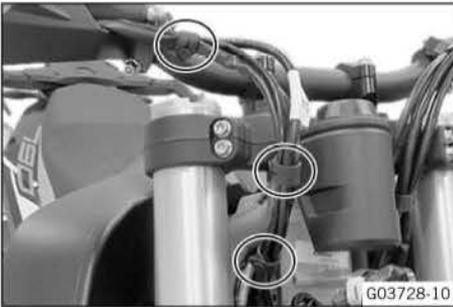
- Position hand guard.
- Tighten screw ②.

Guideline

Hand guard screw	M8	25 Nm (18.4 lbf ft)
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- Join plug-in connector ① and position in the holder.

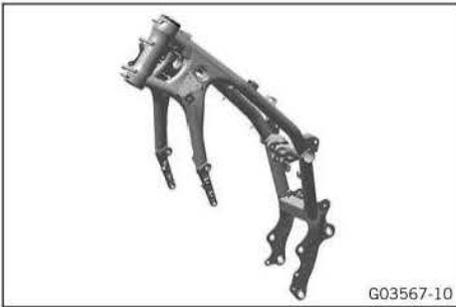


- Route the cables without tension and secure with cable ties.

### Finishing work

- Install the headlight mask with the headlight. (📖 p. 209)
- Check the headlight setting. (📖 p. 210)

## 8.1 Checking the frame



- Check the frame for cracks and deformation.
  - » If the frame exhibits cracks or deformation due to a mechanical impact:
    - Change the frame.



### Info

Always replace a frame that has been damaged due to a mechanical impact. Repair of the frame is not authorized by KTM.

## 9.1 Adjusting the low-speed compression damping of the shock absorber



### Caution

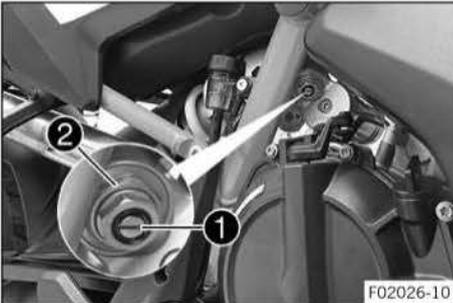
**Risk of injury** Parts of the shock absorber will move around if the shock absorber is detached incorrectly. The shock absorber is filled with highly compressed nitrogen.

- Please follow the description provided.



### Info

The effect of the low-speed setting can be seen in slow to normal compression of the shock absorber.



- Turn adjusting screw **1** clockwise with a screwdriver as far as the last perceptible click.



### Info

Do not loosen fitting **2**!

- Turn the counterclockwise by the number of clicks corresponding to the shock absorber type.

#### Guideline

Low-speed compression damping	
Comfort	20 clicks
Standard	15 clicks
Sport	10 clicks
Full payload	7 clicks



### Info

Turn clockwise to increase damping; turn counterclockwise to reduce damping.

## 9.2 Adjusting the high-speed compression damping of the shock absorber



### Caution

**Risk of injury** Parts of the shock absorber will move around if the shock absorber is detached incorrectly. The shock absorber is filled with highly compressed nitrogen.

- Please follow the description provided.



### Info

The effect of the high-speed setting can be seen in fast compression of the shock absorber.

## 9 SHOCK ABSORBER, LINK FORK



- Turn adjusting screw **1** all the way clockwise with a socket wrench.

### **i** Info

Do not loosen fitting **2**!

- Turn counterclockwise by the number of turns corresponding to the shock absorber type.

### Guideline

High-speed compression damping	
Comfort	2 turns
Standard	1.5 turns
Sport	1.5 turns
Full payload	1 turn

### **i** Info

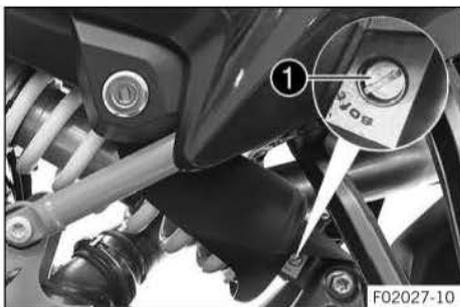
Turn clockwise to increase damping; turn counterclockwise to reduce damping.

### 9.3 Adjusting the rebound damping of the shock absorber

#### **!** Caution

**Risk of injury** Parts of the shock absorber will move around if the shock absorber is detached incorrectly. The shock absorber is filled with highly compressed nitrogen.

- Please follow the description provided.



- Turn adjusting screw **1** clockwise up to the last perceptible click.
- Turn the counterclockwise by the number of clicks corresponding to the shock absorber type.

### Guideline

Rebound damping	
Comfort	20 clicks
Standard	15 clicks
Sport	12 clicks
Full payload	9 clicks

### **i** Info

Turn clockwise to increase damping; turn counterclockwise to reduce damping.

## 9.4 Adjusting the spring preload of the shock absorber



### Warning

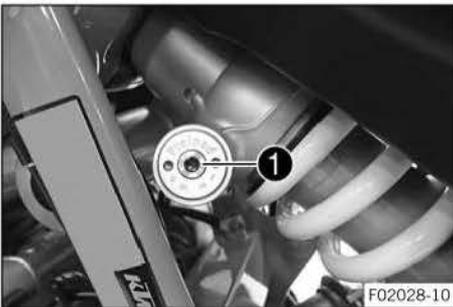
**Danger of accidents** Modifications to the suspension setting may seriously alter the handling characteristic.

- Ride slowly to start with after making adjustments to get the feel of the new handling characteristic.



### Info

The spring preload defines the initial status of the spring operation on the shock absorber. The best spring preload setting is achieved when it is set for the weight of the rider and that of any luggage and a passenger, thus ensuring an ideal compromise between handling and stability.



- Turn adjusting screw ❶ counterclockwise all the way.
- Turn it clockwise by the number of turns corresponding to the shock absorber type and use.

### Guideline

Spring preload - Preload Adjuster	
Comfort	4 turns
Standard	4 turns
Sport	4 turns
Full payload	10 turns



### Info

Turn clockwise to increase the spring pretension; turn counterclockwise to reduce the spring pretension.

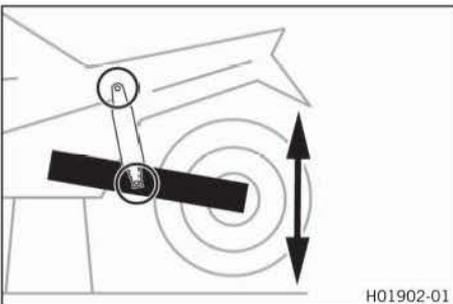
## 9.5 Checking the heim joint for play

### Preparatory work

- Remove the main silencer. (📖 p. 100)
- Raise the motorcycle at the rear using the work stand. (📖 p. 15)
- Place a load on the front of the vehicle.
- ✓ The rear wheel is not in contact with the ground.

### Main work

- Move link fork up and down.
  - » If there is detectable play:
    - Change the heim joint. (📖 p. 70)



### Finishing work

- Remove the motorcycle from the work stand at the rear. (📖 p. 16)
- Install the main silencer. (📖 p. 100)

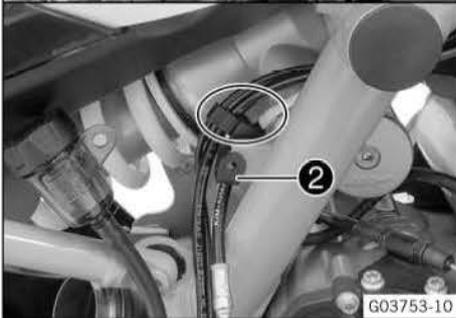
## 9.6 Removing the shock absorber

### Preparatory work

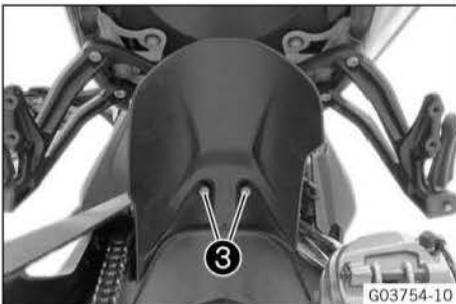
- Remove the main silencer. (🔧 p. 100)
- Raise the motorcycle at the rear using the work stand. (🔧 p. 15)
- Place a load on the front of the vehicle.
  - ✓ The rear wheel is not in contact with the ground.
- Remove the rear wheel (work stand, rear). (🔧 p. 161)

### Main work

- Remove screw ①.
- Hang the brake fluid reservoir to the side.
- Take the brake line and the cable out of the holders.
- Remove holder ②.

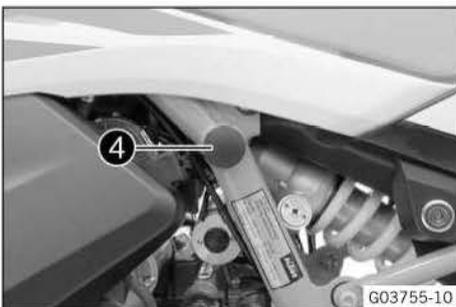


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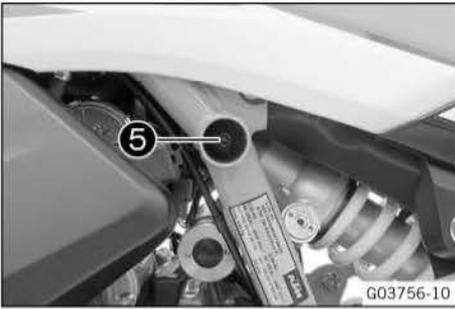
G03754-10

- Remove screws ③.
- Remove the splash protector.



G03755-10

- Remove covering cap ④.



- Loosen screw 5 but do not remove it yet.



- Loosen screw 6 but do not remove it yet.

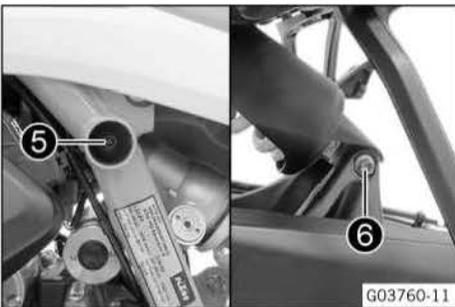


- Loosen adjusting screw 7.

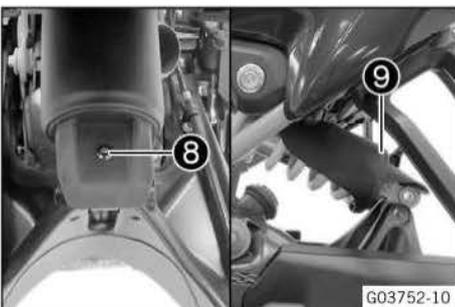
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**i** Info  
LH thread

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- Lift the link fork.
- Remove screw 5.
- Remove screw 6.
- Loosen the shock absorber.



- Remove screw 8.
- Remove shock absorber splash protector 9.

## 9 SHOCK ABSORBER, LINK FORK



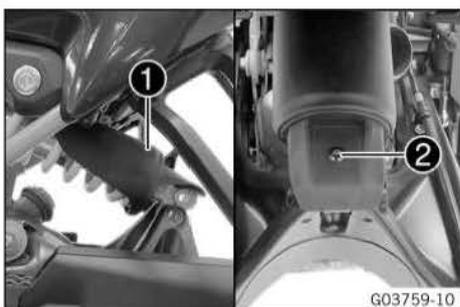
- Remove the shock absorber toward the rear.

### 9.7 Installing the shock absorber



#### Main work

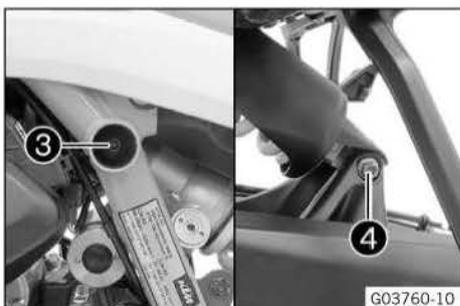
- Position the shock absorber.



- Position shock absorber splash protector ①.
- Mount and tighten screw ②.

#### Guideline

Remaining screws, chassis	M5	5 Nm (3.7 lbf ft)
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- Mount screw ③, but do not tighten yet.

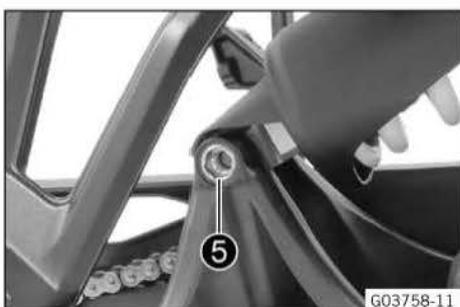
#### Guideline

Screw, top shock absorber	M12	80 Nm (59 lbf ft) <b>Loctite®2701™</b>
---------------------------	-----	-------------------------------------------

- Raise the link fork and mount screw ④ but do not tighten it yet.

#### Guideline

Screw, bottom shock absorber	M12	80 Nm (59 lbf ft) <b>Loctite®2701™</b>
------------------------------	-----	-------------------------------------------



- Tighten adjusting screw ⑤.

#### Guideline

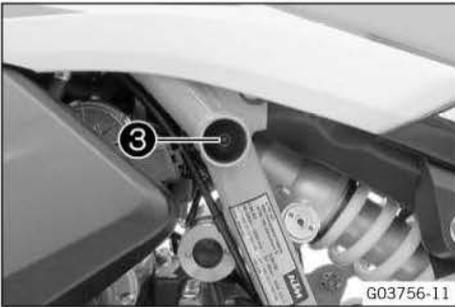
Adjusting screw, swingarm	M20LHx1.5	10 Nm (7.4 lbf ft)
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- Tighten screw ④.

Guideline

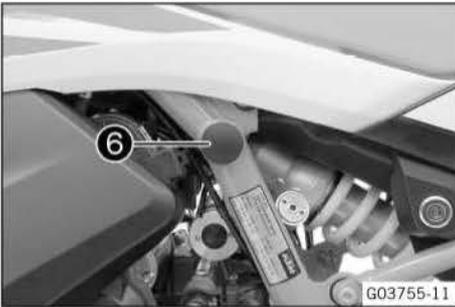
Screw, bottom shock absorber	M12	80 Nm (59 lbf ft) <b>Loctite®2701™</b>
------------------------------	-----	-------------------------------------------



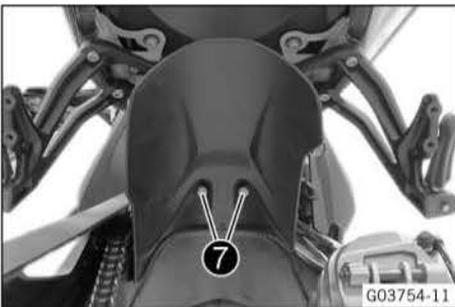
- Tighten screw ③.

Guideline

Screw, top shock absorber	M12	80 Nm (59 lbf ft) <b>Loctite®2701™</b>
---------------------------	-----	-------------------------------------------



- Mount covering cap ⑥.

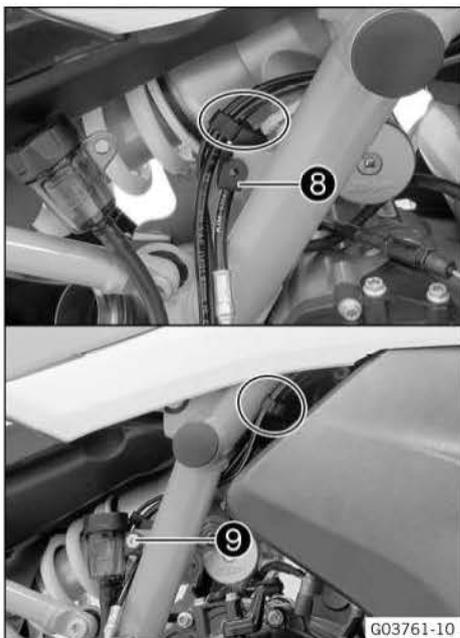


- Position the splash protector.
- Mount and tighten screws ⑦.

Guideline

Remaining screws, chassis	M5	5 Nm (3.7 lbf ft)
---------------------------	----	-------------------

## 9 SHOCK ABSORBER, LINK FORK



- Position holder **8**.
- Secure the brake lines and the cables in the holders.
- Mount and tighten screw **9**.

### Guideline

Screw, brake fluid reservoir for rear brake	M5	5 Nm (3.7 lbf ft) <b>Loctite®243™</b>
---------------------------------------------	----	------------------------------------------

### Finishing work

- Install the rear wheel (work stand, rear). (p. 162)
- Check the chain tension. (p. 171)
- Remove the motorcycle from the work stand at the rear. (p. 16)
- Install the main silencer. (p. 100)

## 9.8 Changing the heim joint

### **i** Info

The operations are the same for the top and bottom heim joints.

### Preparatory work

- Remove the main silencer. (p. 100)
- Raise the motorcycle at the rear using the work stand. (p. 15)
- Place a load on the front of the vehicle.
  - ✓ The rear wheel is not in contact with the ground.
- Remove the rear wheel (work stand, rear). (p. 161)
- Remove the shock absorber. (p. 66)

### Main work

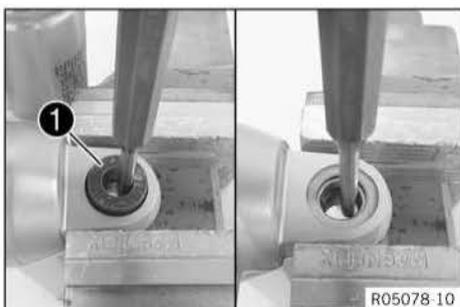
- Clamp the shock absorber into the vise.

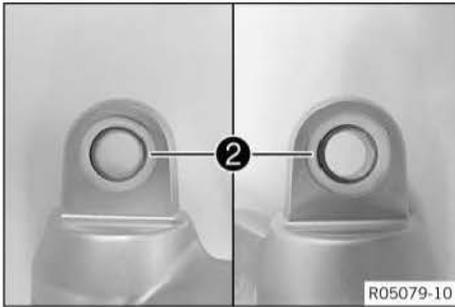
### Guideline

Use soft jaws.

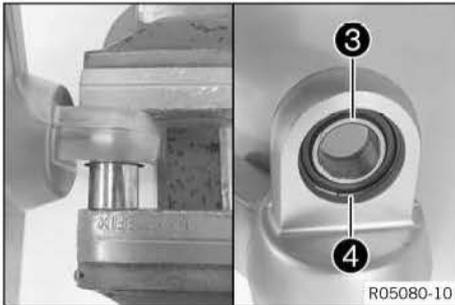
- Remove both collar bushings **1** of the heim joint with a drift.

Drift (T120) (p. 482)





- Remove seal rings **2** on both sides.



- Press heim joint **3** to the side.

Pressing tool (T1207S) (p. 482)

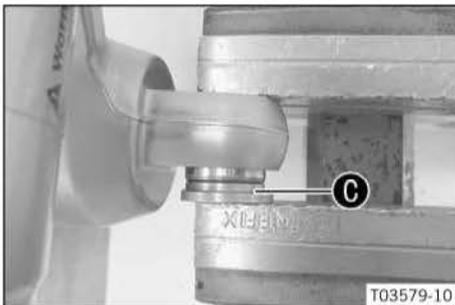
- ✓ The heim joint rests against a lock ring.

- Remove second lock ring **4**.



- Place special tool **A** underneath and press out the heim joint with a special tool **B**.

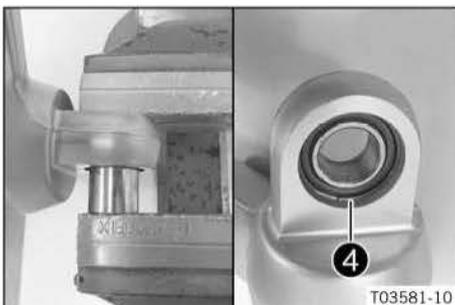
Pressing tool (T1207S) (p. 482)



- Push new heim joint **C** all the way in using the special tool.

Pressing tool (T1206) (p. 482)

**i Info**  
Push in the new heim joint with the rounded side facing inward.

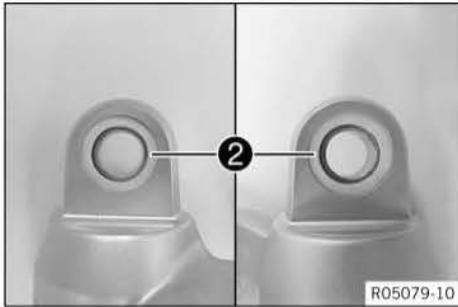


- Push in the heim joint to the lock ring using the special tool.

Pressing tool (T1207S) (p. 482)

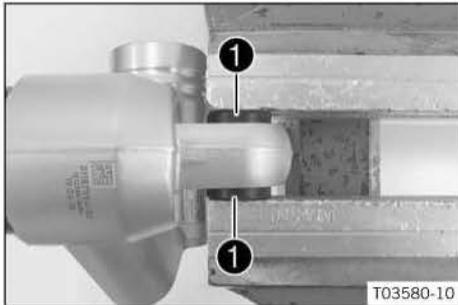
- Mount second lock ring **4**.

## 9 SHOCK ABSORBER, LINK FORK



- Mount and grease seal rings **2** on both sides.

Lubricant (T158) (📖 p. 466)



- Press in both collar bushings **1** of the heim joint.

### Finishing work

- Install the shock absorber. (📖 p. 68)
- Install the rear wheel (work stand, rear). (📖 p. 162)
- Check the chain tension. (📖 p. 171)
- Remove the motorcycle from the work stand at the rear. (📖 p. 16)
- Install the main silencer. (📖 p. 100)

## 9.9 Servicing the shock absorber



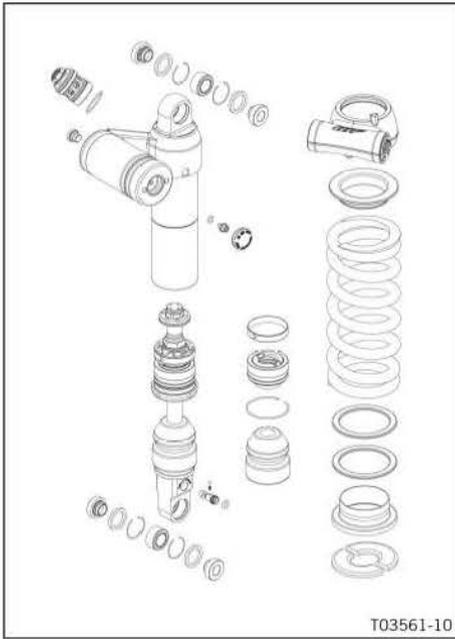
### Caution

**Risk of injury** Parts of the shock absorber will move around if the shock absorber is detached incorrectly. The shock absorber is filled with highly compressed nitrogen.

- Please follow the description provided.

### Condition

The shock absorber has been removed.

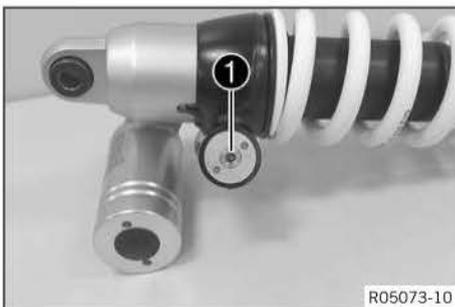


- Remove the spring. (p. 73)
- Disassemble the damper. (p. 74)
- Disassemble the piston rod. (p. 75)
- Disassemble the rebound adjuster. (p. 77)
- Check the damper. (p. 78)
- Remove the heim joint. (p. 79)
- Install the heim joint. (p. 80)
- Assemble the rebound adjuster. (p. 80)
- Assemble the piston rod. (p. 81)
- Assemble the damper. (p. 83)
- Install the spring. (p. 89)

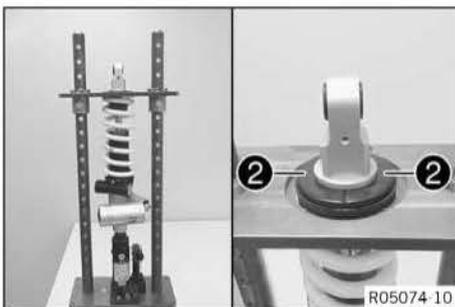
## 9.10 Removing the spring

### Condition

The shock absorber has been removed.



- Measure and note the spring length while the spring is under tension.
- Turn screw **1** on the preload adjuster all the way counter-clockwise.



- Clamp the shock absorber into the special tool.

Spring compressor (T14050S) (p. 484)

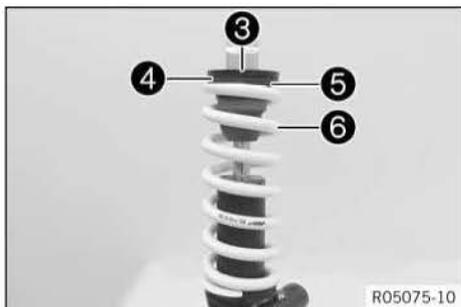


### Info

Use the suitable ring of the special tool with the smallest possible inside diameter.

- Compress the spring.
- Remove half washers **2**.
- Release the spring. Remove the shock absorber from the special tool.

## 9 SHOCK ABSORBER, LINK FORK

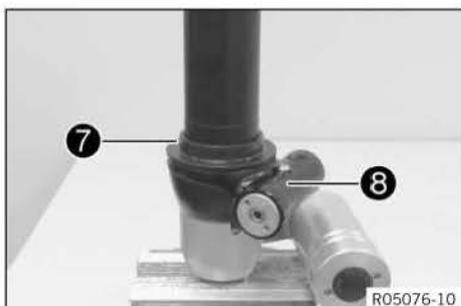


- Clamp the shock absorber into the vise.

Guideline

Use soft jaws.

- Remove spring retainer ③.
- Remove washers ④ and ⑤.
- Remove spring ⑥.



- Remove spring retainer ⑦.
- Remove preload adjuster ⑧.

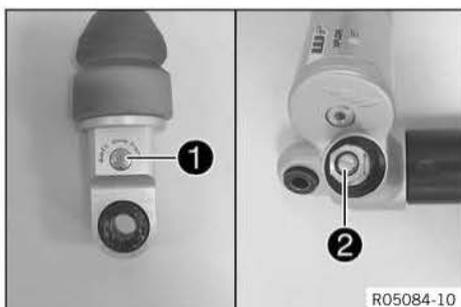
### 9.11 Disassembling the damper

#### Preparatory work

- Remove the spring. (☞ p. 73)

#### Main work

- Make a note of the present state of rebound ① and compression damping ②.
- Open the adjusters of the rebound and compression damping completely.

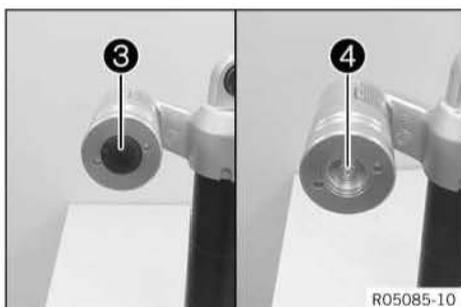


- Clamp the shock absorber into the vise.

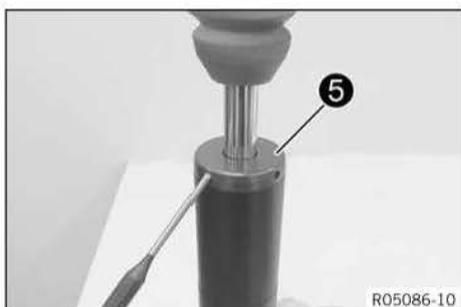
Guideline

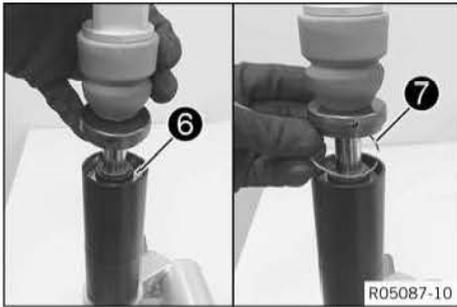
Use soft jaws.

- Remove rubber cap ③ of the reservoir.
- Slowly open screw ④.
- ✓ The nitrogen pressure dissipates.
- Remove the screw with the O-ring.



- Remove locking cap ⑤.





- Push in seal ring retainer ⑥.
- Remove lock ring ⑦.



**Info**

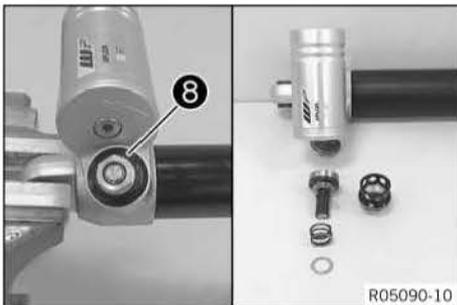
Check inner surface; do not scratch. If necessary, remove any burrs with sandpaper.



- Remove the piston rod.



- Unclamp the shock absorber.
- Drain the oil.



- Clamp the shock absorber into the vise.

**Guideline**

Use soft jaws.

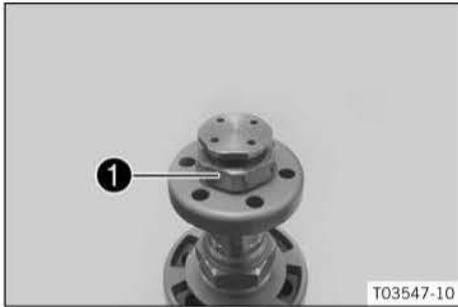
- Remove compression adjuster ⑧. Remove the washer, spring, and piston.

## 9.12 Disassembling the piston rod

**Preparatory work**

- Remove the spring. (p. 73)
- Disassemble the damper. (p. 74)

## 9 SHOCK ABSORBER, LINK FORK



### Main work

- Clamp the foot section of the piston rod into the vise.

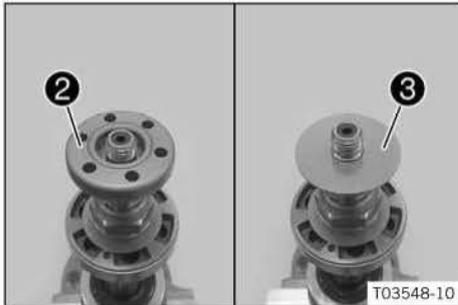
#### Guideline

Use soft jaws.

- Heat nut **1** and remove.

#### Guideline

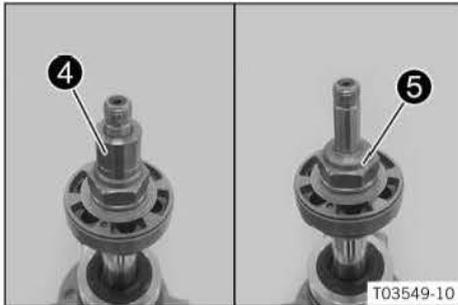
50 °C (122 °F)



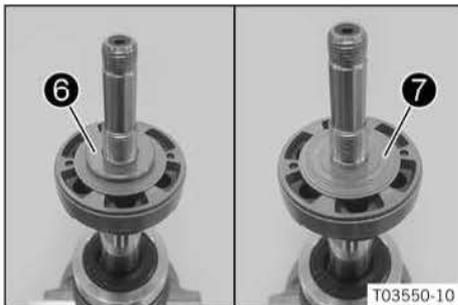
- Remove piston **2**.
- Remove shim stack **3**.

### **i** Info

Guide the shim stack onto a screwdriver and put them to one side together.



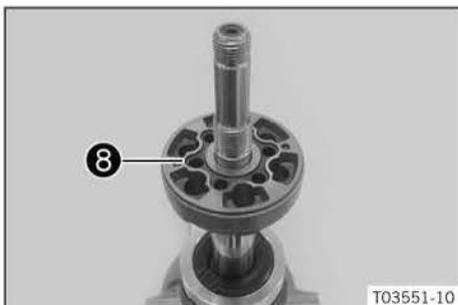
- Remove bushing **4**.
- Remove nut **5**.



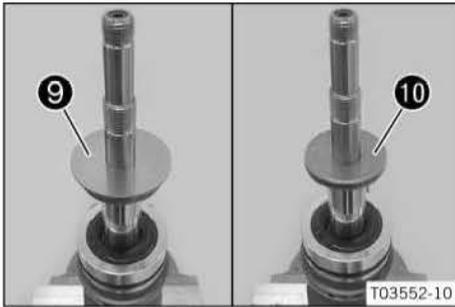
- Remove washer **6**.
- Remove rebound shim stack **7**.

### **i** Info

Guide the rebound shim stack onto a screwdriver and put them aside together.



- Remove piston **8**.



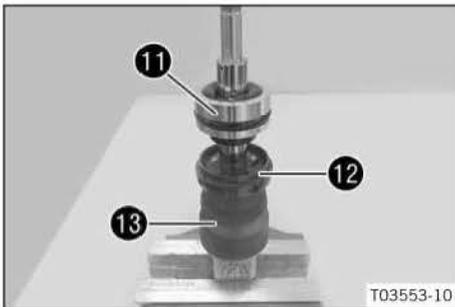
- Remove compression shim stack 9.



### Info

Guide the compression shim stack onto a screwdriver and put them to one side together.

- Remove rebound washer 10.



- Remove seal ring retainer 11.
- Remove locking cap 12 and rubber buffer 13.

## 9.13 Disassembling the rebound adjuster

### Preparatory work

- Remove the spring. (p. 73)
- Disassemble the damper. (p. 74)
- Disassemble the piston rod. (p. 75)

### Main work

- Clamp the foot section of the piston rod into the vise.

Guideline

Use soft jaws.

- Heat lock nut 1.

Guideline

50 °C (122 °F)

- Loosen lock nut.

- Turn piston rod, degrease and clamp using the special tool.

Clamping stand (T1202S) (p. 482)

- Heat the foot section in area A.

Guideline

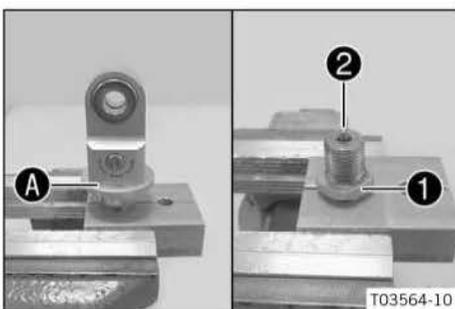
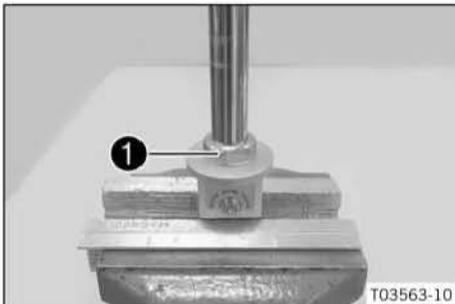
50 °C (122 °F)

- Remove the foot section using a suitable tool.

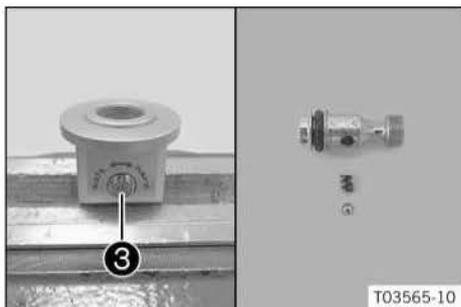
- Remove rebound needle 2 with the O-ring.

- Remove lock nut 1.

- Unclamp the piston rod.



## 9 SHOCK ABSORBER, LINK FORK



- Clamp the foot section into the vise.

### Guideline

Use soft jaws.

- Remove adjusting screw ③.



### Info

Do not misplace the ball and the spring.

### 9.14 Checking the damper



#### Condition

The damper has been disassembled.

- Measure the inside diameter on both ends and in the middle of the damper cartridge.

#### Damper cartridge

Diameter	≤ 46.10 mm (≤ 1.815 in)
----------	-------------------------

- » If the measured value is greater than the specified value:
  - Replace the damper cartridge.

- Check the damper cartridge for damage and wear.

- » If there is damage or wear:

- Replace the damper cartridge.

- Check the heim joint for damage and wear.

- » If there is damage or wear:

- Change the heim joint.

- Check the foot section for damage and wear.

- » If there is damage or wear:

- Change the foot section.

- Check the heim joint for damage and wear.

- » If there is damage or wear:

- Change the heim joint.



- Measure the diameter of the piston rod.

#### Piston rod

Diameter	≥ 17.95 mm (≥ 0.7067 in)
----------	--------------------------

- » If the measured value is less than the specified value:
  - Replace the piston rod.

- Measure the run-out of the piston rod.

#### Piston rod

Run-out	≤ 0.03 mm (≤ 0.0012 in)
---------	-------------------------

- » If the measured value is greater than the specified value:
  - Replace the piston rod.

- Check the piston rod for damage and wear.

- » If there is damage or wear:

- Replace the piston rod.





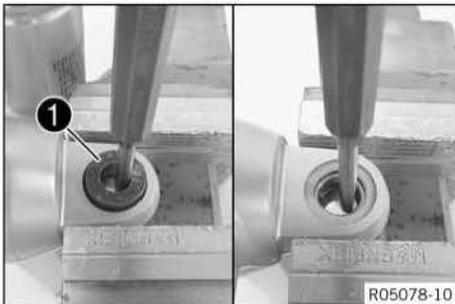
T03571-10

- Check the piston rings for damage and wear.
  - » If damage or a bronze-colored surface is visible:
    - Replace the piston rings.

## 9.15 Removing the heim joint

### Condition

The shock absorber has been removed.



R05078-10

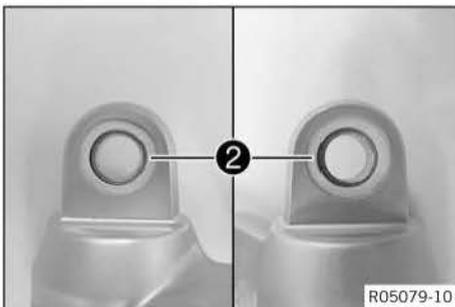
- Clamp the shock absorber into the vise.

### Guideline

Use soft jaws.

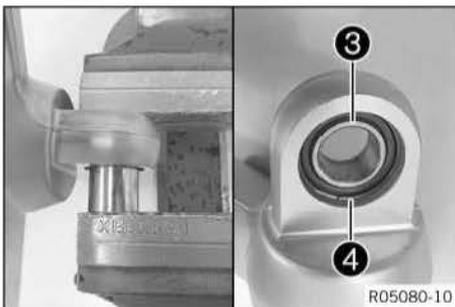
- Remove both collar bushings **1** of the heim joint with a special tool.

Drift (T120) (p. 482)



R05079-10

- Remove seal rings **2** on both sides.



R05080-10

- Press heim joint **3** to the side.

Pressing tool (T1207S) (p. 482)

✓ The heim joint rests against a lock ring.

- Remove second lock ring **4**.

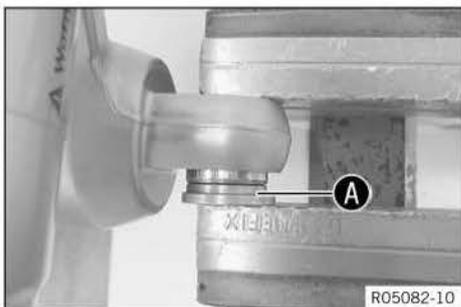


R05081-10

- Place special tool **A** underneath and press out heim joint **3** using special tool **B**.

Pressing tool (T1207S) (p. 482)

## 9.16 Installing the heim joint

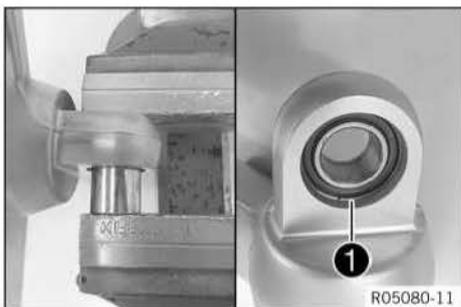


- Push in new heim joint **A** all the way using the special tool.

Guideline

Use soft jaws.

Pressing tool (T1206) (p. 482)



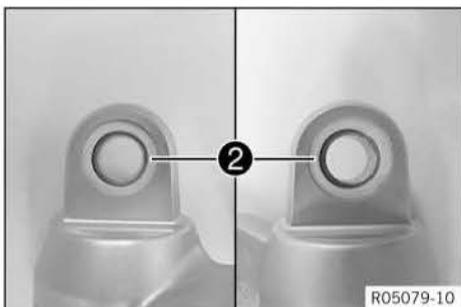
- Press the heim joint against the lock ring using the special tool.

Guideline

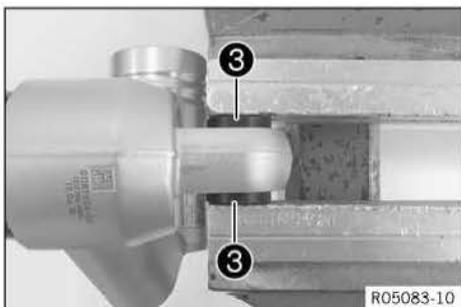
Use soft jaws.

Pressing tool (T1207S) (p. 482)

- Mount second lock ring **1**.



- Mount seal rings **2** on both sides.

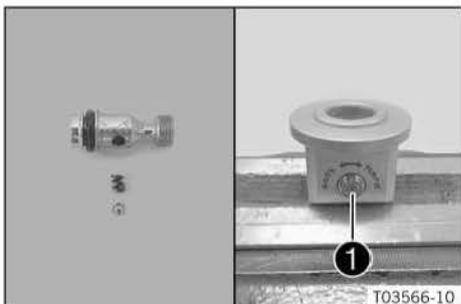


- Position both collar bushings **3** and press in.

Guideline

Use soft jaws.

## 9.17 Assembling the rebound adjuster



- Clamp the foot section into the vise.

Guideline

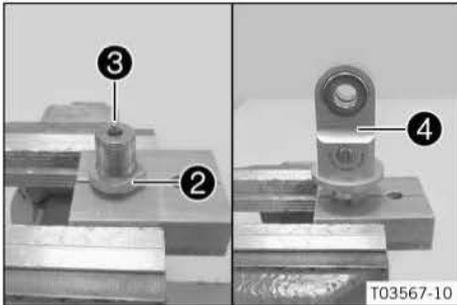
Use soft jaws.

- Grease the O-ring.

Lubricant (T158) (p. 466)

- Lubricate the spring and the ball.

Lubricant (T159) (p. 466)



- Mount adjusting screw ①.
- ✓ The collar is flush with the foot section.
- Unclamp the foot section.
- Clamp the piston rod using the special tool.

Clamping stand (T1202S) (p. 482)

- Mount lock nut ② all the way on.
- Grease the O-ring of the rebound needle.

Lubricant (T159) (p. 466)

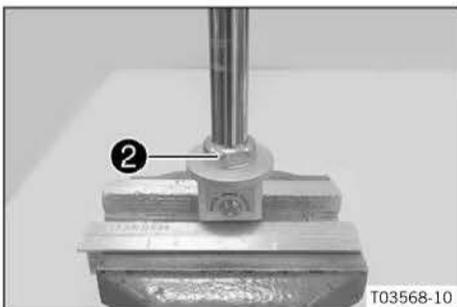
- Mount rebound needle ③ with the O-ring at the top.
- Mount and tighten foot section ④ using a suitable tool.

Piston rod at foot section	M18x1	50 Nm (36.9 lbf ft) <b>Loctite®2701™</b>
----------------------------	-------	---------------------------------------------

- Turn the piston rod over and clamp the foot section of it into the vise.

Guideline

Use soft jaws.



- Tighten lock nut ②.

Guideline

Lock nut	M18x1	110 Nm (81.1 lbf ft) <b>Loctite®2701™</b>
----------	-------	----------------------------------------------

## 9.18 Assembling the piston rod

### Preparatory work

- Assemble the rebound adjuster. (p. 80)

### Main work

- Clamp the foot section of the piston rod into the vise.

Guideline

Use soft jaws.

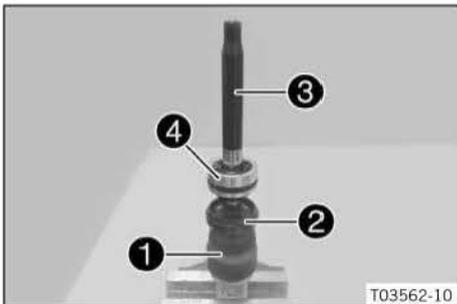
- Mount rubber buffer ① and locking cap ②.
- Position the special tool ③ on the piston rod.

Mounting sleeve (T1554) (p. 485)

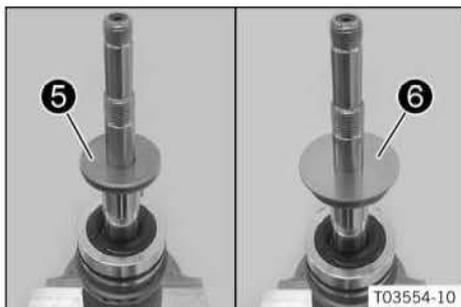
- Grease the seal ring and mount seal ring retainer ④.

Lubricant (T625) (p. 466)

- Remove the special tool.



## 9 SHOCK ABSORBER, LINK FORK

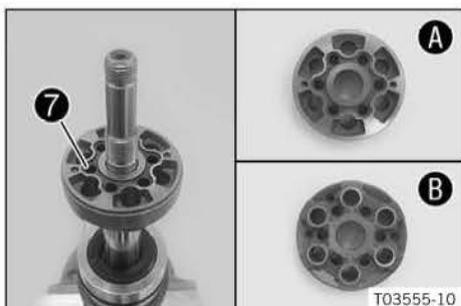


- Mount rebound washer **5** with cut-out facing upward.
- Mount compression shim stack **6** with the smaller washers facing downward.



### Info

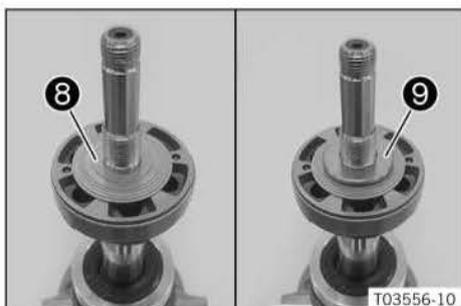
Note the setting list.



- Clean piston **7**.
- Mount the piston.

### Guideline

View <b>A</b>	of piston from above
View <b>B</b>	of piston from below



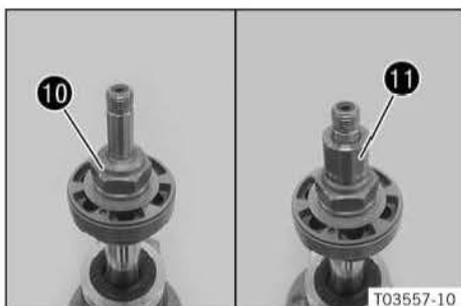
- Mount rebound shim stack **8** with the smaller washers facing upward.



### Info

Note the setting list.

- Mount washer **9**.

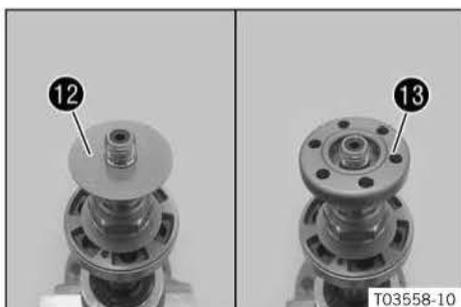


- Mount and tighten nut **10**.

### Guideline

Nut, piston rod, large rod	M12x1	40 Nm (29.5 lbf ft)
----------------------------	-------	---------------------

- Mount bushing **11** with the groove facing downward.



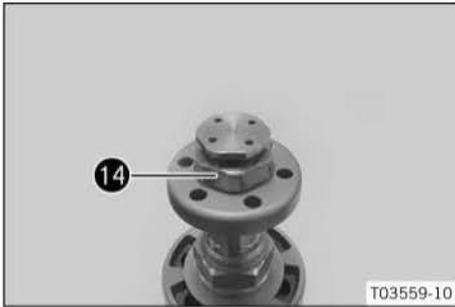
- Mount shim stack **12** with the smaller washers facing downward.



### Info

Note the setting list.

- Mount piston **13** with the groove facing upward.



- Mount and tighten nut 14.

Guideline

Nut, piston rod, small rod	M10x1	30 Nm (22.1 lbf ft) <b>Loctite®2701™</b>
----------------------------	-------	---------------------------------------------

## 9.19 Assembling the damper

### Preparatory work

- Assemble the rebound adjuster. (p. 80)
- Assemble the piston rod. (p. 81)

### Main work

- Grease the O-rings of the compression adjuster.

Lubricant (T158) (p. 466)
---------------------------

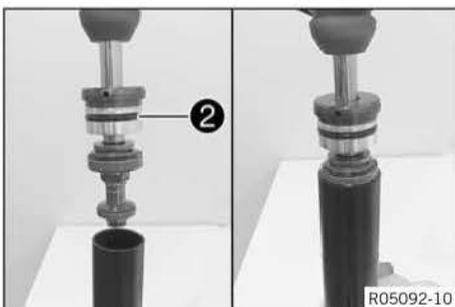
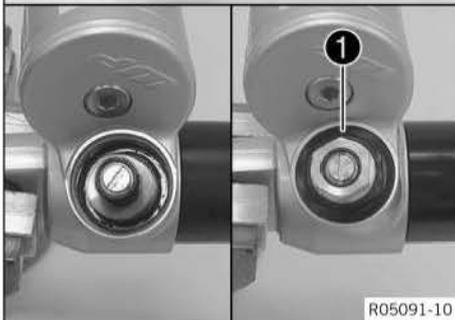
- Lubricate the thread.

Lubricant (T159) (p. 466)
---------------------------

- Mount the piston with the spring and washer.
- Mount and tighten compression adjuster 1.

Guideline

Compression adjuster	M31x1	35 Nm (25.8 lbf ft)
----------------------	-------	---------------------



- Fill the damper cartridge about half full.

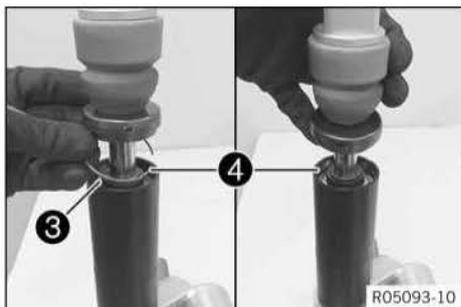
Shock absorber fluid (SAE 2.5) (50180751S1) (p. 465)
------------------------------------------------------

- Lubricate O-ring 2 of the seal ring retainer.

Lubricant (T158) (p. 466)
---------------------------

- Mount the piston rod carefully.

## 9 SHOCK ABSORBER, LINK FORK

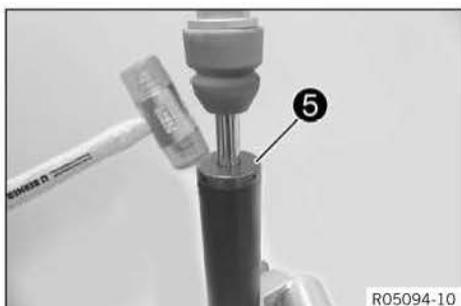


- Mount seal ring retainer **3** and slide it under the ring groove.
- Mount lock ring **4**.

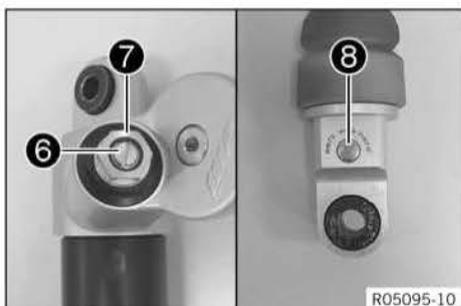
### **i** Info

Do not scratch the inside surface.

- Pull out the piston rod until the seal ring retainer is flush with the lock ring.



- Mount locking cap **5** of the damper cartridge.
- Bleed and fill the damper. (📖 p. 85)
- Fill the damper with nitrogen. (📖 p. 88)



### Alternative 1

- Turn adjusting screw **6** clockwise with a screwdriver as far as the last perceptible click.
- Turn counterclockwise by the number of clicks corresponding to the shock absorber type.

#### Guideline

Low-speed compression damping	
Comfort	20 clicks
Standard	15 clicks
Sport	10 clicks
Full payload	7 clicks

- Using an open end wrench, turn adjusting screw **7** clockwise all the way.
- Turn counterclockwise by the number of turns corresponding to the shock absorber type.

#### Guideline

High-speed compression damping	
Comfort	2 turns
Standard	1.5 turns
Sport	1.5 turns
Full payload	1 turn

- Turn adjusting screw **8** clockwise up to the last perceptible click.
- Turn counterclockwise by the number of clicks corresponding to the shock absorber type.

## Guideline

Rebound damping	
Comfort	20 clicks
Standard	15 clicks
Sport	12 clicks
Full payload	9 clicks

## Alternative 2



### Warning

**Danger of accident** Modifications to the suspension setting may seriously alter the handling characteristic.

Extreme modifications to the suspension setting may cause a serious deterioration in the handling characteristic and overload components.

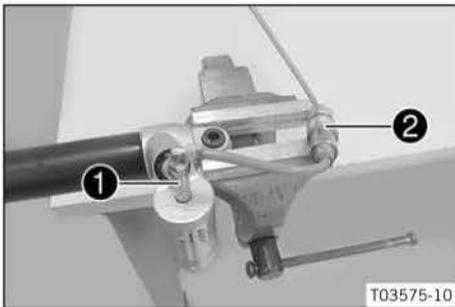
- Only make adjustments within the recommended range.
- Ride slowly to start with after making adjustments to get the feel of the new handling characteristic.

- Position adjusting screws **6**, **7**, and **8** in the location determined during disassembly.

## 9.20 Bleeding and filling the damper

### **i** Info

Before working with the vacuum pump, it is essential that you carefully read through the Owner's Manual included for the vacuum pump.  
Open the adjusters of the rebound and compression damping completely.



- Clamp the damper as shown.

### Guideline

Use soft jaws.

### **i** Info

The filling port must be located at the highest position. The piston rod moves in and out during filling; do not immobilize it by holding it with your hand.

- Remove the screw from the filling port.
- Mount adapter **1** on the damper.

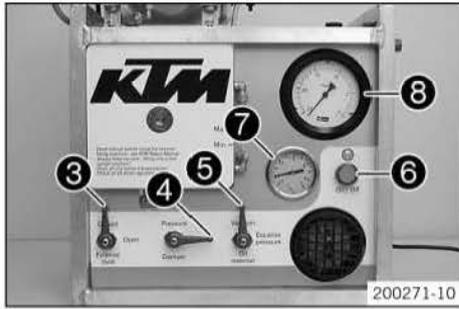
### **i** Info

Hand-tighten only without using a tool.

- Connect adapter **1** to connector **2** of the vacuum pump.

Vacuum pump (T1240S) (p. 483)

# 9 SHOCK ABSORBER, LINK FORK



- Adjust the control lever as shown.
  - ✓ Control lever **External tank** ③ is set to **Closed**, **Damper** ④ is set to **Vacuum** and **Oil reservoir** ⑤ is set to **Vacuum**.

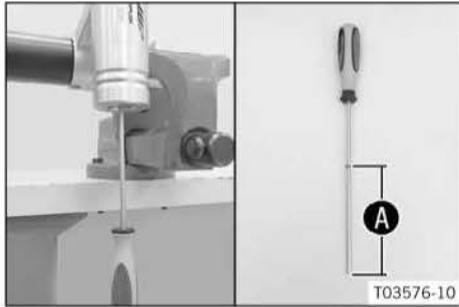
- Activate **On/Off** switch ⑥.

- ✓ The suction process begins.
- ✓ Pressure gauge ⑦ drops to the required value.

< 0 bar

- ✓ Vacuum gauge ⑧ drops to the required value.

4 mbar



- Determine distance **A** between the floating piston and reservoir hole with the special tool.

Depth micrometer (T107S) (p. 481)

- ✓ The floating piston is located in the lowermost position.



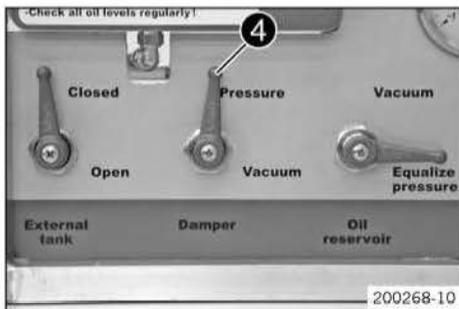
- When the vacuum gauge reaches the required value, turn control lever **Oil reservoir** ⑤ to **Equalize pressure**.

Guideline

4 mbar

- ✓ The pressure gauge rises to the required value.

0 bar



- When the pressure gauge reaches the specified value, turn control lever **Damper** ④ to **Pressure**.

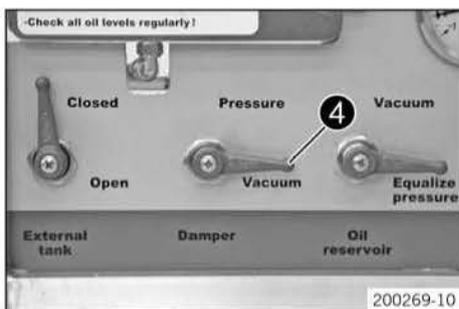
Guideline

0 bar

- ✓ Oil is pumped into the damper.

- ✓ The pressure gauge rises to the required value.

3 bar



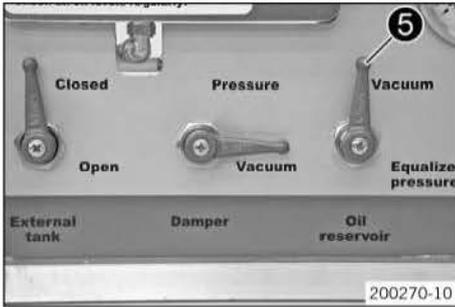
- When the pressure gauge reaches the specified value, turn control lever **Damper** ④ to **Vacuum**.

Guideline

3 bar

- ✓ The pressure gauge drops to the required value.

0 bar



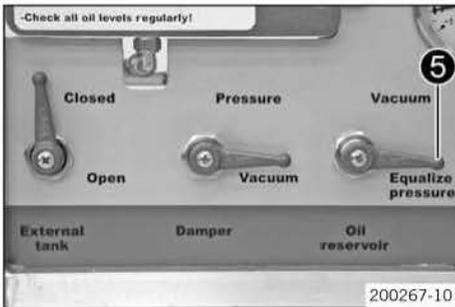
- When the pressure gauge reaches the specified value, turn control lever **Oil reservoir 5** to **Vacuum**.

Guideline

0 bar

- ✓ The vacuum gauge drops to the required value.

4 mbar



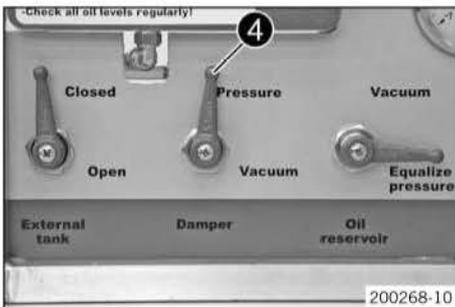
- When the vacuum gauge reaches the required value, turn control lever **Oil reservoir 5** to **Equalize Pressure**.

Guideline

4 mbar

- ✓ The pressure gauge drops to the required value.

0 bar



- When the pressure gauge reaches the specified value, turn control lever **Damper 4** to **Pressure**.

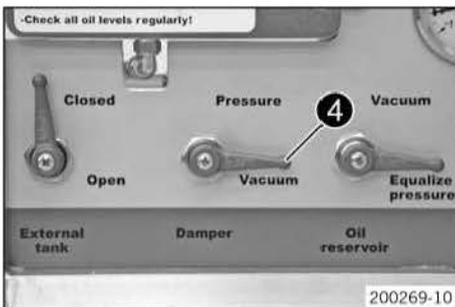
Guideline

0 bar

- ✓ Oil is pumped into the damper.

- ✓ The pressure gauge rises to the required value.

3 bar



- When the pressure gauge reaches the specified value, turn control lever **Damper 4** to **Vacuum**.

Guideline

3 bar

- ✓ The pressure gauge drops to the required value.

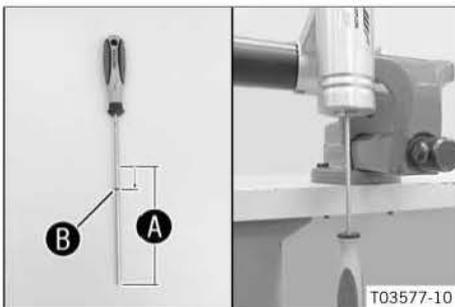
0 bar

- When the pressure gauge reaches the required value, activate switch **On/Off**.

Guideline

0 bar

- ✓ The vacuum pump is switched off.



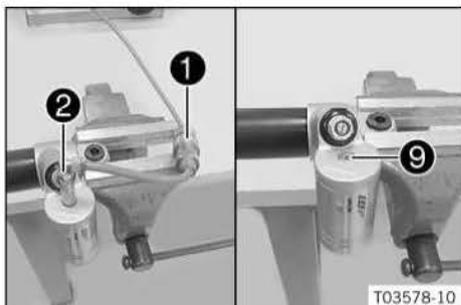
- Slide O-ring **B** to the end of the special tool by the specified value (distance **A** minus specified value).

Guideline

5 mm

Depth micrometer (T107S) (p. 481)

- Slide the floating piston into the reservoir to the shortened position using the special tool.



**i Info**

The floating piston must be positioned at exactly this point when the piston rod is fully extended, otherwise damage will occur during compression of the shock absorber.

- Remove the special tool.
- Remove adapter **1** from connector **2** of the vacuum pump.

**i Info**

Hold the damper so that the filling port is at the highest point.

- Remove the adapter.
- Mount and tighten screw **9**.

Guideline

Filling port screw	M10x1	14 Nm (10.3 lbf ft)
--------------------	-------	---------------------

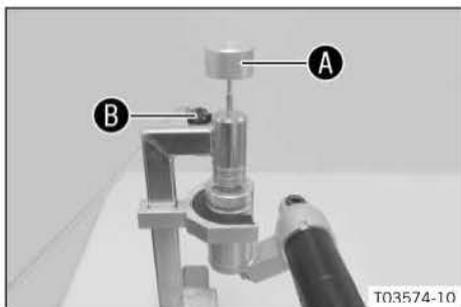
## 9.21 Filling damper with nitrogen



- Mount screw **1** with the O-ring and screw it in approx. 2 full turns, but do not tighten it fully yet.

**i Info**

The piston rod is fully extended.



- Fix the special tool in the vise.

Filling tool (T170S1) (p. 485)

Filling adapter (T1565) (p. 485)

- Connect the special tool to the pressure regulator of the filling cylinder.

Filling gas - nitrogen

- Adjust the pressure regulator.

Guideline

Gas pressure	16 bar (232 psi)
--------------	------------------

- Position the damper in the special tool.

✓ The hexagonal part of tap handle **A** engages in the hexagon socket of the filling port screw.

- Open filler tap **B**.
- Fill the damper for at least 15 seconds.

Guideline

Gas pressure	16 bar (232 psi)
--------------	------------------

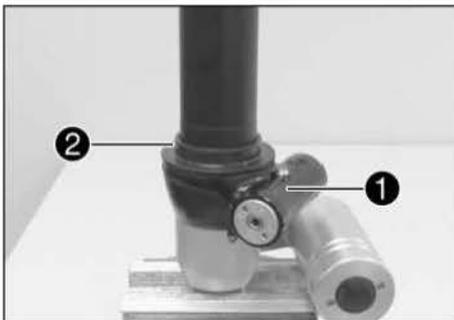
**i Info**  
 Watch the pressure regulator dial.  
 Ensure that the damper is filled to the specified pressure.

- Screw the filling port shut with tap handle **A**.
- Close spigot **B** and take the damper out of the special tool.
- Tighten the filling port screw.

Guideline

Screw, filling port, reservoir	M5	3 Nm (2.2 lbf ft)
--------------------------------	----	-------------------

## 9.22 Installing the spring

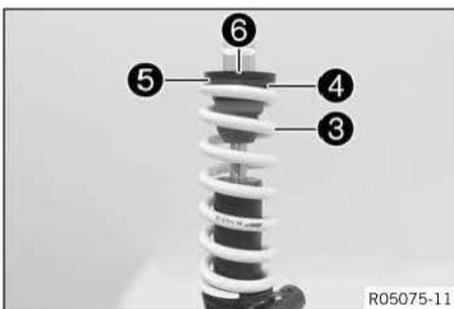
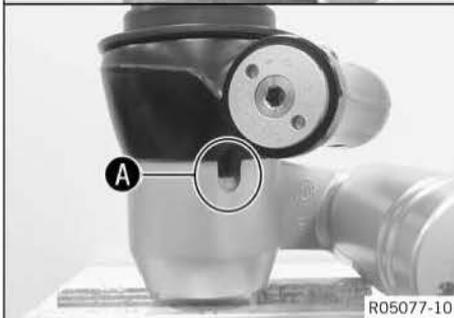


- Clamp the shock absorber into the vise.

Guideline

Use soft jaws.

- Mount preload adjuster **1**.
- ✓ Holding lug **A** engages in the hole.
- Mount spring retainer **2**.



- Measure the overall spring length while the spring is not under tension.

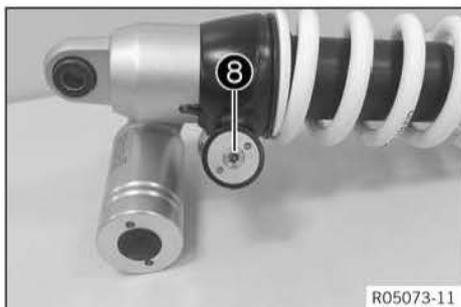
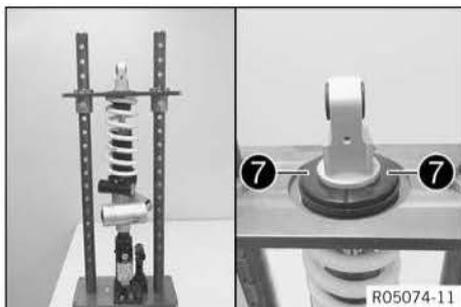
- Position spring **3**.

Guideline

Spring rate	
Weight of rider: 75 ... 85 kg (165 ... 187 lb.)	95 N/mm (542 lb/in)

- Mount washer **4** and **5**.
- Mount spring retainer **6**.

## 9 SHOCK ABSORBER, LINK FORK



- Clamp the shock absorber into the special tool.

Spring compressor (T14050S) (📖 p. 484)

### **i** Info

Use the suitable ring of the special tool with the smallest possible inside diameter.

- Mount washers **7**.
- Release the spring. Remove the shock absorber from the special tool.



### **Warning**

**Danger of accident** Modifications to the suspension setting may seriously alter the handling characteristic. Extreme modifications to the suspension setting may cause a serious deterioration in the handling characteristic and overload components.

- Only make adjustments within the recommended range.
- Ride slowly to start with after making adjustments to get the feel of the new handling characteristic.

- Adjust the spring to the value determined when it was removed by turning screw **8** clockwise.

### 9.23 Checking the link fork



- Check the link fork for damage, cracking, and deformation.
  - » If the link fork exhibits damage, cracking, or deformation:
    - Change the link fork.

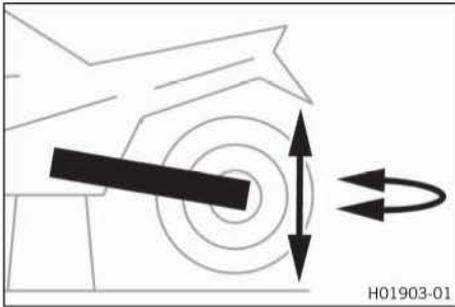
### **i** Info

Always replace a damaged link fork. Repairing the link fork is not authorized by KTM.

### 9.24 Checking the fork bearing for play

#### **Preparatory work**

- Remove the main silencer. (📖 p. 100)
- Raise the motorcycle at the rear using the work stand. (📖 p. 15)
- Place a load on the front of the vehicle.
  - ✓ The rear wheel is not in contact with the ground.

**Main work**

- Move the link fork up and down.
  - » If there is detectable play:
    - Change the link fork bearing. (p. 93)
- Move the link fork from one side to the other.
  - » If there is detectable play:
    - Change the link fork bearing. (p. 93)

**Finishing work**

- Remove the motorcycle from the work stand at the rear. (p. 16)
- Install the main silencer. (p. 100)

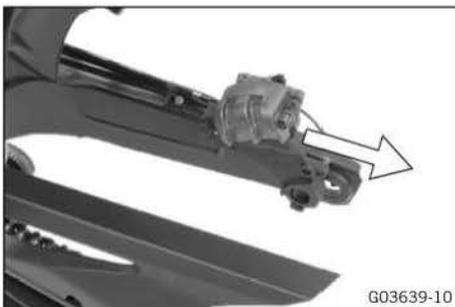
## 9.25 Removing the link fork

**Preparatory work**

- Remove the seat. (p. 114)
- Remove the left side cover. (p. 130)
- Remove the battery cover. (p. 131)
- Remove left fuel tank spoiler. (p. 132)
- Remove the right side cover. (p. 130)
- Remove right fuel tank spoiler. (p. 134)
- Remove engine guard. (p. 138)
- Remove the fuel tank. (p. 114)
- Raise the motorcycle at the front using the work stand. (p. 16)
- Place a load on the front of the vehicle.
  - ✓ The rear wheel is not in contact with the ground.
- Remove the rear wheel (work stand, front). (p. 158)

**Main work**

- Take the brake line and cable out of the holders.

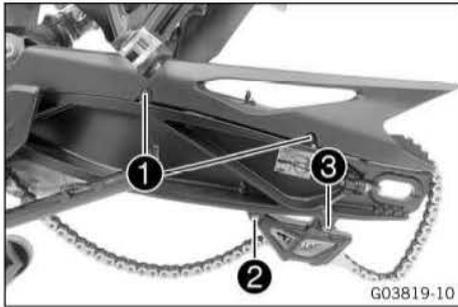


- Take the brake caliper out of the guide and hang it to the side.

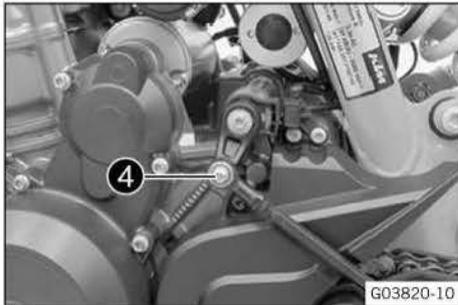
**Info**

Cover the components to protect them against damage.

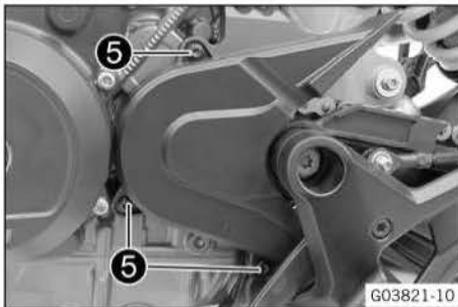
## 9 SHOCK ABSORBER, LINK FORK



- Remove screws **1**.
- Take off the chain guard.
- Remove fitting **2**.
- Remove screw **3**.
- Hang the chain guide with chain to the side.



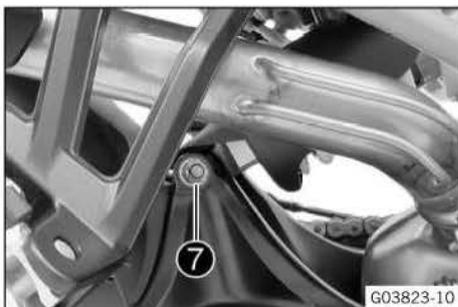
- Remove screw **4** with the washer.
- Place the shift rod to the side.



- Remove screws **5**.
- Take off the engine sprocket cover.



- Loosen screw **6** but do not remove it yet.



- Loosen adjusting screw **7**.

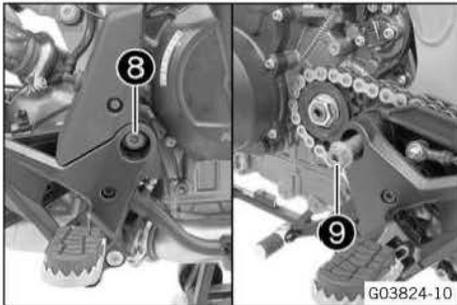


### Info

LH thread



- Lift the link fork.
- Remove screw ⑥.
- Lower the link fork.



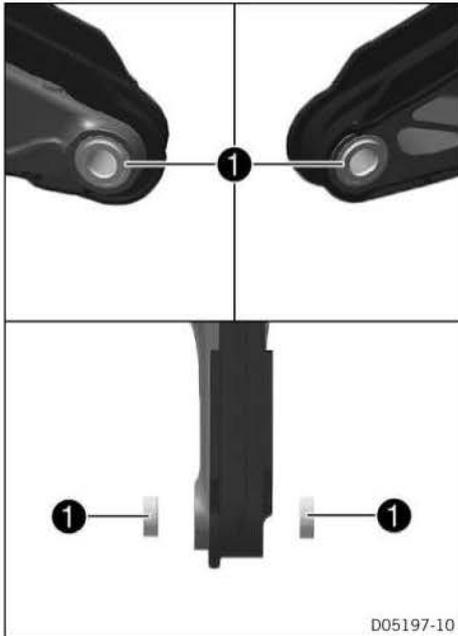
- Remove screw ⑧.
- Remove swingarm pivot ⑨.
- Take off the link fork.

## 9.26 Changing the link fork bearing

### Preparatory work

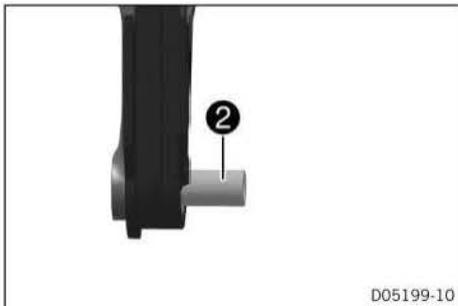
- Remove the seat. (📖 p. 114)
- Remove the left side cover. (📖 p. 130)
- Remove the battery cover. (📖 p. 131)
- Remove left fuel tank spoiler. (📖 p. 132)
- Remove the right side cover. (📖 p. 130)
- Remove right fuel tank spoiler. (📖 p. 134)
- Remove engine guard. (📖 p. 138)
- Remove the fuel tank. (📖 p. 114)
- Raise the motorcycle at the front using the work stand. (📖 p. 16)
- Place a load on the front of the vehicle.
  - ✓ The rear wheel is not in contact with the ground.
- Remove the rear wheel (work stand, front). (📖 p. 158)
- Remove the link fork. (📖 p. 91)

## 9 SHOCK ABSORBER, LINK FORK

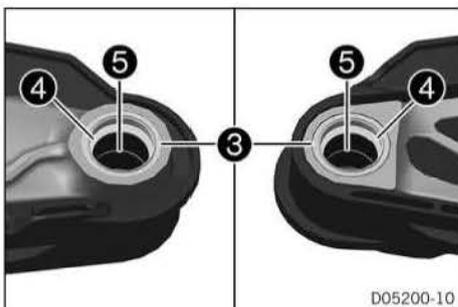


### Left fork bearing

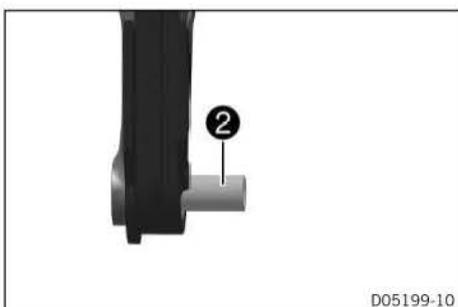
- Remove collar bushings **1**.



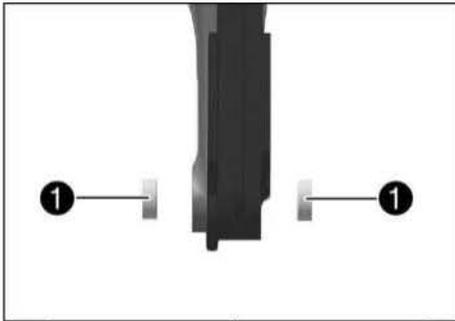
- Remove bushing **2**.



- Remove shaft seal rings **3** using a suitable tool.
- Remove stop disks **4**.
- Press out bearing **5** using a suitable tool.
- Using a suitable tool, press in new bearing **5**.
- Position the stop disks **4**.
- Press in shaft seal rings **3**.



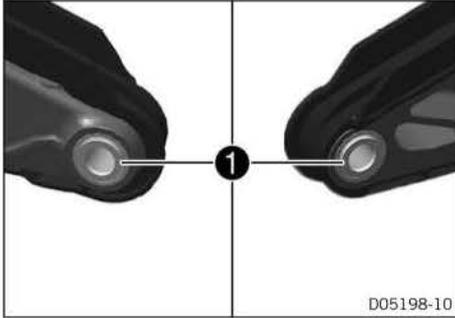
- Mount bushing **2**.



- Grease the shaft seal rings.

Long-life grease (📖 p. 466)

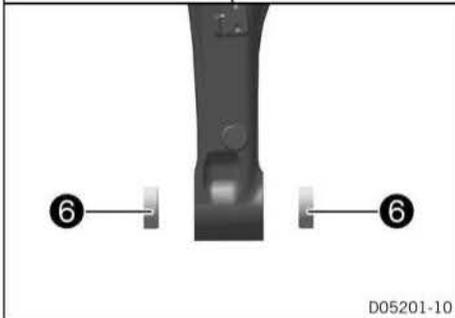
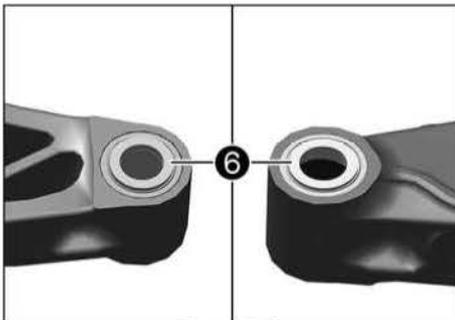
- Position the collar bushings ① with the shoulder facing inward.



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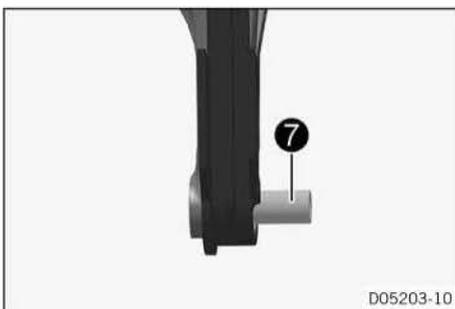
### Right fork bearing

- Remove collar bushings ⑥.



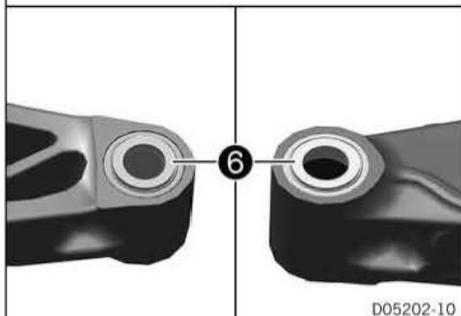
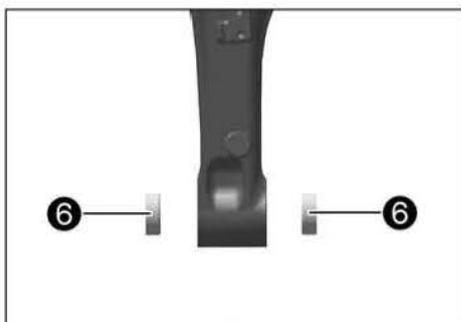
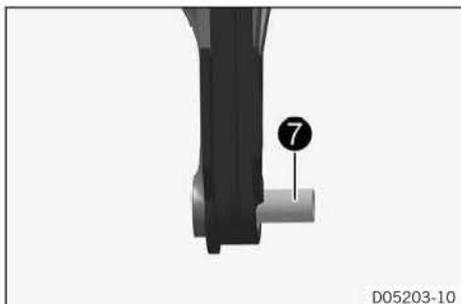
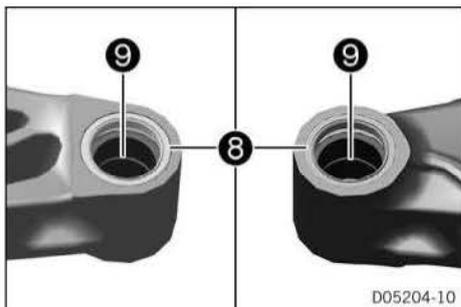
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- Remove bushing ⑦.



D05203-10

## 9 SHOCK ABSORBER, LINK FORK



- Remove shaft seal rings **8** using a suitable tool.
- Press out bearing **9** using a suitable tool.
- Using a suitable tool, press in new bearing **9**.
- Press in shaft seal rings **8**.

- Mount bushing **7**.

- Grease the shaft seal rings.

Long-life grease (📖 p. 466)

- Position the collar bushings **6** with the shoulder facing inward.

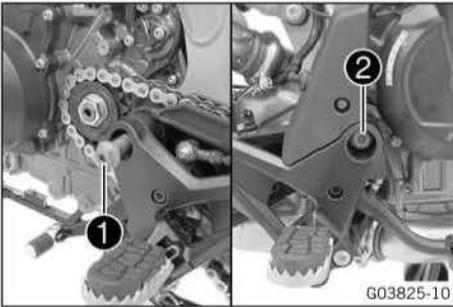
### Finishing work

- Install the link fork. (📖 p. 97)
- Install the rear wheel (work stand, front). (📖 p. 159)
- Check the chain tension. (📖 p. 171)
- Remove the motorcycle from the work stand at the front. (📖 p. 17)
- Install the fuel tank. (📖 p. 117)
- Install the engine guard. (📖 p. 138)
- Install the right fuel tank spoiler. (📖 p. 135)
- Install the right side cover. (📖 p. 131)
- Install the left fuel tank spoiler. (📖 p. 133)
- Install the battery cover. (📖 p. 132)
- Install the left side cover. (📖 p. 130)

- Mount the seat. (📖 p. 114)



## 9.27 Installing the link fork



### Main work

- Position the link fork.
- Mount swingarm pivot **1**.
- Mount and tighten screw **2**.

### Guideline

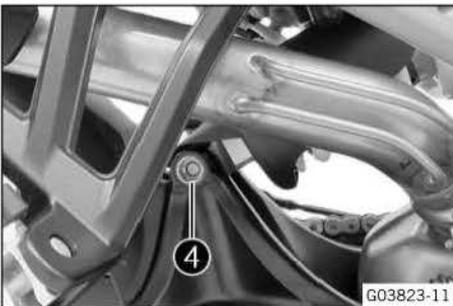
Screw, swingarm pivot	M12	100 Nm (73.8 lbf ft)
-----------------------	-----	----------------------



- Lift the link fork and position the shock absorber.
- Mount screw **3**, but do not tighten yet.

### Guideline

Screw, bottom shock absorber	M12	80 Nm (59 lbf ft) <b>Loctite®2701™</b>
------------------------------	-----	-------------------------------------------



- Tighten adjusting screw **4**.

### Guideline

Adjusting screw, swingarm	M20LHx1.5	10 Nm (7.4 lbf ft)
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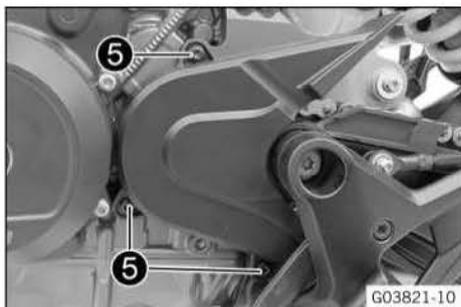


- Tighten screw **3**.

### Guideline

Screw, bottom shock absorber	M12	80 Nm (59 lbf ft) <b>Loctite®2701™</b>
------------------------------	-----	-------------------------------------------

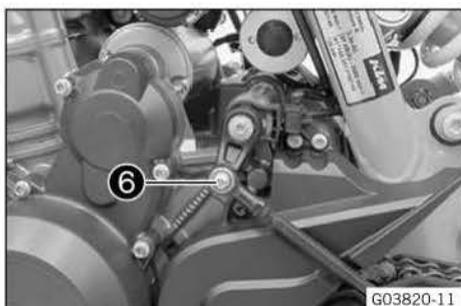
## 9 SHOCK ABSORBER, LINK FORK



- Position the engine sprocket cover.
- Mount and tighten screws ⑤.

Guideline

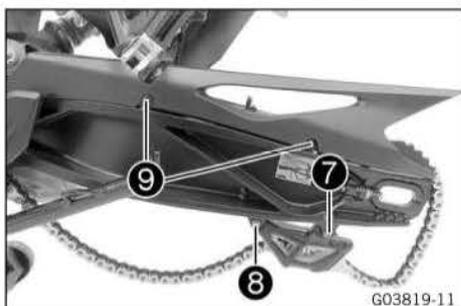
Screw, engine sprocket cover	M5	5 Nm (3.7 lbf ft) <b>Loctite®243™</b>
------------------------------	----	------------------------------------------



- Position the shift lever.
- Mount and tighten screw ⑥.

Guideline

Screw, shift rod	M6	10 Nm (7.4 lbf ft) <b>Loctite®243™</b>
------------------	----	-------------------------------------------



- Position the chain guide.
- Mount screw ⑦, but do not tighten yet.

Guideline

Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
---------------------------	----	--------------------

- Mount and tighten fitting ⑧.

Guideline

Fitting, chain guide	M6	10 Nm (7.4 lbf ft)
----------------------	----	--------------------

- Tighten screw ⑦.

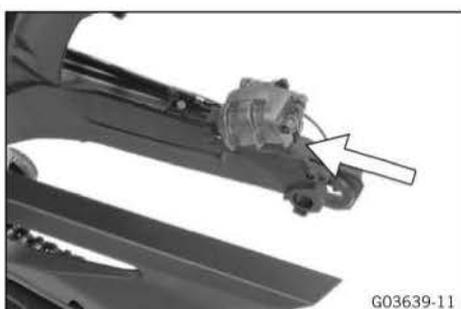
Guideline

Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
---------------------------	----	--------------------

- Position the chain guard.
- Mount and tighten screws ⑨.

Guideline

Remaining screws, chassis	M5	5 Nm (3.7 lbf ft)
---------------------------	----	-------------------



- Position the brake caliper in the guide.

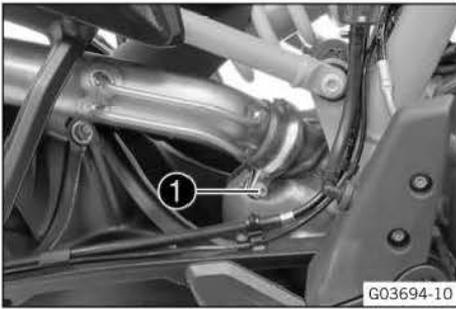


- Secure the brake line and cable in the holders.

### Finishing work

- Install the rear wheel (work stand, front). (p. 159)
- Check the chain tension. (p. 171)
- Remove the motorcycle from the work stand at the front. (p. 17)
- Install the fuel tank. (p. 117)
- Install the engine guard. (p. 138)
- Install the right fuel tank spoiler. (p. 135)
- Install the right side cover. (p. 131)
- Install the left fuel tank spoiler. (p. 133)
- Install the battery cover. (p. 132)
- Install the left side cover. (p. 130)
- Mount the seat. (p. 114)

## 10.1 Removing the main silencer



- Remove screw **1**.
- Remove the clamp.



- Remove screw **2** with the washer.
- Take off the main silencer.

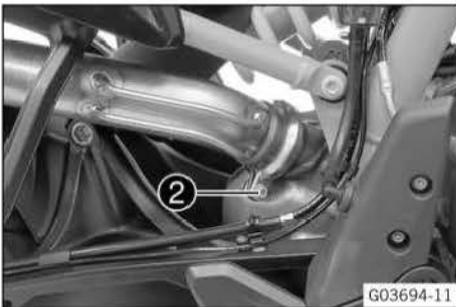
## 10.2 Installing the main silencer



- Position the main silencer with the gasket.
- Mount screw **1** with the washer, but do not tighten yet.

Guideline

Screw, exhaust clamp	M8	25 Nm (18.4 lbf ft)
----------------------	----	---------------------



- Position the clamp.
- Mount and tighten screw **2**.

Guideline

Screw, presilencer exhaust clamp	M6	8 Nm (5.9 lbf ft) Copper paste
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- Tighten screw **1**.

Guideline

Screw, exhaust clamp	M8	25 Nm (18.4 lbf ft)
----------------------	----	---------------------

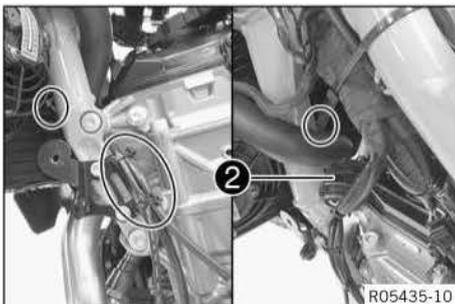
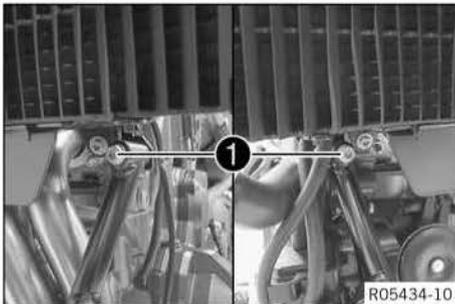
## 10.3 Removing the exhaust system

### Preparatory work

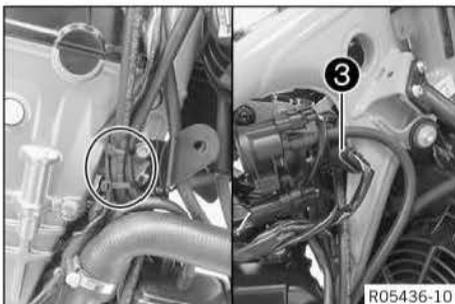
- Remove the main silencer. (p. 100)
- Raise motorcycle with rear lifting gear. (p. 15)
- Remove the seat. (p. 114)
- Remove the left side cover. (p. 130)
- Remove the battery cover. (p. 131)
- Remove left fuel tank spoiler. (p. 132)
- Remove the right side cover. (p. 130)
- Remove right fuel tank spoiler. (p. 134)
- Remove engine guard. (p. 138)
- Remove the fuel tank. (p. 114)

### Main work

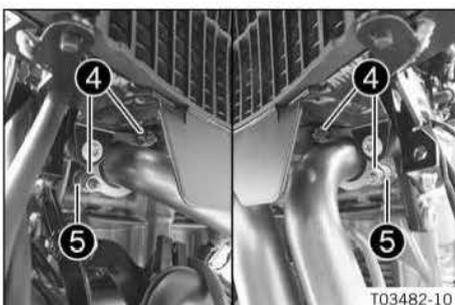
- Remove screws **1**.
- Take off the engine guard connection.



- Remove the cable ties.
- Disconnect plug-in connector **2**.
- Expose the cable.



- Remove the cable ties.
- Pull off and disconnect plug-in connector **3** from the holder.
- Expose the cable.



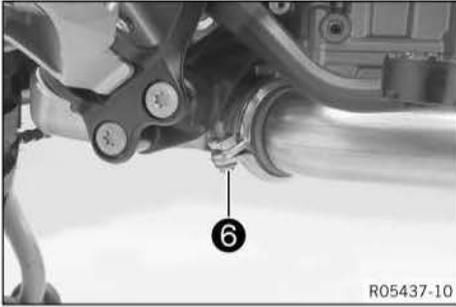
- Remove nuts **4**.

---

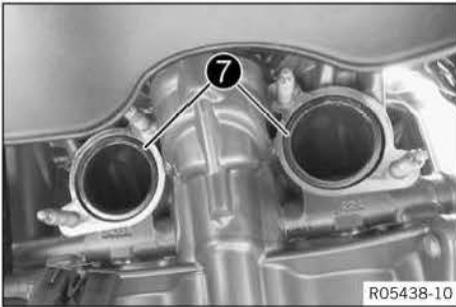
**i Info**  
Do not misplace spacers **5**.

---

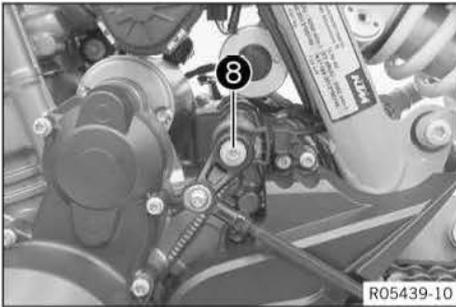
# 10 EXHAUST SYSTEM



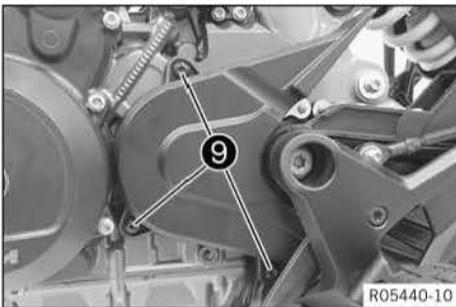
- Remove screw 6.
- Take off the exhaust clamp.
- Remove manifold with gasket.



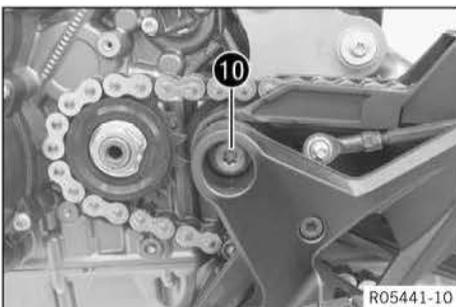
- Remove exhaust gaskets 7.



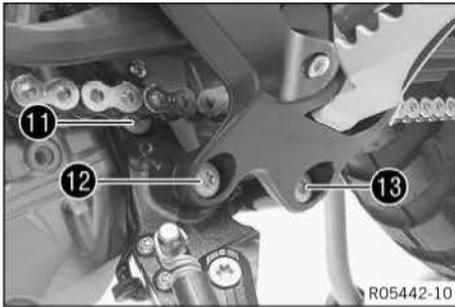
- Remove screw 8 with the washers.
- Hang the bell crank with the shift linkage to the side.



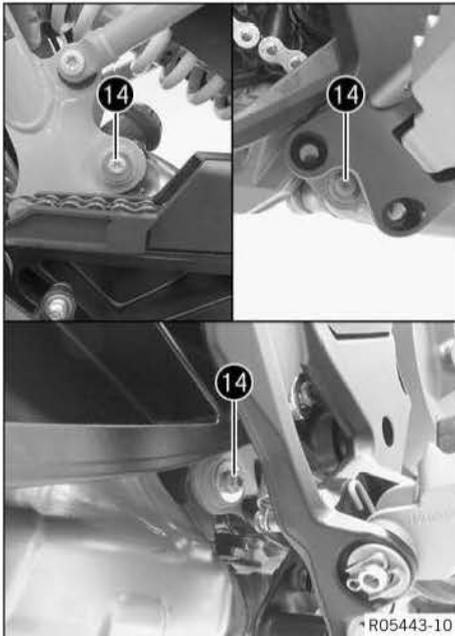
- Remove screws 9.
- Take off the engine sprocket cover.



- Loosen screw 10.

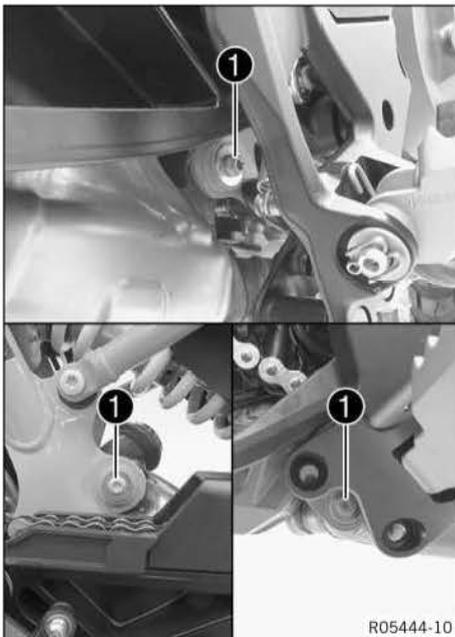


- Remove screw 11.
- Remove screw 12.
- Remove screw 13 with the bushing.
- Take off the side stand bracket and allow it to hang tension-free to the side.



- Remove screws 14.
- Take off the presilencer in a downward direction.

## 10.4 Installing the exhaust system

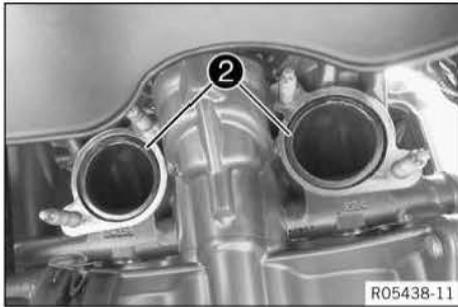


### Main work

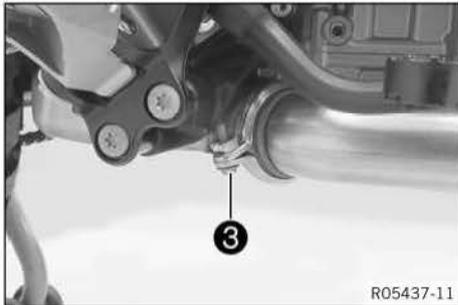
- Position the presilencer.
- Mount screws 1, but do not tighten yet.

### Guideline

Screw, presilencer on frame	M8	25 Nm (18.4 lbf ft) <b>Loctite®243™</b>
-----------------------------	----	--------------------------------------------



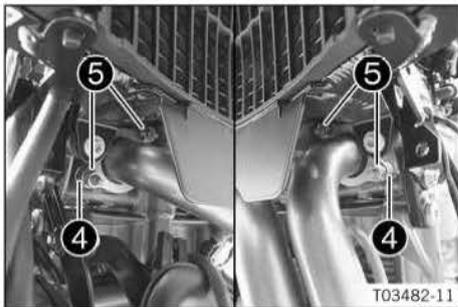
- Position exhaust gaskets **2**.



- Position the manifold with the gasket.
- Position the clamp. Mount screw **3**, but do not tighten yet.

Guideline

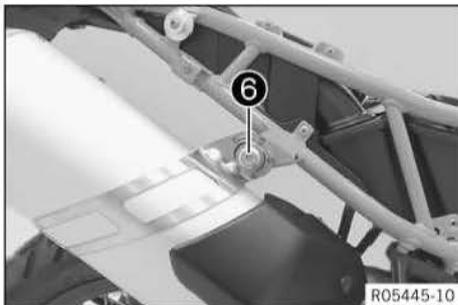
Screw, manifold clamp	M6	8 Nm (5.9 lbf ft) Copper paste
-----------------------	----	-----------------------------------



- Position spacers **4**.
- Mount nuts **5**, but do not tighten yet.

Guideline

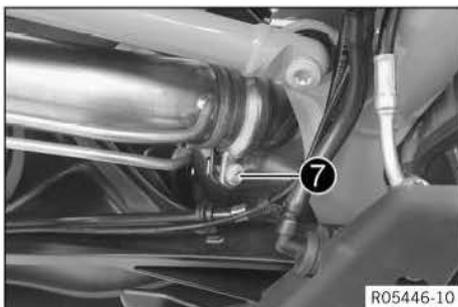
Nut, manifold on cylinder head	M8	Tighten the nuts evenly. Do not bend the metal. 20 Nm (14.8 lbf ft) Copper paste
--------------------------------	----	-------------------------------------------------------------------------------------



- Position the main silencer with the gasket.
- Mount screw **6** with the washer, but do not tighten yet.

Guideline

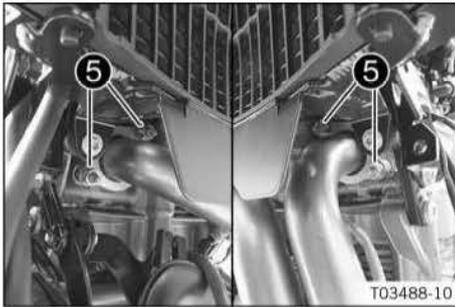
Screw, main silencer fastening	M8	15 Nm (11.1 lbf ft)
--------------------------------	----	---------------------



- Position the clamp. Mount screw **7**, but do not tighten yet.

Guideline

Screw, pre-silencer exhaust clamp	M6	8 Nm (5.9 lbf ft) Copper paste
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- Tighten nuts **5** evenly.

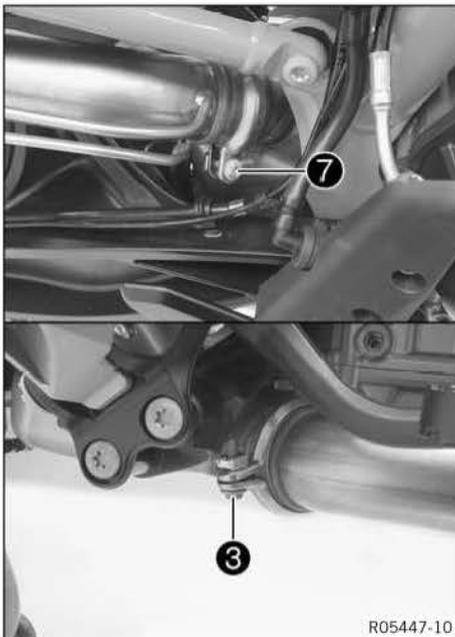
Guideline

Nut, manifold on cylinder head	M8	Tighten the nuts evenly. Do not bend the metal. 20 Nm (14.8 lbf ft) Copper paste
--------------------------------	----	-------------------------------------------------------------------------------------



**Info**

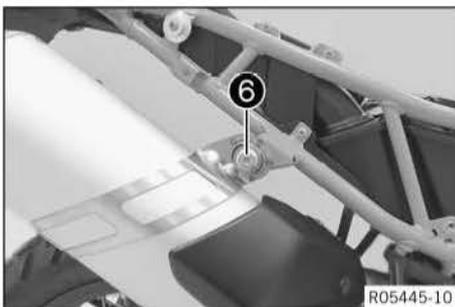
First, tighten the nuts on the bushings.



- Tighten screws **7** and **3** evenly.

Guideline

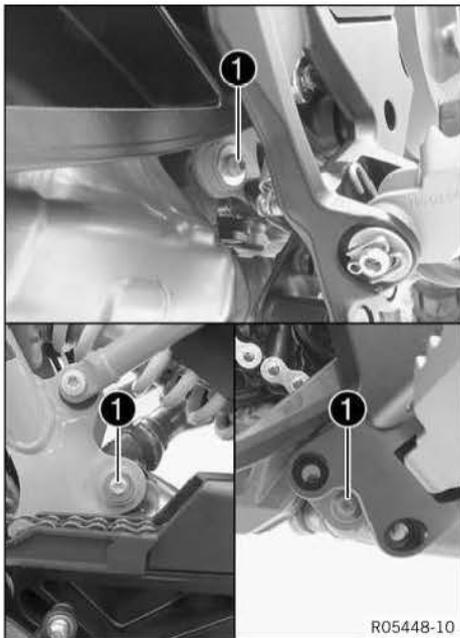
Screw, presilencer exhaust clamp	M6	8 Nm (5.9 lbf ft) Copper paste
Screw, manifold clamp	M6	8 Nm (5.9 lbf ft) Copper paste



- Tighten screw **6**.

Guideline

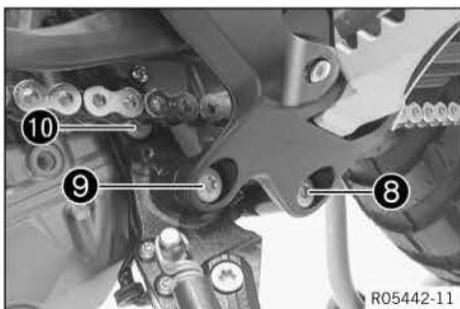
Screw, main silencer fastening	M8	15 Nm (11.1 lbf ft)
--------------------------------	----	---------------------



- Tighten screws **1**.

Guideline

Screw, presilencer on frame	M8	25 Nm (18.4 lbf ft) <b>Loctite®243™</b>
-----------------------------	----	--------------------------------------------



- Position the side stand bracket.
- Mount and tighten screw **8** with the bushing.

Guideline

Screw, front footrest bracket	M10x40	45 Nm (33.2 lbf ft) <b>Loctite®243™</b>
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- Mount and tighten screw **9**.

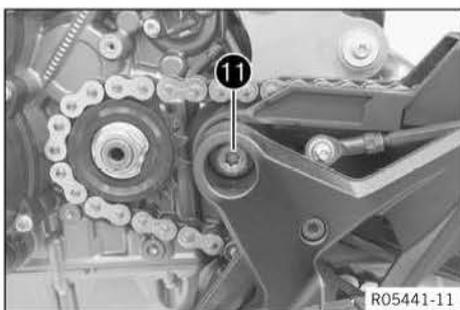
Guideline

Screw, front footrest bracket	M10x65	45 Nm (33.2 lbf ft) <b>Loctite®243™</b>
-------------------------------	--------	--------------------------------------------

- Mount and tighten screw **10**.

Guideline

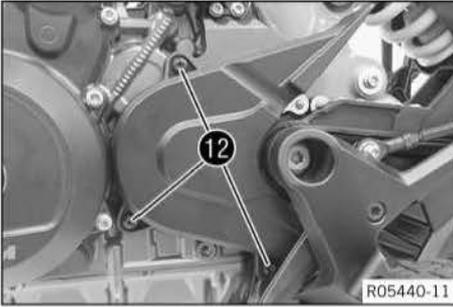
Screw, front footrest bracket	M10x30	45 Nm (33.2 lbf ft) <b>Loctite®243™</b>
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- Tighten screw **11**.

Guideline

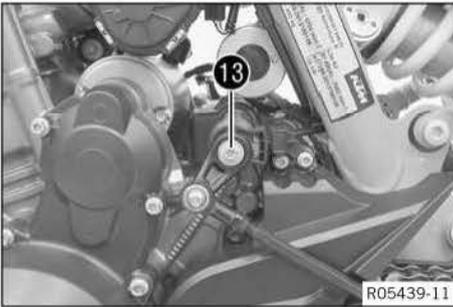
Screw, swingarm pivot	M12	100 Nm (73.8 lbf ft)
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- Position engine sprocket cover.
- Mount and tighten screws **12**.

Guideline

Screw, engine sprocket cover	M5	5 Nm (3.7 lbf ft) <b>Loctite®243™</b>
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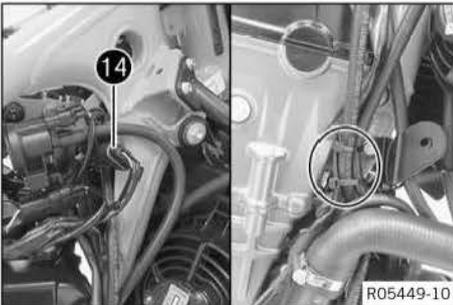
- Position the bell crank.

**i Info**  
The shift lever must not come into contact with any other vehicle components during the shift procedure.

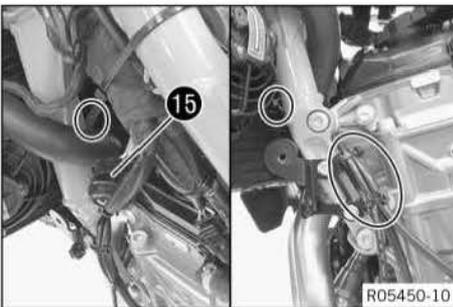
- Locate and tighten screw **13** with the washers.

Guideline

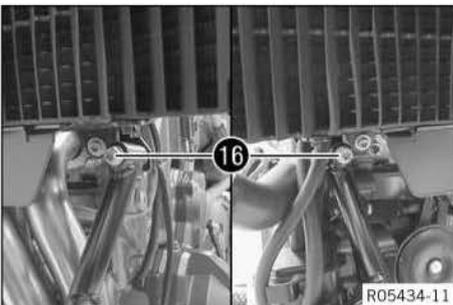
Screw, shift lever	M6	14 Nm (10.3 lbf ft) <b>Loctite®243™</b>
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- Route the cable without tension.
- Join plug-in connector **14** and position in the holder.
- Mount the cable ties.



- Route the cable without tension.
- Join plug-in connector **15**.
- Mount the cable ties.



- Position engine guard connection.
- Mount and tighten screws **16**.

Guideline

Remaining screws, chassis	M8	25 Nm (18.4 lbf ft)
---------------------------	----	---------------------

**Finishing work**

- Install the fuel tank. (📖 p. 117)
- Install the engine guard. (📖 p. 138)
- Install the right fuel tank spoiler. (📖 p. 135)

- Install the right side cover. (🔗 p. 131)
- Install the left fuel tank spoiler. (🔗 p. 133)
- Install the battery cover. (🔗 p. 132)
- Install the left side cover. (🔗 p. 130)
- Mount the seat. (🔗 p. 114)
- Remove the rear of the motorcycle from the lifting gear.  
(🔗 p. 15)

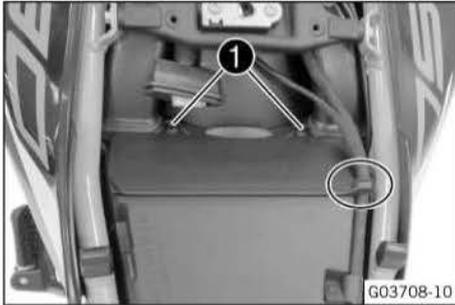
## 11.1 Removing the air filter

### Preparatory work

- Remove the seat. (📖 p. 114)

### Main work

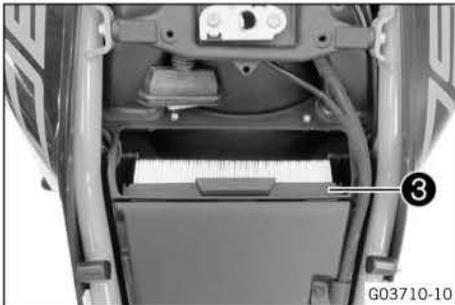
- Remove screws ❶.
- Remove the air filter box lid, loosening the wiring harness from the holder at the same time.



- Remove air filter clamping wedge ❷ upwards.



- Remove air filter frame ❸ with the air filter.



- Remove the air filter from the air filter frame.



## 11.2 Installing the air filter

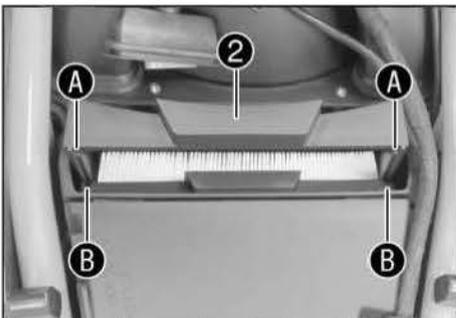


### Main work

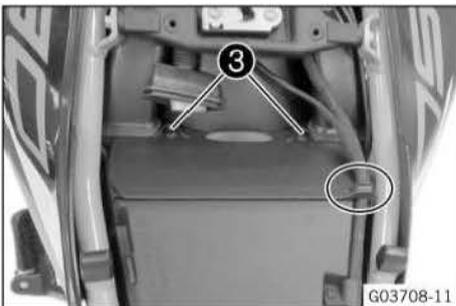
- Position air filter in the air filter frame.



- Clean the air filter box.
- Position air filter frame **1** with air filter.



- Mount air filter clamping wedge **2**.
  - ✓ The open side of the air filter clamping wedge faces downward.
  - ✓ Guide rails **A** engage in recesses **B**.



- Positioning air filter box lid.
  - ✓ Wiring harness is attached with the holder.
- Mount and tighten screws **3**.

### Guideline

Screw, air filter box	M5	3 Nm (2.2 lbf ft)
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### Finishing work

- Mount the seat. (p. 114)

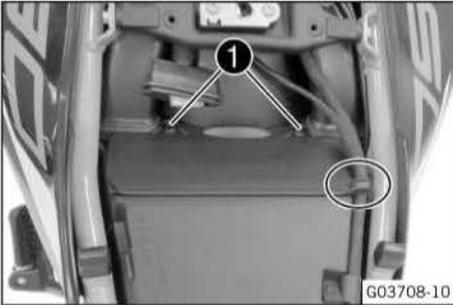
## 11.3 Changing the air filter, cleaning the air filter box

### Preparatory work

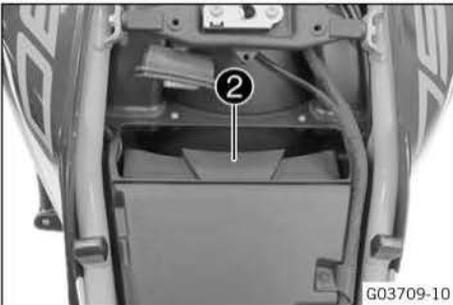
- Remove the seat. (📖 p. 114)

### Main work

- Remove screws ❶.
- Remove the air filter box lid, loosening the wiring harness from the holder at the same time.



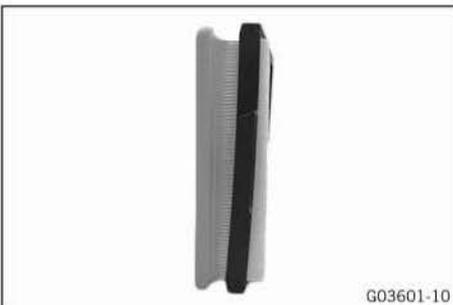
- Remove air filter clamping wedge ❷ upwards.



- Remove air filter frame ❸ with the air filter.

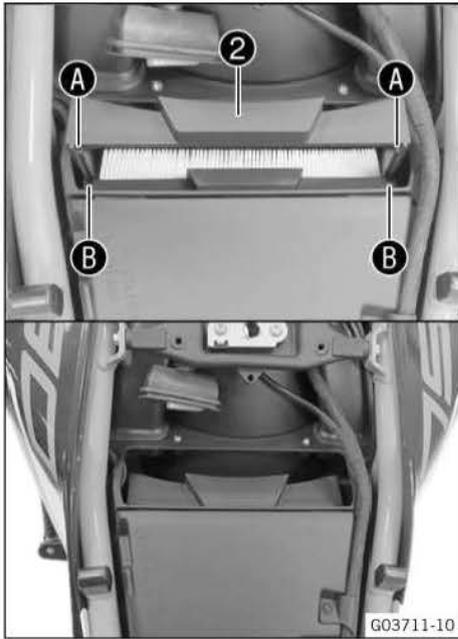


- Remove the air filter from the air filter frame.
- Position the new air filter in the air filter frame.

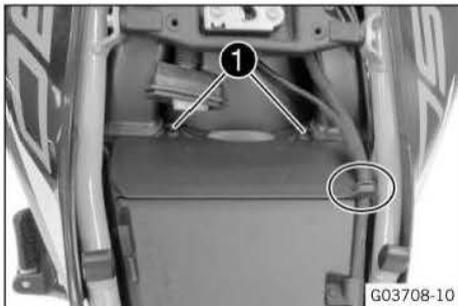


- Position air filter frame ❸ with the air filter.





- Mount air filter clamping wedge **2**.
  - ✓ The open side of the air filter clamping wedge faces downward.
  - ✓ Guide rails **A** engage in recesses **B**.



- Positioning air filter box lid.
  - ✓ Wiring harness is attached with the holder.
- Mount and tighten screws **1**.

Guideline

Screw, air filter box	M5	3 Nm (2.2 lbf ft)
-----------------------	----	-------------------

**Finishing work**

- Mount the seat. (📖 p. 114)

12.1 Opening the fuel tank filler cap



**Danger**

**Fire hazard** Fuel is highly flammable.

The fuel in the fuel tank expands when warm and can escape if overfilled.

- Do not refuel the vehicle in the vicinity of open flames or lit cigarettes.
- Switch off the engine for refueling.
- Make sure that no fuel is spilled; particularly not on hot parts of the vehicle.
- If any fuel is spilled, wipe it off immediately.
- Observe the specifications for refueling.



**Warning**

**Danger of poisoning** Fuel is poisonous and a health hazard.

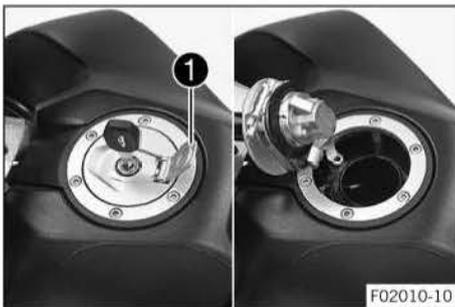
- Avoid skin, eye and clothing contact with fuel.
- Immediately consult a doctor if you swallow fuel.
- Do not inhale fuel vapors.
- In case of skin contact, rinse the affected area with plenty of water.
- Rinse the eyes thoroughly with water, and consult a doctor in case of fuel contact with the eyes.
- Change your clothing in case of fuel spills on them.
- Keep fuels correctly in a suitable canister, and out of the reach of children.



**Note**

**Environmental hazard** Improper handling of fuel is a danger to the environment.

- Do not allow fuel to enter the groundwater, the soil, or the sewage system.



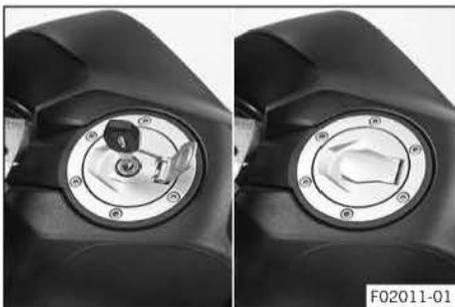
- Lift cover ① of the fuel tank filler cap and insert the ignition key into the lock.

**Note**

**Danger of damage** The ignition key may break if overloaded. Damaged ignition keys must be replaced.

- Push down on the fuel tank filler cap to take pressure off the ignition key.
- Turn the ignition key 90° clockwise.
- Lift the fuel tank filler cap.

12.2 Closing the fuel tank filler cap



- Fold down the fuel tank filler cap.
- Turn the ignition key 90° clockwise.
- Push down the fuel tank filler cap and turn the ignition key counterclockwise until the lock closes.



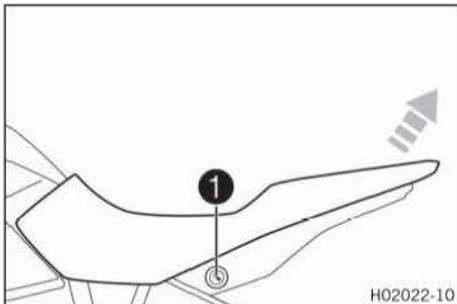
## Warning

**Fire hazard** Fuel is highly flammable, toxic and a health hazard.

- Check that the fuel tank filler cap is locked correctly after closing.
- Change your clothing if fuel spills on them.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.

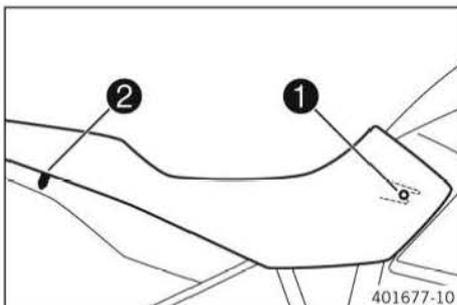
- Remove the ignition key and close the cover.

## 12.3 Removing the seat



- Insert the ignition key in seat lock ① and turn it clockwise.
- Raise the rear of the seat, pull the seat back, and lift it off.
- Remove the ignition key.

## 12.4 Mounting the seat



- Hook holding lug ① of the seat onto the fuel tank, lower the rear and push it forward.
- Insert locking pin ② into the lock housing and push down the rear of the seat until the locking pin engages with a click.
- Check that the seat is correctly mounted.

## 12.5 Removing the fuel tank



## Danger

**Fire hazard** Fuel is highly flammable.

The fuel in the fuel tank expands when warm and can escape if overfilled.

- Do not refuel the vehicle in the vicinity of open flames or lit cigarettes.
- Switch off the engine for refueling.
- Make sure that no fuel is spilled; particularly not on hot parts of the vehicle.
- If any fuel is spilled, wipe it off immediately.
- Observe the specifications for refueling.



**Warning**

**Danger of poisoning** Fuel is poisonous and a health hazard.

- Avoid skin, eye and clothing contact with fuel.
- Immediately consult a doctor if you swallow fuel.
- Do not inhale fuel vapors.
- In case of skin contact, rinse the affected area with plenty of water.
- Rinse the eyes thoroughly with water, and consult a doctor in case of fuel contact with the eyes.
- Change your clothing in case of fuel spills on them.
- Keep fuels correctly in a suitable canister, and out of the reach of children.

**Preparatory work**

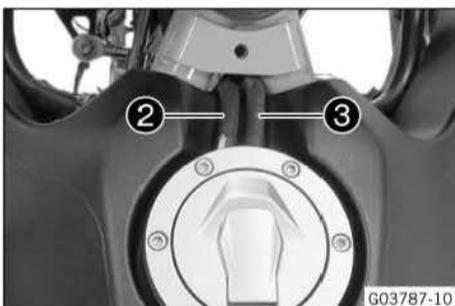
- Remove the seat. (p. 114)
- Remove the left side cover. (p. 130)
- Remove the battery cover. (p. 131)
- Remove left fuel tank spoiler. (p. 132)
- Remove the right side cover. (p. 130)
- Remove right fuel tank spoiler. (p. 134)
- Remove engine guard. (p. 138)

**Main work**

- Remove fuel tank cover ①.



- Pull off vent hoses ② and ③.



- Thoroughly clean the plug-in connection of the fuel line using compressed air.

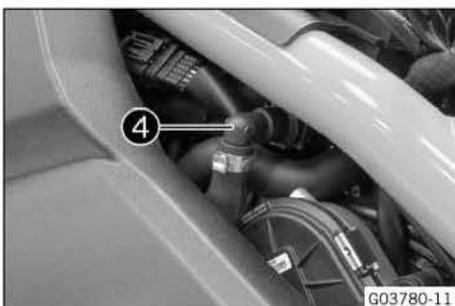
**i Info**

Under no circumstances should dirt enter into the fuel line. Dirt in the fuel line clogs the injection valve!

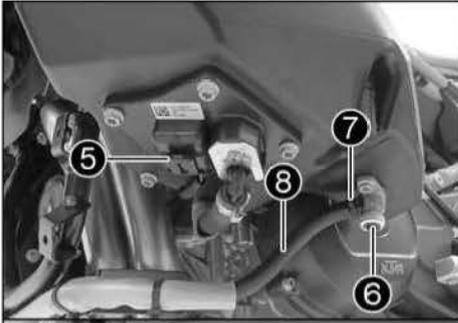
- Disconnect fuel hose connection ④.

**i Info**

Remaining fuel may flow out of the fuel hose.



## 12 FUEL TANK, SEAT, TRIM

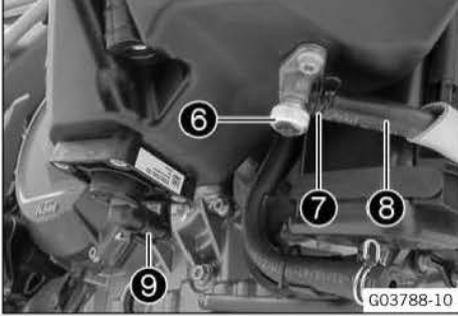


- Unplug connector 5.
- Close fuel cocks 6.
- Push back hose clips 7 and pull off fuel lines 8.

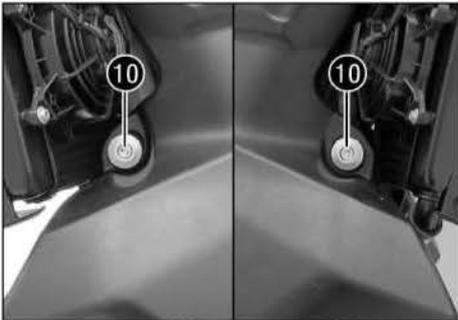


### Info

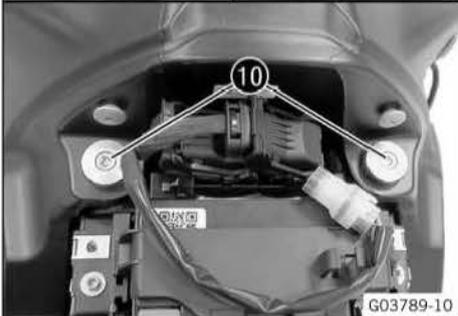
A residue of fuel may run out of the fuel lines.



- Unplug connector 9.



- Remove screws 10 with bearing sleeves and rubber bushings.



- Take off the fuel tank.

12.6 Installing the fuel tank



**Danger**

**Fire hazard** Fuel is highly flammable.

The fuel in the fuel tank expands when warm and can escape if overfilled.

- Do not refuel the vehicle in the vicinity of open flames or lit cigarettes.
- Switch off the engine for refueling.
- Make sure that no fuel is spilled; particularly not on hot parts of the vehicle.
- If any fuel is spilled, wipe it off immediately.
- Observe the specifications for refueling.



**Warning**

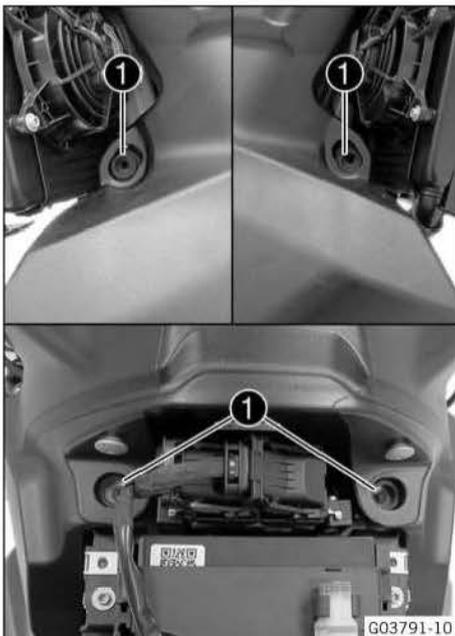
**Danger of poisoning** Fuel is poisonous and a health hazard.

- Avoid skin, eye and clothing contact with fuel.
- Immediately consult a doctor if you swallow fuel.
- Do not inhale fuel vapors.
- In case of skin contact, rinse the affected area with plenty of water.
- Rinse the eyes thoroughly with water, and consult a doctor in case of fuel contact with the eyes.
- Change your clothing in case of fuel spills on them.
- Keep fuels correctly in a suitable canister, and out of the reach of children.



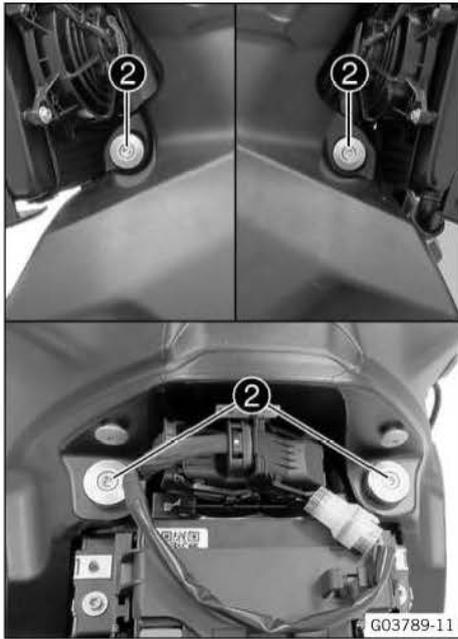
**Main work**

- Position the fuel tank.



- Check rubber bushings ① are seated properly.

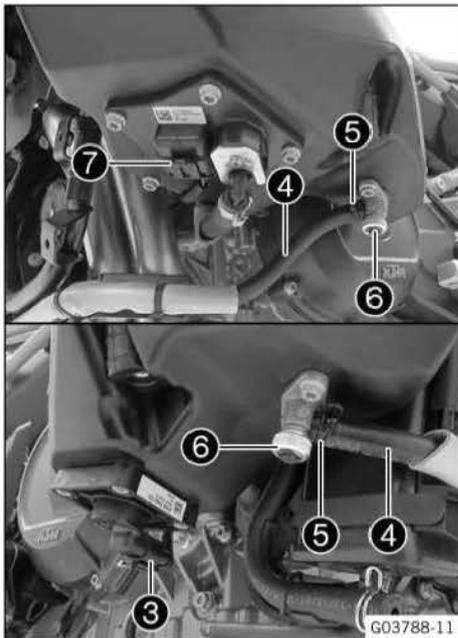
## 12 FUEL TANK, SEAT, TRIM



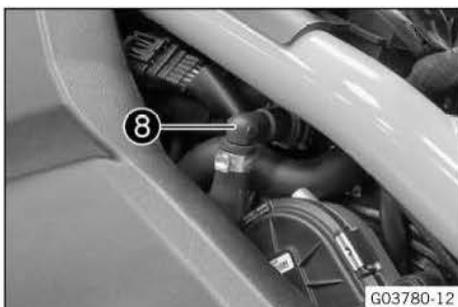
- Mount and tighten screws **2** with the bearing sleeves and the rubber bushings.

### Guideline

Screw, fuel tank	M6	10 Nm (7.4 lbf ft)
------------------	----	--------------------



- Plug in connector **3**.
- Mount fuel lines **4**.
- Position hose clips **5**.
- Open fuel cocks **6**.
- Plug in connector **7**.



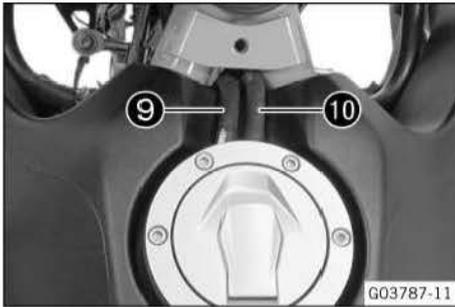
- Thoroughly clean the plug-in connection of the fuel line using compressed air.



### Info

Under no circumstances should dirt enter into the fuel line. Dirt in the fuel line clogs the injection valve!

- Join fuel hose connection **8**.



- Mount vent hoses 9 and 10.



- Mount fuel tank cover 11.

**Finishing work**

- Install the engine guard. (p. 138)
- Install the right fuel tank spoiler. (p. 135)
- Install the right side cover. (p. 131)
- Install the left fuel tank spoiler. (p. 133)
- Install the battery cover. (p. 132)
- Install the left side cover. (p. 130)
- Mount the seat. (p. 114)



**12.7 Checking the fuel pressure**



**Danger**

**Fire hazard** Fuel is highly flammable.

The fuel in the fuel tank expands when warm and can escape if overfilled.

- Do not refuel the vehicle in the vicinity of open flames or lit cigarettes.
- Switch off the engine for refueling.
- Make sure that no fuel is spilled; particularly not on hot parts of the vehicle.
- If any fuel is spilled, wipe it off immediately.
- Observe the specifications for refueling.



**Warning**

**Danger of poisoning** Fuel is poisonous and a health hazard.

- Avoid skin, eye and clothing contact with fuel.
- Immediately consult a doctor if you swallow fuel.
- Do not inhale fuel vapors.
- In case of skin contact, rinse the affected area with plenty of water.
- Rinse the eyes thoroughly with water, and consult a doctor in case of fuel contact with the eyes.
- Change your clothing in case of fuel spills on them.
- Keep fuels correctly in a suitable canister, and out of the reach of children.

## Condition

The fuel tank is completely full.  
 Ensure that the battery voltage does not drop below 12.5 V.  
 The ignition is off.  
 The diagnostic tool is connected.

## Preparatory work

- Remove the seat. (📖 p. 114)
- Remove the left side cover. (📖 p. 130)
- Remove the battery cover. (📖 p. 131)
- Remove left fuel tank spoiler. (📖 p. 132)

## Main work

- Thoroughly clean the plug-in connection of the fuel line using compressed air.



### **i** Info

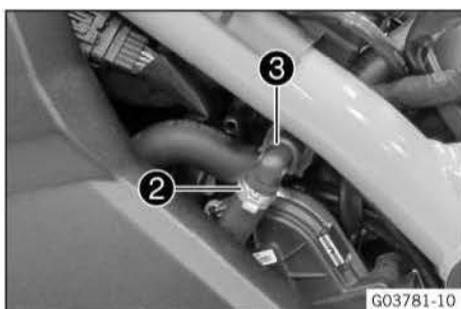
Under no circumstances should dirt enter into the fuel line. Dirt in the fuel line clogs the injection valve!

- Disconnect fuel hose connection ①.

### **i** Info

Remaining fuel may flow out of the fuel hose.

- Remove hose clamp ②.
- Remove angle piece ③.



- Remove hose clip ④.

Pressure testing tool (61029094000) (📖 p. 473)
------------------------------------------------

- Remove the hose.



- Mount special tool ⑤ and secure with a hose clip.

Pressure testing tool (61029094000) (📖 p. 473)
------------------------------------------------

- Mount special tool ⑥ with nozzle code 1,05.

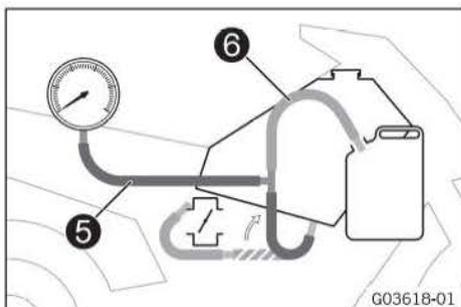
Testing hose (61029093000) (📖 p. 472)
---------------------------------------

- Position the hose end in a fuel can.

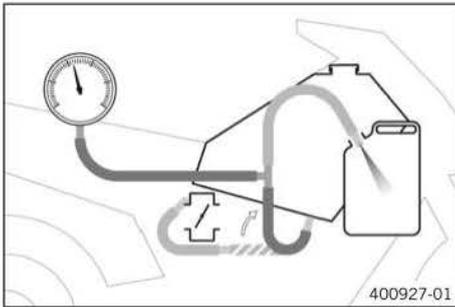
### Guideline

Minimum size, fuel can	10 l (2.6 US gal)
------------------------	-------------------

- Connect the diagnostic tool and start it.

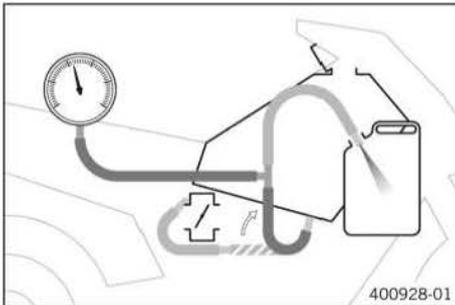


- Execute "**Engine Electronics**" > "**Actuator Test**" > "**Function test of fuel pump controller**".
- Check the fuel pressure with the fuel tank filler cap closed.



Fuel pressure	
When the fuel pump is active	3.8 ... 4.2 bar (55 ... 61 psi)

- » If the specification is not reached:
  - Open the fuel tank filler cap.
  - Check the fuel tank breather.

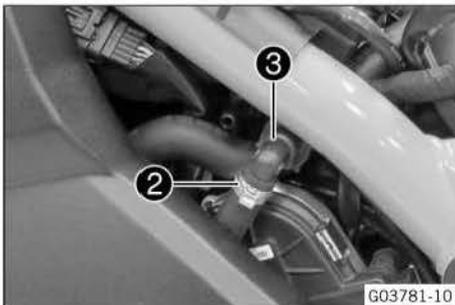


- Check the fuel pressure with the fuel tank filler cap open.

Fuel pressure	
When the fuel pump is active	3.8 ... 4.2 bar (55 ... 61 psi)

- » If the specification is not reached:
  - Check that the fuel line is clear.
  - Change the fuel filter. (📖 p. 124)
  - Change the fuel pump. (📖 p. 123)

- Finish the actuator test.
- Remove the special tools.



- Mount angle piece ③.
- Mount hose clamp ②.

Hose clamp plier (60029057000) (📖 p. 472)
-------------------------------------------



- Join fuel hose connection ①.

### Finishing work

- Install the left fuel tank spoiler. (📖 p. 133)
- Install the battery cover. (📖 p. 132)
- Install the left side cover. (📖 p. 130)
- Mount the seat. (📖 p. 114)

## 12.8 Changing the fuel level sensor



### Danger

**Fire hazard** Fuel is highly flammable.

The fuel in the fuel tank expands when warm and can escape if overfilled.

- Do not refuel the vehicle in the vicinity of open flames or lit cigarettes.
- Switch off the engine for refueling.
- Make sure that no fuel is spilled; particularly not on hot parts of the vehicle.
- If any fuel is spilled, wipe it off immediately.
- Observe the specifications for refueling.



### Warning

**Danger of poisoning** Fuel is poisonous and a health hazard.

- Avoid skin, eye and clothing contact with fuel.
- Immediately consult a doctor if you swallow fuel.
- Do not inhale fuel vapors.
- In case of skin contact, rinse the affected area with plenty of water.
- Rinse the eyes thoroughly with water, and consult a doctor in case of fuel contact with the eyes.
- Change your clothing in case of fuel spills on them.
- Keep fuels correctly in a suitable canister, and out of the reach of children.

### Note

**Material damage** Inadequate fuel quality causes the fuel filter to quickly become clogged.

In some countries and regions, the available fuel quality and cleanliness may not be sufficient. This will result in problems with the fuel system.

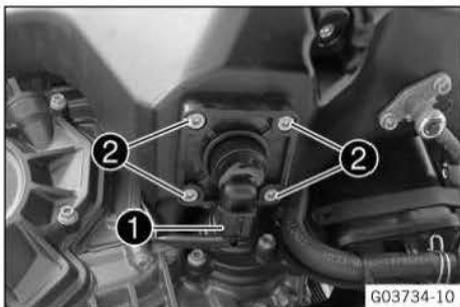
- Refuel only with clean fuel that meets the specified standards.



### Note

**Environmental hazard** Improper handling of fuel is a danger to the environment.

- Do not allow fuel to enter the groundwater, the soil, or the sewage system.



### Preparatory work

- Remove right fuel tank cover. (📖 p. 137)
- Drain the fuel from the fuel tank into a suitable container.

### Main work

- Unplug connector ①.
- Remove screws ②.
- Remove the fuel level sensor with gasket.
- Position the new fuel level sensor with gasket.
- Mount and tighten screws ②.

#### Guideline

Screw, fuel level sensor	M5	3 Nm (2.2 lbf ft)
--------------------------	----	-------------------

- Plug in connector ①.

### Finishing work

- Install the right fuel tank cover. (📖 p. 137)

12.9 Changing the fuel pump



**Danger**

**Fire hazard** Fuel is highly flammable.

The fuel in the fuel tank expands when warm and can escape if overfilled.

- Do not refuel the vehicle in the vicinity of open flames or lit cigarettes.
- Switch off the engine for refueling.
- Make sure that no fuel is spilled; particularly not on hot parts of the vehicle.
- If any fuel is spilled, wipe it off immediately.
- Observe the specifications for refueling.



**Warning**

**Danger of poisoning** Fuel is poisonous and a health hazard.

- Avoid skin, eye and clothing contact with fuel.
- Immediately consult a doctor if you swallow fuel.
- Do not inhale fuel vapors.
- In case of skin contact, rinse the affected area with plenty of water.
- Rinse the eyes thoroughly with water, and consult a doctor in case of fuel contact with the eyes.
- Change your clothing in case of fuel spills on them.
- Keep fuels correctly in a suitable canister, and out of the reach of children.

**Note**

**Material damage** Inadequate fuel quality causes the fuel filter to quickly become clogged.

In some countries and regions, the available fuel quality and cleanliness may not be sufficient. This will result in problems with the fuel system.

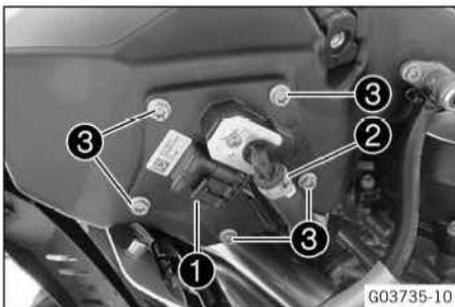
- Refuel only with clean fuel that meets the specified standards.



**Note**

**Environmental hazard** Improper handling of fuel is a danger to the environment.

- Do not allow fuel to enter the groundwater, the soil, or the sewage system.



**Preparatory work**

- Remove left fuel tank cover. (📖 p. 136)
- Drain the fuel from the fuel tank into a suitable container.

**Main work**

- Unplug connector ①.
- Remove hose clamp ② and pull off the fuel hose.
- Remove screws ③.
- Remove the fuel pump with the gasket.



**Info**

Remaining fuel may flow out of the fuel tank. Place an appropriate container under the engine.

- Position the new fuel pump with the gasket.
- Mount and tighten screws ③.

**Guideline**

Screw, fuel pump	M6	6 Nm (4.4 lbf ft)
------------------	----	-------------------

- Mount fuel hose.

- Mount hose clamp ②.

Hose clamp plier (60029057000) (📖 p. 472)

- Plug in connector ①.

#### Finishing work

- Install the left fuel tank cover. (📖 p. 136)

## 12.10 Changing the fuel filter



### Danger

**Fire hazard** Fuel is highly flammable.

The fuel in the fuel tank expands when warm and can escape if overfilled.

- Do not refuel the vehicle in the vicinity of open flames or lit cigarettes.
- Switch off the engine for refueling.
- Make sure that no fuel is spilled; particularly not on hot parts of the vehicle.
- If any fuel is spilled, wipe it off immediately.
- Observe the specifications for refueling.



### Warning

**Danger of poisoning** Fuel is poisonous and a health hazard.

- Avoid skin, eye and clothing contact with fuel.
- Immediately consult a doctor if you swallow fuel.
- Do not inhale fuel vapors.
- In case of skin contact, rinse the affected area with plenty of water.
- Rinse the eyes thoroughly with water, and consult a doctor in case of fuel contact with the eyes.
- Change your clothing in case of fuel spills on them.
- Keep fuels correctly in a suitable canister, and out of the reach of children.

### Note

**Material damage** Inadequate fuel quality causes the fuel filter to quickly become clogged.

In some countries and regions, the available fuel quality and cleanliness may not be sufficient. This will result in problems with the fuel system.

- Refuel only with clean fuel that meets the specified standards.



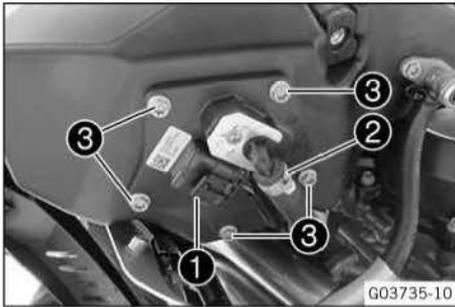
### Note

**Environmental hazard** Improper handling of fuel is a danger to the environment.

- Do not allow fuel to enter the groundwater, the soil, or the sewage system.

### Preparatory work

- Remove left fuel tank cover. (📖 p. 136)
- Drain the fuel from the fuel tank into a suitable container.



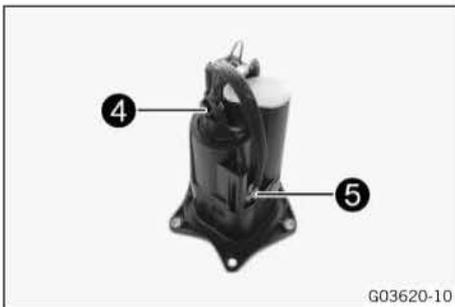
### Main work

- Unplug connector ①.
- Remove hose clamp ② and pull off the fuel hose.
- Remove screws ③.
- Remove the fuel pump with the gasket.

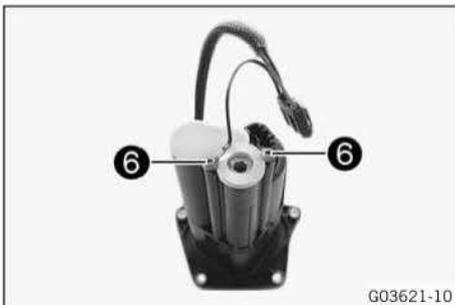


### Info

Remaining fuel may flow out of the fuel tank.  
Place an appropriate container under the engine.



- Detach connectors ④ and ⑤.



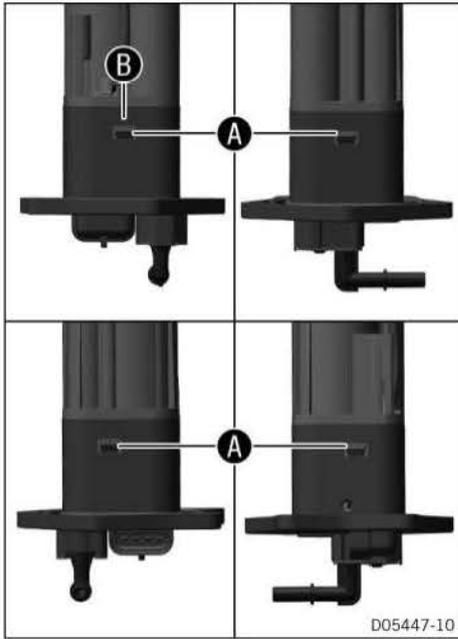
- Remove screws ⑥.
- Take off the cables.



- Remove retaining washer ⑦.



- Remove pressure control valve ⑧ with O-ring.



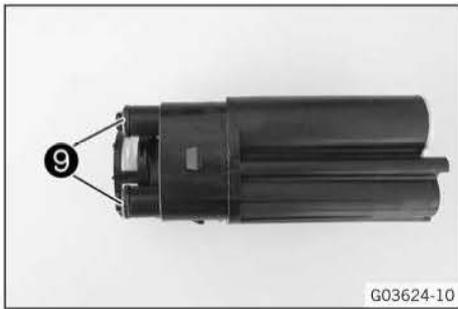
- Disengage locking mechanisms **A** on all sides in area **B**.



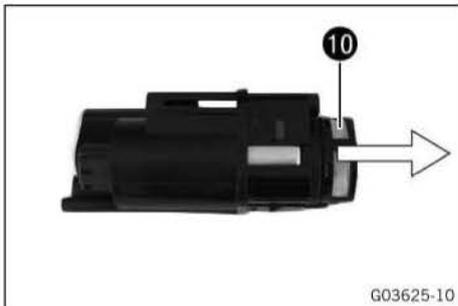
**Info**

The housing halves are damaged in this step and are contained in the filter set.

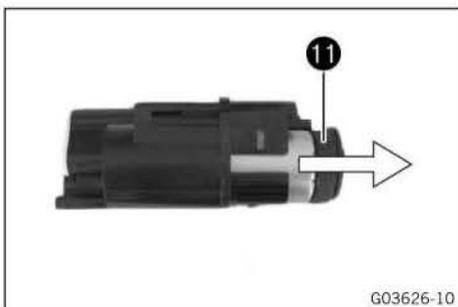
- Disengage housing halves.



- Remove O-rings **9**.



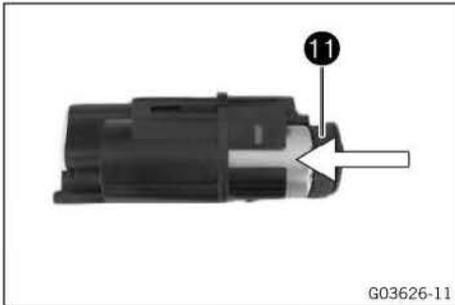
- Pull fuel filter **10** off the fuel pump.



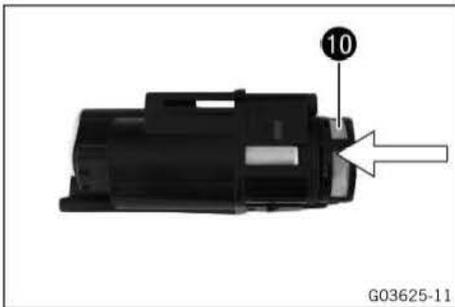
- Pull fuel pump **11** out of the fuel pump housing.



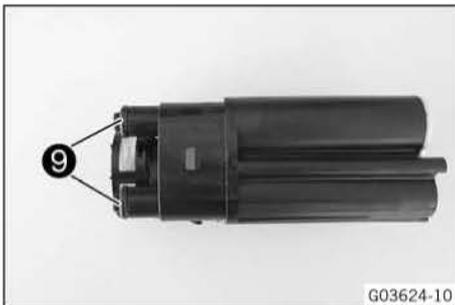
- Remove O-ring 12 and mount new O-ring.



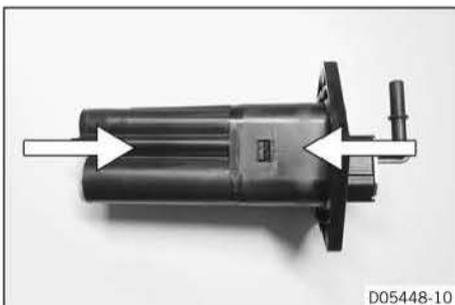
- Mount fuel pump 11 in new fuel pump housing.



- Mount new fuel filter 10 on the fuel pump.



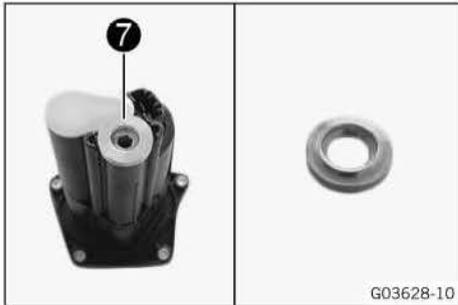
- Mount new O-rings 9.



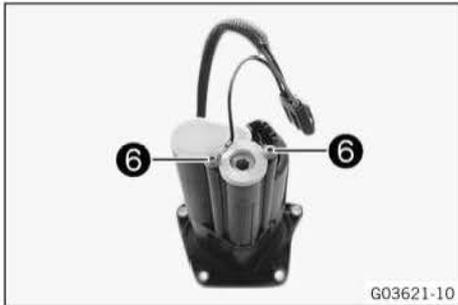
- Join housing halves and allow to click into place.



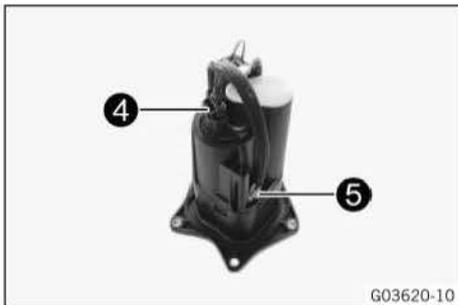
- Mount pressure control valve **8** with new O-ring.



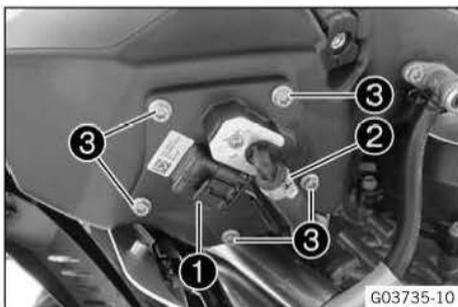
- Position retaining waster **7** with the collar facing downward.



- Position the ground wire.
- Mount and tighten screws **6**.



- Plug in connectors **5** and **4**.



- Position the fuel pump with the gasket.
- Mount and tighten screws **3**.

**Guideline**

Screw, fuel pump	M6	6 Nm (4.4 lbf ft)
------------------	----	-------------------

- Mount fuel hose.
- Mount hose clamp **2**.

Hose clamp plier (60029057000) (p. 472)
-----------------------------------------

- Plug in connector **1**.

**Finishing work**

- Install the left fuel tank cover. (p. 136)

12.11 Refueling



**Danger**

**Fire hazard** Fuel is highly flammable.

The fuel in the fuel tank expands when warm and can escape if overfilled.

- Do not refuel the vehicle in the vicinity of open flames or lit cigarettes.
- Switch off the engine for refueling.
- Make sure that no fuel is spilled; particularly not on hot parts of the vehicle.
- If any fuel is spilled, wipe it off immediately.
- Observe the specifications for refueling.



**Warning**

**Danger of poisoning** Fuel is poisonous and a health hazard.

- Avoid skin, eye and clothing contact with fuel.
- Immediately consult a doctor if you swallow fuel.
- Do not inhale fuel vapors.
- In case of skin contact, rinse the affected area with plenty of water.
- Rinse the eyes thoroughly with water, and consult a doctor in case of fuel contact with the eyes.
- Change your clothing in case of fuel spills on them.

**Note**

**Material damage** Inadequate fuel quality causes the fuel filter to quickly become clogged.

In some countries and regions, the available fuel quality and cleanliness may not be sufficient. This will result in problems with the fuel system.

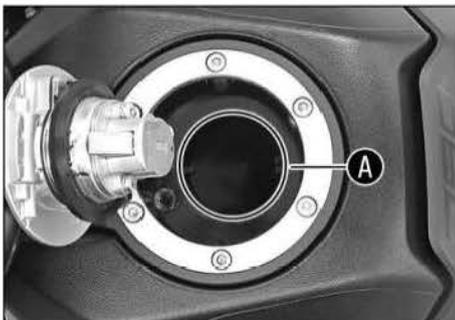
- Refuel only with clean fuel that meets the specified standards.



**Note**

**Environmental hazard** Improper handling of fuel is a danger to the environment.

- Do not allow fuel to enter the groundwater, the soil, or the sewage system.



- Switch off the engine.
- Open the fuel tank filler cap. (📖 p. 113)
- Fill the fuel tank with fuel up to the lower edge **A** of the filler neck.

Total fuel tank capacity, approx.	20 l (5.3 US gal)	Super unleaded (ROZ 95/RON 95/PON 91) (📖 p. 465)
-----------------------------------	----------------------	--------------------------------------------------------

- Close the fuel tank filler cap. (📖 p. 113)



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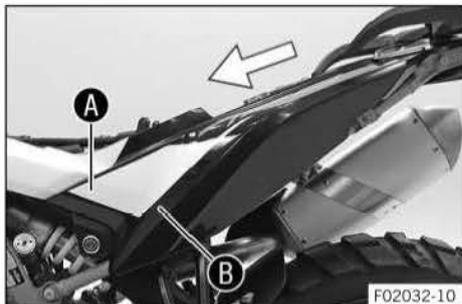
## 13.1 Removing the left side cover

### Preparatory work

- Remove the seat. (🗨️ p. 114)

### Main work

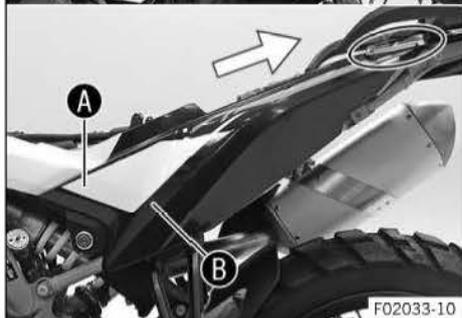
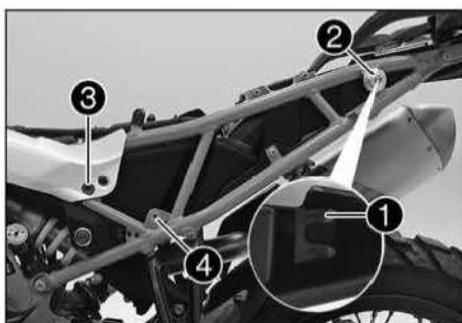
- Remove left side cover from the rubber bushings in the areas **A** and **B**.
- Pull off the left side cover sideways and remove it toward the front.



## 13.2 Installing the left side cover

### Main work

- Position the left side cover with holding lug **1** on bushing **2** and push backward.
  - ✓ The left side cover engages under the tail part.
- Press the left side cover in area **A** into rubber bushing **3** and press into rubber bushing **B** in area **4**.



### Finishing work

- Mount the seat. (🗨️ p. 114)

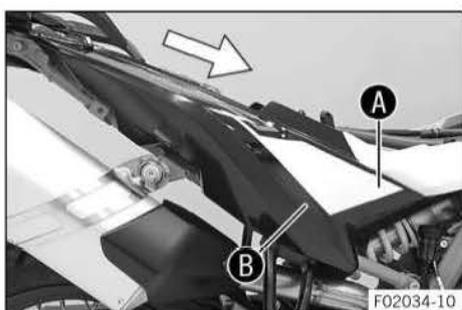
## 13.3 Removing the right side cover

### Preparatory work

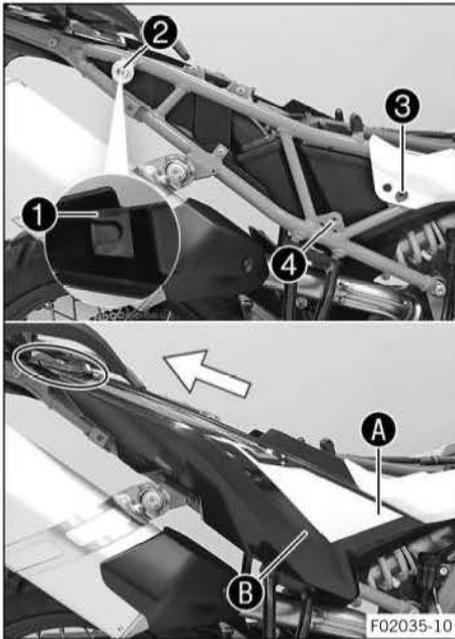
- Remove the seat. (🗨️ p. 114)

### Main work

- Remove the side cover from the rubber bushings in areas **A** and **B**.
- Pull off the right side cover sideways and remove it toward the front.



**13.4 Installing the right side cover**



**Main work**

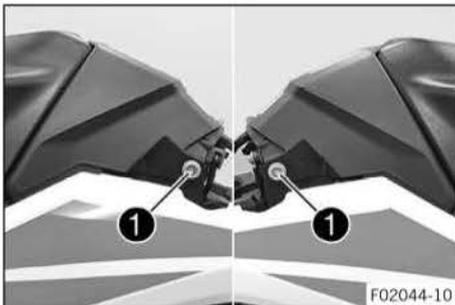
- Position the right side cover with holding lug ① on bushing ② and push backward.
- ✓ The right side cover engages under the tail part.
- Press the right side cover in the area A into rubber bushing ③ and press into rubber bushing B in area ④.

**Finishing work**

- Mount the seat. (📖 p. 114)



**13.5 Removing the battery cover**



**Preparatory work**

- Remove the seat. (📖 p. 114)

**Main work**

- Remove screws ① with the bushings.
- Remove the battery cover from above.



## 13.6 Installing the battery cover



### Main work

- Position the battery cover with holding lugs **1** on bushings **2** and push downward.
- ✓ The battery cover engages on the left and right under the fuel tank spoiler.
- Mount screws **3** with the bushings and tighten.

### Guideline

Screw, seat fixing	M6	5 Nm (3.7 lbf ft)
--------------------	----	-------------------

### Finishing work

- Mount the seat. (📖 p. 114)

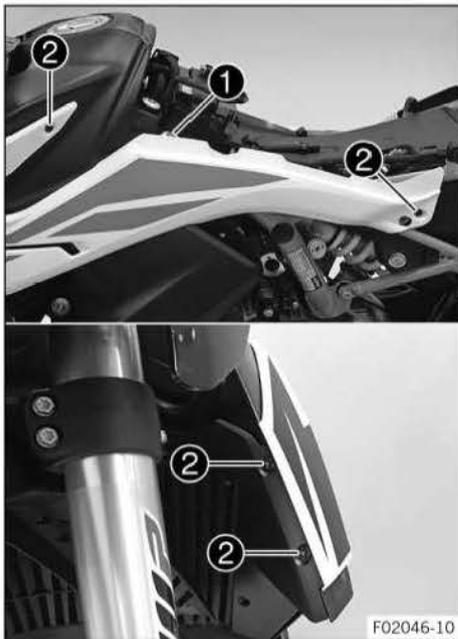
## 13.7 Removing left fuel tank spoiler

### Preparatory work

- Remove the seat. (📖 p. 114)
- Remove the left side cover. (📖 p. 130)
- Remove the battery cover. (📖 p. 131)

### Main work

- Remove screw **1**.
- Remove screws **2**.





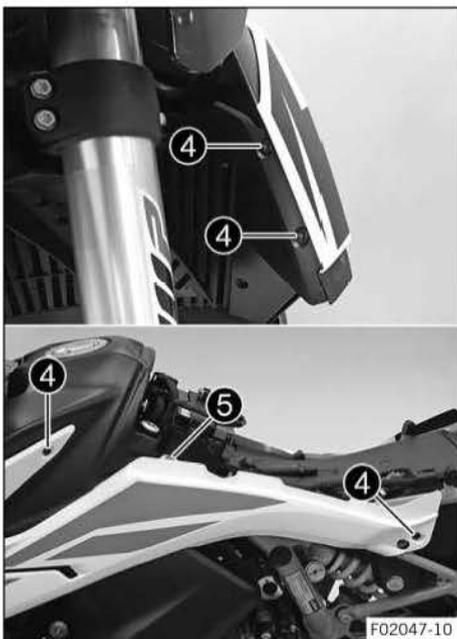
- Remove the left fuel tank spoiler from the rubber bushing in area **A**.
- Pull off the left fuel tank spoiler sideways and remove it toward the front.

**13.8 Installing the left fuel tank spoiler**



**Main work**

- Position the left fuel tank spoiler with holding lug **1** on bushing **2** and push backward laterally.
- Press the fuel tank spoiler into rubber bushing **3** in area **A**.



- Mount screws **4**, but do not tighten yet.

**Guideline**

Remaining screws, chassis	M5	5 Nm (3.7 lbf ft)
---------------------------	----	-------------------

- Mount screw **5**, but do not tighten yet.

**Guideline**

Screw, fuel tank spoiler	M6	5 Nm (3.7 lbf ft)
--------------------------	----	-------------------

- ✓ The front edge of the left fuel tank spoiler is evenly aligned.

- Tighten all the screws of the left fuel tank spoiler.

**Guideline**

Remaining screws, chassis	M5	5 Nm (3.7 lbf ft)
Screw, fuel tank spoiler	M6	5 Nm (3.7 lbf ft)

## Finishing work

- Install the battery cover. (🔧 p. 132)
- Install the left side cover. (🔧 p. 130)
- Mount the seat. (🔧 p. 114)

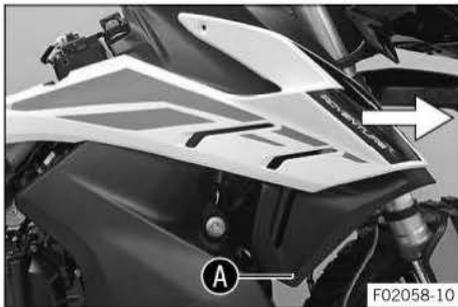
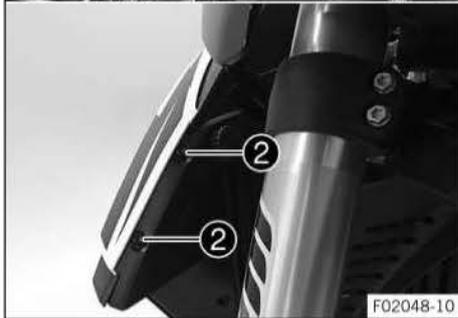
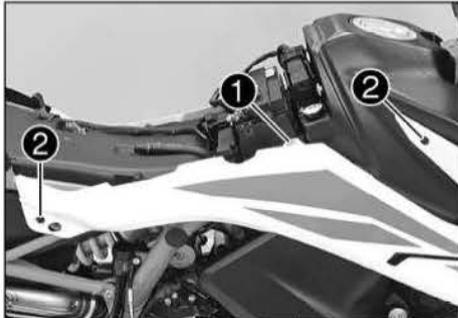
## 13.9 Removing right fuel tank spoiler

### Preparatory work

- Remove the seat. (🔧 p. 114)
- Remove the right side cover. (🔧 p. 130)
- Remove the battery cover. (🔧 p. 131)

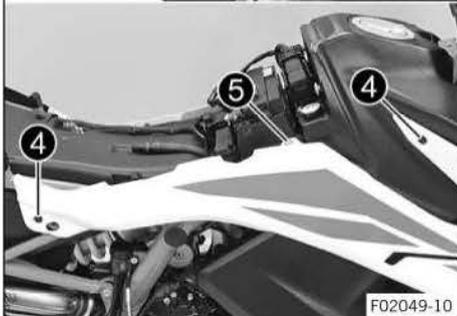
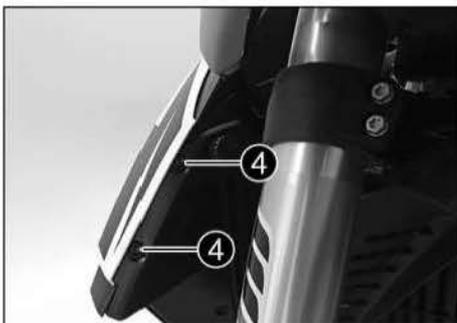
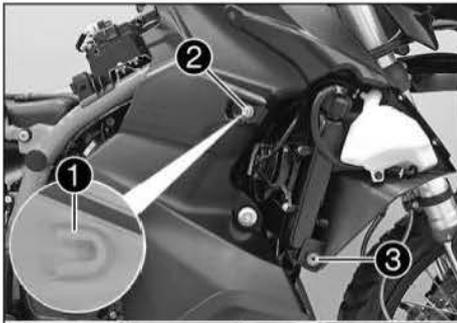
### Main work

- Remove screw ①.
- Remove screws ②.



- Remove the fuel tank spoiler from the rubber bushing in area A.
- Pull off the right fuel tank spoiler sideways and remove it toward the front.

**13.10 Installing the right fuel tank spoiler**



**Main work**

- Position the right fuel tank spoiler with holding lug ① on bushing ② and push backward laterally.
- Press the right fuel tank spoiler into rubber bushing ③ in area A.

- Mount screws ④, but do not tighten yet.

Guideline

Remaining screws, chassis	M5	5 Nm (3.7 lbf ft)
---------------------------	----	-------------------

- Mount screw ⑤, but do not tighten yet.

Guideline

Screw, fuel tank spoiler	M6	5 Nm (3.7 lbf ft)
--------------------------	----	-------------------

- ✓ The front edge of the right fuel tank spoiler is evenly aligned.

- Tighten all the screws of the right fuel tank spoiler.

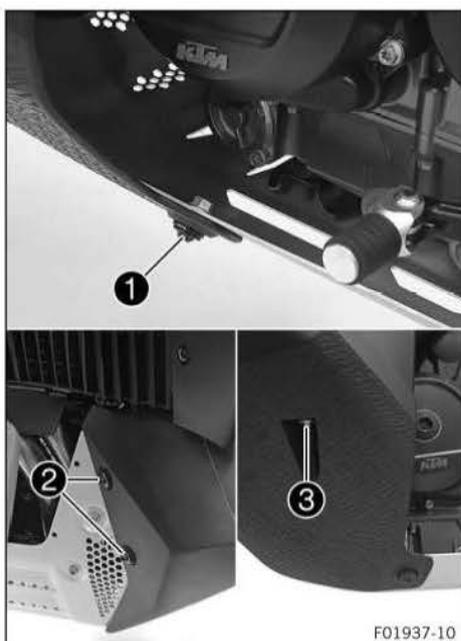
Guideline

Remaining screws, chassis	M5	5 Nm (3.7 lbf ft)
Screw, fuel tank spoiler	M6	5 Nm (3.7 lbf ft)

**Finishing work**

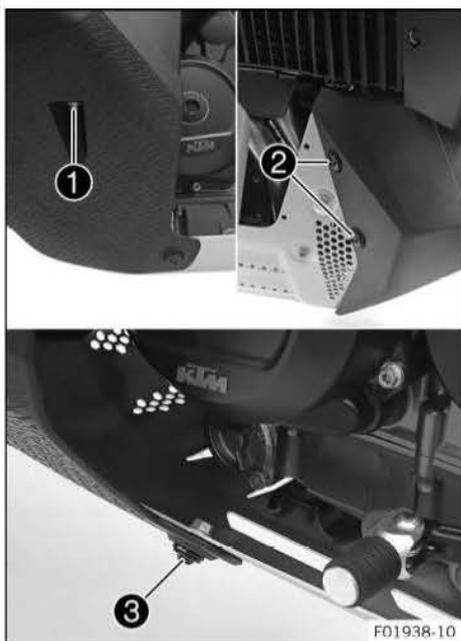
- Install the battery cover. (📖 p. 132)
- Install the right side cover. (📖 p. 131)
- Mount the seat. (📖 p. 114)

## 13.11 Removing left fuel tank cover



- Remove fitting ①.
- Remove screws ②.
- Remove screw ③.
- Remove left fuel tank cover.

## 13.12 Installing the left fuel tank cover



- Position the left fuel tank cover.
- Mount and tighten screw ①.

Guideline

Screw, fuel tank cover	M6x12	8 Nm (5.9 lbf ft)
------------------------	-------	-------------------

- Mount screws ②, but do not tighten yet.

Guideline

Screw, fuel tank cover	M6x18	5 Nm (3.7 lbf ft) <b>Loctite®243™</b>
------------------------	-------	------------------------------------------

- Mount fitting ③, but do not tighten yet.

Guideline

Screw, fuel tank cover	M6	5 Nm (3.7 lbf ft) <b>Loctite®243™</b>
------------------------	----	------------------------------------------

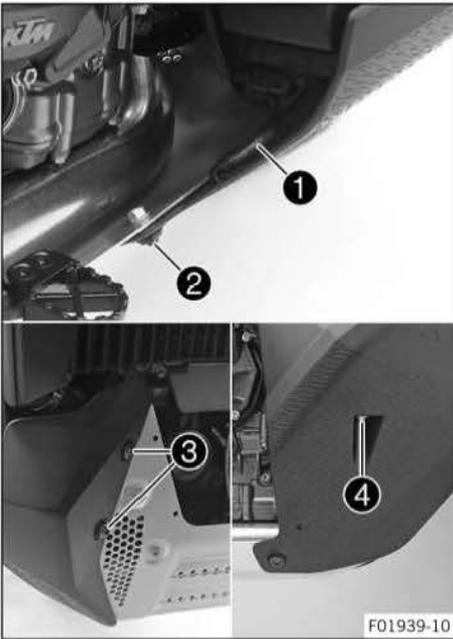
✓ The left fuel tank cover is directed evenly toward the front.

- Tighten all the screws of the left fuel tank cover.

Guideline

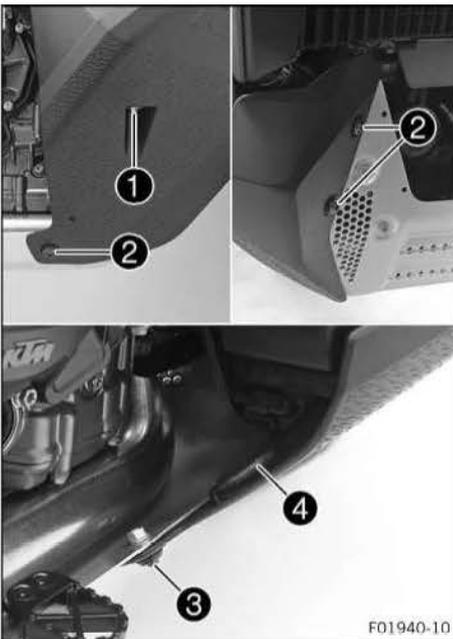
Screw, fuel tank cover	M6x12	8 Nm (5.9 lbf ft)
Screw, fuel tank cover	M6x18	5 Nm (3.7 lbf ft) <b>Loctite®243™</b>
Screw, fuel tank cover	M6	5 Nm (3.7 lbf ft) <b>Loctite®243™</b>

**13.13 Removing right fuel tank cover**



- Pull out tube **1** from the angle piece.
- Remove fitting **2**.
- Remove screws **3**.
- Remove screw **4**.
- Remove right fuel tank cover.

**13.14 Installing the right fuel tank cover**



- Position the right fuel tank cover.
- Mount and tighten screw **1**.

Guideline

Screw, fuel tank cover	M6x12	8 Nm (5.9 lbf ft)
------------------------	-------	-------------------

- Mount screws **2**, but do not tighten yet.

Guideline

Screw, fuel tank cover	M6x18	5 Nm (3.7 lbf ft) <b>Loctite®243™</b>
------------------------	-------	------------------------------------------

- Mount fitting **3**, but do not tighten yet.

Guideline

Screw, fuel tank cover	M6	5 Nm (3.7 lbf ft) <b>Loctite®243™</b>
------------------------	----	------------------------------------------

✓ The right fuel tank cover is directed evenly toward the front.

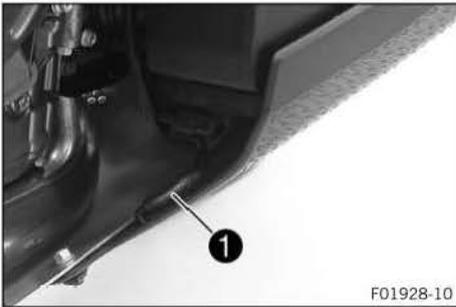
- Tighten all the screws of the right fuel tank cover.

Guideline

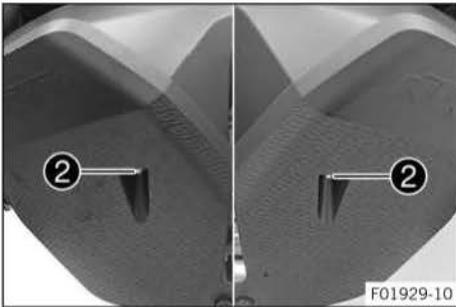
Screw, fuel tank cover	M6x12	8 Nm (5.9 lbf ft)
Screw, fuel tank cover	M6x18	5 Nm (3.7 lbf ft) <b>Loctite®243™</b>
Screw, fuel tank cover	M6	5 Nm (3.7 lbf ft) <b>Loctite®243™</b>

- Attach tube **4** to the angle piece.

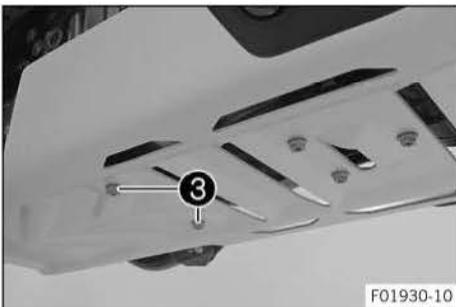
## 13.15 Removing engine guard



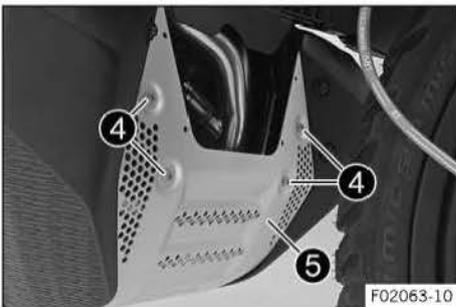
- Pull out tube **1** from the angle piece.



- Remove screws **2**.

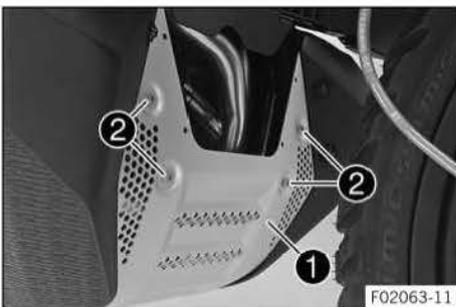


- Remove screws **3**.



- Remove screws **4** and engine guard **5**.

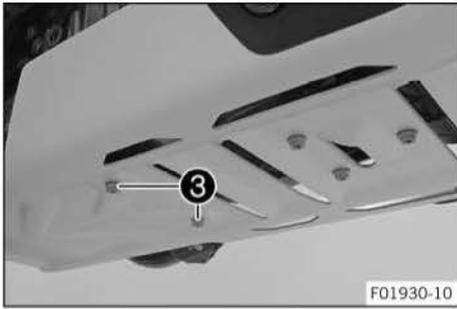
## 13.16 Installing the engine guard



- Position engine guard **1**.
- Mount screws **2**, but do not tighten yet.

Guideline

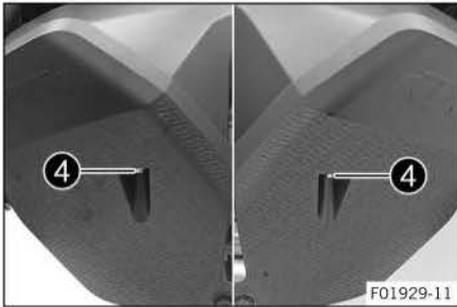
Screw, engine guard	M6x10	10 Nm (7.4 lbf ft) <b>Loctite®243™</b>
---------------------	-------	-------------------------------------------



- Mount screws **3**, but do not tighten yet.

Guideline

Screw, engine guard	M6x8	8 Nm (5.9 lbf ft)
---------------------	------	-------------------



- Mount screws **4**, but do not tighten yet.

Guideline

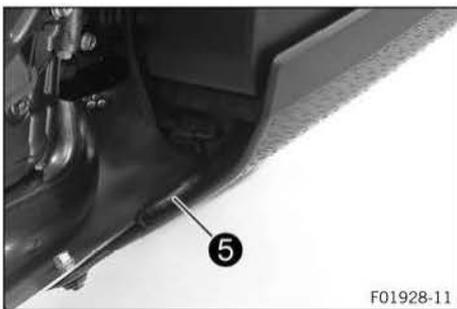
Screw, fuel tank cover	M6x12	8 Nm (5.9 lbf ft)
------------------------	-------	-------------------

✓ The engine guard is directed evenly toward the front.

- Tighten all the screws of the engine guard.

Guideline

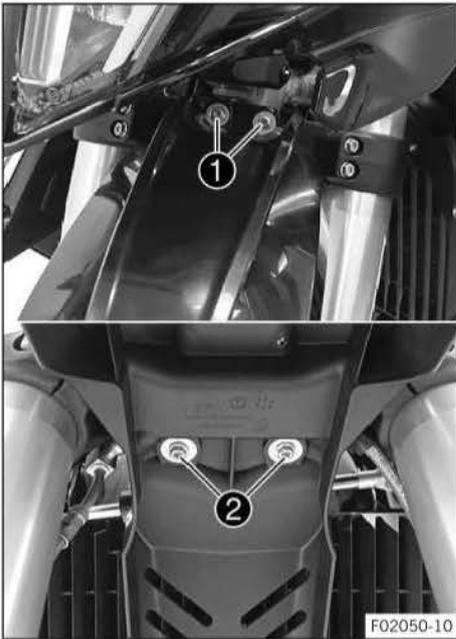
Screw, engine guard	M6x8	8 Nm (5.9 lbf ft)
Screw, engine guard	M6x10	10 Nm (7.4 lbf ft) <b>Loctite®243™</b>
Screw, fuel tank cover	M6x12	8 Nm (5.9 lbf ft)



- Attach tube **5** to the angle piece.

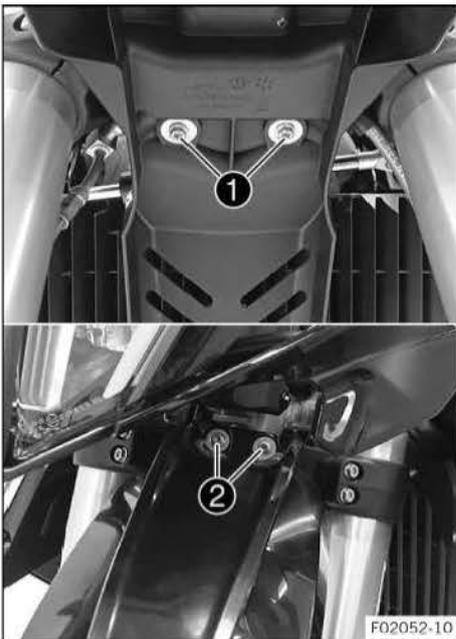


## 13.17 Removing the front fender



- Remove screws **1**.
- Remove screws **2**.
- Take the fender off to the front.

## 13.18 Installing the front fender



- Position the front fender. Mount screws **1**, but do not tighten yet.

Guideline

Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
---------------------------	----	--------------------

- Mount screws **2**, but do not tighten yet.

Guideline

Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
---------------------------	----	--------------------

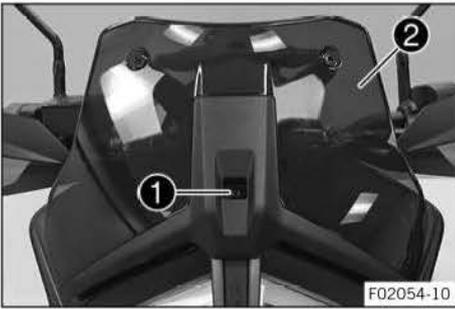
✓ The fender is evenly aligned to the front.

- Tighten all screws on the front fender.

Guideline

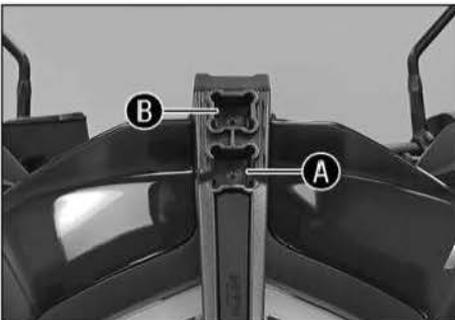
Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
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**13.19 Removing the windshield**



- Remove screw 1 and windshield 2.

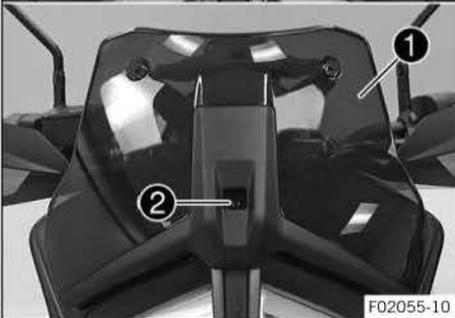
**13.20 Installing the windshield**



- Position windshield 1 in upper recess A or in lower recess B.
- Mount and tighten screw 2.

Guideline

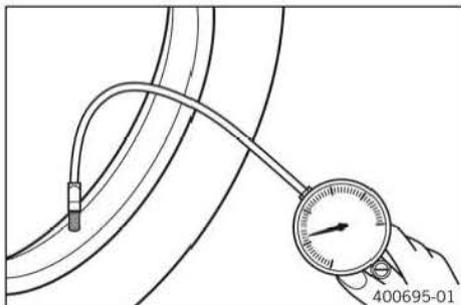
Remaining screws, chassis	M5	5 Nm (3.7 lbf ft)
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## 14.1 Checking tire pressure

### **i** Info

Low tire pressure leads to abnormal wear and overheating of the tire. Correct tire pressure ensures optimal riding comfort and maximum tire service life.



- Remove protection cap.
- Check tire pressure when the tires are cold.

Tire pressure solo / with passenger	
front	2.4 bar (35 psi)
rear	2.4 bar (35 psi)

Offroad tire pressure	
front	1.8 bar (26 psi)
rear	1.8 bar (26 psi)

Tire pressure full payload	
front	2.6 bar (38 psi)
rear	2.9 bar (42 psi)

- » If the tire pressure does not meet specifications:
  - Correct tire pressure.
- Mount the protection cap.

## 14.2 Checking the tire condition



### Warning

**Danger of accidents** If a tire bursts while riding, the vehicle becomes uncontrollable.

- Ensure that damaged or worn tires are replaced immediately.



### Warning

**Danger of crashing** Different tire tread patterns on the front and rear wheel impair the handling characteristic.

Different tire tread patterns can make the vehicle significantly more difficult to control.

- Make sure that only tires with a similar tire tread pattern are fitted to the front and rear wheel.



### Warning

**Danger of accidents** Non-approved or non-recommended tires and wheels impact the handling characteristic.

- Only use tires/wheels approved by KTM with the corresponding speed index.



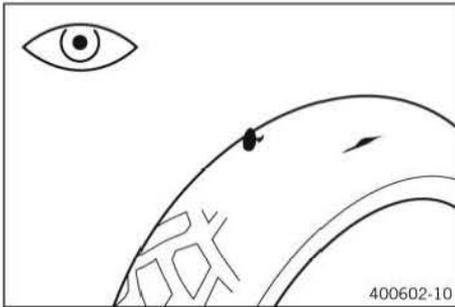
### Warning

**Danger of accidents** New tires have reduced road grip.

The contact surface on new tires is not yet roughened.

- Run in new tires with moderate riding at alternating angles.  
Running-in phase 200 km (124 mi)

**i Info** Tire type, tire condition, and tire pressure influence the braking and handling characteristics of the vehicle. Worn tires have a negative effect on handling characteristics, especially on wet surfaces.

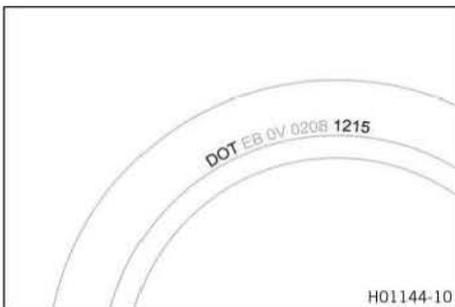


- Check the front and rear tires for cuts, embedded objects, and other damage.
  - » If the tires have cuts, run-in objects, or other damage:
    - Change the tires.
- Check the tread depth.

**i Info** Adhere to the legally required minimum tread depth.

Minimum tread depth	≥ 2 mm (≥ 0.08 in)
---------------------	--------------------

- » If the tread depth is less than the minimum tread depth:
  - Change the tires.



- Check the tire age.

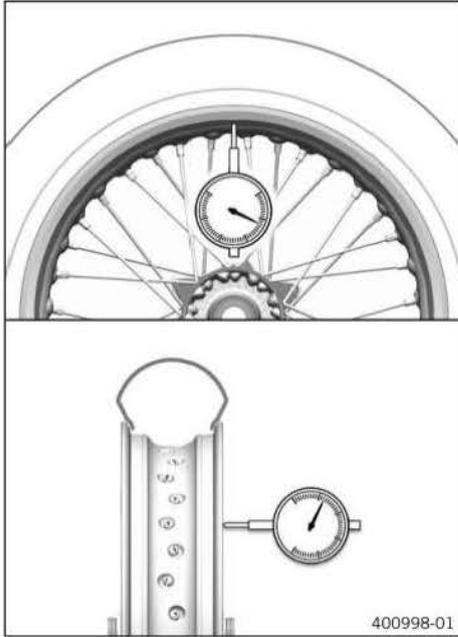
**i Info** The tire date of manufacture is usually contained in the tire label and is indicated by the last four digits of the **DOT** number. The first two digits indicate the week of manufacture and the last two digits the year of manufacture. KTM recommends that the tires be changed after 5 years at the latest, regardless of the actual state of wear.

- » If the tires are more than 5 years old:
  - Change the tires.

### 14.3 Checking the rim run-out

**Warning** **Danger of accidents** Incorrectly tensioned spokes impair the handling characteristic and result in secondary damage. The spokes break due to being overloaded if they are too tightly tensioned. If the tension in the spokes is too low, then lateral and radial run-out will form in the wheel. Other spokes will become looser as a result.

- Check spoke tension regularly, and in particular on a new vehicle.



- Check for lateral and radial run-out of the rims.

Lateral runout	
outside the rim joint	< 1.8 mm (< 0.071 in)

Radial runout	
outside the rim joint	< 1.8 mm (< 0.071 in)

- » If the measured value is greater than the specified value:
  - Center the rim.

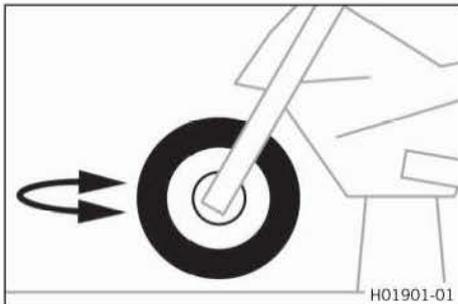
**i Info**  
Center the rim by pulling the spoke nipple on the other side of the rim run-out. If there is significant deformation, change the rim.

- Correct the spoke tension.

## 14.4 Checking the wheel bearing for play

### Preparatory work

- Remove the main silencer. (📖 p. 100)
- Raise the motorcycle at the rear using the work stand. (📖 p. 15)
- Place a load on the rear of the vehicle.
- ✓ The front wheel is not in contact with the ground.

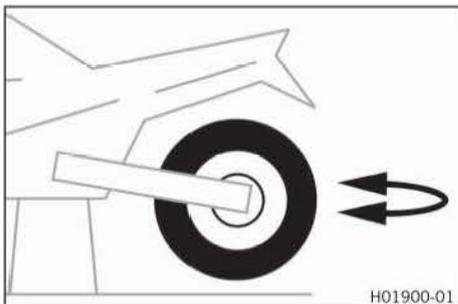


### Main work

- Move the front wheel from side to side.

**i Info**  
Hold fork leg to check it.

- » If there is detectable play:
  - Change front wheel bearing. (📖 p. 149)



- Place a load on the front of the vehicle.
- ✓ The rear wheel is not in contact with the ground.
- Move the rear wheel from side to side.

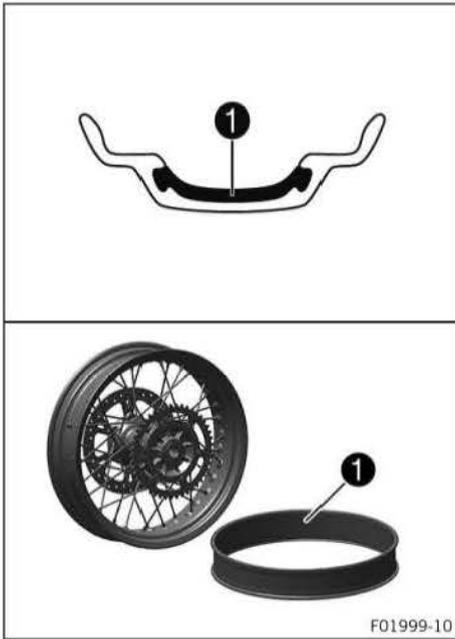
**i Info**  
Hold link fork to check it.

- » If there is detectable play:
  - Change the rear wheel bearing. (📖 p. 163)

### Finishing work

- Remove the motorcycle from the work stand at the rear. (📖 p. 16)
- Install the main silencer. (📖 p. 100)

14.5 Tubeless tire system



This vehicle uses a tubeless tire system in which a rim seal band 1 is used instead of the conventional tube. The advantages of the tubeless system lie in the absence of danger from a faulty tube. This greatly reduces the risk of a sudden loss in pressure. The masses and moments of inertia of these wheels are smaller than in conventional spoke wheels with a tube. This results in better handling and riding comfort. The rigid rim design results in a spoke wheel that is almost entirely maintenance-free. KTM recommends that the rim seal band be changed after 5 years at the latest, regardless of the actual state of wear.

14.6 Checking spoke tension

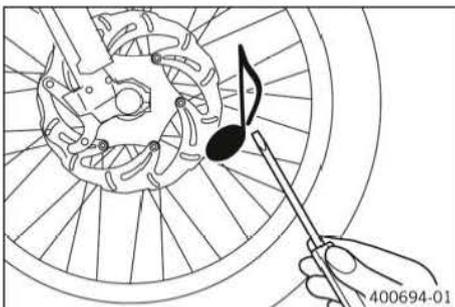


**Warning**

**Danger of accidents** Incorrectly tensioned spokes impair the handling characteristic and result in secondary damage.

The spokes break due to being overloaded if they are too tightly tensioned. If the tension in the spokes is too low, then lateral and radial run-out will form in the wheel. Other spokes will become looser as a result.

- Check spoke tension regularly, and in particular on a new vehicle.



- Strike each spoke briefly using a screwdriver blade.



**Info**

The frequency of the sound depends on the spoke length and spoke diameter. If spokes of the same length and diameter vibrate with a different tone, this is an indication that the spoke tensions differ.

You should hear a high note.

- » If the spoke tension differs:
  - Correct the spoke tension.



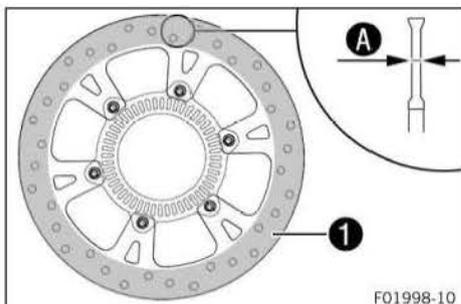
## 14.7 Checking brake discs



### Warning

**Danger of accidents** Worn-out brake discs reduce the braking effect.

- Make sure that worn-out brake discs are replaced immediately.



- Check front and rear brake disc thickness at multiple points for the dimension **A**.

### Info

Wear will reduce the thickness of the brake disc at contact surface **1** of the brake linings.

#### Brake discs - wear limit

front	4.5 mm (0.177 in)
rear	4.5 mm (0.177 in)

- » If the brake disc thickness is less than the specified value.
  - Change the front brake discs. (📖 p. 151)
  - Change the rear brake disc. (📖 p. 166)
- Check front and rear brake discs for damage, cracking, and deformation.
  - » If the brake disc exhibits damage, cracking, or deformation:
    - Change the front brake discs. (📖 p. 151)
    - Change the rear brake disc. (📖 p. 166)

## 14.8 Programming the tire pressure sensor (Option: With TPMS)

### Condition

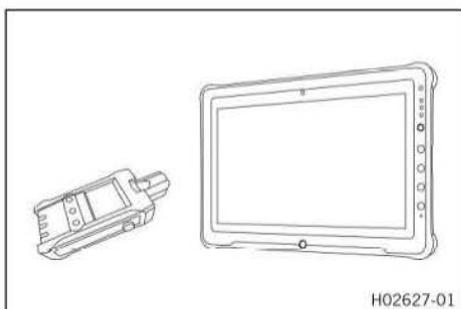
The diagnostic tool is connected and running.

- Execute **"Tire pressure monitor" > "Functions" > "Program the tire pressure sensor" > "Select the wheel"**.

### Info

The instructions must be followed precisely.

- Clear the fault memory using the KTM diagnostics tool.
  - » Take a test ride.
    - Read out the trouble code memory using the KTM diagnostics tool.



## 14.9 Front wheel

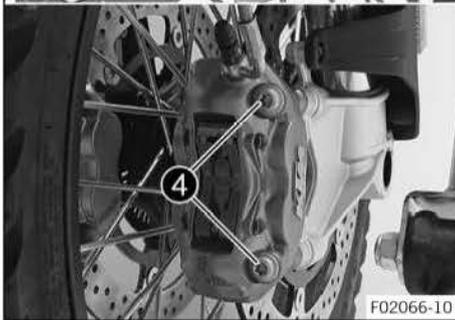
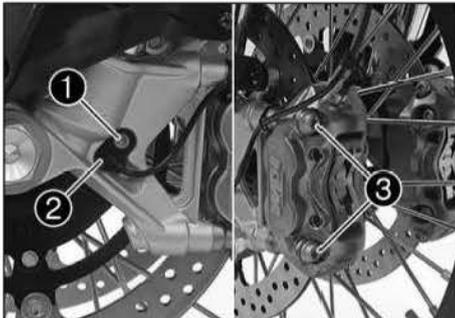
### 14.9.1 Removing the front wheel

#### Preparatory work

- Raise motorcycle with rear lifting gear. (📖 p. 15)
- Remove the front fender. (📖 p. 140)
- Lift the motorcycle with the front lifting gear. (📖 p. 14)

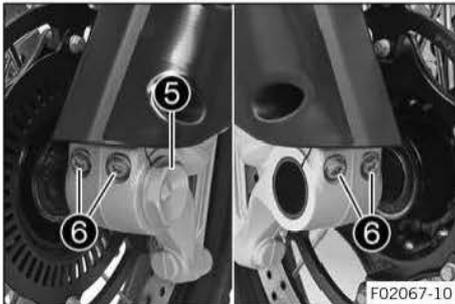
#### Main work

- Remove screw ① and pull wheel speed sensor ② out of the hole.
- Remove screws ③ and ④.
- Press back the brake linings by slightly tilting the left and right brake caliper laterally on the brake disc. Pull the left and right brake caliper carefully back from the brake disc and hang to the side.



#### Info

Do not operate the hand brake lever if the brake calipers have been removed.



- Loosen screw ⑤ by several rotations.
- Loosen screws ⑥.
- Press on screw ⑤ to push the wheel spindle out of the axle clamp.
- Remove screw ⑤.

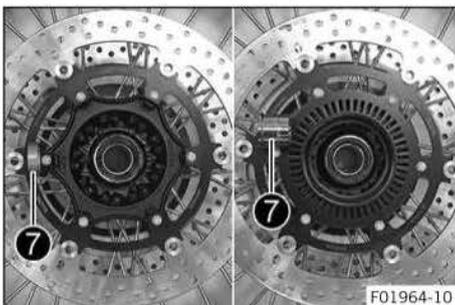


#### Warning

**Danger of accidents** Damaged brake discs reduce the braking effect.

- Always lay the wheel down in such a way that the brake discs are not damaged.

- Hold the front wheel and remove the wheel spindle. Take the front wheel out of the fork.
- Remove spacers ⑦.



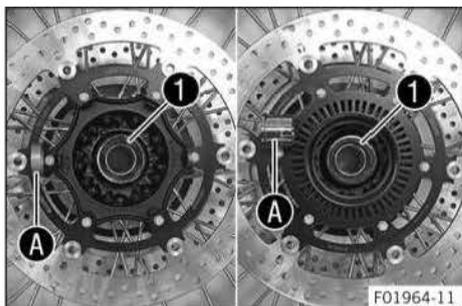
## 14.9.2 Installing the front wheel



### Warning

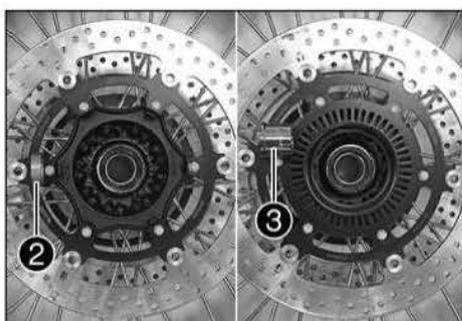
**Danger of accidents** Oil or grease on the brake discs reduces the braking effect.

- Always keep the brake discs free of oil and grease.
- Clean the brake discs with brake cleaner when necessary.



- Check the wheel bearing for damage and wear.
  - » If the wheel bearing is damaged or worn:
    - Change front wheel bearing. (p. 149)
- Clean and grease shaft seal rings 1 and contact surfaces A of the spacers.

Long-life grease (p. 466)

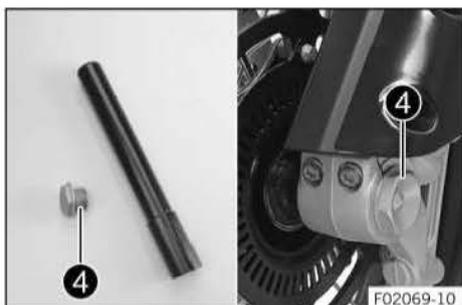
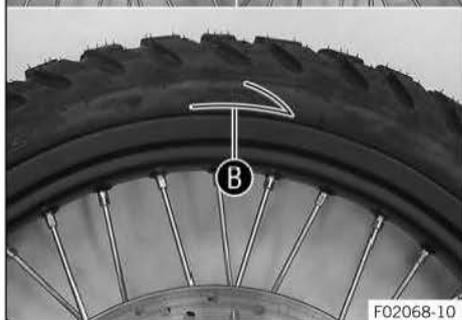


- Insert narrow spacer 2 on the right in the direction of travel.
- Insert wide spacer 3 on the left in the direction of travel.



### Info

Arrow B indicates the direction of travel of the front wheel.  
The ABS sensor wheel is on the left viewed in the direction of travel.



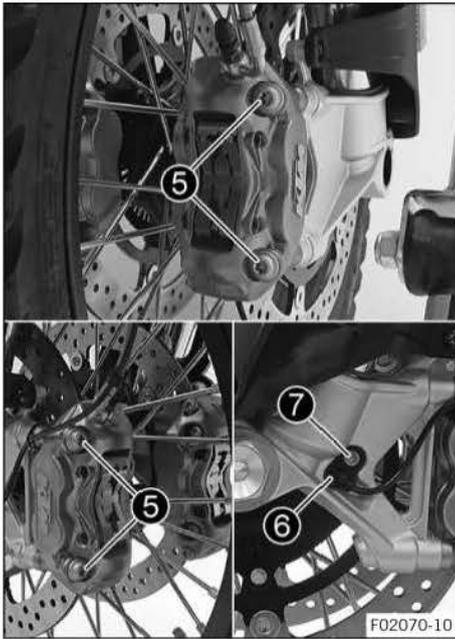
- Clean screw 4 and the wheel spindle.
- Grease wheel spindle lightly.

Long-life grease (p. 466)

- Jack up the front wheel into the fork, position it, and insert the wheel spindle.
- Mount and tighten screw 4.

### Guideline

Screw, front wheel spindle	M25x1.5	45 Nm (33.2 lbf ft) Thread greased
----------------------------	---------	---------------------------------------



- Position both brake calipers.
- ✓ The brake linings are correctly positioned.
- Mount screws **5** on both sides but do not tighten yet.

Guideline

Screw, front brake caliper	M10x1.25	45 Nm (33.2 lbf ft) <b>Loctite®243™</b>
----------------------------	----------	--------------------------------------------

- Operate the hand brake lever repeatedly until the brake linings are in contact with the brake disc and there is a pressure point. Secure the hand brake lever in the activated position.
- ✓ The brake calipers straighten.
- Tighten screws **5** on both sides.

Guideline

Screw, front brake caliper	M10x1.25	45 Nm (33.2 lbf ft) <b>Loctite®243™</b>
----------------------------	----------	--------------------------------------------

- Position wheel speed sensor **6** in the hole.
- Mount and tighten screw **7**.

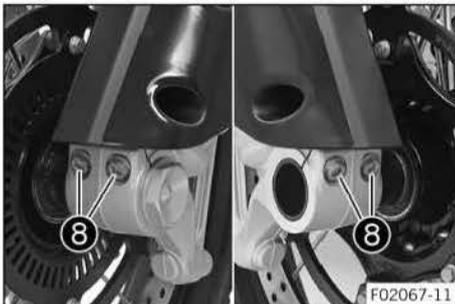
Guideline

Screw, front wheel speed sensor	M6	10 Nm (7.4 lbf ft)
---------------------------------	----	--------------------

- Remove the locking piece of the hand brake lever.
- Take the motorcycle off the front lifting gear. (📖 p. 14)
- Remove the rear of the motorcycle from the lifting gear. (📖 p. 15)
- Operate the front brake and compress the fork a few times firmly.
- ✓ The fork legs straighten.
- Tighten screws **8**.

Guideline

Screw, fork stub	M8	15 Nm (11.1 lbf ft)
------------------	----	---------------------



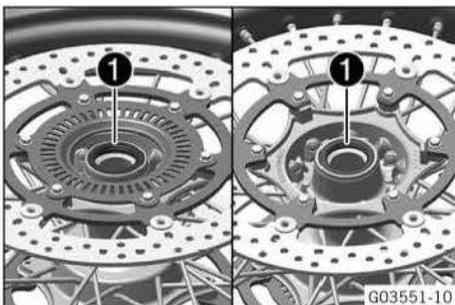
### 14.9.3 Changing the front wheel bearing

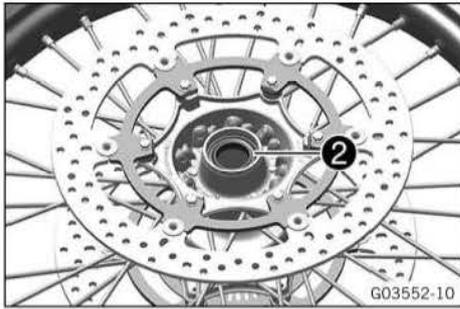
**Preparatory work**

- Raise motorcycle with rear lifting gear. (📖 p. 15)
- Remove the front fender. (📖 p. 140)
- Lift the motorcycle with the front lifting gear. (📖 p. 14)
- Remove the front wheel. (📖 p. 147)

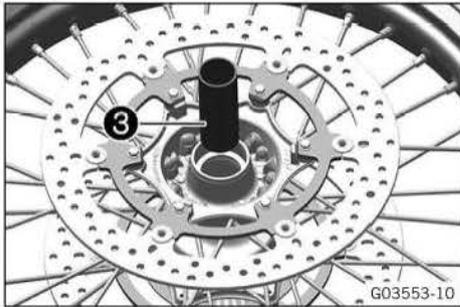
**Main work**

- Remove shaft seal rings **1**.

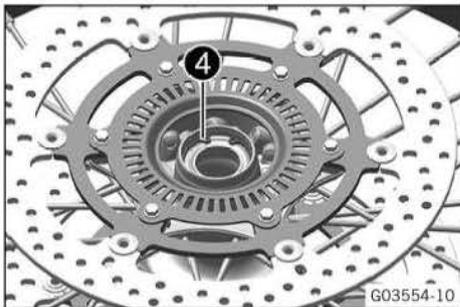




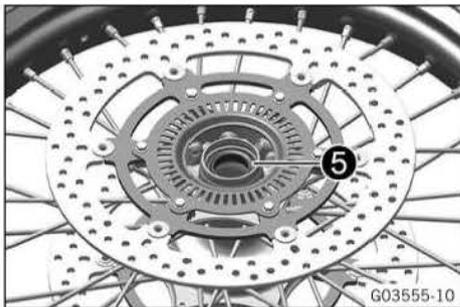
- Using a suitable tool, press bearing **2** out from the inside to the outside.



- Remove spacing tube **3**.



- Remove lock ring **4**.

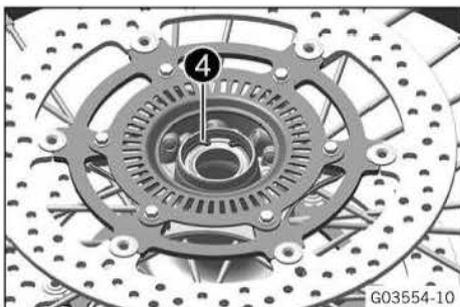


- Using a suitable tool, press bearing **5** out from the inside to the outside.
- Press new bearing all the way in from the outside to the inside.

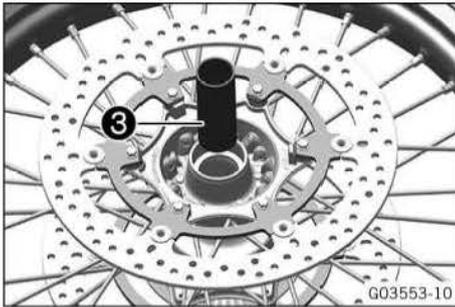


**Info**

Only press the bearing in via the outer bearing ring; otherwise the bearing will be damaged when it is pressed in.

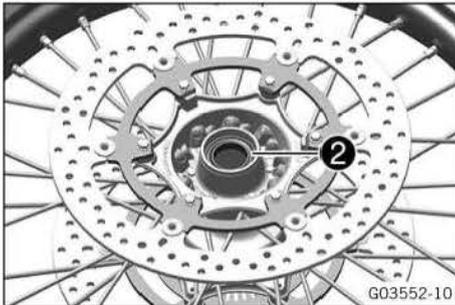


- Mount lock ring **4**.  
 ✓ The lock ring engages audibly.



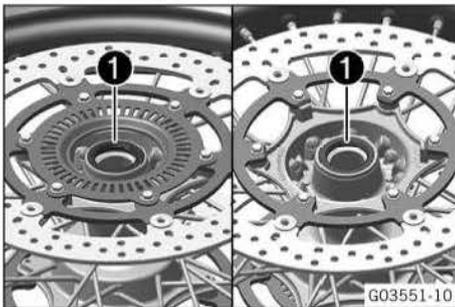
- Clean, grease, and mount spacing tube ③.

Long-life grease (📖 p. 466)



- Press new bearing ② all the way in from the outside to the inside.

**i Info**  
Only press the bearing in via the outer bearing race; otherwise the bearing will be damaged when it is pressed in.



- Grease new shaft seal rings ① and press them in until they are flush.

Long-life grease (📖 p. 466)

**Finishing work**

- Install the front wheel. (📖 p. 148)

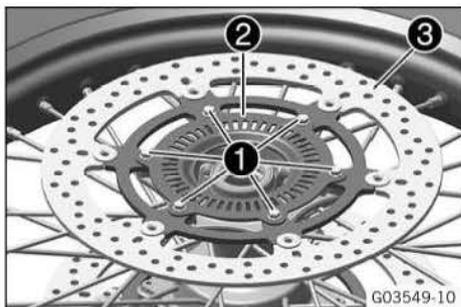


**14.9.4 Changing the front brake discs**

**i Info**  
If the brake discs are changed, the brake linings must also be changed.

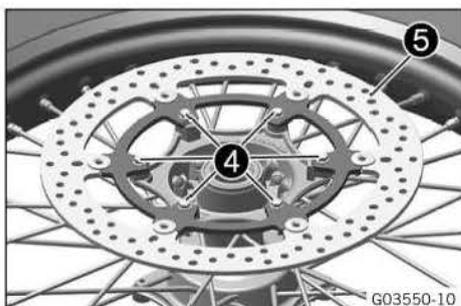
**Preparatory work**

- Raise motorcycle with rear lifting gear. (📖 p. 15)
- Remove the front fender. (📖 p. 140)
- Lift the motorcycle with the front lifting gear. (📖 p. 14)
- Remove the front wheel. (📖 p. 147)



### Main work

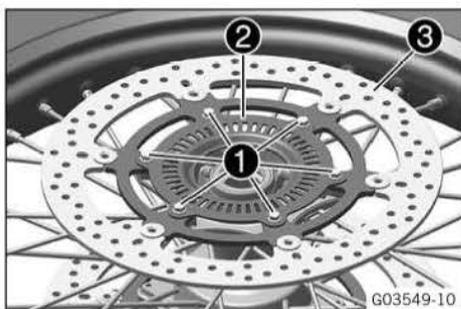
- Remove screws ①.
- Remove ABS sensor wheel ②.
- Remove left brake disc ③.



- Remove screws ④.
- Remove right brake disc ⑤.
- Clean the contact surface of the brake disc.
- Position the brake disc with the label facing outward.
- Mount and tighten the screws.

### Guideline

Screw, front brake disc	M6	14 Nm (10.3 lbf ft) <b>Loctite®243™</b>
-------------------------	----	--------------------------------------------



- Clean the contact surface of the brake disc.
- Position new brake disc ③ with the label facing outward.
- Position ABS sensor wheel ②.
- ✓ The ABS sensor wheel is on the left viewed in the direction of travel.
- Mount and tighten screws ①.

### Guideline

Screw, front brake disc	M6	14 Nm (10.3 lbf ft) <b>Loctite®243™</b>
-------------------------	----	--------------------------------------------

### Finishing work

- Install the front wheel. (📖 p. 148)

## 14.9.5 Changing the front tubeless sealing profile

### Preparatory work

- Raise motorcycle with rear lifting gear. (📖 p. 15)
- Remove the front fender. (📖 p. 140)
- Lift the motorcycle with the front lifting gear. (📖 p. 14)
- Remove the front wheel. (📖 p. 147)
- Remove wheel.

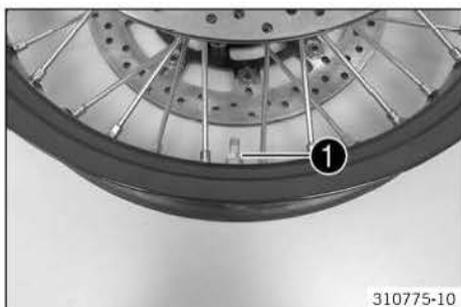
### Main work

#### (Option: With TPMS)

- Remove nut ①.
- Take off the tire pressure sensor.

#### (Option: without TPMS)

- Remove nut ①.
- Take off the valve.



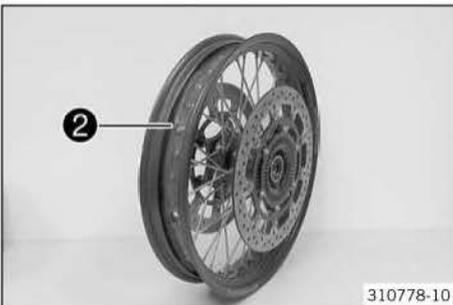


- Carefully cut through the tubeless sealing profile and pull it off.

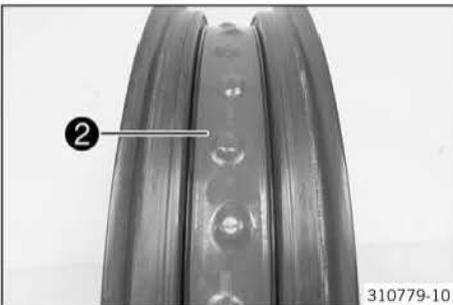
---

**i Tip**  
Raise the tubeless sealing profile slightly so that the rim tape is not damaged.

---



- Take off rim tape ②.
- Clean the seal groove.
- Check the rim for damage and wear.
  - » If there is damage or wear:
    - Change the rim.
- Check the rim run-out. (📖 p. 143)



- Mount rim tape ②.

---

**i Info**  
Ensure that the rim tape is in exactly the right position.

---



- Lubricate the seal groove lightly.

Thinned tire mounting paste

- Position new tubeless sealing profile.

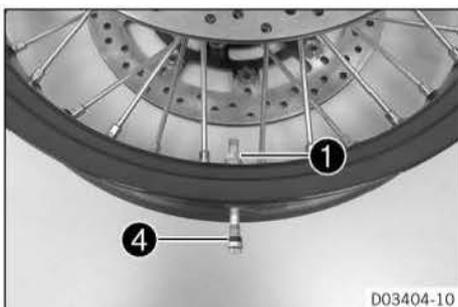
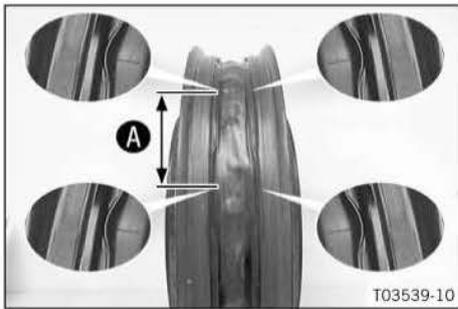
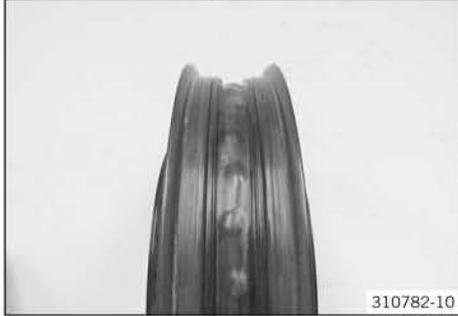
---

**i Tip**  
Using a suitable screw ③, secure the holes of the tubeless sealing profile and the rim together. Do not tighten the screw so that the seal ring is not damaged.

---



- Pull the tubeless sealing profile evenly over the rim.



- Align the tubeless sealing profile.
- ✓ Both sides of the tubeless sealing profile are positioned in the bottom of the seal groove.



**Info**

Ensure that the tubeless sealing profile does not develop folds in the longitudinal direction.

- Lubricate the tubeless sealing profile at the edges.

Thinned tire mounting paste

- Using spacing **A**, press the tubeless sealing profile into the seal groove.

Guideline

Distance <b>A</b>	15 cm (5.9 in)
-------------------	----------------



**Info**

This step aids in positioning, making it easier to mount the tubeless sealing profile. Press perpendicular to the rim to avoid shifting the profile in a radial direction.

- Press the tubeless sealing profile into the seal groove along the entire circumference.
- Check that the tubeless sealing profile is seated correctly around the entire circumference.
- ✓ The valve is straight.

**(Option: without TPMS)**

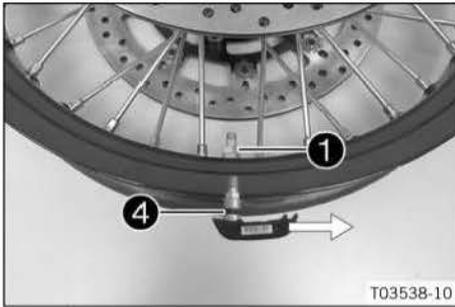
- Grease O-ring **4** slightly.

Thinned tire mounting paste

- Position the valve.
- Mount and tighten nut **1**.

Guideline

Nut, valve	ISO 10V2	12 Nm (8.9 lbf ft) <b>Loctite®2701™</b>
------------	----------	--------------------------------------------



**(Option: With TPMS)**

- Grease O-ring 4 slightly.

Thinned tire mounting paste

- Position the tire pressure sensor.
  - ✓ The tire pressure sensor points to the rear in the direction of travel.
- Mount and tighten nut 1.

**Guideline**

Nut, tire pressure sensor	ISO 10V2	12 Nm (8.9 lbf ft) <b>Loctite®2701™</b>
---------------------------	----------	--------------------------------------------

**Finishing work**

- Mount and balance the tires.
- Install the front wheel. (p. 148)

**(Option: With TPMS)**

- Program the tire pressure sensor. (p. 146)



**14.9.6 Changing the front tire pressure sensor (Option: With TPMS)**

**Preparatory work**

- Raise motorcycle with rear lifting gear. (p. 15)
- Remove the front fender. (p. 140)
- Lift the motorcycle with the front lifting gear. (p. 14)
- Remove the front wheel. (p. 147)
- Remove wheel.



**Main work**

- Remove nut 1.
- Take off the tire pressure sensor.

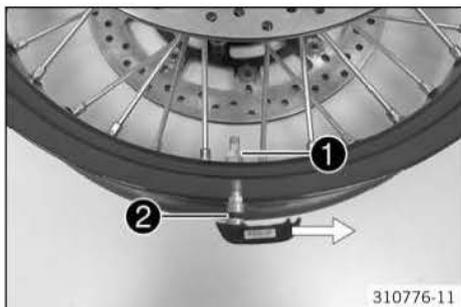


- Note ID number A of the new tire pressure sensor.



**Info**

The ID number is used to program the tire pressure sensor.



310776-11

- Grease O-ring **2** slightly.

Thinned tire mounting paste

- Position the new tire pressure sensor.
  - ✓ The tire pressure sensor points to the rear in the direction of travel.
- Mount and tighten nut **1**.

#### Guideline

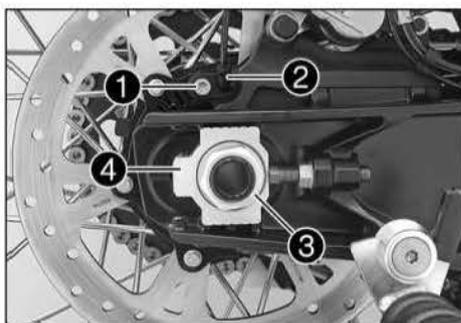
Nut, tire pressure sensor	ISO 10V2	12 Nm (8.9 lbf ft) <b>Loctite®2701™</b>
---------------------------	----------	--------------------------------------------

#### Finishing work

- Mount and balance the tires.
- Install the front wheel. (📖 p. 148)
- Program the tire pressure sensor. (📖 p. 146)

## 14.10 Rear wheel

### 14.10.1 Removing the rear wheel



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#### Preparatory work

- Raise motorcycle with rear lifting gear. (📖 p. 15)

#### Main work

- Manually press the brake caliper toward the brake disc to push back the brake piston.
- Remove screw **1** and pull wheel speed sensor **2** out of the hole.
- Remove nut **3**. Take off chain adjuster **4**.
- Only pull out wheel spindle **5** far enough to allow the rear wheel to be pushed forward.

- Push the rear wheel forward as far as possible. Take the chain off the rear sprocket and place it on chain sprocket guard **6**.

#### **i** Info

Cover the components to protect them against damage.

- Hold the rear wheel and remove the wheel spindle.
- Pull the rear wheel back until the brake caliper bracket is suspended freely between the brake disc and rim.



**Warning**

**Danger of accidents** Damaged brake discs reduce the braking effect.

- Always lay the wheel down in such a way that the brake disc is not damaged.

- Take the rear wheel out of the link fork.



**Info**

Do not operate the foot brake lever when the rear wheel is removed.



**14.10.2 Installing the rear wheel**



**Warning**

**Danger of accidents** Oil or grease on the brake discs reduces the braking effect.

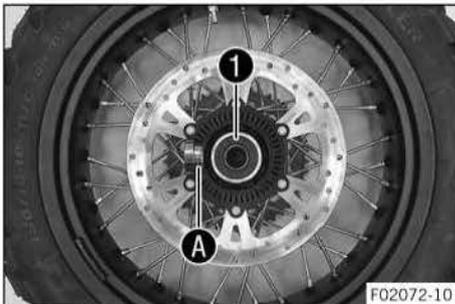
- Always keep the brake discs free of oil and grease.
- Clean the brake discs with brake cleaner when necessary.



**Warning**

**Danger of accidents** There is no braking effect to start with at the rear brake after installing the rear wheel.

- Actuate the foot brake several times before going on a ride until you can feel a firm pressure point.



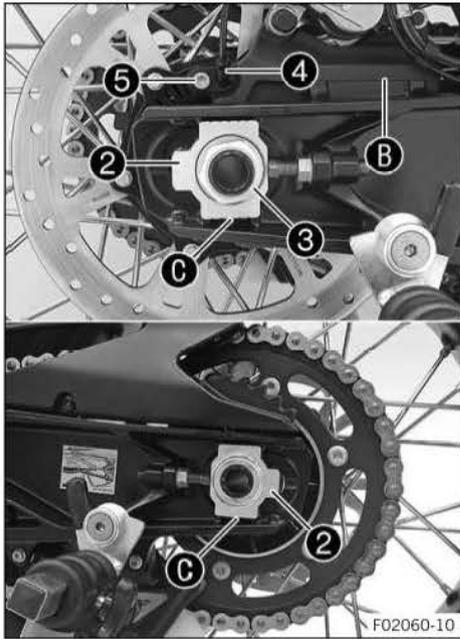
**Main work**

- Check the rear hub damping rubber pieces. (📖 p. 177)
- Check the wheel bearing for damage and wear.
  - » If the wheel bearing is damaged or worn:
    - Change the rear wheel bearing. (📖 p. 163)
- Remove spacer.
- Clean and grease shaft seal ring **1** and contact surface **A** of the spacer.
 

Long-life grease (📖 p. 466)
- Insert a spacer.
- Clean and grease the thread of the wheel spindle and nut.
 

Long-life grease (📖 p. 466)
- Clean and grease the wheel spindle.
 

Long-life grease (📖 p. 466)
- Clean the contact areas on the brake caliper bracket and link fork.



- Engage the thrust bearing of brake caliper bracket **B** and the link fork.
- Jack up the rear wheel into the link fork, position it, and insert the wheel spindle.
  - ✓ The brake linings are correctly positioned.
- Place the chain on the sprocket.
- Position chain adjuster **2**. Mount nut **3**, but do not tighten it yet.



### Info

Mount the left and right chain adjusters in the same position.

- Make sure that chain adjusters **2** are fitted correctly on the adjusting screws. Tighten nut **3**.

### Guideline

In order for the rear wheel to be correctly aligned, the markings on the left and right chain adjusters must be in the same position relative to reference markings **C**.

Nut, rear wheel spindle	M25x1.5	90 Nm (66.4 lbf ft) Thread and contact area of wheel spindle greased
-------------------------	---------	-------------------------------------------------------------------------

- Position wheel speed sensor **4** in the hole.
- Mount and tighten screw **5**.

### Guideline

Screw, rear wheel speed sensor	M6	6 Nm (4.4 lbf ft)
--------------------------------	----	-------------------

- Operate the foot brake lever repeatedly until the brake linings are in contact with the brake disc and there is a pressure point.

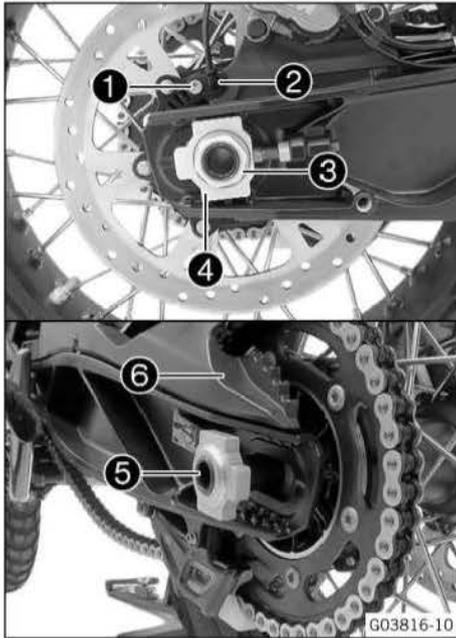
### Finishing work

- Check the chain tension. (📖 p. 171)
- Remove the rear of the motorcycle from the lifting gear. (📖 p. 15)

## 14.10.3 Removing the rear wheel (work stand, front)

### Preparatory work

- Remove the seat. (📖 p. 114)
- Remove the left side cover. (📖 p. 130)
- Remove the battery cover. (📖 p. 131)
- Remove left fuel tank spoiler. (📖 p. 132)
- Remove the right side cover. (📖 p. 130)
- Remove right fuel tank spoiler. (📖 p. 134)
- Remove engine guard. (📖 p. 138)
- Remove the fuel tank. (📖 p. 114)
- Raise the motorcycle at the front using the work stand. (📖 p. 16)
- Place a load on the front of the vehicle.



- ✓ The rear wheel is not in contact with the ground.

### Main work

- Manually press the brake caliper toward the brake disc to push back the brake piston.
- Remove screw **1** and pull wheel speed sensor **2** out of the hole.
- Remove nut **3**. Take off chain adjuster **4**.
- Pull out wheel spindle **5** far enough to allow the rear wheel to be pushed forward.
- Push the rear wheel forward as far as possible. Take the chain off the rear sprocket and place it on chain sprocket guard **6**.



### Info

Cover the components to protect them against damage.

- Hold the rear wheel and remove the wheel spindle.
- Pull the rear wheel back until the brake caliper bracket is suspended freely between the brake disc and rim.



### Warning

**Danger of accidents** Damaged brake discs reduce the braking effect.

- Always lay the wheel down in such a way that the brake disc is not damaged.

- Take the rear wheel out of the link fork.



### Info

Do not operate the foot brake lever when the rear wheel is removed.

## 14.10.4 Installing the rear wheel (work stand, front)



### Warning

**Danger of accidents** Oil or grease on the brake discs reduces the braking effect.

- Always keep the brake discs free of oil and grease.
- Clean the brake discs with brake cleaner when necessary.



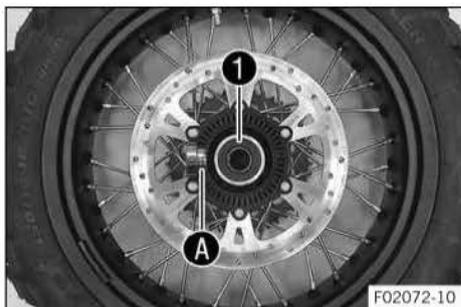
### Warning

**Danger of accidents** There is no braking effect to start with at the rear brake after installing the rear wheel.

- Actuate the foot brake several times before going on a ride until you can feel a firm pressure point.

### Main work

- Check the rear hub damping rubber pieces. (📖 p. 177)



- Check the wheel bearing for damage and wear.
  - » If the wheel bearing is damaged or worn:
    - Change the rear wheel bearing. (🔧 p. 163)
- Remove spacer.
- Clean and grease shaft seal ring **1** and contact surface **A** of the spacer.

Long-life grease (🔧 p. 466)

- Insert a spacer.
- Clean and grease the thread of the wheel spindle and nut.

Long-life grease (🔧 p. 466)

- Clean and grease the wheel spindle.

Long-life grease (🔧 p. 466)

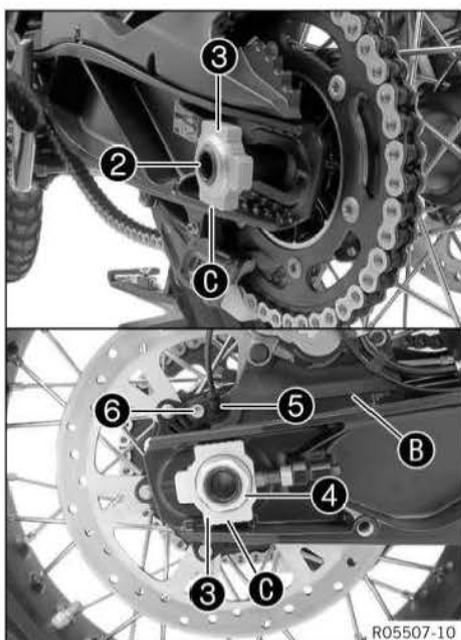
- Clean the contact areas on the brake caliper bracket and link fork.

- Engage the thrust bearing of brake caliper bracket **B** and the link fork.

- Lift the rear wheel into the link fork, position it, and insert wheel spindle **2**.

✓ The brake linings are correctly positioned.

- Place the chain on the sprocket.
- Position chain adjuster **3**. Mount nut **4**, but do not tighten it yet.



### **i** Info

Mount the left and right chain adjusters in the same position.

- Make sure that chain adjusters **3** are fitted correctly on the adjusting screws. Tighten nut **4**.

### Guideline

In order for the rear wheel to be correctly aligned, the markings on the left and right chain adjusters must be in the same position relative to reference markings **C**.

Nut, rear wheel spindle	M25x1.5	90 Nm (66.4 lbf ft) Thread and contact area of wheel spindle greased
-------------------------	---------	-------------------------------------------------------------------------

- Position wheel speed sensor **5** in the hole.
- Mount and tighten screw **6**.

### Guideline

Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
---------------------------	----	--------------------

- Operate the foot brake lever repeatedly until the brake linings are in contact with the brake disc and there is a pressure point.

### Finishing work

- Check the chain tension. (🔧 p. 171)

- Remove the motorcycle from the work stand at the front. (🔧 p. 17)
- Install the fuel tank. (🔧 p. 117)
- Install the engine guard. (🔧 p. 138)
- Install the right fuel tank spoiler. (🔧 p. 135)
- Install the right side cover. (🔧 p. 131)
- Install the left fuel tank spoiler. (🔧 p. 133)
- Install the battery cover. (🔧 p. 132)
- Install the left side cover. (🔧 p. 130)
- Mount the seat. (🔧 p. 114)



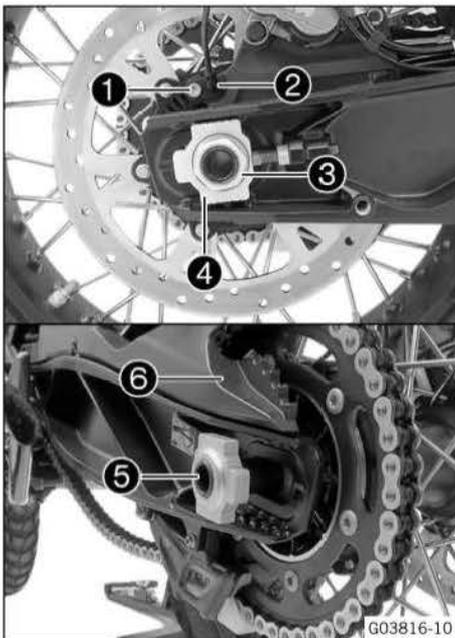
**14.10.5 Removing the rear wheel (work stand, rear)**

**Preparatory work**

- Remove the main silencer. (🔧 p. 100)
- Raise the motorcycle at the rear using the work stand. (🔧 p. 15)
- Place a load on the front of the vehicle.
- ✓ The rear wheel is not in contact with the ground.

**Main work**

- Manually press the brake caliper toward the brake disc to push back the brake piston.
- Remove screw ❶ and pull wheel speed sensor ❷ out of the hole.
- Remove nut ❸. Take off chain adjuster ❹.
- Pull out wheel spindle ❺ far enough to allow the rear wheel to be pushed forward.
- Push the rear wheel forward as far as possible. Take the chain off the rear sprocket and place it on chain sprocket guard ❻.



**i Info**  
Cover the components to protect them against damage.

- Hold the rear wheel and remove the wheel spindle.
- Pull the rear wheel back until the brake caliper bracket is suspended freely between the brake disc and rim.

**⚠ Warning**  
**Danger of accidents** Damaged brake discs reduce the braking effect.

- Always lay the wheel down in such a way that the brake disc is not damaged.

- Take the rear wheel out of the link fork.

**i Info**  
Do not operate the foot brake lever when the rear wheel is removed.



## 14.10.6 Installing the rear wheel (work stand, rear)



### Warning

**Danger of accidents** Oil or grease on the brake discs reduces the braking effect.

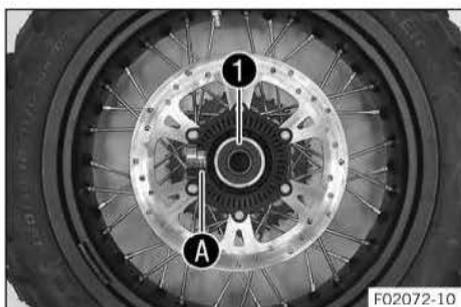
- Always keep the brake discs free of oil and grease.
- Clean the brake discs with brake cleaner when necessary.



### Warning

**Danger of accidents** There is no braking effect to start with at the rear brake after installing the rear wheel.

- Actuate the foot brake several times before going on a ride until you can feel a firm pressure point.



### Main work

- Check the rear hub damping rubber pieces. (📖 p. 177)
- Check the wheel bearing for damage and wear.
  - » If the wheel bearing is damaged or worn:
    - Change the rear wheel bearing. (📖 p. 163)
- Remove spacer.
- Clean and grease shaft seal ring **1** and contact surface **A** of the spacer.

Long-life grease (📖 p. 466)

- Insert a spacer.
- Clean and grease the thread of the wheel spindle and nut.

Long-life grease (📖 p. 466)

- Clean and grease the wheel spindle.

Long-life grease (📖 p. 466)

- Clean the contact areas on the brake caliper bracket and link fork.

- Engage the thrust bearing of brake caliper bracket **B** and the link fork.

- Lift the rear wheel into the link fork, position it, and insert wheel spindle **2**.

✓ The brake linings are correctly positioned.

- Place the chain on the sprocket.

- Position chain adjuster **3**. Mount nut **4**, but do not tighten it yet.



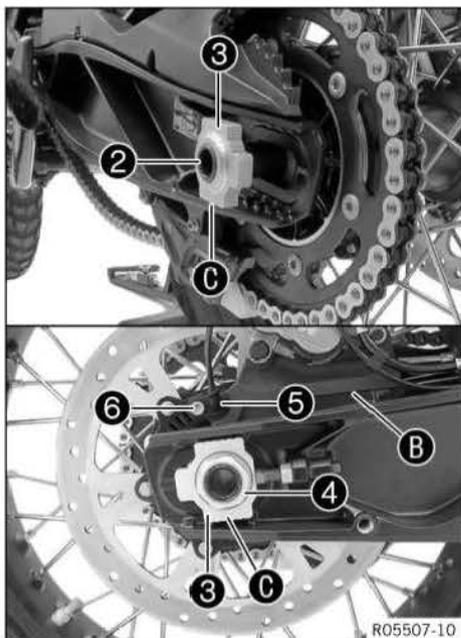
### Info

Mount the left and right chain adjusters in the same position.

- Make sure that chain adjusters **3** are fitted correctly on the adjusting screws. Tighten nut **4**.

### Guideline

In order for the rear wheel to be correctly aligned, the markings on the left and right chain adjusters must be in the same position relative to reference markings **C**.



Nut, rear wheel spindle	M25x1.5	90 Nm (66.4 lbf ft) Thread and contact area of wheel spindle greased
-------------------------	---------	-------------------------------------------------------------------------

- Position wheel speed sensor **5** in the hole.
- Mount and tighten screw **6**.

**Guideline**

Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
---------------------------	----	--------------------

- Operate the foot brake lever repeatedly until the brake linings are in contact with the brake disc and there is a pressure point.

**Finishing work**

- Check the chain tension. (📖 p. 171)
- Remove the motorcycle from the work stand at the rear. (📖 p. 16)
- Install the main silencer. (📖 p. 100)



## 14.10.7 Changing the rear wheel bearing

**Preparatory work**

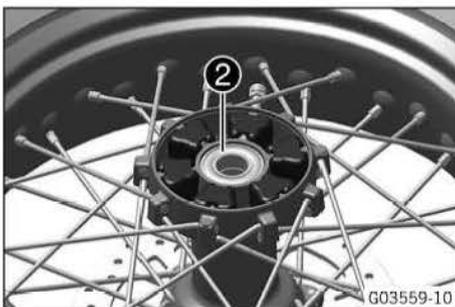
- Raise motorcycle with rear lifting gear. (📖 p. 15)
- Remove the rear wheel. (📖 p. 156)

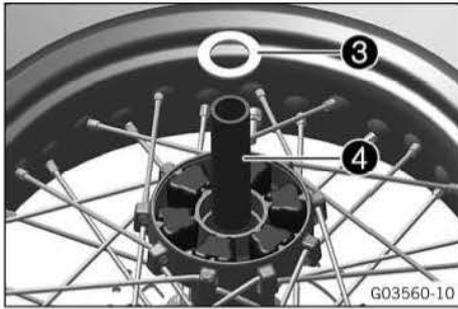
**Main work**

- Remove rear sprocket carrier **1**.

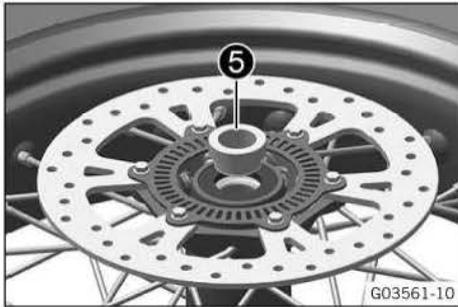


- Using a suitable tool, press bearing **2** out from the inside to the outside.

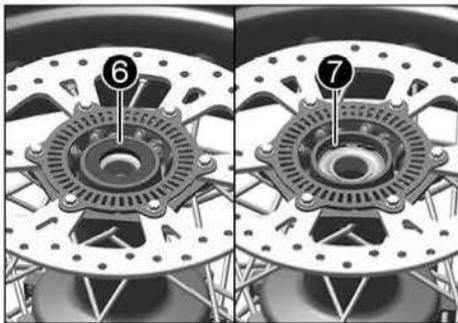




- Remove spacer washer **3**.
- Remove spacing tube **4**.



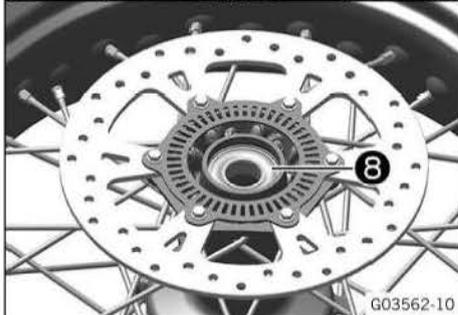
- Remove spacer **5**.



- Remove shaft seal ring **6**.
- Remove lock ring **7**.
- Using a suitable tool, press bearing **8** out from the inside to the outside.
- Press the new bearing all the way in from the outside to the inside.

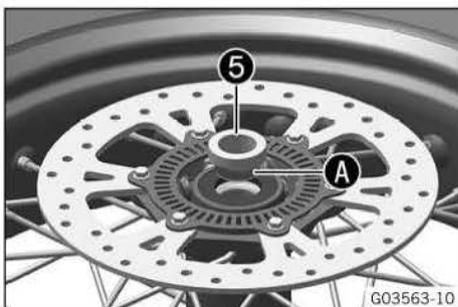
**i Info**

Only press the bearing in via the outer bearing race; otherwise the bearing will be damaged when it is pressed in.



- Mount the lock ring.
- ✓ The lock ring engages audibly.
- Grease new shaft seal ring and press it in until it is flush.

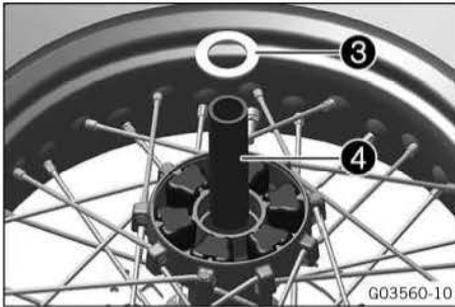
Long-life grease (☞ p. 466)



- Clean and grease the contact surfaces **A** of the spacer.

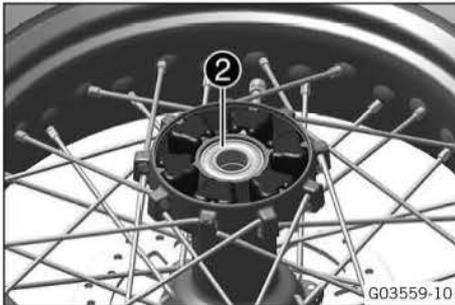
Long-life grease (☞ p. 466)

- Position spacer **5**.



- Check spacer washer **3** for damage and wear.
  - » If the spacer washer is damaged or worn:
    - Replace the spacer washer.
- Mount the spacer washer.
- Clean, grease, and mount spacing tube **4**.

Long-life grease (📖 p. 466)



- Press new bearing **2** all the way in from the outside to the inside.

**i Info**  
Only press the bearing in via the outer bearing race; otherwise the bearing will be damaged when it is pressed in.



- Ensure that the damping rubber pieces are correctly seated.
- Mount rear sprocket carriers **1**.

### Finishing work

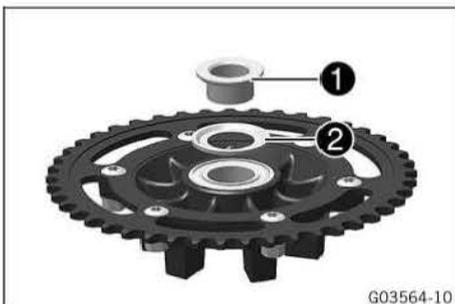
- Install the rear wheel. (📖 p. 157)
- Check the chain tension. (📖 p. 171)
- Remove the rear of the motorcycle from the lifting gear. (📖 p. 15)

## 14.10.8 Changing the bearing of the rear sprocket carrier

### Condition

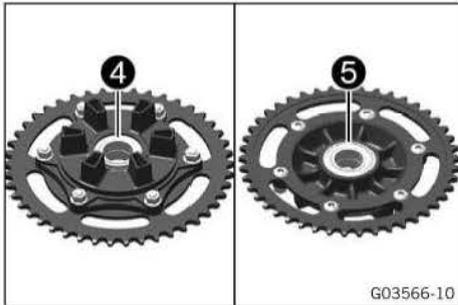
Rear sprocket carrier is removed.

- Remove spacer **1** with washer **2**.





- Remove collar bushing ③.



- Using a suitable tool, press bearings ④ and ⑤ out from the inside to the outside.
- Using a suitable tool, press in new bearings ⑤ and ④ from the outside to the inside until they are flush.

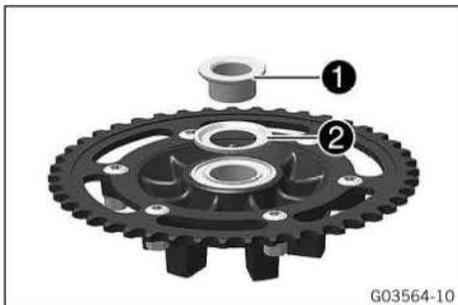


**Info**

Only press the bearings in using the outer bearing ring; otherwise, the bearings will be damaged when they are pressed in.



- Mount collar bushing ③.



- Mount spacer ① with washer ②.

### 14.10.9 Changing the rear brake disc

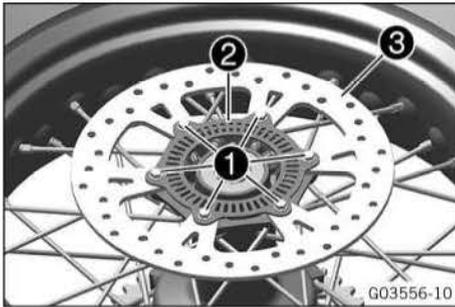


**Info**

If the brake discs are changed, the brake linings must also be changed.

**Preparatory work**

- Raise motorcycle with rear lifting gear. (📖 p. 15)
- Remove the rear wheel. (📖 p. 156)



**Main work**

- Remove screws ①.
- Remove ABS sensor wheel ②.
- Take off brake disc ③.
- Clean the contact surface of the brake disc.
- Position the brake disc with the label facing outward.
- Position the ABS sensor wheel.
- Mount and tighten the screws.

Guideline

Screw, rear brake disc	M6	14 Nm (10.3 lbf ft) <b>Loctite®243™</b>
---------------------------	----	--------------------------------------------

**Finishing work**

- Install the rear wheel. (📖 p. 157)
- Check the chain tension. (📖 p. 171)
- Remove the rear of the motorcycle from the lifting gear. (📖 p. 15)



**14.10.10 Changing the rear tubeless sealing profile**

**Preparatory work**

- Raise motorcycle with rear lifting gear. (📖 p. 15)
- Remove the rear wheel. (📖 p. 156)
- Take off the rear sprocket carrier and the damping rubbers.
- Remove wheel.

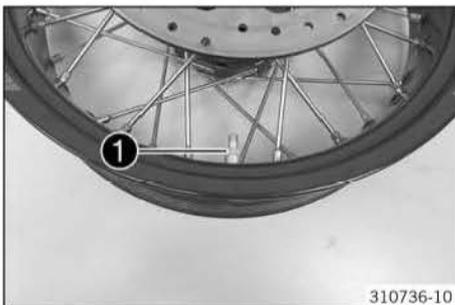
**Main work**

**(Option: With TPMS)**

- Remove nut ①.
- Take off the tire pressure sensor.

**(Option: without TPMS)**

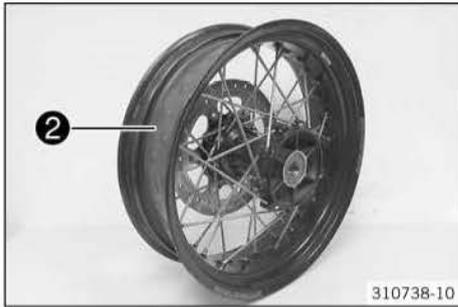
- Remove nut ①.
- Take off the valve.



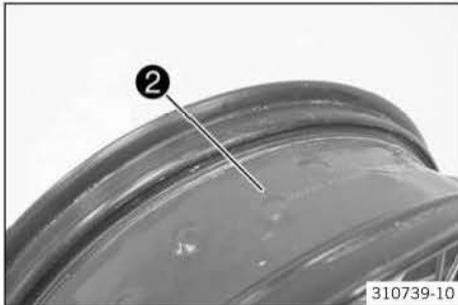
- Carefully cut through the tubeless sealing profile and pull it off.

**i Tip**

Raise the tubeless sealing profile slightly so that the rim tape is not damaged.



- Take off rim tape ②.
- Clean the seal groove.
- Check the rim for damage and wear.
  - » If there is damage or wear:
    - Change the rim.
- Check the rim run-out. (🔧 p. 143)

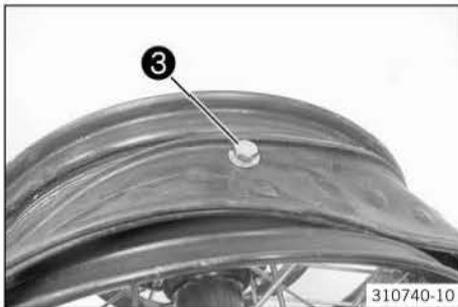


- Mount rim tape ②.



**Info**

Ensure that the rim tape is in exactly the right position.



- Lubricate the seal groove lightly.

Thinned tire mounting paste

- Position new tubeless sealing profile.



**Tip**

Using a suitable screw ③, secure the holes of the tubeless sealing profile and the rim together. Do not tighten the screw so that the seal ring is not damaged.



- Pull the tubeless sealing profile evenly over the rim.



- Align the tubeless sealing profile.
  - ✓ Both sides of the tubeless sealing profile are positioned in the bottom of the seal groove.
  - ✓ Markings **A** are aligned along the entire circumference of the rim.



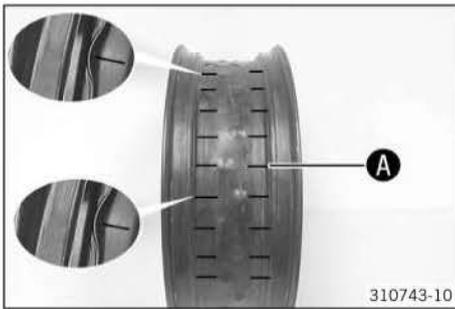
**Info**

Ensure that the tubeless sealing profile does not develop folds in the longitudinal direction.



- Lubricate the tubeless sealing profile at the edges.

Thinned tire mounting paste



- Press the tubeless sealing profile into the seal groove at intervals that are 5 markings **A** apart.

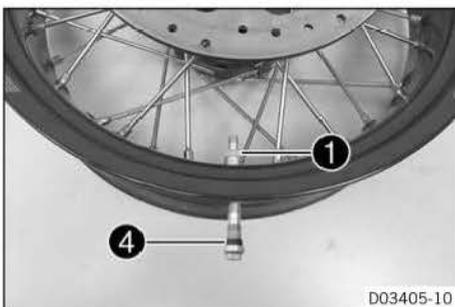


**Info**

This step aids in positioning, making it easier to mount the tubeless sealing profile. Press perpendicular to the rim to avoid shifting the profile in a radial direction.



- Press the tubeless sealing profile into the seal groove along the entire circumference.
- Check that the tubeless sealing profile is seated correctly around the entire circumference.
  - ✓ The valve is straight.



**(Option: without TPMS)**

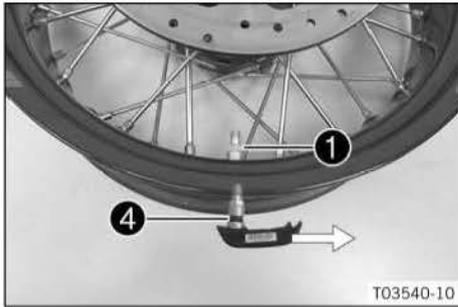
- Grease O-ring **4** slightly.

Thinned tire mounting paste

- Position the valve.
- Mount and tighten nut **1**.

Guideline

Nut, valve	ISO 10V2	12 Nm (8.9 lbf ft) <b>Loctite®2701™</b>
------------	----------	--------------------------------------------



**(Option: With TPMS)**

- Grease O-ring 4 slightly.

Thinned tire mounting paste

- Position the tire pressure sensor.
  - ✓ The tire pressure sensor points to the rear in the direction of travel.

- Mount and tighten nut 1.

**Guideline**

Nut, tire pressure sensor	ISO 10V2	12 Nm (8.9 lbf ft) <b>Loctite®2701™</b>
---------------------------	----------	--------------------------------------------

**Finishing work**

- Mount and balance the tires.
- Mount the damping rubbers and rear sprocket carrier.
- Install the rear wheel. (p. 157)
- Check the chain tension. (p. 171)
- Remove the rear of the motorcycle from the lifting gear. (p. 15)

**(Option: With TPMS)**

- Program the tire pressure sensor. (p. 146)

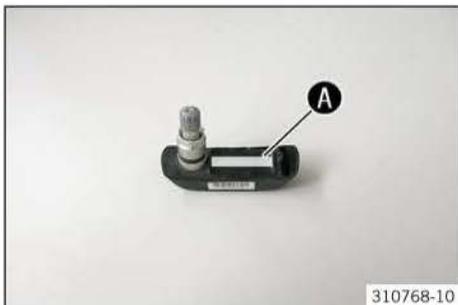
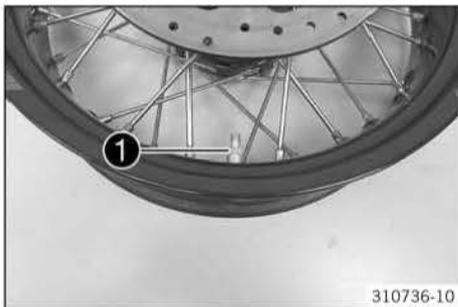
## 14.10.11 Changing the rear tire pressure sensor (Option: With TPMS)

**Preparatory work**

- Raise motorcycle with rear lifting gear. (p. 15)
- Remove the rear wheel. (p. 156)
- Take off the rear sprocket carrier and the damping rubbers.
- Remove wheel.

**Main work**

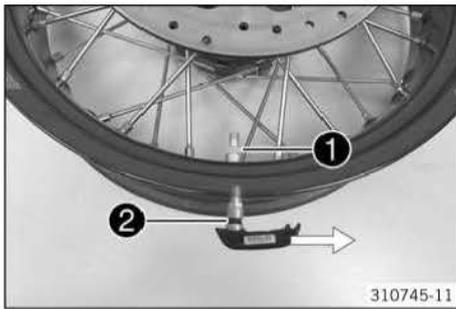
- Remove nut 1.
- Take off the tire pressure sensor.



- Note ID number A of the new tire pressure sensor.

**i Info**

The ID number is used to program the tire pressure sensor.



- Grease O-ring **2** slightly.

Thinned tire mounting paste

- Position the new tire pressure sensor.
  - ✓ The tire pressure sensor points to the rear in the direction of travel.
- Mount and tighten nut **1**.

Guideline

Nut, tire pressure sensor	ISO 10V2	12 Nm (8.9 lbf ft) <b>Loctite®2701™</b>
---------------------------	----------	--------------------------------------------

**Finishing work**

- Mount and balance the tires.
- Mount the damping rubbers and rear sprocket carrier.
- Install the rear wheel. (📖 p. 157)
- Check the chain tension. (📖 p. 171)
- Remove the rear of the motorcycle from the lifting gear. (📖 p. 15)
- Program the tire pressure sensor. (📖 p. 146)



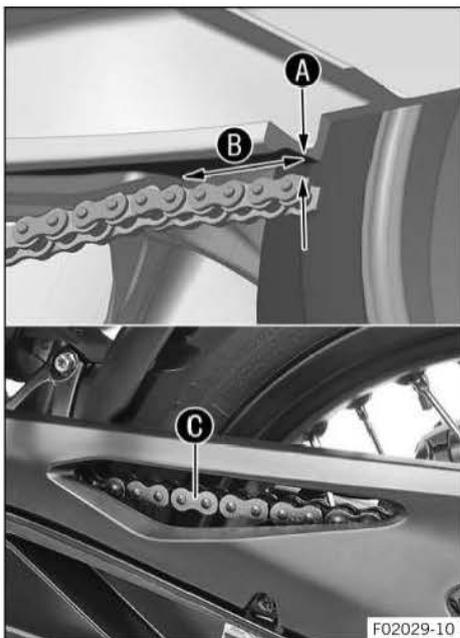
**14.10.12 Checking the chain tension**

**Warning**  
**Danger of accidents** Incorrect chain tension damages components and results in accidents.  
 If the chain is tensioned too much, the chain, engine sprocket, rear sprocket, transmission and rear wheel bearings wear more quickly. Some components may break if overloaded.  
 If the chain is too loose, the chain may fall off the engine sprocket or the rear sprocket. As a result, the rear wheel locks or the engine will be damaged.

- Check the chain tension regularly.
- Set the chain tension in accordance with the specification.

**Preparatory work**

- Raise motorcycle with rear lifting gear. (📖 p. 15)



### Main work

- Shift the transmission into neutral **N**.
- Push the chain behind the chain sliding piece up and determine the chain tension **A** between the link fork and the upper edge of the chain.

### Guideline

Distance <b>B</b> from the chain sliding piece	2.5 cm (0.98 in)
Measure the distance from the flat part of the link fork directly above the chain, not from the edge of the link fork.	

### **i** Info

Top chain section **C** must be taut. Chain wear is not always even. Repeat this measurement at different chain positions.

Chain tension	2 ... 5 mm (0.08 ... 0.2 in)
---------------	------------------------------

- » If the chain tension does not meet the specification:
  - Adjust the chain tension. (🔧 p. 172)
- Remove the rear of the motorcycle from the lifting gear. (🔧 p. 15)

## 14.10.13 Adjusting the chain tension



### Warning

**Danger of accidents** Incorrect chain tension damages components and results in accidents.

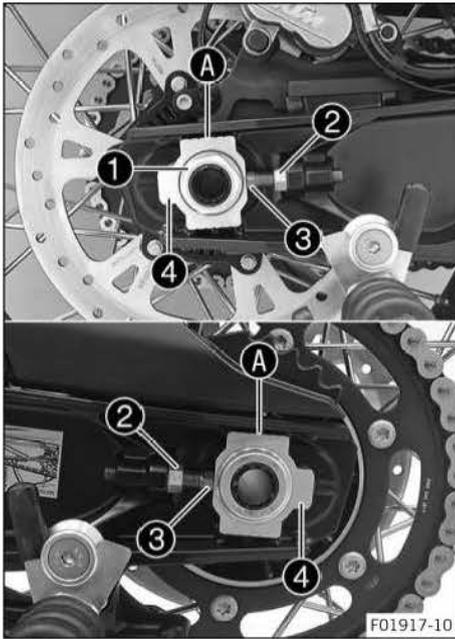
If the chain is tensioned too much, the chain, engine sprocket, rear sprocket, transmission and rear wheel bearings wear more quickly. Some components may break if overloaded.

If the chain is too loose, the chain may fall off the engine sprocket or the rear sprocket. As a result, the rear wheel locks or the engine will be damaged.

- Check the chain tension regularly.
- Set the chain tension in accordance with the specification.

### Preparatory work

- Raise motorcycle with rear lifting gear. (🔧 p. 15)
- Check the chain tension. (🔧 p. 171)



### Main work

- Loosen nut ①.
- Loosen nuts ②.
- Adjust the chain tension by turning adjusting screws ③ left and right.

#### Guideline

Chain tension	2 ... 5 mm (0.08 ... 0.2 in)
Turn the adjusting screws ③ on the left and right so that the markings on the left and right chain adjusters ④ are in the same position relative to the reference marks A. The rear wheel is then correctly aligned.	

### **i** Info

The top chain section must be taut.  
Chain wear is not always even. Repeat this measurement at different chain positions.

- Tighten nuts ②.
- Make sure that chain adjusters ④ are fitted correctly on adjusting screws ③.
- Tighten nut ①.

#### Guideline

Nut, rear wheel spindle	M25x1.5	90 Nm (66.4 lbf ft) Thread and contact area of wheel spindle greased
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### Finishing work

- Check the chain tension. (📖 p. 171)



## 14.10.14 Checking the chain, rear sprocket, engine sprocket, and chain guide

### Preparatory work

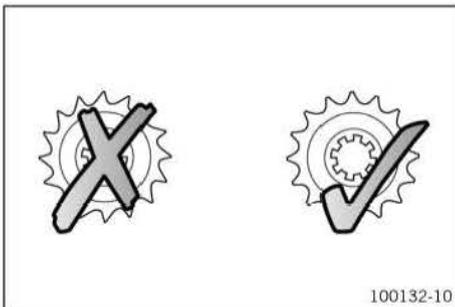
- Raise motorcycle with rear lifting gear. (📖 p. 15)

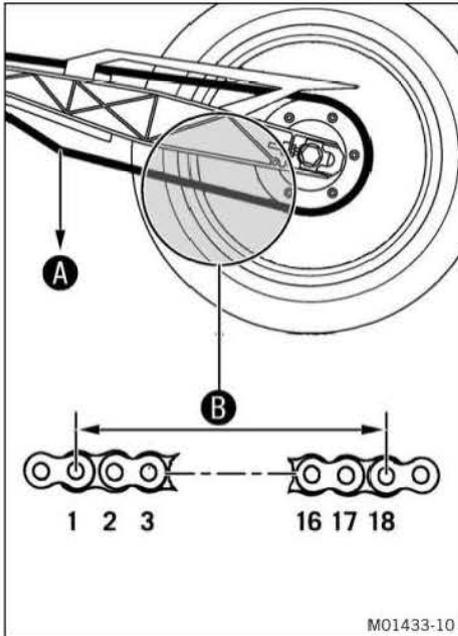
### Main work

- Check the chain, rear sprocket, and engine sprocket for wear.
  - » If the chain, rear sprocket or engine sprocket is worn:
    - Change the drivetrain kit. (📖 p. 179)

### **i** Info

The engine sprocket, rear sprocket, and chain should always be replaced together.





- Shift the transmission into neutral **N**.
- Pull on the lower chain section with the specified weight **A**.

Guideline

Weight, chain wear measurement	15 kg (33 lb.)
--------------------------------	----------------

- Measure distance **B** of 18 chain rollers in the lower chain section.

**i** Info

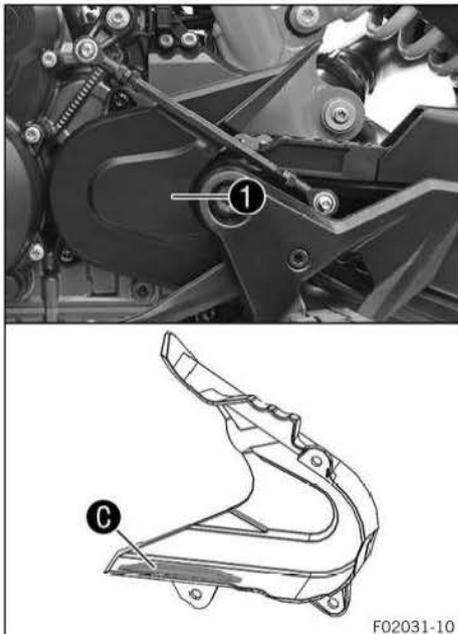
Chain wear is not always even. Repeat this measurement at different chain positions.

Maximum distance <b>B</b> from 18 chain rollers at the longest chain section	272 mm (10.71 in)
------------------------------------------------------------------------------	-------------------

- » If distance **B** is greater than the specified measurement:
  - Change the drivetrain kit. (📖 p. 179)

**i** Info

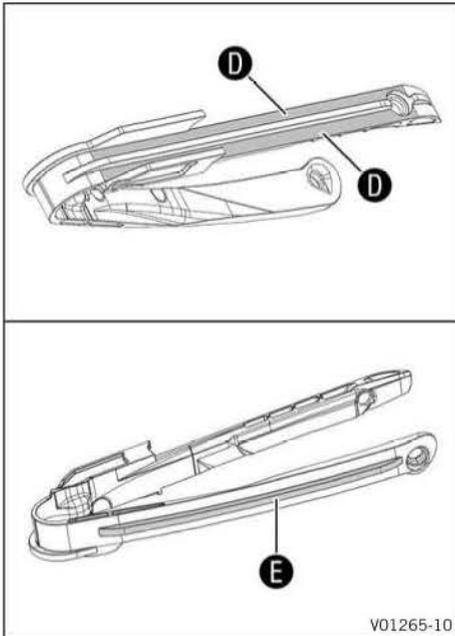
When a new chain is mounted, the rear sprocket and engine sprocket should also be changed. New chains wear out faster on old, worn sprockets. For safety reasons, the chain has no chain joint.



- Check the engine sprocket cover **1** for wear.
  - » If the engine sprocket cover is highly worn in the marked area **C**:
    - Change the engine sprocket cover.
- Check the engine sprocket cover **1** for tightness.
  - » If the engine sprocket cover is loose:
    - Tighten the screws on the engine sprocket cover.

Guideline

Screw, engine sprocket cover	M5	5 Nm (3.7 lbf ft) <b>Loctite®243™</b>
------------------------------	----	------------------------------------------



- Check the chain sliding guard for wear.
  - » If continuous signs of wear to the chain are visible on the chain sliding guard in the area **D** marked:
    - Change the chain sliding guard.
  - » If the chain sliding guard is highly worn on the underside in the marked area **E**:
    - Change the chain sliding guard.
- Check that the chain sliding guard is firmly seated.
  - » If the chain sliding guard is loose:
    - Tighten screws on the chain sliding guard.

Guideline

Remaining screws, chassis	M5	5 Nm (3.7 lbf ft)
---------------------------	----	-------------------

**Finishing work**

- Remove the rear of the motorcycle from the lifting gear. (🔧 p. 15)



**14.10.15 Cleaning the chain**



**Warning**

**Danger of accidents** Lubricants on the tires reduces the road grip.

- Remove lubricants from the tires using a suitable cleaning agent.



**Warning**

**Danger of accidents** Oil or grease on the brake discs reduces the braking effect.

- Always keep the brake discs free of oil and grease.
- Clean the brake discs with brake cleaner when necessary.



**Note**

**Environmental hazard** Hazardous substances cause environmental damage.

- Dispose of oils, grease, filters, fuel, cleaning agents, brake fluid, etc., correctly and in compliance with the applicable regulations.

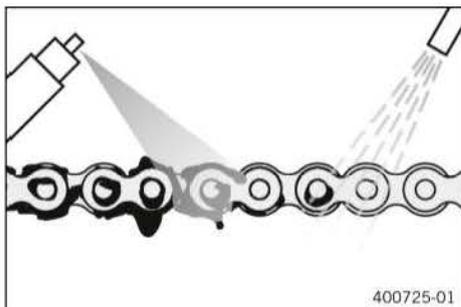


**Info**

The service life of the chain depends largely on its maintenance.

**Preparatory work**

- Raise motorcycle with rear lifting gear. (🔧 p. 15)



## Main work

- Rinse off loose dirt with a soft jet of water.
- Remove old grease residue with chain cleaner.

Chain cleaner (📖 p. 466)

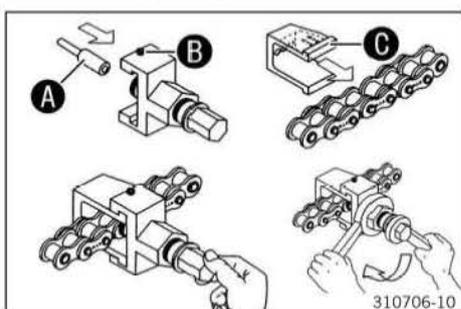
- After drying, apply chain spray.

Street chain spray (📖 p. 467)

## Finishing work

- Remove the rear of the motorcycle from the lifting gear. (📖 p. 15)

### 14.10.16 Opening the chain



- Mount press drift **A** with the larger diameter in the spindle of the special tool. Turn the spindle counterclockwise.

Chain rivet tool (60029020000) (📖 p. 472)

- Make the connecting link of the chain accessible. Fret the riveting point.

- Position the special tool with the press drift on one of the 2 pins of the connecting link of the chain.

✓ Locking screw **B** points upwards.

- Position retaining clamp **C** of the special tool on the chain from the rear.

✓ Markings **A** and **B** point upwards.

- Slide retaining clamp **C** of the special tool into the pressing tool.

✓ The arrow of marking **A** points to locking screw **B**.

- Screw the locking screw hand-tight as far as it will go.

✓ The retaining clamp is fixed.

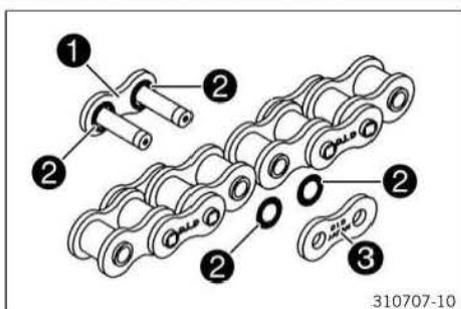
- Hold the special tool and screw in the spindle.

✓ The chain pin is pressed out through the retaining clamp drill hole.

- Unscrew the locking screw and remove the special tool.

- Repeat the process on the second pin of the chain link.

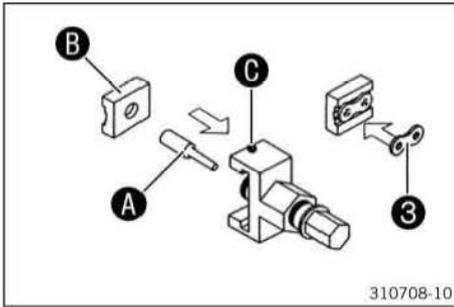
### 14.10.17 Riveting the chain



- Grease new connecting link **1** and position an X-ring **2** on each pin.

- Connect the chain ends with a connecting link.

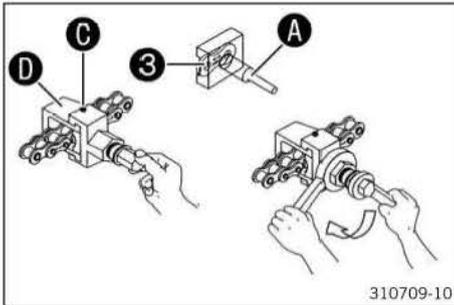
- Position another X-ring **2** on each pin.



- Mount press drift **A** with the smaller diameter in the spindle of the special tool. Turn the spindle counterclockwise.

Chain rivet tool (60029020000) (📖 p. 472)

- Position press plate **B** of the special tool on the press drift.
- Position chain joint plate **3** in the press plate.



- Position the special tool on the chain.
  - ✓ Locking screw **C** points upwards.
- Position retaining clamp **D** of the special tool on the chain from the rear.
  - ✓ Markings **A** and **B** point upwards.
- Slide retaining clamp **D** of the special tool into the pressing tool.
  - ✓ The arrow of marking **A** points to locking screw **C**.
- Screw the locking screw hand-tight as far as it will go.
  - ✓ The retaining clamp is fixed.
- Hold the special tool and screw in the spindle.
  - ✓ Press drift **A** of the special tool presses against the center of the chain joint plate **3**.
  - ✓ The chain joint plate is pressed on.
- Unscrew the locking screw and remove the special tool.
- Rivet the two pins of the connecting link with special tool.

Chain rivet tool (60029020000) (📖 p. 472)

### 14.10.18 Checking the rear hub damping rubber pieces

#### **i** Info

The engine power is transmitted from the rear sprocket to the rear wheel via the 6 damping rubber pieces. They eventually wear out during operation. If the damping rubber pieces are not changed in time, the rear sprocket carrier and the rear hub will be damaged.

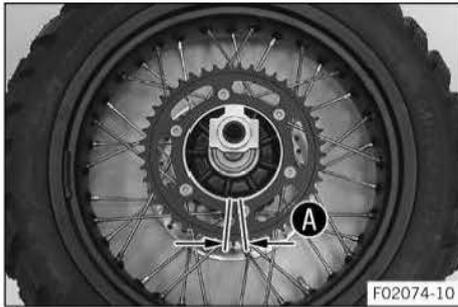
#### Preparatory work

- Raise motorcycle with rear lifting gear. (📖 p. 15)
- Remove the rear wheel. (📖 p. 156)

#### Main work

- Check bearing **1**.
  - » If the bearing is damaged or worn:
    - Change the bearing of the rear sprocket carrier. (📖 p. 165)
- Check damping rubber pieces **2** of the rear hub for damage and wear.
  - » If the damping rubber pieces of the rear hub are damaged or worn:
    - Change all the damping rubber pieces of the rear hub.





- Lay the rear wheel on a workbench with the rear sprocket facing upwards and insert the wheel spindle in the hub.
- To check play **A**, hold the rear wheel tight and try to turn the rear sprocket with your hand.

**i Info**

Measure the play on the outside of the rear sprocket.

Play of damping rubber pieces on rear wheel	≤ 5 mm (≤ 0.2 in)
---------------------------------------------	-------------------

- » If clearance **A** is larger than the specified value:
  - Change all the damping rubber pieces of the rear hub. (🔧 p. 178)

**Finishing work**

- Install the rear wheel. (🔧 p. 157)
- Check the chain tension. (🔧 p. 171)
- Remove the rear of the motorcycle from the lifting gear. (🔧 p. 15)

## 14.10.19 Changing all the damping rubber pieces of the rear hub

**Preparatory work**

- Raise motorcycle with rear lifting gear. (🔧 p. 15)
- Remove the rear wheel. (🔧 p. 156)

**Main work**

- Remove rear sprocket carrier **1**.



- Remove all damping rubber pieces **2**.
- Position new damping rubber pieces.





- Mount rear sprocket carriers **1**.

### Finishing work

- Install the rear wheel. (📖 p. 157)
- Check the chain tension. (📖 p. 171)
- Remove the rear of the motorcycle from the lifting gear. (📖 p. 15)



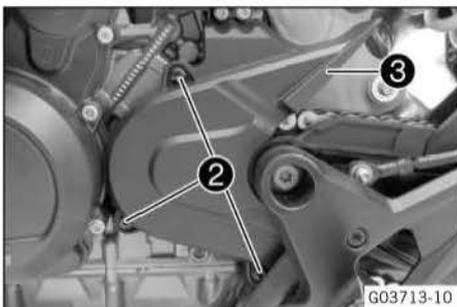
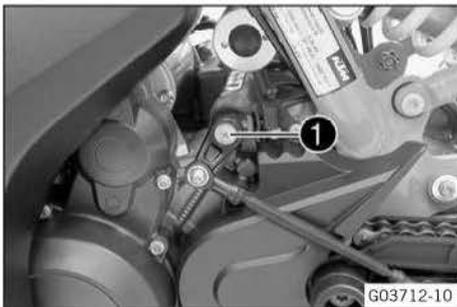
## 14.10.20 Changing the drivetrain kit

### Preparatory work

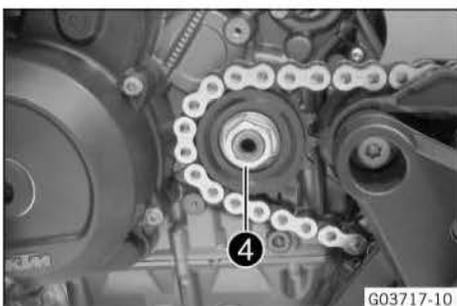
- Raise motorcycle with rear lifting gear. (📖 p. 15)

### Main work

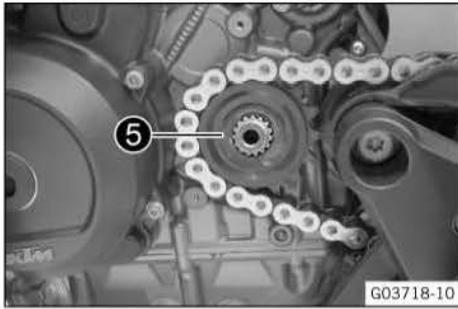
- Remove screw **1** with the washers.
- Hang bell crank with shift linkage to the side.



- Remove screws **2**.
- Take off engine sprocket cover **3**.



- Bend up the lock washer.
- Have an assistant operate the rear brake.
- Remove nut **4** with the lock washer.
- Remove the rear wheel. (📖 p. 156)



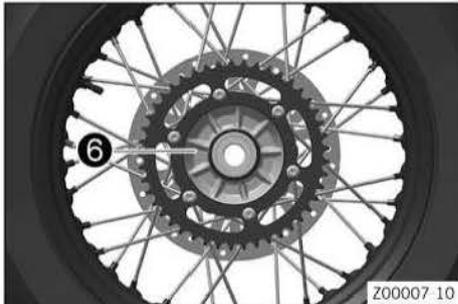
- Remove engine sprocket **5**.
- Open the chain. (🔧 p. 176)
- Take off the chain.



**Info**

Protect the components against damage by covering them.

- Mount new chain.
- Rivet the chain. (🔧 p. 176)
- Position new engine sprocket **5** in the chain and mount on the countershaft.
- Remove rear sprocket carrier **6**.



- Fix the rear sprocket carrier in the vise.



**Info**

Use soft jaws.

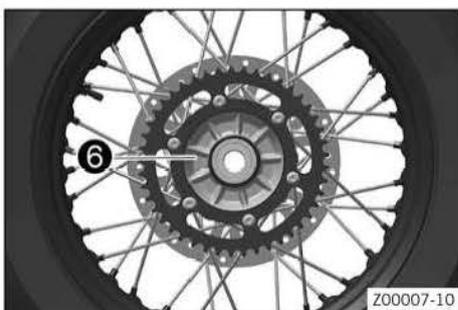
- Remove fittings **7** and take off the rear sprocket.
- Clean the contact area of the rear sprocket.
- Position the new rear sprocket.
- Mount and tighten fittings **7**.

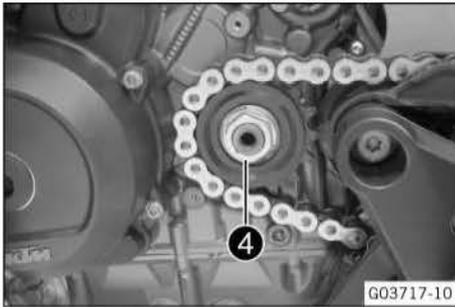


Guideline

Nut, rear sprocket screw	M10x1.25	50 Nm (36.9 lbf ft) <b>Loctite®243™</b>
--------------------------	----------	--------------------------------------------

- Mount rear sprocket carriers **6**.



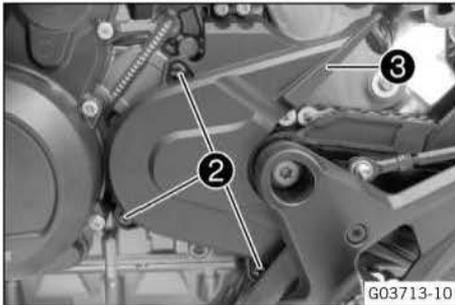


- Install the rear wheel. (📖 p. 157)
- Have an assistant operate the rear brake.
- Mount nut **4** with lock washer and tighten.

Guideline

Nut, engine sprocket	M20x1.5	100 Nm (73.8 lbf ft) <b>Loctite®243™</b>
----------------------	---------	---------------------------------------------

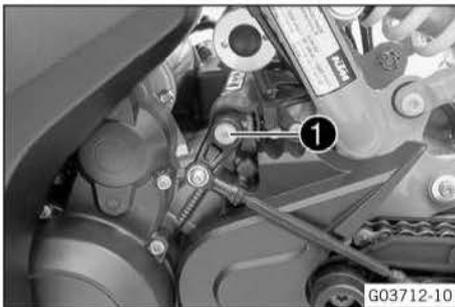
- Secure nut with lock washer.



- Position engine sprocket cover **3**.
- Mount and tighten screws **2**.

Guideline

Screw, engine sprocket cover	M5	5 Nm (3.7 lbf ft) <b>Loctite®243™</b>
------------------------------	----	------------------------------------------



- Position the bell crank.

**i** Info

The shift lever must not come into contact with any other vehicle components during the shift procedure.

- Locate and tighten screw **1** with the washers.

Guideline

Screw, shift lever	M6	14 Nm (10.3 lbf ft) <b>Loctite®243™</b>
--------------------	----	--------------------------------------------

**Finishing work**

- Check the chain tension. (📖 p. 171)

## 15.1 Removing the 12-V battery



### Warning

**Risk of injury** Battery acid and battery gases cause serious chemical burns.

- Keep 12 V batteries out of the reach of children.
- Wear suitable protective clothing and safety glasses.
- Avoid contact with battery acid and battery gases.
- Keep sparks or open flames away from the 12 V battery.
- Only charge 12 V batteries in well-ventilated rooms.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes with water for at least 15 minutes and consult a doctor immediately if battery acid and battery gases get into the eyes.



### Caution

**Danger of accidents** Electronic components and safety devices will be damaged if the 12-V battery is discharged or missing.

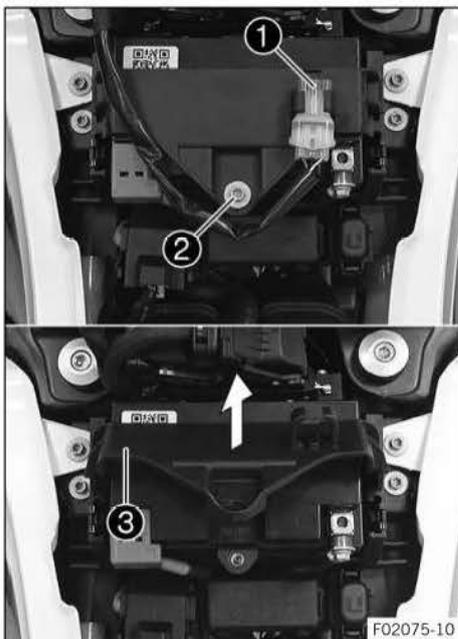
- Never operate the vehicle with a discharged 12-V battery or without a 12-V battery.

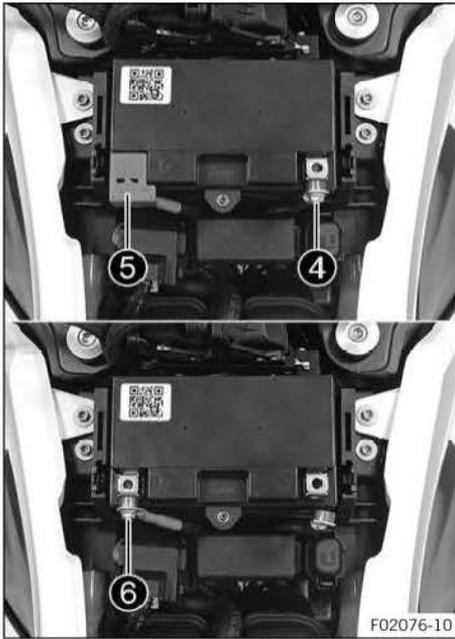
### Preparatory work

- Switch off the ignition by turning the ignition key to the position  $\otimes$ .
- Remove the seat. (📖 p. 114)
- Remove the battery cover. (📖 p. 131)

### Main work

- Pull the diagnostic connector **1** out of the bracket and hang to the side.
- Remove screw **2**.
- Raise the battery mounting element **3** at the rear and remove in upward direction.





- Disconnect negative cable ④ from the 12-V battery.
- Remove positive terminal cover ⑤.
- Disconnect positive cable ⑥ from the 12-V battery.
- Pull the 12-V battery upwards and out of the battery compartment.

## 15.2 Installing the 12-V battery



### Warning

**Risk of injury** Battery acid and battery gases cause serious chemical burns.

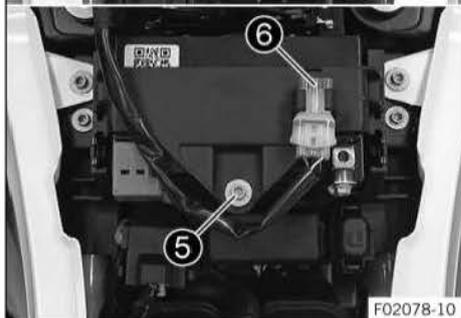
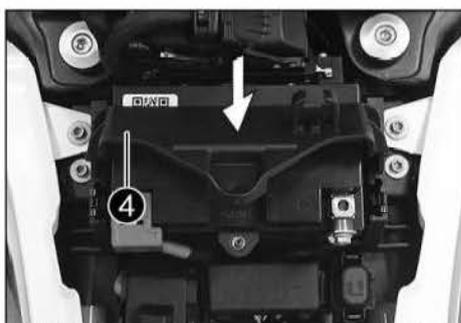
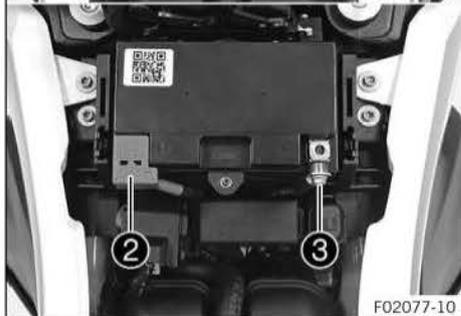
- Keep 12 V batteries out of the reach of children.
- Wear suitable protective clothing and safety glasses.
- Avoid contact with battery acid and battery gases.
- Keep sparks or open flames away from the 12 V battery.
- Only charge 12 V batteries in well-ventilated rooms.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes with water for at least 15 minutes and consult a doctor immediately if battery acid and battery gases get into the eyes.



### Caution

**Danger of accidents** Electronic components and safety devices will be damaged if the 12-V battery is discharged or missing.

- Never operate the vehicle with a discharged 12-V battery or without a 12-V battery.



## Main work

- Position the 12-V battery in the battery compartment.

12-V battery (HTZ12A-BS) (p. 404)
-----------------------------------

- ✓ The battery terminals face opposite the direction of travel.

- Connect positive cable ① to the 12-V battery.

### Guideline

Screw, battery terminal	M6	4.5 Nm (3.32 lbf ft)
-------------------------	----	-------------------------

- Mount positive terminal cover ②.
- Connect negative cable ③ to the 12-V battery.

### Guideline

Screw, battery terminal	M6	4.5 Nm (3.32 lbf ft)
-------------------------	----	-------------------------

- Hang battery mounting bracket ④ to the left and right in the holding lugs and push downward at the back.

- Mount and tighten screw ⑤.

### Guideline

Screw, battery support bracket	M6	4.5 Nm (3.32 lbf ft)
--------------------------------	----	-------------------------

- Position the diagnostics connector ⑥ in the holder.

## Finishing work

- Install the battery cover. (p. 132)
- Mount the seat. (p. 114)
- Set the time and date.

### 15.3 Disconnecting the negative cable of the 12-V battery



#### Warning

**Risk of injury** Battery acid and battery gases cause serious chemical burns.

- Keep 12 V batteries out of the reach of children.
- Wear suitable protective clothing and safety glasses.
- Avoid contact with battery acid and battery gases.
- Keep sparks or open flames away from the 12 V battery.
- Only charge 12 V batteries in well-ventilated rooms.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes with water for at least 15 minutes and consult a doctor immediately if battery acid and battery gases get into the eyes.



#### Caution

**Danger of accidents** Electronic components and safety devices will be damaged if the 12-V battery is discharged or missing.

- Never operate the vehicle with a discharged 12-V battery or without a 12-V battery.

#### Preparatory work

- Switch off the ignition by turning the ignition key to the position  $\otimes$ .
- Remove the seat. (📖 p. 114)

#### Main work

- Disconnect negative cable ❶ from the 12-V battery.



### 15.4 Connecting the negative cable of the 12-V battery



#### Warning

**Risk of injury** Battery acid and battery gases cause serious chemical burns.

- Keep 12 V batteries out of the reach of children.
- Wear suitable protective clothing and safety glasses.
- Avoid contact with battery acid and battery gases.
- Keep sparks or open flames away from the 12 V battery.
- Only charge 12 V batteries in well-ventilated rooms.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes with water for at least 15 minutes and consult a doctor immediately if battery acid and battery gases get into the eyes.



#### Caution

**Danger of accidents** Electronic components and safety devices will be damaged if the 12-V battery is discharged or missing.

- Never operate the vehicle with a discharged 12-V battery or without a 12-V battery.



### Main work

- Connect negative cable ① to the 12-V battery.

### Guideline

Screw, battery terminal	M6	4.5 Nm (3.32 lbf ft)
-------------------------	----	-------------------------

### Finishing work

- Mount the seat. (📖 p. 114)
- Set the time and date.

## 15.5 Charging the 12-V battery



### Warning

**Risk of injury** Battery acid and battery gases cause serious chemical burns.

- Keep 12 V batteries out of the reach of children.
- Wear suitable protective clothing and safety glasses.
- Avoid contact with battery acid and battery gases.
- Keep sparks or open flames away from the 12 V battery.
- Only charge 12 V batteries in well-ventilated rooms.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes with water for at least 15 minutes and consult a doctor immediately if battery acid and battery gases get into the eyes.



### Note

**Environmental hazard** 12 V batteries contain environmentally hazardous materials.

- Do not dispose of 12 V batteries as household waste.
- Dispose of 12 V batteries at a collection point for used batteries.



### Note

**Environmental hazard** Hazardous substances cause environmental damage.

- Dispose of oils, grease, filters, fuel, cleaning agents, brake fluid, etc., correctly and in compliance with the applicable regulations.



### Info

Even if there is no load on the 12-V battery, it discharges steadily each day.

The charging level and the method of charging are very important for the service life of the 12-V battery.

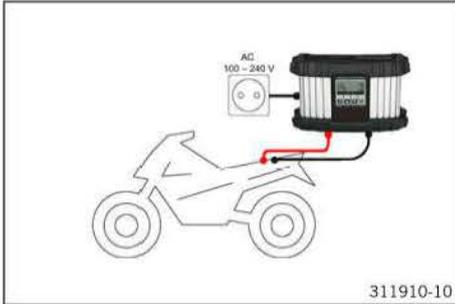
Rapid recharging with a high charging current shortens the service life of the battery.

If the charging current, charging voltage, and charging time are exceeded, the 12-V battery will be destroyed.

If the 12-V battery is depleted from starting the vehicle repeatedly, the battery must be charged immediately.

If the 12-V battery is left in a discharged state for an extended period, it will become deeply discharged and sulfating occurs, destroying the battery.

The 12-V battery is maintenance-free, i.e. the acid level does not have to be checked.



### Preparatory work

- Switch off the ignition by turning the ignition key to the position ☒.
- Remove the seat. (📖 p. 114)
- Disconnect the negative cable of the 12-V battery. (📖 p. 185)

### Main work

- Connect the battery charger to the 12-V battery. Adjust the battery charger.

EU battery charger **XCharge-professional** (00029095050) (📖 p. 468)

#### Alternative 1

US battery charger **XCharge-professional** (00029095051) (📖 p. 469)

#### Alternative 2

UK battery charger **XCharge-professional** (00029095052) (📖 p. 469)

#### Alternative 3

CH battery charger **XCharge-professional** (00029095053) (📖 p. 469)



### Info

Follow the instructions of the charger and the manual.

- Disconnect the battery charger after charging the 12-V battery. Guideline

The charging current, charging voltage, and charging time must not be exceeded.

Recharge the 12-V battery regularly when the motorcycle is not being used	3 months
---------------------------------------------------------------------------	----------

### Finishing work

- Connect the negative cable of the 12-V battery. (📖 p. 185)
- Mount the seat. (📖 p. 114)
- Set the time and date.



## 15.6 Changing the main fuse



### Warning

**Fire hazard** Incorrect fuses overload the electrical system.

- Only use fuses with the required ampere value.
- Do not bypass or repair fuses.

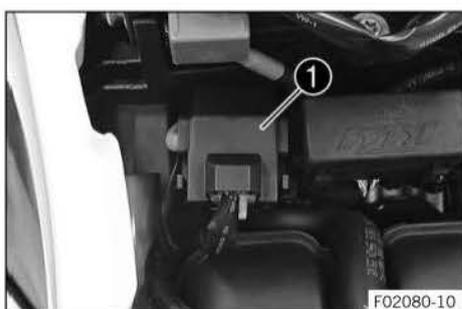
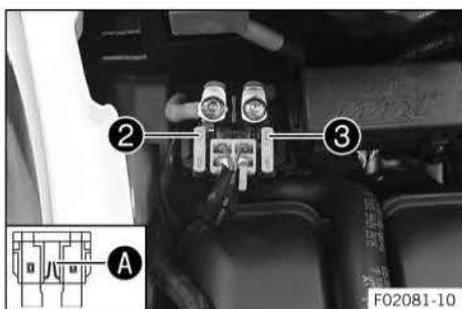
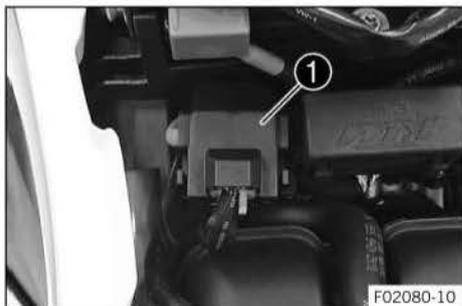


### Info

The main fuse protects all power consumers of the vehicle. The main fuse is under the seat.

### Preparatory work

- Switch off the ignition by turning the ignition key to the position ☒.



- Remove the seat. (📖 p. 114)

### Main work

- Remove protection cap ①.

- Remove faulty main fuse ②.

### Info

A faulty fuse has a burned-out fuse wire **A**.  
A spare fuse **③** is located in the starter relay.

- Insert a new main fuse.

Fuse (58011109130) (📖 p. 404)

### Tip

Insert a new spare fuse into the starter relay to have it available when needed.

- Mount protection cap ①.

### Finishing work

- Mount the seat. (📖 p. 114)
- Set the time and date.

## 15.7 Changing the fuses of individual power consumers



### Warning

**Fire hazard** Incorrect fuses overload the electrical system.

- Only use fuses with the required ampere value.
- Do not bypass or repair fuses.

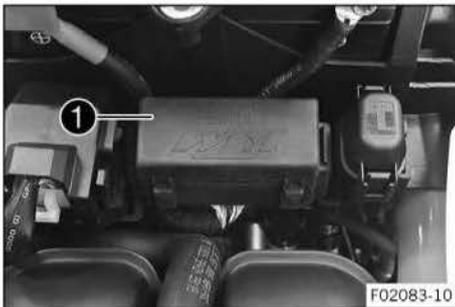


### Info

The fuse box containing the fuses of individual power consumers is located under the seat.

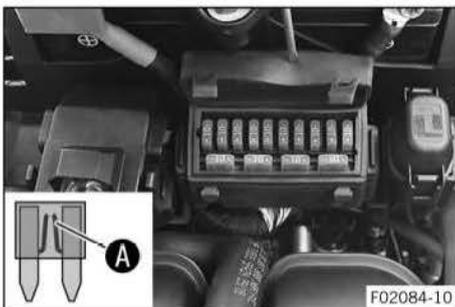
### Preparatory work

- Switch off the ignition by turning the ignition key to the position .
- Remove the seat. ( p. 114)



### Main work

- Open fuse box cover **1**.



- Remove the faulty fuse.

#### Guideline

Fuse <b>1</b> - 10 A - ignition, alarm system (optional)
Fuse <b>2</b> - 10 A - ignition, engine electronics control unit, electronic fuel injection, evaporate emission control system, lambda sensor, immobilizer
Fuse <b>3</b> - 10 A - fuel pump
Fuse <b>4</b> - 10 A - radiator fan
Fuse <b>5</b> - 10 A - horn, combination instrument, brake light
Fuse <b>6</b> - 10 A - high beam, low beam, position light, tail light, license plate lamp
Fuse <b>7</b> - 10 A - ACC1
Fuse <b>8</b> - 10 A - ACC2
Fuse <b>9</b> - 10 A - ABS control unit, diagnostics connector, 5D sensor, TPMS (optional)
Fuse <b>10</b> - 10 A - headlight control unit
Fuse <b>SPARE</b> - 10 A - spare fuses



#### Info

A faulty fuse has a burned-out fuse wire **A**.

- Insert a spare fuse with the correct rating.

Fuse (75011088010) ( p. 404)



#### Tip

Replace the spare fuse in the fuse box so that it is available if needed.

- Check that the power consumer is functioning properly.
- Close the fuse box cover.

### Finishing work

- Mount the seat. ( p. 114)

## 15.8 Checking the charging voltage

### Condition

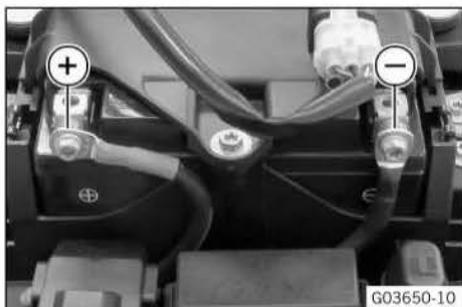
The 12-V battery must be fully functional and completely charged.

### Preparatory work

- Remove the seat. (📖 p. 114)
- Remove the battery cover. (📖 p. 131)

### Main work

- Take off positive terminal cover.
- Start the motorcycle to check the function. (📖 p. 19)
- **V** Measure the voltage between the specified points.  
Measuring point **plus (+)** – Measuring point **Ground (-)**



Charging voltage	
5,000 rpm	13.5 ... 15.0 V

- » If the displayed value is greater than the specified value:
  - Change voltage regulator.
- Mount the positive terminal cover.

### Finishing work

- Install the battery cover. (📖 p. 132)
- Mount the seat. (📖 p. 114)

## 15.9 Checking the open-circuit current

### Preparatory work

- Switch off the ignition by turning the ignition key to the position ☒.
- Remove the seat. (📖 p. 114)
- Disconnect the negative cable of the 12-V battery. (📖 p. 185)

### Main work

- Measure the current between the 12-V battery ground (-) and the negative cable.



**i Info**  
The value of the open-circuit current only applies to vehicles in their original state without additional power consumers.  
After switching off the ignition, wait 1 minute until the measurement.

Maximum open-circuit current	< 1.0 mA
------------------------------	----------

- » If the measured value is greater than the specified value:
  - Disconnect the voltage regulator from the wiring harness and perform the measurement again.

### Finishing work

- Connect the negative cable of the 12-V battery. (📖 p. 185)
- Mount the seat. (📖 p. 114)
- Set the time and date.

## 16.1 Checking the front brake linings



### Warning

**Danger of accidents** Worn-out brake linings reduce the braking effect.

- Ensure that worn-out brake linings are replaced immediately.

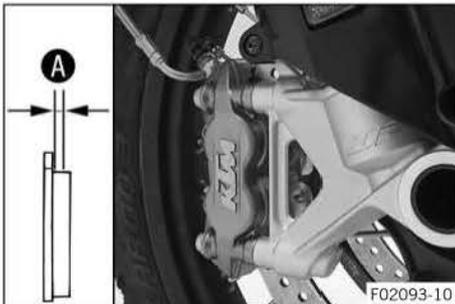


### Warning

**Danger of accidents** Damaged brake discs reduce the braking effect.

If the brake linings are not changed in time, the brake lining carriers grind against the brake disc. As a consequence, the braking effect is greatly reduced and the brake discs are destroyed.

- Check the brake linings regularly.



- Check all brake linings on both brake calipers to ensure they have the minimum thickness **A**.

Minimum thickness <b>A</b>	$\geq 1 \text{ mm } (\geq 0.04 \text{ in})$
----------------------------	---------------------------------------------

- » If the minimum thickness is less than specified:
  - Change the front brake linings. (p. 191)
- Check all brake linings on both brake calipers for damage and cracking.
  - » If there is damage or cracking:
    - Change the front brake linings. (p. 191)

## 16.2 Changing the front brake linings



### Warning

**Danger of accidents** Incorrect servicing will cause the brake system to fail.

- Ensure that service work and repairs are performed professionally.



### Warning

**Skin irritation** Brake fluid causes skin irritation.

- Keep brake fluid out of the reach of children.
- Wear suitable protective clothing and safety glasses.
- Do not allow brake fluid to come into contact with the skin, the eyes or clothing.
- Consult a doctor immediately if brake fluid has been swallowed.
- Rinse the affected area with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly with water immediately and consult a doctor if brake fluid comes into contact with the eyes.
- If brake fluid spills on to your clothing, change the clothing.



### Warning

**Danger of accidents** Old brake fluid reduces the braking effect.

- Make sure that brake fluid for the front and rear brake is changed in accordance with the service schedule.



### Warning

**Danger of accidents** Oil or grease on the brake discs reduces the braking effect.

- Always keep the brake discs free of oil and grease.
- Clean the brake discs with brake cleaner when necessary.



## Warning

**Danger of accidents** Brake linings which have not been approved alter the braking efficiency.

Not all brake linings are tested and approved for KTM motorcycles. The structure and friction coefficient of the brake linings, and thus their brake power, may vary greatly from that of original brake linings. If brake linings are used that differ from the original equipment, compliance with the original homologation is not guaranteed. In this case, the vehicle no longer corresponds to its condition at delivery and the warranty shall be void.

- Only use brake linings approved and recommended by KTM.



## Note

**Environmental hazard** Hazardous substances cause environmental damage.

- Dispose of oils, grease, filters, fuel, cleaning agents, brake fluid, etc., correctly and in compliance with the applicable regulations.

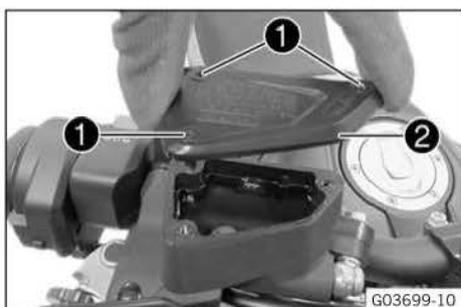


## Info

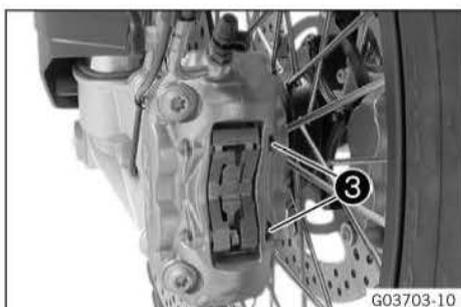
Never use DOT 5 brake fluid. It is silicone-based and purple in color. Oil seals and brake lines are not designed for DOT 5 brake fluid.

Avoid contact between brake fluid and painted parts. Brake fluid attacks paint.

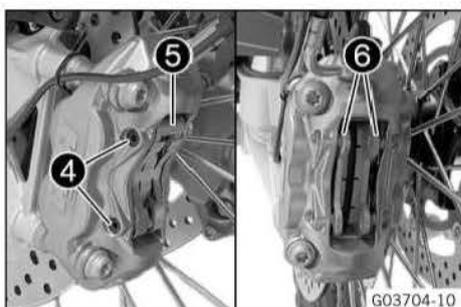
Only use clean brake fluid from a sealed container.



- Move the brake fluid reservoir mounted on the handlebar to a horizontal position.
- Remove screws **1**.
- Take off cover **2** with the membrane.



- Remove lock rings **3**.



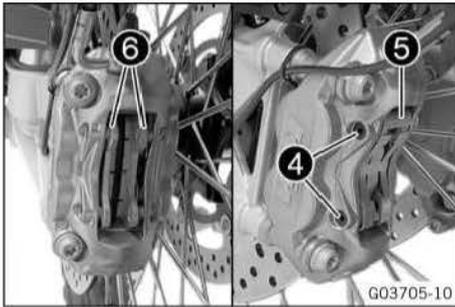
- Remove pins **4**.
- Take off plate **5**.
- Push the brake piston back into the basic position.



## Info

Ensure that brake fluid does not flow out of the brake fluid reservoir; extract some if necessary.

- Remove brake linings **6**.
- Clean the brake caliper.



- Position the new brake linings ⑥.



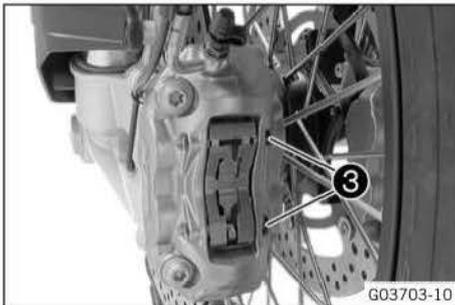
**Info**

Always change the brake linings in sets and on both sides.

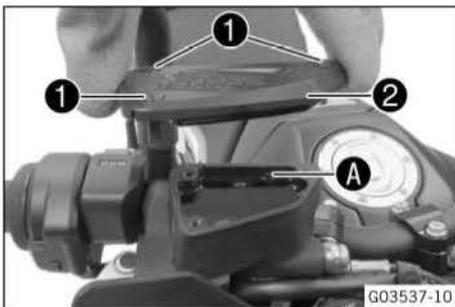
- Position plate ⑤.
- ✓ The arrow faces upward.
- Mount pins ④.

Guideline

Securing bolt for brake linings	M8	10 Nm (7.4 lbf ft)
---------------------------------	----	--------------------



- Mount lock rings ③.
- Repeat these steps on the opposite side.
- Operate the hand brake lever repeatedly until the brake linings are in contact with the brake disc and there is a pressure point.



- Correct the brake fluid to the **MAX** marking ①.

Brake fluid DOT 4 / DOT 5.1 (see p. 464)
------------------------------------------

- Position cover ② with the membrane.
- Mount and tighten screws ①.



**Info**

Immediately clean up any brake fluid that has overflowed or spilled with water.

## 16.3 Checking the front brake fluid level



**Warning**

**Danger of accidents** An insufficient brake fluid level will cause the brake system to fail.

If the brake fluid level drops below the specified marking or the specified value, the brake system is leaking or the brake linings are worn down.

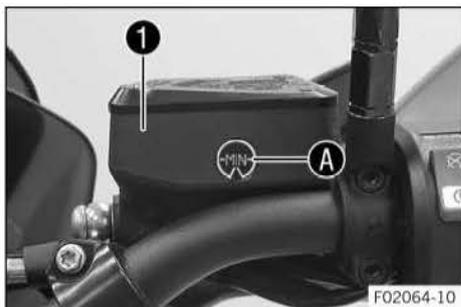
- Check the brake system and do not continue riding until the problem is eliminated.



**Warning**

**Danger of accidents** Old brake fluid reduces the braking effect.

- Make sure that brake fluid for the front and rear brake is changed in accordance with the service schedule.



- Move the brake fluid reservoir mounted on the handlebar to a horizontal position.
- Check the brake fluid level in brake fluid reservoir **1**.
  - » If the brake fluid level has dropped below **MIN** marking **A**:
    - Add the front brake fluid. (📖 p. 194)

## 16.4 Adding the front brake fluid



### Warning

**Danger of accidents** An insufficient brake fluid level will cause the brake system to fail. If the brake fluid level drops below the specified marking or the specified value, the brake system is leaking or the brake linings are worn down.

- Check the brake system and do not continue riding until the problem is eliminated.



### Warning

**Skin irritation** Brake fluid causes skin irritation.

- Keep brake fluid out of the reach of children.
- Wear suitable protective clothing and safety glasses.
- Do not allow brake fluid to come into contact with the skin, the eyes or clothing.
- Consult a doctor immediately if brake fluid has been swallowed.
- Rinse the affected area with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly with water immediately and consult a doctor if brake fluid comes into contact with the eyes.
- If brake fluid spills on to your clothing, change the clothing.



### Warning

**Danger of accidents** Old brake fluid reduces the braking effect.

- Make sure that brake fluid for the front and rear brake is changed in accordance with the service schedule.



### Note

**Environmental hazard** Hazardous substances cause environmental damage.

- Dispose of oils, grease, filters, fuel, cleaning agents, brake fluid, etc., correctly and in compliance with the applicable regulations.



### Info

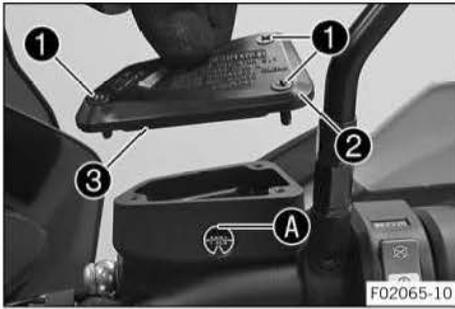
Never use DOT 5 brake fluid. It is silicone-based and purple in color. Oil seals and brake lines are not designed for DOT 5 brake fluid.

Avoid contact between brake fluid and painted parts. Brake fluid attacks paint.

Only use clean brake fluid from a sealed container.

### Preparatory work

- Check the front brake linings. (📖 p. 191)



**Main work**

- Move the brake fluid reservoir mounted on the handlebar to a horizontal position.
- Remove screws ①.
- Take off cover ② with membrane ③.
- Add brake fluid up to the marking A.

Brake fluid DOT 4 / DOT 5.1 (📖 p. 464)

- Position cover ② with membrane ③.
- Mount and tighten screws ①.

**i Info**  
Immediately clean up any brake fluid that has overflowed or spilled with water.

**16.5 Changing the front brake fluid**

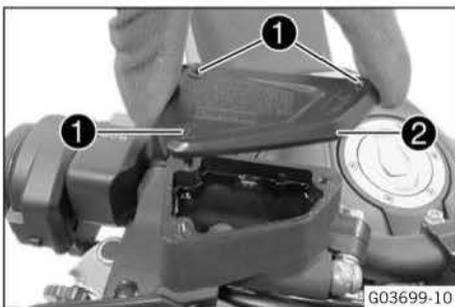
**⚠ Warning**  
**Skin irritation** Brake fluid causes skin irritation.

- Keep brake fluid out of the reach of children.
- Wear suitable protective clothing and safety glasses.
- Do not allow brake fluid to come into contact with the skin, the eyes or clothing.
- Consult a doctor immediately if brake fluid has been swallowed.
- Rinse the affected area with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly with water immediately and consult a doctor if brake fluid comes into contact with the eyes.
- If brake fluid spills on to your clothing, change the clothing.

**🌿 Note**  
**Environmental hazard** Hazardous substances cause environmental damage.

- Dispose of oils, grease, filters, fuel, cleaning agents, brake fluid, etc., correctly and in compliance with the applicable regulations.

**i Info**  
Never use DOT 5 brake fluid. It is silicone-based and purple in color. Oil seals and brake lines are not designed for DOT 5 brake fluid.  
Avoid contact between brake fluid and painted parts. Brake fluid attacks paint.  
Only use clean brake fluid from a sealed container.



- Move the brake fluid reservoir mounted on the handlebar to a horizontal position.
- Cover the painted parts.
- Remove screws ①.
- Take off cover ② with the membrane.
- Extract the old brake fluid from the brake fluid reservoir using a syringe and fill with a fresh brake fluid.

Syringe (50329050000) (📖 p. 470)

Brake fluid DOT 4 / DOT 5.1 (📖 p. 464)

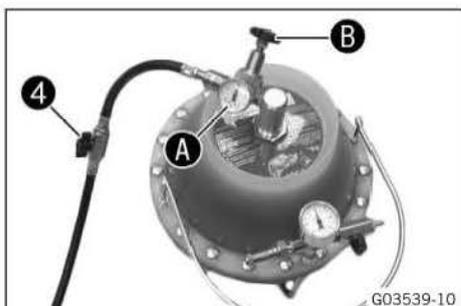


- Mount corresponding bleeder cover **3** from the special tool set.

Bleeder cover (00029013021) (📖 p. 468)

- Connect the bleeding device.

Bleeding device (00029013100) (📖 p. 468)



- Open shut-off valve **4**.

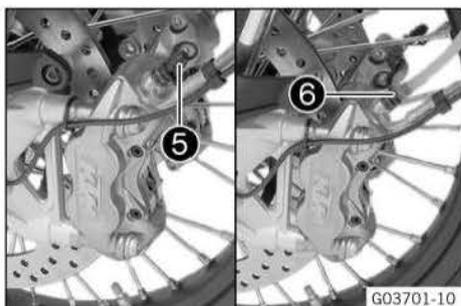
**i Info**

Follow the instructions in the Owner's Manual of the bleeding device.

- Ensure that the inflation pressure is set at pressure gauge **A**. Correct the inflation pressure on pressure regulator **B** if necessary.

**Guideline**

Inflation pressure	2 ... 2,5 bar (29 ... 36 psi)
--------------------	-------------------------------



- Pull protection cap **5** off the bleeder screw of the left brake caliper.

- Connect the bleeder bottle hose.

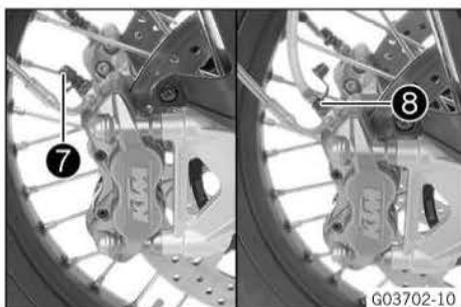
Bleeding device (00029013100) (📖 p. 468)

- Open bleeder screw **6** by approx. one half turn.

**i Info**

Drain until fresh brake fluid emerges in the bleeder bottle hose without bubbles.

- Tighten the bleeder screw. Remove the bleeder bottle hose.
- Mount the protection cap.



- Pull protection cap **7** off the bleeder screw of the right brake caliper.

- Connect the bleeder bottle hose.

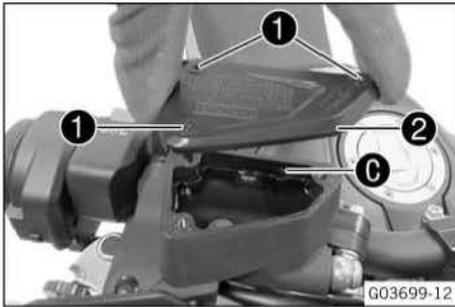
Bleeding device (00029013100) (📖 p. 468)

- Open bleeder screw **8** by approx. one half turn.

**i Info**

Drain until fresh brake fluid emerges in the bleeder bottle hose without bubbles.

- Tighten the bleeder screw.
- Close shut-off valve **4**.
- Open the bleeder screw again until brake fluid stops emerging.
  - ✓ Overfilling the brake fluid reservoir is prevented.
- Tighten the bleeder screw. Remove the bleeder bottle hose.
- Mount the protection cap.
- Disconnect the bleeding device. Remove the bleeder cover.



- Correct the brake fluid to **MAX** marking **C**.

Brake fluid DOT 4 / DOT 5.1 ( p. 464)

- Position cover **2** with the membrane.
- Mount and tighten screws **1**.



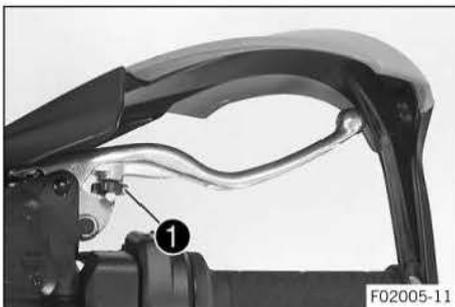
**Info**

Immediately clean up any brake fluid that has overflowed or spilled with water.

- Check the hand brake lever for a firm pressure point.



**16.6 Adjusting the basic position of the hand brake lever**



- Push hand brake lever forward.
- Adjust the basic position of the hand brake lever to your hand size by turning adjusting screw **1**.



**Info**

Turn the adjusting screw clockwise to decrease the distance between the hand brake lever and the handlebar.  
 Turn the adjusting screw counterclockwise to increase the distance between the hand brake lever and the handlebar.  
 The range of adjustment is limited.  
 Only turn the adjusting screw by hand, and do not use force.  
 Do not make any adjustments while riding.



**16.7 Checking the rear brake linings**



**Warning**

**Danger of accidents** Worn-out brake linings reduce the braking effect.

- Ensure that worn-out brake linings are replaced immediately.

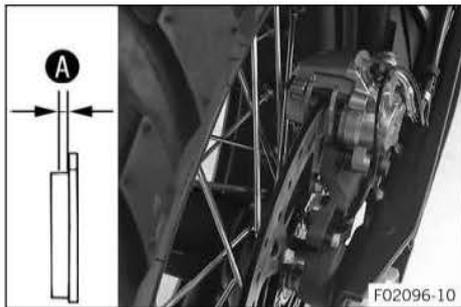


**Warning**

**Danger of accidents** Damaged brake discs reduce the braking effect.

If the brake linings are not changed in time, the brake lining carriers grind against the brake disc. As a consequence, the braking effect is greatly reduced and the brake discs are destroyed.

- Check the brake linings regularly.



- Check the brake linings for minimum thickness **A**.

Minimum thickness <b>A</b>	$\geq 1 \text{ mm } (\geq 0.04 \text{ in})$
----------------------------	---------------------------------------------

- » If the minimum thickness is less than specified:
  - Change the brake pads of the rear brake. (📖 p. 198)
- Check the brake linings for damage and cracking.
  - » If there is wear or tearing:
    - Change the brake pads of the rear brake. (📖 p. 198)

## 16.8 Changing the brake pads of the rear wheel brake



### Warning

**Danger of accidents** Incorrect servicing will cause the brake system to fail.

- Ensure that service work and repairs are performed professionally.



### Warning

**Skin irritation** Brake fluid causes skin irritation.

- Keep brake fluid out of the reach of children.
- Wear suitable protective clothing and safety glasses.
- Do not allow brake fluid to come into contact with the skin, the eyes or clothing.
- Consult a doctor immediately if brake fluid has been swallowed.
- Rinse the affected area with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly with water immediately and consult a doctor if brake fluid comes into contact with the eyes.
- If brake fluid spills on to your clothing, change the clothing.



### Warning

**Danger of accidents** Old brake fluid reduces the braking effect.

- Make sure that brake fluid for the front and rear brake is changed in accordance with the service schedule.



### Warning

**Danger of accidents** Oil or grease on the brake discs reduces the braking effect.

- Always keep the brake discs free of oil and grease.
- Clean the brake discs with brake cleaner when necessary.



### Warning

**Danger of accidents** Brake linings which have not been approved alter the braking efficiency.

Not all brake linings are tested and approved for KTM motorcycles. The structure and friction coefficient of the brake linings, and thus their brake power, may vary greatly from that of original brake linings. If brake linings are used that differ from the original equipment, compliance with the original homologation is not guaranteed. In this case, the vehicle no longer corresponds to its condition at delivery and the warranty shall be void.

- Only use brake linings approved and recommended by KTM.



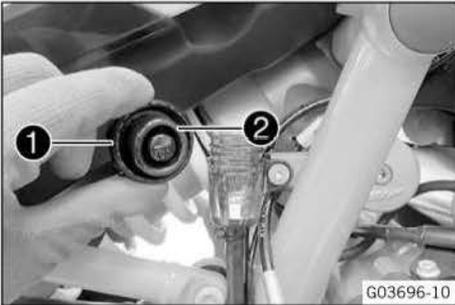
### Note

**Environmental hazard** Hazardous substances cause environmental damage.

- Dispose of oils, grease, fuel, cleaning agents, brake fluid, etc., correctly and in compliance with the applicable regulations.

**i Info**

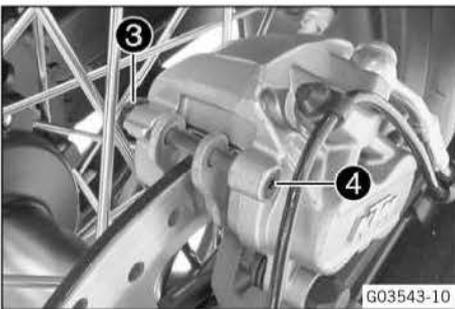
Never use DOT 5 brake fluid! It is silicone-based and purple in color. Oil seals and brake lines are not designed for DOT 5 brake fluid.  
 Avoid contact between brake fluid and painted parts. Brake fluid attacks paint.  
 Only use clean brake fluid from a sealed container.



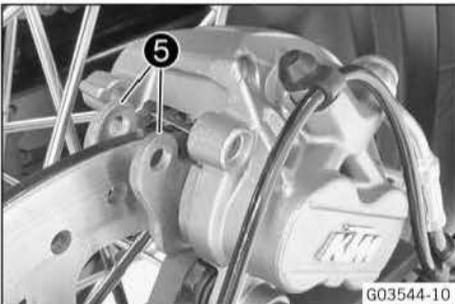
- Position the vehicle upright.
- Remove screw cap **1** with the insert and membrane **2**.
- Manually press the brake caliper toward the brake disc to push back the brake pistons.

**i Info**

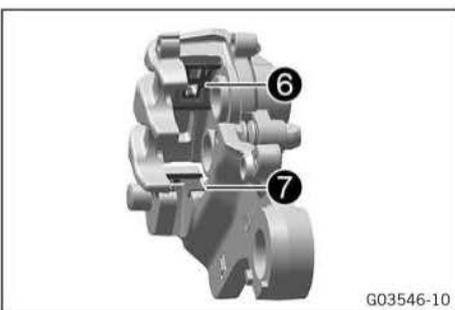
Ensure that brake fluid does not flow out of the brake fluid reservoir; extract some if necessary.



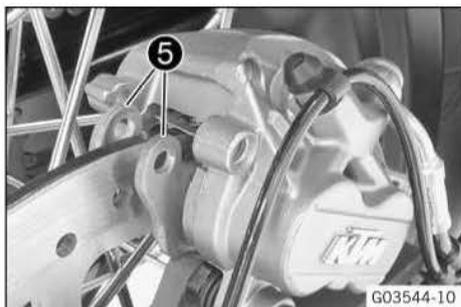
- Remove lock ring **3**.
- Remove pin **4**.



- Remove brake linings **5**.



- Clean the brake caliper and the brake caliper bracket.
- Check that spring plate **6** and sliding plate **7** are seated properly.

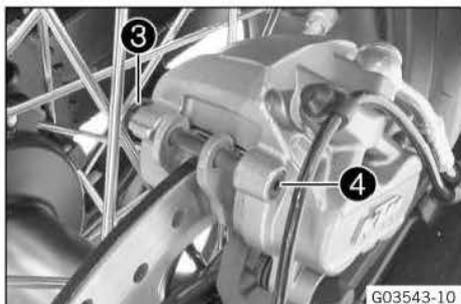


- Position new brake linings **5**.



**Info**

Always change the brake linings in pairs.

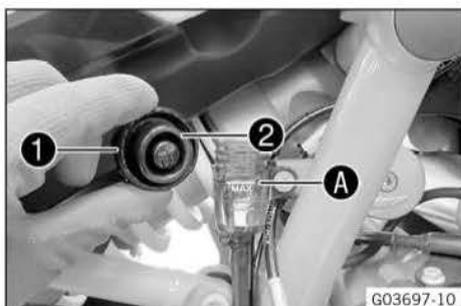


- Mount and tighten pin **4**.

Guideline

Pin, rear brake caliper	M8	22 Nm (16.2 lbf ft)
-------------------------	----	---------------------

- Mount lock ring **3**.



- Operate the foot brake lever repeatedly until the brake linings are in contact with the brake disc and there is a pressure point.

- Correct the brake fluid level to the **MAX** marking **A**.

Brake fluid DOT 4 / DOT 5.1 (see p. 464)
------------------------------------------

- Mount and tighten screw cap **1** with the insert and membrane **2**.



**Info**

Immediately clean up any brake fluid that has overflowed or spilled with water.

## 16.9 Checking the free travel of the foot brake lever

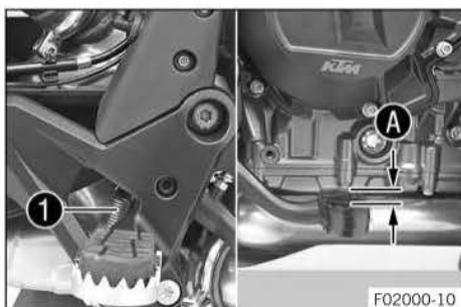


**Warning**

**Danger of accidents** The brake system fails in the event of overheating.

If there is no free travel on the foot brake lever, pressure builds up in the brake system on the rear brake.

- Set the free travel on the foot brake lever in accordance with the specification.



- Detach spring **1**.
- Move the foot brake lever back and forth between the end stop and the contact to the foot brake cylinder piston and check free travel **A**.

Guideline

Free travel at foot brake lever	3 ... 5 mm (0.12 ... 0.2 in)
---------------------------------	------------------------------

- » If the free travel does not match the specification:
  - Adjust the basic position of the foot brake lever. (see p. 201)

- Attach spring ①.



## 16.10 Adjusting the basic position of the foot brake lever

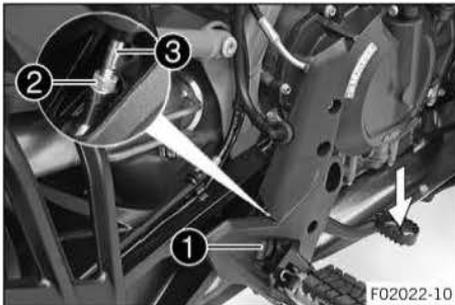


### Warning

**Danger of accidents** The brake system fails in the event of overheating.

If there is no free travel on the foot brake lever, pressure builds up in the brake system on the rear brake.

- Set the free travel on the foot brake lever in accordance with the specification.



- Detach spring ①.
- Loosen nut ②.



### Tip

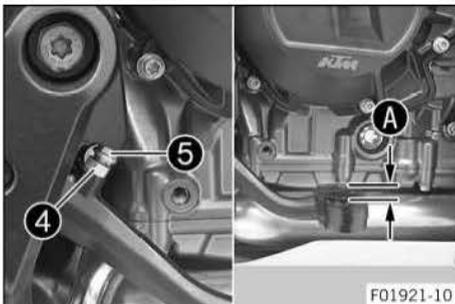
Press the foot brake lever downwards to make this easier.

- Turn the push rod ③ to set the basic position of the foot brake lever.



### Info

The range of adjustment is limited. The screw must be screwed in by at least five full turns. Screwing the push rod into the ball joint adjusts the foot brake lever downwards. Screwing the push rod out of the ball joint adjusts the brake lever upwards.



- Loosen nut ④ and turn screw ⑤ correspondingly until the free travel A is present. If necessary, adjust the basic position of the foot brake lever.

### Guideline

Free travel at foot brake lever	3 ... 5 mm (0.12 ... 0.2 in)
---------------------------------	------------------------------

- Hold screw ⑤ and tighten nut ④.

### Guideline

Remaining nuts, chassis	M6	10 Nm (7.4 lbf ft)
-------------------------	----	--------------------

- Tighten nut ②.

### Guideline

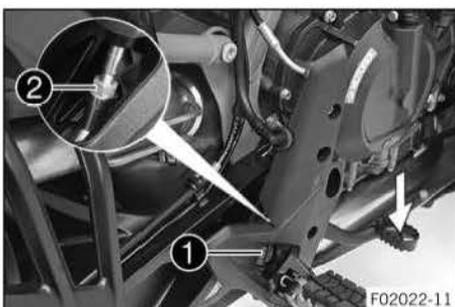
Nut, push rod, foot brake lever	M6	6 Nm (4.4 lbf ft)
---------------------------------	----	-------------------



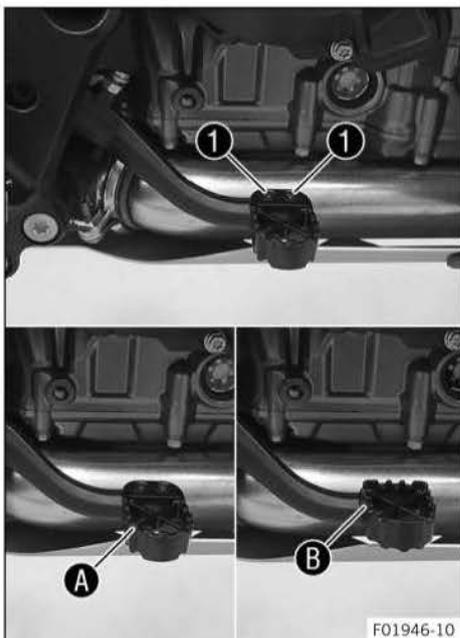
### Tip

Press the foot brake lever downwards to make this easier.

- Attach spring ①.



## 16.11 Adjusting foot brake lever stub



- Remove screws **1** with the foot brake lever stub.
- Move the foot brake lever stub into desired position **A** or **B**. Mount and tighten screws **1**.

### Guideline

Screw, foot brake lever stub	M5	5 Nm (3.7 lbf ft) <b>Loctite®243™</b>
------------------------------	----	------------------------------------------

## 16.12 Checking the rear brake fluid level



### Warning

**Danger of accidents** An insufficient brake fluid level will cause the brake system to fail. If the brake fluid level drops below the **MIN** marking, the brake system is leaking or the brake linings are worn down.

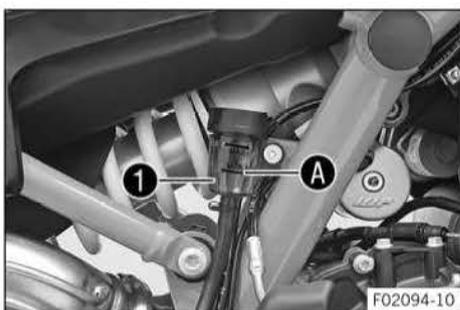
- Check the brake system and do not continue riding until the problem is eliminated.



### Warning

**Danger of accidents** Old brake fluid reduces the braking effect.

- Make sure that brake fluid for the front and rear brake is changed in accordance with the service schedule.



- Position the vehicle upright.
- Check the brake fluid level in brake fluid reservoir **1**.
  - » If the fluid level reaches the **MIN** marking **A**:
    - Add rear brake fluid. (📖 p. 203)

## 16.13 Adding rear brake fluid

**Warning**

**Danger of accidents** An insufficient brake fluid level will cause the brake system to fail.

If the brake fluid level drops below the **MIN** marking, the brake system is leaking or the brake linings are worn down.

- Check the brake system and do not continue riding until the problem is eliminated.

**Warning**

**Skin irritation** Brake fluid causes skin irritation.

- Keep brake fluid out of the reach of children.
- Wear suitable protective clothing and safety glasses.
- Do not allow brake fluid to come into contact with the skin, the eyes or clothing.
- Consult a doctor immediately if brake fluid has been swallowed.
- Rinse the affected area with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly with water immediately and consult a doctor if brake fluid comes into contact with the eyes.
- If brake fluid spills on to your clothing, change the clothing.

**Warning**

**Danger of accidents** Old brake fluid reduces the braking effect.

- Make sure that brake fluid for the front and rear brake is changed in accordance with the service schedule.

**Note**

**Environmental hazard** Hazardous substances cause environmental damage.

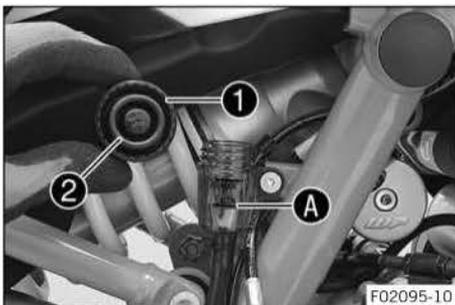
- Dispose of oils, grease, filters, fuel, cleaning agents, brake fluid, etc., correctly and in compliance with the applicable regulations.

**Info**

Never use DOT 5 brake fluid. It is silicone-based and purple in color. Oil seals and brake lines are not designed for DOT 5 brake fluid.

Avoid contact between brake fluid and painted parts. Brake fluid attacks paint.

Only use clean brake fluid from a sealed container.

**Preparatory work**

- Check the rear brake linings. (📖 p. 197)

**Main work**

- Stand the vehicle upright.
- Remove screw cap ① with the insert and membrane ②.
- Add brake fluid up to the **MAX** marking **A**.

Brake fluid DOT 4 / DOT 5.1 (📖 p. 464)

- Mount and tighten screw cap ① with the insert and membrane ②.

**Info**

Immediately clean up any brake fluid that has overflowed or spilled with water.

## 16.14 Changing the rear brake fluid



### Warning

**Skin irritation** Brake fluid causes skin irritation.

- Keep brake fluid out of the reach of children.
- Wear suitable protective clothing and safety glasses.
- Do not allow brake fluid to come into contact with the skin, the eyes or clothing.
- Consult a doctor immediately if brake fluid has been swallowed.
- Rinse the affected area with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly with water immediately and consult a doctor if brake fluid comes into contact with the eyes.
- If brake fluid spills on to your clothing, change the clothing.



### Note

**Environmental hazard** Hazardous substances cause environmental damage.

- Dispose of oils, grease, filters, fuel, cleaning agents, brake fluid, etc., correctly and in compliance with the applicable regulations.



### Info

Never use DOT 5 brake fluid. It is silicone-based and purple in color. Oil seals and brake lines are not designed for DOT 5 brake fluid.

Avoid contact between brake fluid and painted parts. Brake fluid attacks paint.

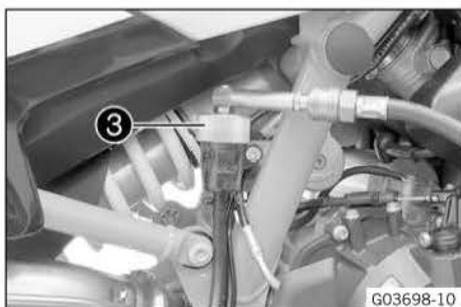
Only use clean brake fluid from a sealed container.



- Cover the painted parts.
- Remove screw cap **1** with the insert and membrane **2**.
- Extract the old brake fluid from the brake fluid reservoir using a syringe and fill with a fresh brake fluid.

Syringe (50329050000) (📖 p. 470)
----------------------------------

Brake fluid DOT 4 / DOT 5.1 (📖 p. 464)
----------------------------------------

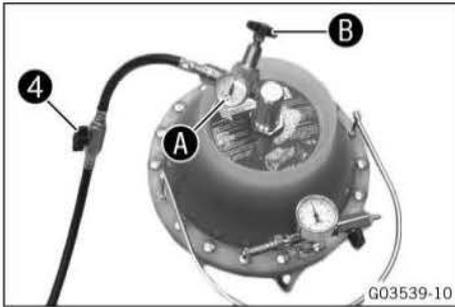


- Mount bleeder cover **3**.

Bleeder cover (00029013022) (📖 p. 468)
----------------------------------------

- Connect the bleeding device.

Bleeding device (00029013100) (📖 p. 468)
------------------------------------------



G03539-10

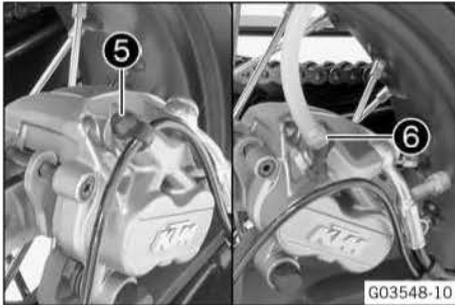
- Open shut-off valve 4.

**i Info**  
Follow the instructions in the Owner's Manual of the bleeding device.

- Ensure that the inflation pressure is set at pressure gauge A. Correct the inflation pressure on pressure regulator B if necessary.

**Guideline**

Inflation pressure	2 ... 2.5 bar (29 ... 36 psi)
--------------------	-------------------------------



G03548-10

- Pull off protection cap 5 of the bleeder screw. Hang the cable to the side.
- Connect the bleeder bottle hose.

Bleeding device (00029013100) (☞ p. 468)
------------------------------------------

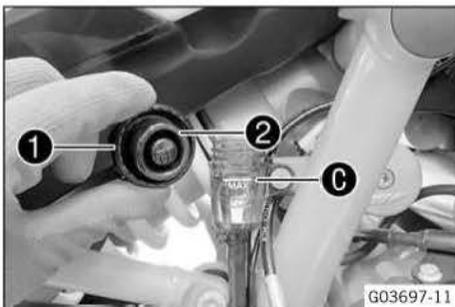
- Open bleeder screw 6 by approx. one half turn.

**i Info**  
Drain until fresh brake fluid emerges in the bleeder bottle hose without bubbles.

- Tighten the bleeder screw.
- Close shut-off valve 4.
- Open the bleeder screw again until brake fluid stops emerging.  
✓ Overfilling the brake fluid reservoir is prevented.
- Tighten the bleeder screw. Remove the bleeder bottle hose.
- Position the cable on the protection cap. Mount the protection cap.
- Disconnect the bleeding device. Remove the bleeder cover.
- Correct the brake fluid to **MAX** marking C.

Brake fluid DOT 4 / DOT 5.1 (☞ p. 464)
----------------------------------------

- Mount and tighten screw cap 1 with the insert and membrane 2.



G03697-11

**i Info**  
Immediately clean up any brake fluid that has overflowed or spilled with water.

## 16.15 Bleeding the brake system



### Warning

**Skin irritation** Brake fluid causes skin irritation.

- Keep brake fluid out of the reach of children.
- Wear suitable protective clothing and safety glasses.
- Do not allow brake fluid to come into contact with the skin, the eyes or clothing.
- Consult a doctor immediately if brake fluid has been swallowed.
- Rinse the affected area with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly with water immediately and consult a doctor if brake fluid comes into contact with the eyes.
- If brake fluid spills on to your clothing, change the clothing.



### Note

**Environmental hazard** Hazardous substances cause environmental damage.

- Dispose of oils, grease, filters, fuel, cleaning agents, brake fluid, etc., correctly and in compliance with the applicable regulations.



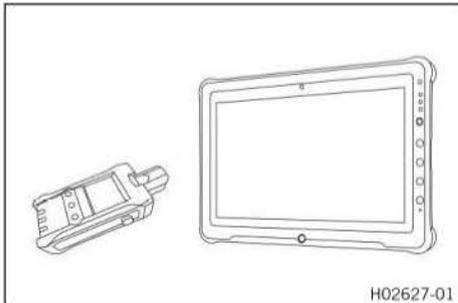
### Info

Avoid contact between brake fluid and painted parts. Brake fluid attacks paint!  
Use only clean brake fluid from a sealed container.

### Condition

The diagnostic tool is connected and running.

- Execute "**Brake electronics**" > "**Functions**" > "**Bleed brake system**".
- Follow the instructions in the diagnostics tool.



## 17.1 Programming the ignition key

### **i** Info

If an ignition key is lost or replaced, all ignition keys must be reactivated. This will also prevent the vehicle from being operated without authorization with the lost ignition key. You can activate up to four ignition keys. All ignition keys not programmed during the activation procedure are invalid, but can be reprogrammed in a further activation procedure. An enabling code is required to activate the ignition keys.

### Condition

The diagnostics tool is connected and running.

- Switch on the ignition by turning the ignition key to the position  $\odot$ .
- Select **"CU diagnostics" > "Immobilizer" > "ECU"**.
- **"Functions" > "Program key" > "Select"**.

### **i** Info

The instructions in the diagnostics tool must be followed precisely.

- Select **"Request enabling code"**.
- Select **"Start programming procedure"**.

### **i** Info

The instructions in the diagnostics tool must be followed precisely.

- Clear the fault memory using the KTM diagnostics tool.
- Switch off the ignition for 20 seconds.
- Read out the trouble code memory using the KTM diagnostics tool.
  - » If an error is still present:
    - Repeat the procedure.



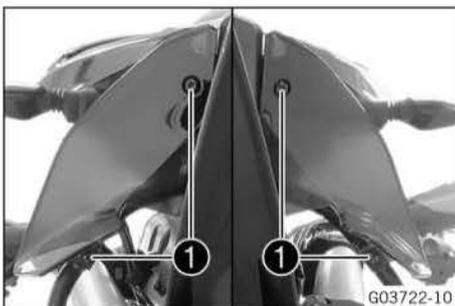
## 17.2 Removing the headlight mask with the headlight

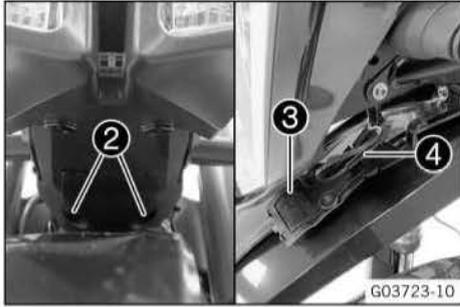
### Preparatory work

- Switch off the ignition by turning the ignition key to the position  $\otimes$ .

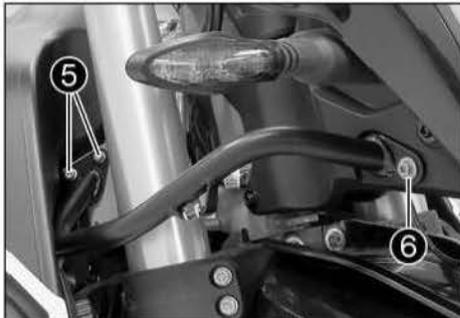
### Main work

- Remove screws **1**.
- Remove the mask spoilers.

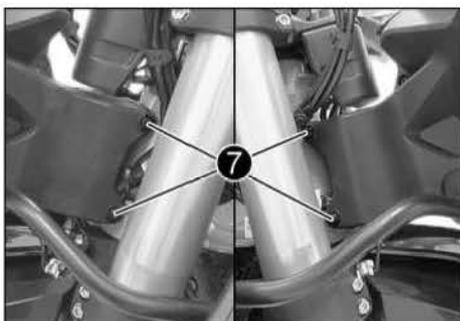




- Remove expanding rivets ② and open cover ③.
- Detach temperature sensor ④.
- Remove the cover.



- Loosen screws ⑤.
- Remove screws ⑥.



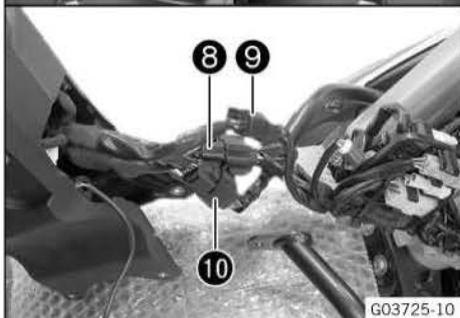
- Remove screws ⑦.
- Pull the headlight mask forward.



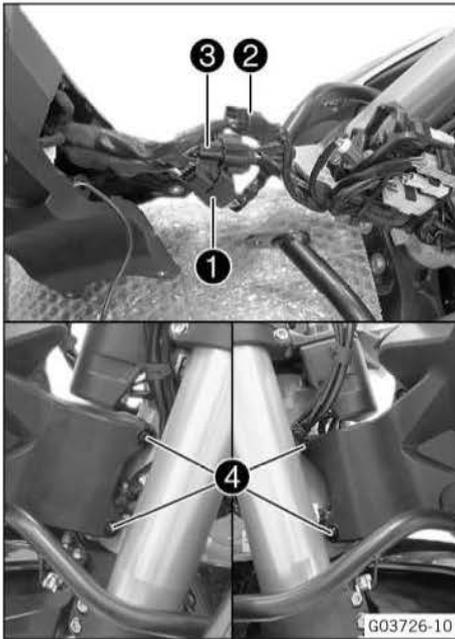
**Info**

Cover the components to protect them against damage.

- Disconnect plug-in connectors ⑧, ⑨ and ⑩.
- Take off the headlight mask.



## 17.3 Installing the headlight mask with the headlight

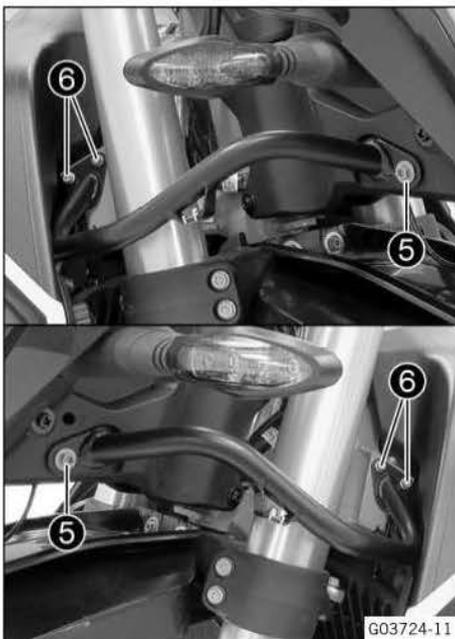


### Main work

- Join plug-in connectors ①, ② and ③.
- Position the headlight mask.
- Mount and tighten screws ④.

### Guideline

Screw, head-light mask	M6	10 Nm (7.4 lbf ft) <b>Loctite®243™</b>
------------------------	----	-------------------------------------------



- Mount and tighten screws ⑤.

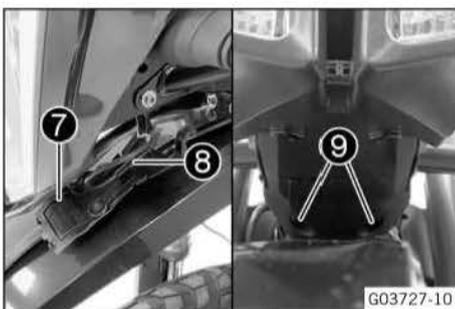
### Guideline

Screw, head-light mask sup-port	M6	10 Nm (7.4 lbf ft) <b>Loctite®243™</b>
---------------------------------	----	-------------------------------------------

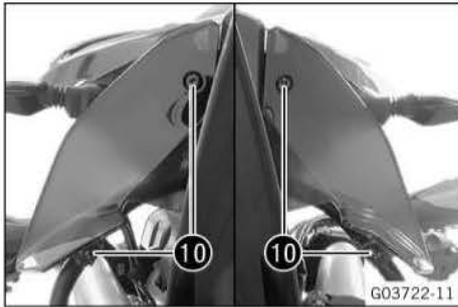
- Remove screws ⑥.
- Mount and tighten screws ⑥.

### Guideline

Screw, head-light mask sup-port	M6	10 Nm (7.4 lbf ft) <b>Loctite®243™</b>
---------------------------------	----	-------------------------------------------



- Hook cover ⑦ to the rear.
- Secure temperature sensor ⑧ in the holder.
- Position the cover and mount expanding rivets ⑨.



- Position the mask spoilers.
- Mount and tighten screws 10.

**Guideline**

Screw, trim	M5	3 Nm (2.2 lbf ft)
-------------	----	-------------------

**Finishing work**

- Check the headlight setting. (p. 210)

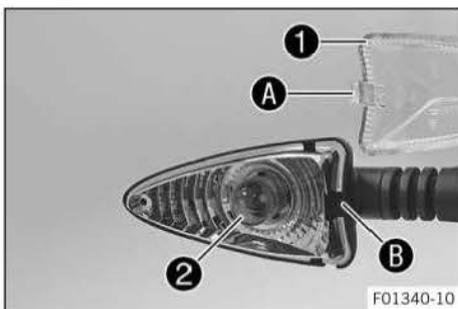
## 17.4 Changing the turn signal bulb (US)

**Note**

**Damage to reflector** Grease on the reflector reduces the light intensity.

Grease on the bulb will evaporate due to the heat and be deposited on the reflector.

- Clean and degrease the bulbs before mounting.
- Do not touch the bulbs with your bare hands.



- Remove the screw on the front of the turn signal glass.
- Carefully remove turn signal glass 1.
- Press bulb 2 carefully into the socket, turn it counterclockwise by about 30°, and take it out of the socket.
- Push the new bulb gently into the socket and turn it clockwise all the way in.

Turn signal (RY10W / socket BAU15s) (p. 404)
----------------------------------------------

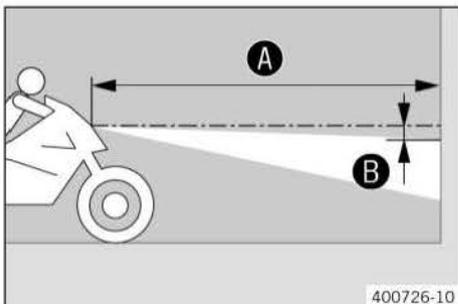
- Check that the turn signal is functioning properly.
- Position the turn signal glass.

**i Info**

Insert holding lug A into cut-out B.

- Insert the screw and first turn counterclockwise until it engages in the thread with a small jerk. Tighten the screw lightly.

## 17.5 Checking the headlight setting



- Park the vehicle on a horizontal surface in front of a light-colored wall and make a mark at the height of the center of the low beam headlight.
- Make another mark at a distance B under the first marking.

**Guideline**

Distance B	5 cm (2 in)
------------	-------------

- Position the vehicle upright at distance A from the wall and switch on the low beam.

Guideline

Distance <b>A</b>	5 m (16 ft)
-------------------	-------------

- The rider now mounts the motorcycle with luggage and passenger if applicable.
- Check the headlight setting.

The light-dark boundary must be exactly on the lower marking when the motorcycle is ready to be operated with the rider mounted along with any luggage and a passenger if applicable.

- » If the boundary between light and dark does not meet specifications:
  - Adjust headlight range. (📖 p. 211)



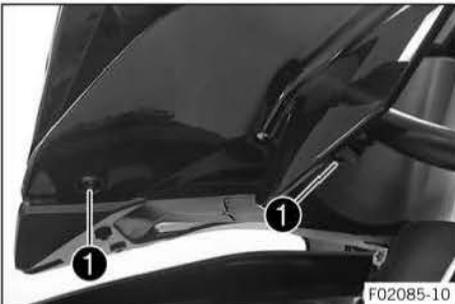
## 17.6 Adjusting the headlight range

**Preparatory work**

- Check the headlight setting. (📖 p. 210)

**Main work**

- Remove screws **1**.
- Remove the left mask spoiler.



- Turn adjusting screw **2** to adjust the headlight range.

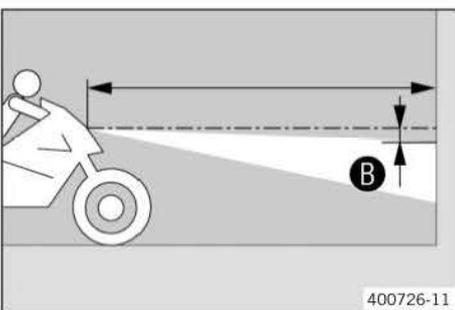


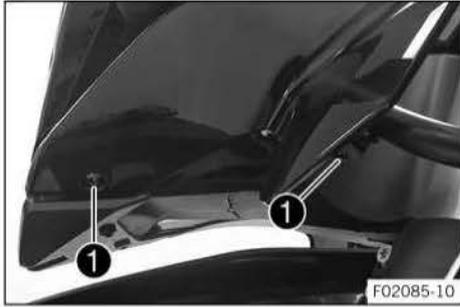
**i Info**  
 Turn clockwise to reduce the headlight range; turn counterclockwise to increase the headlight range. If you have a payload, you may have to correct the headlight range.

- Set the headlight to marking **B**.

Guideline

The light-dark boundary must lie exactly on lower marking **B** when the motorcycle is ready to operate with the rider mounted along with any luggage and a passenger, if applicable.



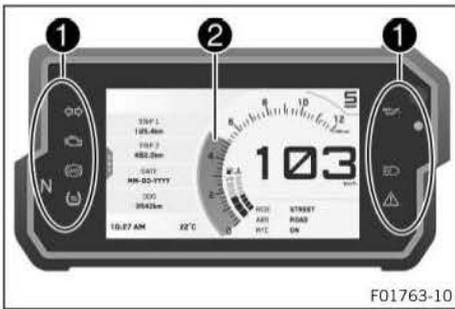


- Position left mask spoiler.
- Mount and tighten screws ①.

Guideline

Remaining screws, chassis	M5	5 Nm (3.7 lbf ft)
------------------------------	----	-------------------

## 18.1 Combination instrument



The combination instrument is attached in front of the handlebar. The combination instrument is divided into two function areas.

- ① indicator lamps (p. 215)
- ② Display

## 18.2 Activation and test



### Activation

The combination instrument is activated when the ignition is switched on.

- i Info**  
The brightness of the displays is controlled by an ambient light sensor in the combination instrument.

### Test

The welcome text appears on the display and all indicator lamps are briefly activated for a function check.

- i Info**  
The malfunction indicator lamp  always lights up as long as the engine is not running. If the engine is running and the malfunction indicator lamp  lights up, stop (taking care not to endanger yourself or other road users in the process) and contact an authorized KTM workshop.  
The oil pressure warning lamp  always lights up as long as the engine is not running. If the engine is running and the oil pressure warning lamp  lights up, stop immediately (taking care not to endanger yourself or other road users in the process) and switch off the engine.  
The ABS warning lamp  and TC indicator lamp  light up until a speed of approx. 6 km/h (approx. 4 mph) or more has been reached.

## 18.3 Day-night mode



Day mode is shown in a bright color.



Night mode is shown in a dark color.

**i Info**  
The ambient light sensor in the combination instrument measures the brightness of the environment. The display is brightened, darkened or switched to the other mode depending on the light intensity measured by the ambient light sensor.  
The display mode can be configured in the **Display Theme** submenu. Here, you can select automatic day-night mode or permanent night mode.

## 18.4 Warnings



Warnings appear on the top and/or bottom edge of the display; these are marked yellow or red depending on their relevance. Yellow warnings **1** indicate errors or information which require prompt intervention or an adjustment to the riding style. Red warnings **2** indicate errors or information which require immediate intervention.

**i Info**  
Warnings can be hidden by pressing any button. All the existing warnings are displayed in the **Warning** submenu until they are no longer active.

## 18.5 Ice warning



The ice warning ❄ goes on when there is an increased risk of ice on the roads.  
The ice warning ❄ appears on the display when the ambient temperature drops below the specified value.

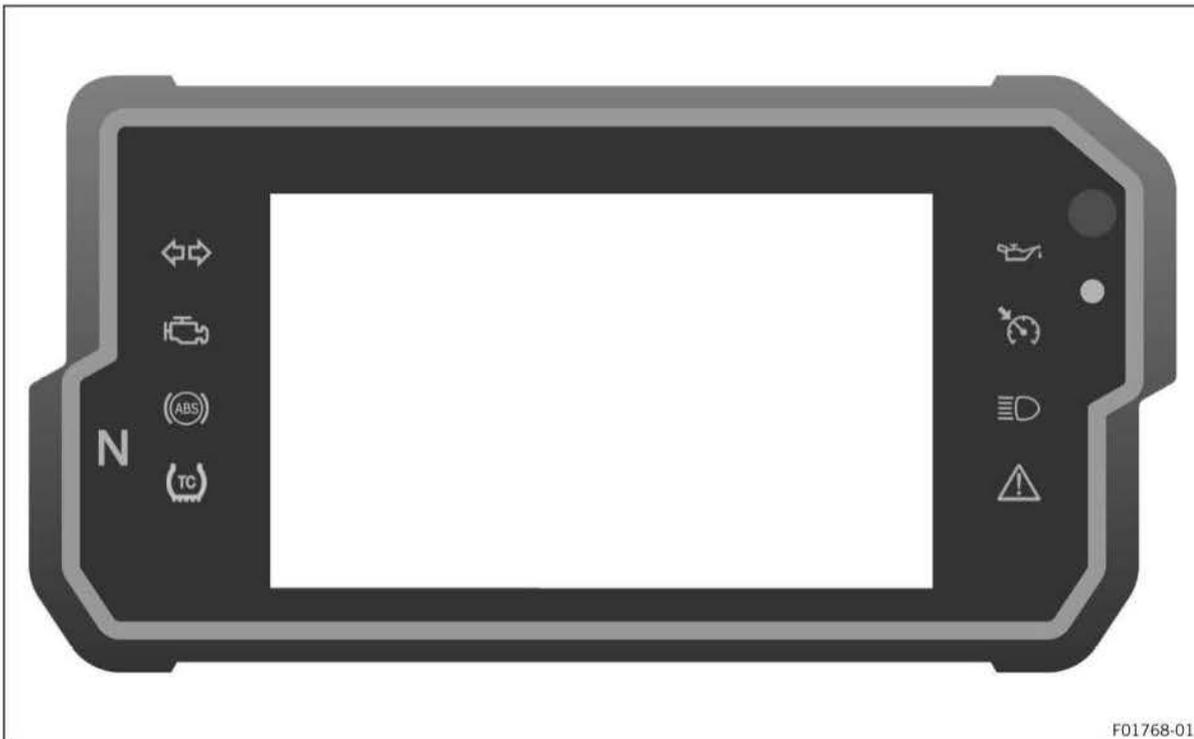
Temperature	$\leq 4 \text{ }^\circ\text{C}$ ( $\leq 39 \text{ }^\circ\text{F}$ )
-------------	----------------------------------------------------------------------

The ice warning ❄ goes out on the display when the ambient temperature rises above the specified value.

Temperature	$\geq 6 \text{ }^\circ\text{C}$ ( $\geq 43 \text{ }^\circ\text{F}$ )
-------------	----------------------------------------------------------------------

**i Info**  
When the ice warning ❄ lights up, the warning **ICE WARNING** also appears.

18.6 Indicator lamps



F01768-01

The indicator lamps offer additional information about the operating state of the motorcycle. When the ignition is switched on, all indicator lamps light up briefly, except for the TC indicator lamp.

**i** Info

The malfunction indicator lamp always lights up as long as the engine is not running. If the engine is running and the malfunction indicator lamp lights up, stop (taking care not to endanger yourself or other road users in the process) and contact an authorized KTM workshop.

The oil pressure warning lamp always lights up as long as the engine is not running. If the engine is running and the oil pressure warning lamp lights up, stop immediately (taking care not to endanger yourself or other road users in the process) and switch off the engine.

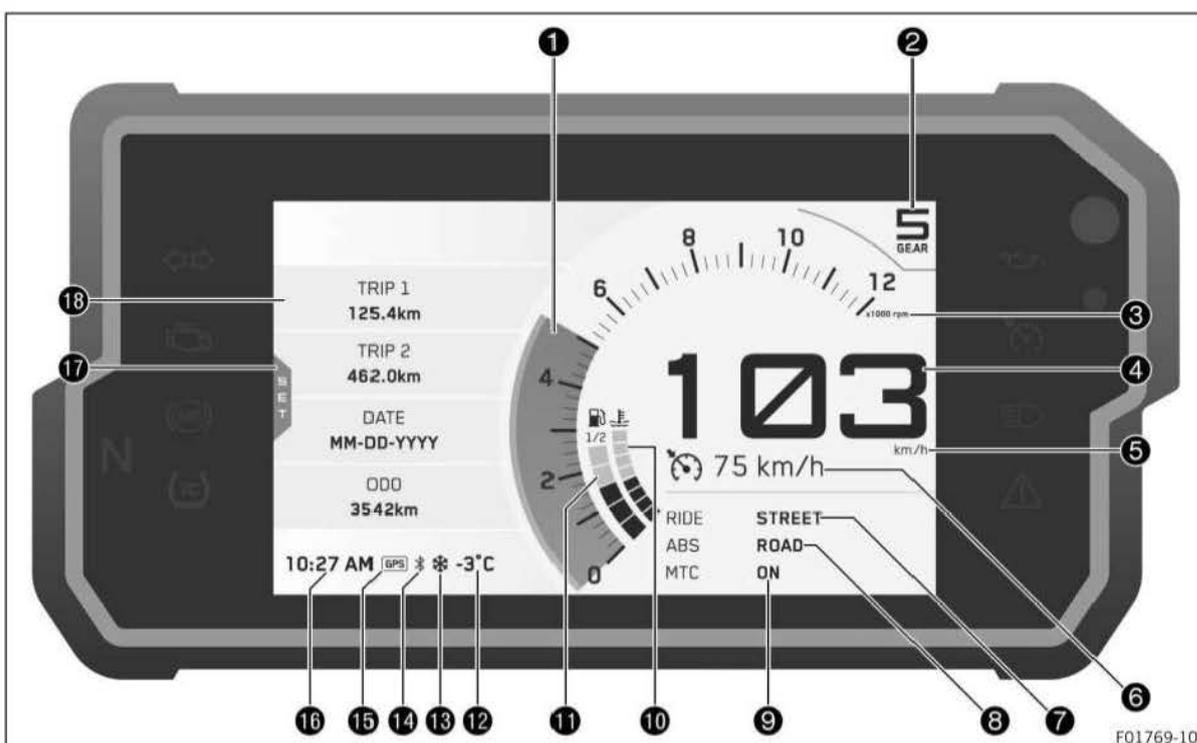
The ABS warning lamp and TC indicator lamp light up until a speed of approx. 6 km/h (approx. 4 mph) or more has been reached.

**Possible states**

	The turn signal indicator lamp flashes green simultaneously with the turn signal – The turn signal is switched on.
	Malfunction indicator lamp lights up yellow – The <u>OBD</u> has detected an error in the vehicle electronics. Come safely to a halt, and contact an authorized KTM workshop.
	ABS warning lamp lights up/flashes yellow – Status or error messages relating to <u>ABS</u> . The ABS warning lamp flashes if the ABS mode <b>Offroad</b> is enabled.
	The idle indicator lamp lights up green – The transmission is in neutral.
	TC indicator lamp lights up/flashes yellow – <b>MTC</b> is not enabled or is currently intervening. The TC indicator lamp also lights up if an error is detected. Contact an authorized KTM workshop. The TC indicator lamp flashes if <b>MTC</b> makes an active intervention.

	The oil pressure warning lamp lights up red – The oil pressure is too low. Stop immediately, taking care not to endanger yourself or other road users in the process, and switch off the engine.
	The alarm system indicator lamp lights up or flashes red – Status or error message of the alarm system.
	The cruise control system indicator lamp (optional) lights up yellow – The cruise control system function is switched on, but cruise control is not activated.
	The cruise control system indicator lamp (optional) lights up green – The cruise control system function is switched on and cruise control is activated.
	The high beam indicator lamp lights up blue – The high beam is switched on.
	The general warning lamp lights up yellow – A note/warning note on operating safety has been detected. This is also shown in the display.

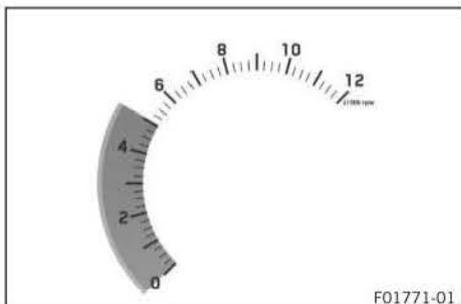
## 18.7 Display



- 1 Speed (p. 218)
- 1 Shift warning light (p. 218)
- 1 The shift warning light is integrated in the tachometer display.
- 2 Gear display
- 3 Unit for the speed display
- 4 Speedometer (p. 218)
- 5 Unit for the speedometer
- 6 Cruise control indicator (optional) (p. 219)
- 7 Ride display (p. 219)
- 8 ABS display (p. 219)
- 9 MTC display (p. 219)

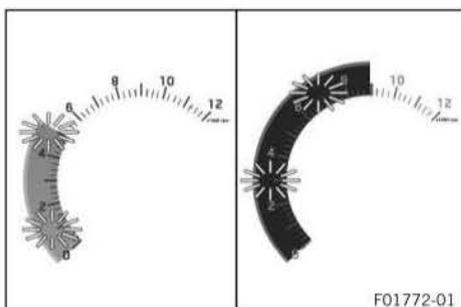


## 18.9 Speed



The speed is measured in revolutions per minute.

## 18.10 Shift warning light



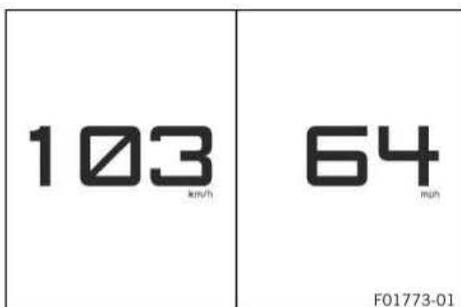
The shift warning light is integrated in the tachometer display. In the **Shift Light** submenu, the engine speed for the shift warning light can be set. The shift warning light is always active during the running-in phase (up to 1,000 km / 621 mi). The shift warning light can only be deactivated, and the values for **Lights up** and **Flashes** can only be adjusted after this. In **Lights up** the shift warning light flashes and in **Flashes** it flashes and the color changes.

### **i** Info

In sixth gear, the shift warning light is deactivated when the engine is warm after the first service.

Coolant temperature	≤ 35 °C (≤ 95 °F)
<b>ODO</b>	< 1,000 km (< 620 mi)
The shift warning light always flashes at	6,500 rpm
Coolant temperature	> 35 °C (> 95 °F)
<b>ODO</b>	> 1,000 km (> 620 mi)
<b>Lights up</b> shift warning light	flashes
<b>Flashes</b> shift warning light	flashes and changes color

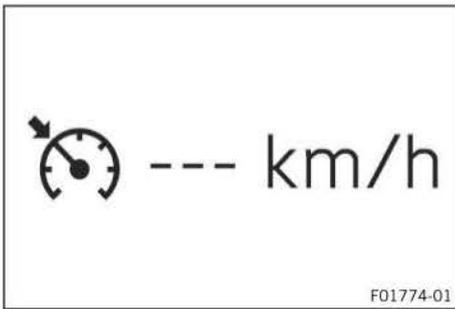
## 18.11 Speedometer



Speed is shown in kilometers per hour **km/h** or in miles per hour **mph**.

The unit of speed can be configured in the **Distance** submenu.

### 18.12 Cruise control indicator (optional)

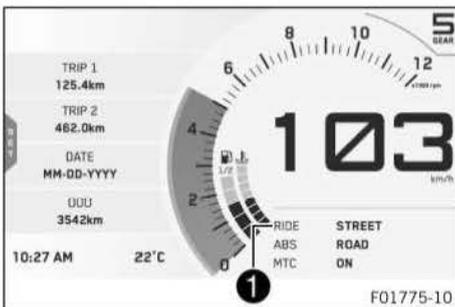


When cruise control is activated, the operating mode is shown on the combination instrument display.  
Cruise control is operated using [the cruise control tip switch](#).

#### **i** Info

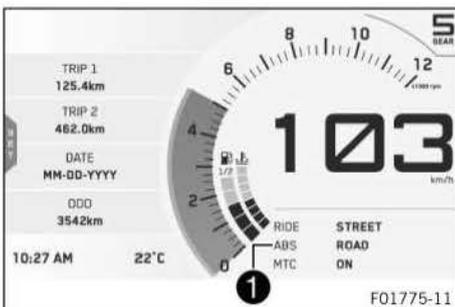
If the cruise control system function is switched on but cruise control is not activated, the cruise control system indicator lamp lights up yellow.  
If the cruise control system function is switched on and cruise control is activated, the cruise control system indicator lamp lights up green.

### 18.13 Ride display



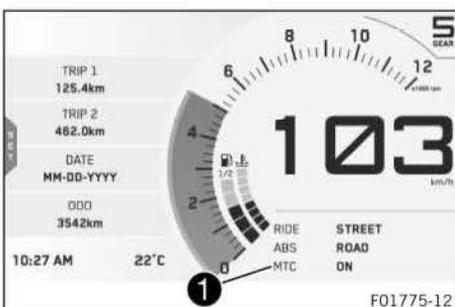
The **Ride Mode** setting is shown in area **1** of the display.  
The drive mode can be configured in the **Ride Mode** submenu.

### 18.14 ABS display



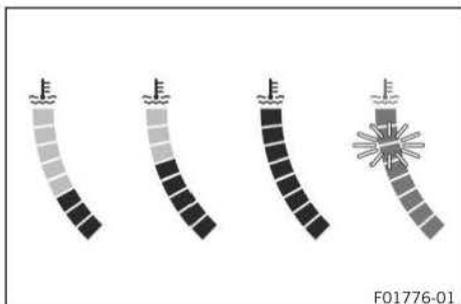
The ABS mode setting is shown in the **1** area of the display.  
The ABS can be configured in the **ABS** submenu.

### 18.15 MTC display



The **1** area of the display indicates whether **MTC** is switched on or off.  
The motorcycle traction control can be switched on or off in the **MTC** submenu.

## 18.16 Coolant temperature indicator



The coolant temperature indicator consists of bars. The more bars that light up, the hotter the coolant.

Emergency operation is automatically activated at 120 °C coolant temperature.

### Note

**Engine failure** Overheating damages the engine.

- If the coolant temperature warning is displayed, stop immediately and take care not to endanger yourself or other traffic participants in the process.
- Allow the engine and cooling system to cool down.
- Check and, if necessary, correct the coolant level on the cooling system while it is in a cooled state.



### Info

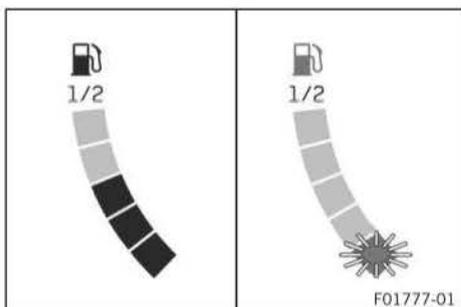
When all the bars flash, the warning **ENGINE TEMP HIGH** also appears.

If the cooling system overheats, the maximum engine speed is limited.

### Possible states

- The engine is cold – Up to three bars light up.
- Engine warm – Four bars light up.
- Engine hot – Five to eight bars light up.
- Engine very hot – All eight bars light up red.

## 18.17 Fuel level display



The fuel level display consists of bars. The more bars are lit, the more fuel is in the fuel tank.



### Info

Measurement of the fuel supply only becomes active after reaching half of the fuel tank content. Up to half of the fuel tank content, the fuel level display will be shown as full.

If the fuel level is getting low, the last segment flashes red and the following warning **LOW FUEL** also appears.

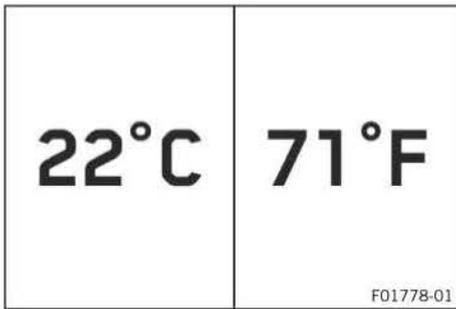
The fuel level is displayed with a slight delay to prevent the indicator from constantly moving while riding.

The fuel level display is not updated while the side stand is folded out or the emergency off switch is switched off.

Once the side stand is folded up and the emergency OFF switch is switched on, the fuel level display is next updated after 2 minutes.

The fuel level display flashes if the combination instrument does not receive a signal from the fuel level sensor.

**18.18 Ambient air temperature indicator**



The ambient air temperature is displayed in °C or °F. The unit of the ambient air temperature can be configured in the **Temperature** submenu.

**18.19 Time**



The time is displayed in 24 hour format in all languages except for EN-US. The time is displayed in 12 hour format if the language is set to EN-US. The time can be configured in the **Clock/Date** submenu.



**Info**

The time must be reset if the 12-V battery was disconnected from the vehicle or the fuse was removed.

**18.20 Favorites display**



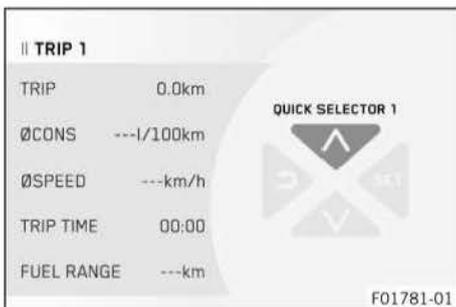
Up to eight items of information are shown in the **Favorites** display. The **Favorites** display can be freely configured in the **Favorites** submenu.



**Info**

One to four items of information selected are displayed on two lines. Five to eight items of information selected are displayed on a single line.

**18.21 Quick Selector 1 display**



When the menu is closed, the **Quick Selector 1** display is opened by pressing the **UP** button.

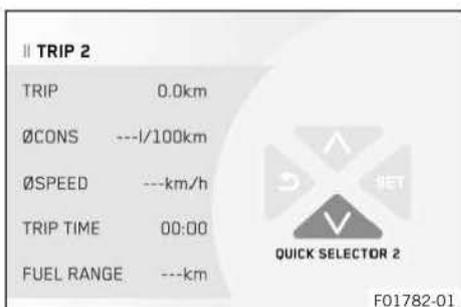
Press the **BACK** button to close the **Quick Selector 1** display.



**Info**

The **Quick Selector 1** display can be configured in the **Quick Selector 1** submenu. Any information can be selected.

## 18.22 Quick Selector 2 display



When the menu is closed, the **Quick Selector 2** display is opened by pressing the **DOWN** button. Press the **BACK** button to close the **Quick Selector 2** display.

**i Info**  
The **Quick Selector 2** display can be configured in the **Quick Selector 2** submenu. Any information can be selected.

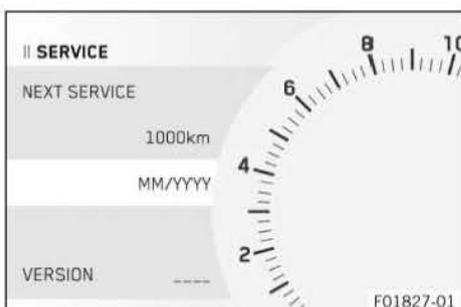
## 18.23 Navigation display (optional)



The **Navigation** display appears when the navigation function is active. In the **Navigation** display, the direction arrow, the distance from the destination, the estimated arrival time of the cellphone, the distance to the next waypoint and the street name are displayed. The **Navigation** display can be configured in the **Navigation** submenu.

**i Info**  
If the visual navigation is activated, the **Favorites** display is hidden.

## 18.24 Setting the service interval display

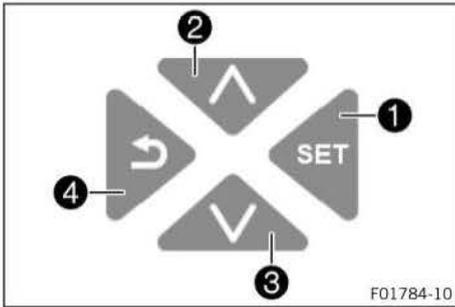


### Condition

The motorcycle is stationary.

- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is marked.
- Press and hold the **UP** and **DOWN** buttons simultaneously for 3 seconds until the menu **Service** opens.
- Press the **UP** or **DOWN** button until the riding distance display is marked. Press the **SET** button to increase the kilometers in intervals of 500.
- Press the **UP** or **DOWN** button until the date display is marked. Press the **SET** button to advance the date in intervals of one month.
- Press the **BACK** button to close the current menu and save the settings.

## 18.25 Menu



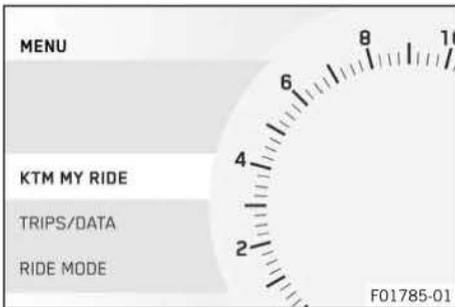
### Info

Press the **SET** button ① in the start screen to open the menu.

Navigate through the menu using the **UP** button ② or the **DOWN** button ③.

By pressing the **BACK** button ④, the menu structure jumps one step back, or the menu is closed.

### 18.25.1 KTM MY RIDE (optional)



#### Condition

- The motorcycle is stationary.
- Function **KTM MY RIDE** (optional) activated.
- Function **Bluetooth®** (optional) activated.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **KTM MY RIDE** is marked. Press the **SET** button to open the menu.

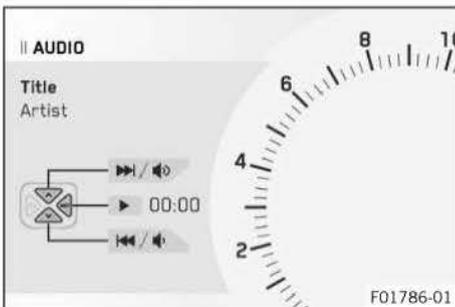
In the **KTM MY RIDE** menu, an appropriate cellphone or headset can be paired with the combination instrument via **Bluetooth®** and the audio function and navigation function can be configured.

### Info

Not every cellphone and headset is suitable for pairing with the combination instrument.

The standard **Bluetooth®** 2.1 must be supported.

### 18.25.2 Audio (optional)



#### Condition

- Function **KTM MY RIDE** (optional) activated.
- Function **Bluetooth®** (optional) activated.
- The combination instrument is connected to a suitable cellphone.
- The combination instrument is connected to a suitable headset.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **KTM MY RIDE** is marked. Press the **SET** button to open the menu.



#### Warning

**Danger of accidents** Headphone volume which is too high distracts attention from traffic activity.

- Always select headphone volume which is low enough for you to still clearly hear acoustic signals.

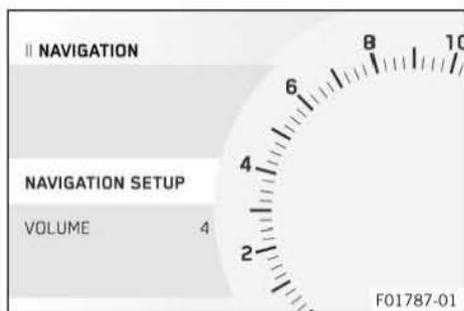
- Press the **UP** or **DOWN** button until **Audio** is marked. Press the **SET** button to open the submenu.
- Press and hold the **UP** button to increase the audio volume.

- Press and hold the **DOWN** button to reduce the audio volume.
- Press the **UP** button briefly to change to the next audio track.
- Briefly pressing the **DOWN** button twice changes to the previous audio title or plays the current audio title, depending on the cellphone model.
- Press the **SET** button to play or pause the audio track.

### **i** Info

With some cellphones, the audio player needs to be started before playback is possible.  
The audio function can be added to **Quick Selector 1** or **Quick Selector 2** for easier operation.

### 18.25.3 Navigation (optional)



### Condition

- Function **KTM MY RIDE** (optional) activated.
  - Function **Bluetooth®** (optional) activated.
  - The **KTM MY RIDE** app (optional) is installed and opened on a suitable cellphone (**Android®** devices Version 6.0 and higher, **iOS** devices Version 10 and higher).
  - The combination instrument is connected to a suitable cellphone.
  - The GPS function is activated on the connected cellphone.
  - For voice navigation: The combination instrument is connected to a suitable headset and an appropriate language package has been downloaded in the **KTM MY RIDE** app.
- Press the **SET** button when the menu is closed.
  - Press the **UP** or **DOWN** button until **KTM MY RIDE** is marked. Press the **SET** button to open the menu.
  - Press the **UP** or **DOWN** button until **Navigation** is marked. Press the **SET** button to open the submenu.

The navigation function can be configured in the **Navigation** menu.

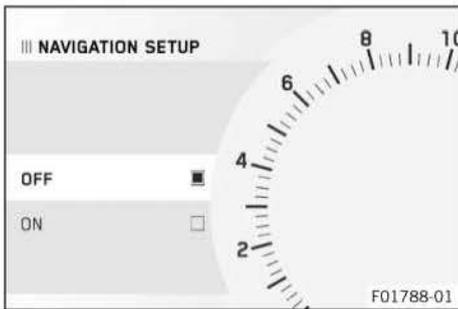
### **i** Info

The audio function can be used with the navigation function at the same time.

An incoming call is visualized in a small window at the top of the combination instrument display when the navigation function is active.

When the navigation function is switched on and the device is connected, the **GPS** symbol appears in the display of the combination instrument.

### 18.25.4 Navigation Setup (optional)



#### Condition

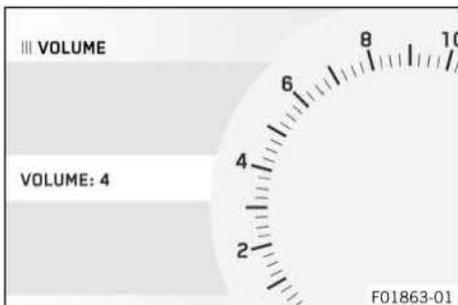
- Function **KTM MY RIDE** (optional) activated.
- The **KTM MY RIDE** app (optional) is installed and opened on a suitable cellphone (**Android**® devices Version 6.0 and higher, iOS devices Version 10 and higher).
- The combination instrument is connected to a suitable cellphone.
- The GPS function is activated on the connected cellphone.
- For voice navigation: The combination instrument is connected to a suitable headset and an appropriate language package has been downloaded in the **KTM MY RIDE** app.
  - Press the **SET** button when the menu is closed.
  - Press the **UP** or **DOWN** button until **KTM MY RIDE** is marked. Press the **SET** button to open the menu.
  - Press the **UP** or **DOWN** button until **Navigation** is marked. Press the **SET** button to open the submenu.
  - Press the **UP** or **DOWN** button until **Navigation Setup** is marked. Press the **SET** button to open the submenu.
  - Activate the menu item using the **UP** or **DOWN** button.
  - Press the **SET** button to switch the visual navigation on or off.



#### Info

Voice navigation remains switched on if it has been activated.

### 18.25.5 Volume (optional)



#### Condition

- Function **KTM MY RIDE** (optional) activated.
- The **KTM MY RIDE** app (optional) is installed and opened on a suitable cellphone (**Android**® devices Version 6.0 and higher, iOS devices Version 10 and higher).
- The combination instrument is connected to a suitable cellphone.
- The GPS function is activated on the connected cellphone.
- For voice navigation: The combination instrument is connected to a suitable headset and an appropriate language package has been downloaded in the **KTM MY RIDE** app.
  - Press the **SET** button when the menu is closed.
  - Press the **UP** or **DOWN** button until **KTM MY RIDE** is marked. Press the **SET** button to open the menu.
  - Press the **UP** or **DOWN** button until **Navigation** is marked. Press the **SET** button to open the submenu.



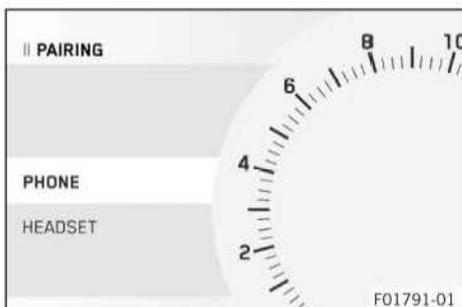
#### Warning

**Danger of accidents** Headphone volume which is too high distracts attention from traffic activity.

- Always select headphone volume which is low enough for you to still clearly hear acoustic signals.

- Press the **UP** or **DOWN** button until **Volume** is marked. Press the **SET** button to open the submenu.
- Press the **UP** button to increase the volume of the activated voice navigation.
- Press the **UP** button to reduce the volume of the activated voice navigation.

## 18.25.6 Pairing (optional)



### Condition

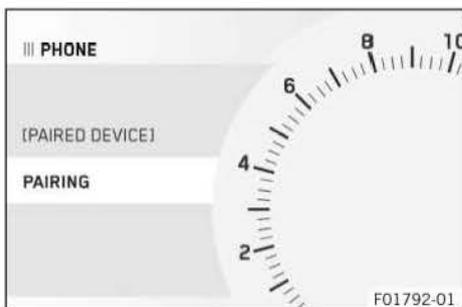
- The motorcycle is stationary.
- Function **KTM MY RIDE** (optional) activated.
- Function **Bluetooth**® (optional) activated.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **KTM MY RIDE** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Pairing** is marked. Press the **SET** button to open the submenu.

A suitable cellphone or headset can be paired with the combination instrument via **Bluetooth**® in the **Pairing** submenu.

### Info

The **Bluetooth**® function can only be used in conjunction with **KTM MY RIDE** (optional). When the **Bluetooth**® function is switched on and the device is connected, the **Bluetooth**® symbol appears in the display of the combination instrument. Not every cellphone and headset is suitable for pairing with the combination instrument.

## 18.25.7 Phone (optional)



### Condition

- The motorcycle is stationary.
- Function **KTM MY RIDE** (optional) activated.
- Function **Bluetooth** (optional) activated.
- The **Bluetooth**® function should also be activated in the device to be paired.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **KTM MY RIDE** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Pairing** is marked. Press the **SET** button to open the submenu.
- Press the **UP** or **DOWN** button until **Phone** is marked. Press the **SET** button to open the submenu.

### Info

Two cellphones can never be paired simultaneously with the combination instrument.

- Press the **UP** or **DOWN** button until **Pairing** is marked. Press the **SET** button to open the submenu.
- The combination instrument starts searching for a suitable cellphone. If the search was successful, the name of the cell-

phone is displayed in the **Pairing** submenu. Press the **SET** button to start the pairing.



#### Info

The cellphone must be visible via **Bluetooth®** for the cellphone to be found by the combination instrument.

- A message appears on the combination instrument indicating that this is now ready for pairing. The pairing is completed successfully by confirming the **Passkey** on the cellphone and on the combination instrument.



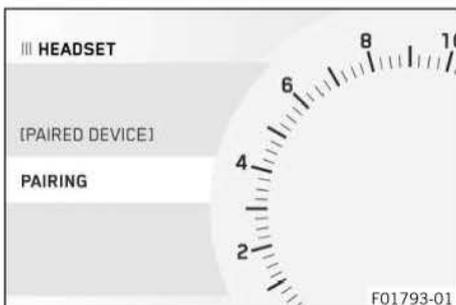
#### Info

Once the pairing is completed, the name of the paired cellphone is displayed in the **Phone** submenu. Press the **UP** or **DOWN** button until the paired device is marked. The paired device can be deleted by pressing the **SET** button. Not every cellphone is suitable for pairing with the combination instrument.

- Move the previously paired device into the range of the combination instrument while the **Bluetooth®** function is active.
  - ✓ The device is automatically paired with the combination instrument.
  - ✗ If the device is not automatically paired with the combination instrument after approx. 30 seconds:
    - Restart the combination instrument or repeat the **Pairing** procedure.

A suitable cellphone can be paired with the combination instrument in the **Phone** submenu.

### 18.25.8 Headset (optional)



#### Condition

- The motorcycle is stationary.
- Function **KTM MY RIDE** (optional) activated.
- Function **Bluetooth** (optional) activated.
- The **Bluetooth®** function should also be activated in the device to be paired.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **KTM MY RIDE** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Pairing** is marked. Press the **SET** button to open the submenu.
- Press the **UP** or **DOWN** button until **Headset** is marked. Press the **SET** button to open the submenu.
- Press the **UP** or **DOWN** button until **Pairing** is marked. Press the **SET** button to open the submenu.
- The combination instrument starts searching for a suitable headset. If the search was successful, the name of the headset is displayed in the **Pairing** submenu. Press the **SET** button to select the device. Press the **SET** button again to confirm

the **Confirm** submenu item. The pairing of a headset with the combination instrument is now completed at this point.

**i Info**

The headset must be in pairing mode for the headset to be found by the combination instrument. Follow the instructions in the Owner's Manual of the headset. Once the pairing is completed, the name of the paired headset is displayed in the **Headset** submenu. Press the **UP** or **DOWN** button until the paired device is marked. The paired device can be deleted by pressing the **SET** button. Not every headset is suitable for pairing with the combination instrument.

- Move the previously paired device into the range of the combination instrument while the **Bluetooth®** function is active.
  - ✓ The device is automatically paired with the combination instrument.
  - ✗ If the device is not automatically paired with the combination instrument after approx. 30 seconds:
    - Restart the combination instrument or repeat the **Pairing** procedure.

A suitable headset can be paired with the combination instrument in the **Headset** submenu.

## 18.25.9 Telephony (optional)



**Condition**

- Function **KTM MY RIDE** (optional) activated.
- Function **Bluetooth®** (optional) activated.
- The **Bluetooth®** function should also be activated in the device to be paired.
- The combination instrument is connected to a suitable cell-phone.
- The combination instrument is connected to a suitable headset.

**! Warning**

**Danger of accidents** Headphone volume which is too high distracts attention from traffic activity.

- Always select headphone volume which is low enough for you to still clearly hear acoustic signals.

- Press the **SET** button to accept an incoming call.
- Press the **BACK** button to reject an incoming call.
- Press and hold the **UP** button to increase the audio volume.
- Press and hold the **DOWN** button to reduce the audio volume.



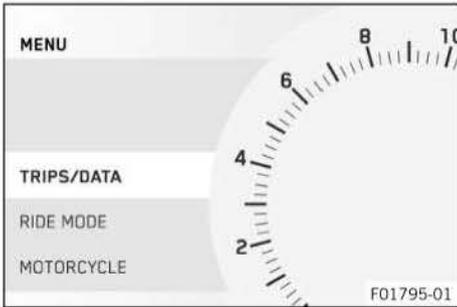
**Info**

It is not possible to change the audio volume using the combination switch with every cellphone. The call duration and contact are displayed. Depending on the cellphone settings, the contact is shown by name.

An incoming call is visualized in a small window at the top of the combination instrument display when the navigation function is active.

You cannot navigate in the menu during an active phone conversation.

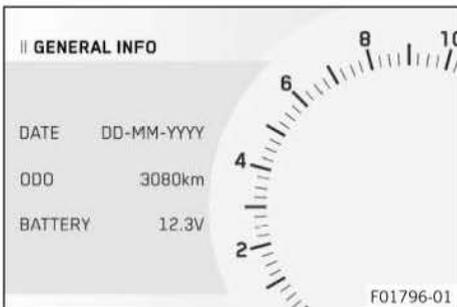
**18.25.10 Trips/Data**



- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Trips/Data** is marked. Press the **SET** button to open the menu.

General information can be accessed in the menu **Trips/Data**.

**18.25.11 General Info**



- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Trips/Data** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **General Info** is marked. Press the **SET** button to open the submenu.

In the submenu **General Info**, the date, total route ridden and battery voltage of the 12-V battery can be viewed.



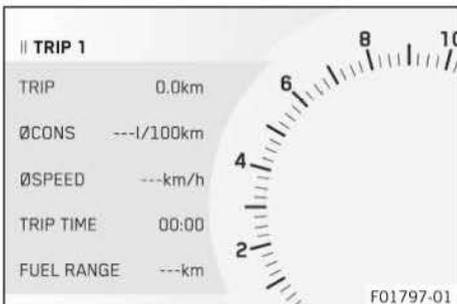
**Info**

**Date** shows the date.

**ODO** shows the total distance covered.

**Battery** shows the battery voltage of the 12-V battery.

**18.25.12 Trip 1**



- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Trips/Data** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Trip 1** is marked. Press the **SET** button to open the submenu.

Information on **Trip 1** can be viewed in the **Trip 1** submenu.



### Info

**Trip** shows the distance since the last reset, such as between two refueling stops. **Trip** is running and counts up to **9999**.

**ØCons** indicates the average fuel consumption based on **Trip**.

**ØSpeed** indicates the average speed based on **Trip** and **Trip Time**.

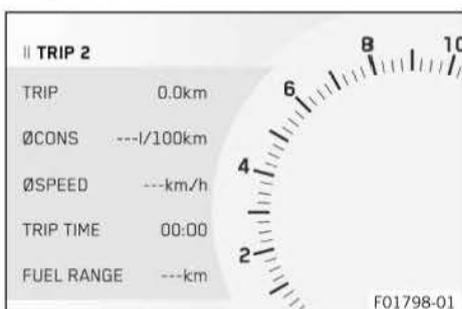
**Trip Time** shows the journey time on the basis of **Trip** and runs as soon as a speed signal is received.

**Fuel Range** indicates the possible distance you can cover with the fuel reserve.

Press and hold the **SET** button for 3 - 5 seconds.

All the entries in the **Trip 1** submenu are reset.

### 18.25.13 Trip 2



- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Trips/Data** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Trip 2** is marked. Press the **SET** button to open the submenu.

Information on **Trip 2** can be viewed in the **Trip 2** submenu.



### Info

**Trip** shows the distance since the last reset, such as between two refueling stops. **Trip** is running and counts up to **9999**.

**ØCons** indicates the average fuel consumption based on **Trip**.

**ØSpeed** indicates the average speed based on **Trip** and **Trip Time**.

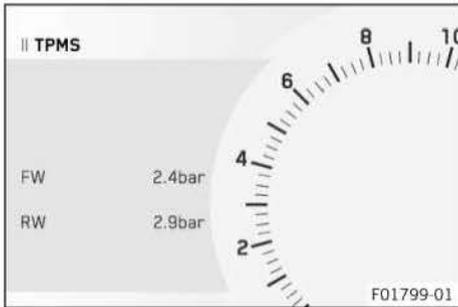
**Trip Time** shows the journey time on the basis of **Trip** and runs as soon as a speed signal is received.

**Fuel Range** indicates the possible distance you can cover with the fuel reserve.

Press and hold the **SET** button for 3 - 5 seconds.

All the entries in the **Trip 2** submenu are reset.

18.25.14 TPMS



**Condition**

- Model with TPMS.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Trips/Data** is marked. Press the **SET** button to open the menu.



**Warning**

**Danger of accidents** The tire pressure monitoring system does not eliminate the necessity to check the tires before going on a ride.

To avoid false alarms, the tire pressure values are evaluated over a period of several minutes.

- Check the tire pressure before every ride.
- Correct the tire pressure if the tire pressure deviates from the specified value.
- Even if the tire pressure values are correct, stop the vehicle immediately if its behavior indicates a loss of pressure in the tires.

- Press the **UP** or **DOWN** button until **TPMS** is marked. Press the **SET** button to open the submenu.

Guideline

Tire pressure, solo / with passenger / full payload	
front: with cold tires	2.4 bar (35 psi)
rear: with cold tires	2.9 bar (42 psi)

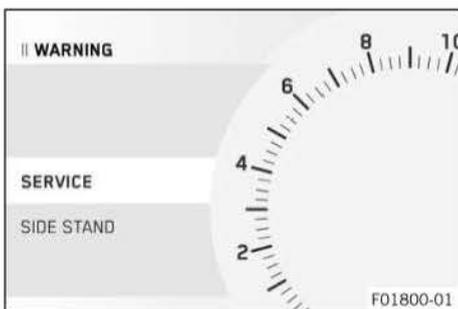
The tire pressure of the front and rear tires can be viewed in the **TPMS** submenu.



**Info**

**FW** indicates the tire pressure at the front.  
**RW** indicates the tire pressure at the rear.

18.25.15 Warning



**Condition**

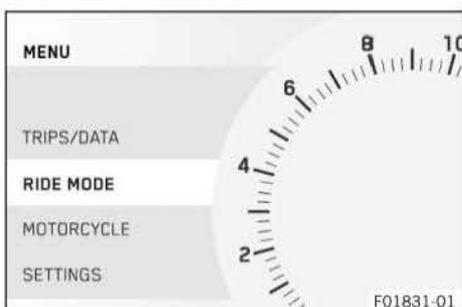
- Message or warning is present.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Trips/Data** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Warning** is marked. Press the **SET** button to open the submenu.
- Use the **UP** or **DOWN** button to navigate through the warnings.



**Info**

The warnings that have occurred are saved in the display until they are no longer active.

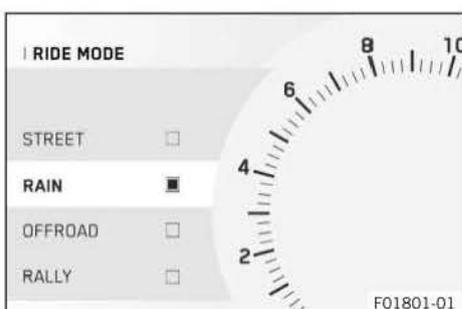
## 18.25.16 Ride Mode



- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Ride Mode** is marked. Press the **SET** button to open the menu.

The drive mode of the vehicle can be configured in the **Ride Mode** menu.

## 18.25.17 Ride Mode



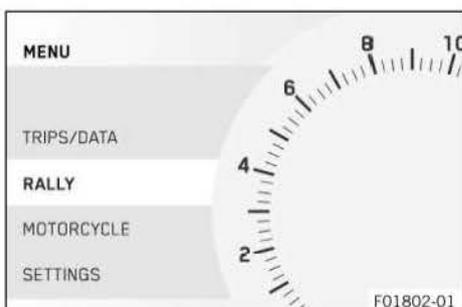
### Condition

- Emergency off switch deactivated.
- Cruise control system function (optional) deactivated.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Ride Mode** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Ride Mode** is marked on the display. Press the **SET** button to open the submenu.
- Activate menu item using the **UP** or **DOWN** button.
- Press the **SET** button to select the engine and motorcycle traction control settings that are coordinated with each other.
  - ✓ **STREET** – homologated performance with balanced response; the motorcycle traction control allows normal slip on the rear wheel. The Anti-Wheelie mode is active.
  - ✓ **RAIN** – reduced homologated performance for better rideability; the motorcycle traction control allows normal slip on the rear wheel. The Anti-Wheelie mode is active.
  - ✓ **OFFROAD** – reduced homologated performance for better rideability; the motorcycle traction control allows high slip on the rear wheel. The Anti-Wheelie mode is deactivated.
  - ✓ **RALLY** – setting with homologated performance and extremely direct response. The motorcycle traction control and the characteristic map of the throttle response can be individually set. The Anti-Wheelie mode is deactivated.

### **i** Info

Do not open the throttle during the selection.

## 18.25.18 Rally

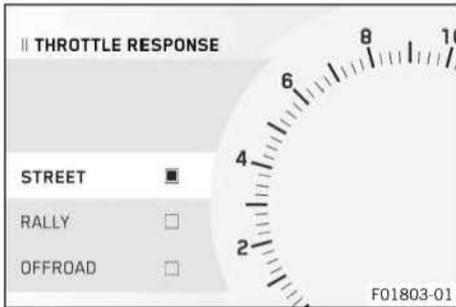


### Condition

- The drive mode **RALLY** is activated.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Rally** is marked on the display. Press the **SET** button to open the menu.

The individual settings of the **RALLY PACK** can be adjusted in the **Rally** menu.

## 18.25.19 Throttle Response

**Condition**

- The drive mode **RALLY** is activated.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Rally** is marked on the display. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Throttle Response** is marked on the display. Press the **SET** button to open the submenu.
- Activate menu item using the **UP** or **DOWN** button.
- The characteristic map of the throttle response can be adjusted by pressing the **SET** button.
- ✓ STREET – balanced response.
- ✓ RALLY – extremely direct response.
- ✓ OFFROAD – very direct response.

**Info**

Do not open the throttle when setting it.

## 18.25.20 Leave Rally

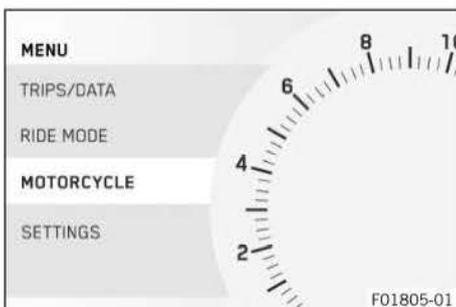
**Condition**

- The drive mode **RALLY** is activated.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Rally** is marked on the display. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Leave Rally** is marked on the display. Press the **SET** button to end drive mode **RALLY** and automatically switch to drive mode **STREET**.

**Info**

Do not open the throttle when deactivating drive mode **RALLY**.

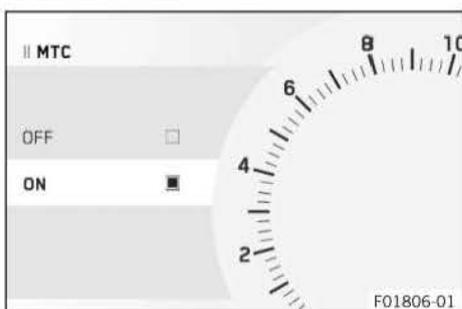
## 18.25.21 Motorcycle



- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Motorcycle** is marked. Press the **SET** button to open the menu.

In the **Motorcycle** menu, the motorcycle traction control and the quickshifter + (optional) can be switched on or off and the ABS can be configured.

## 18.25.22 MTC



- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Motorcycle** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **MTC** is marked. Press the **SET** button to open the submenu.
- Activate the menu item using the **UP** or **DOWN** button.
- Switch the **MTC** on or off by pressing the **SET** button.

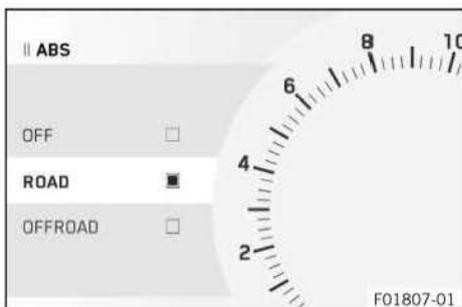
### **i** Info

Do not open the throttle when switching on or off. After the ignition is switched on, motorcycle traction control is enabled again.

Press and hold the **SET** button for 3 - 5 seconds.

Activation of the motorcycle traction control.

## 18.25.23 ABS



- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Motorcycle** is marked. Press the **SET** button to open the menu.

### **Note**

**Voiding of the government approval for road use and the insurance coverage** If the ABS is switched off completely, the vehicle's approval for road use is invalidated.

- Only operate the vehicle in closed-off areas remote from public road traffic if the ABS is switched off completely.

- Press the **UP** or **DOWN** button until **ABS** is marked. Press the **SET** button to open the submenu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to switch off ABS or to select the desired ABS mode.

### **i** Info

During the journey, the ABS mode can be switched, but not deactivated.

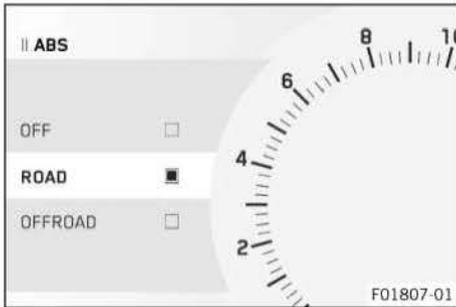
Do not open the throttle during the selection.

The ABS can only be reactivated by switching on the ignition again.

When the **Road** ABS mode is active, ABS controls both wheels.

When the **Offroad** ABS mode is active, ABS only controls the front wheel. The rear wheel is not controlled by ABS and may lock during braking maneuvers.

## 18.25.24 ABS



- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Motorcycle** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **ABS** is marked. Press the **SET** button to open the submenu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to switch off ABS or to select the desired ABS mode.

**Info**

During the journey, the ABS mode can be switched, but not deactivated.

Do not open the throttle during the selection.

The ABS can only be reactivated by switching on the ignition again.

When the **Road** ABS mode is active, ABS controls both wheels.

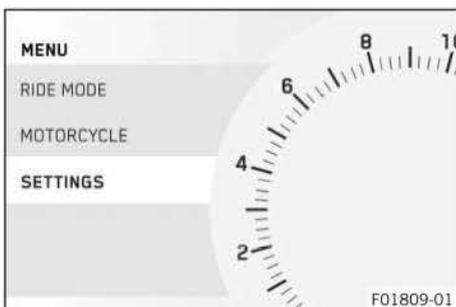
When the **Supermoto** ABS mode is active, ABS only controls the front wheel. The rear wheel is not controlled by ABS and may lock during braking maneuvers.

## 18.25.25 Quick Shift+ (optional)



- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Motorcycle** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Quick Shift+** is marked. Press the **SET** button to open the submenu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to switch quickshifter + button on or off.

## 18.25.26 Settings

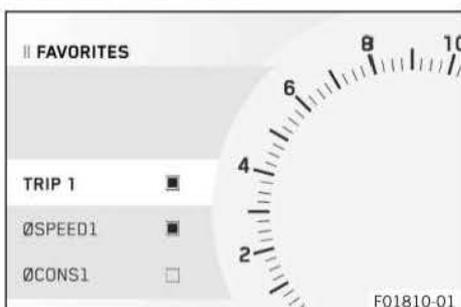
**Condition**

- The motorcycle is stationary.

- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is marked. Press the **SET** button to open the menu.

In the **Settings** menu, favorites, quick selections and the combination instrument display can be configured. Settings can be made for units or various values. Several functions can be enabled or disabled.

## 18.25.27 Favorites



### Condition

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Favorites** is marked. Press the **SET** button to open the submenu.
- Access menu item with the **UP** or **DOWN** button, and add the selected information to the **SET** display using the **Favorites** button.

Up to eight items of information can be selected in the **Favorites** menu.

## 18.25.28 Quick Selector 1



### Condition

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Quick Selector 1** is marked. Press the **SET** button to open the menu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to set a submenu for direct dialing for **Quick Selector 1**.



### Info

When the menu is closed, the submenu defined in **Quick Selector 1** is opened by pressing the **UP** button.

## 18.25.29 Quick Selector 2



### Condition

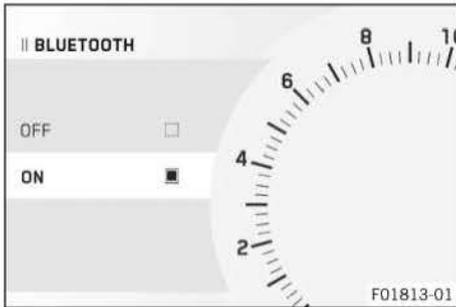
- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Quick Selector 2** is marked. Press the **SET** button to open the menu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to set a submenu for direct dialing for **Quick Selector 2**.



### Info

When the menu is closed, the submenu defined in **Quick Selector 2** is opened by pressing the **DOWN** button.

## 18.25.30 Bluetooth (optional)

**Condition**

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Bluetooth** is marked. Press the **SET** button to open the submenu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to switch the **Bluetooth®** function on or off.

**i Info**

The **Bluetooth®** function can only be used in conjunction with **KTM MY RIDE** (optional).

If a device has been paired via the submenu **Pairing** but is currently not connected, the **Bluetooth®** symbol flashes when the **Bluetooth®** function is switched on. The **Bluetooth®** symbol lights up as soon as a device is connected.

## 18.25.31 Display Theme

**Condition**

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Display Theme** is marked. Press the **SET** button to open the submenu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to set up automatic day-night mode or permanent night mode.

**i Info**

In both modes, the display is brightened or dimmed depending on the amount of ambient light.

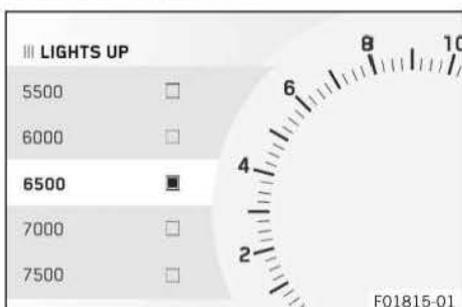
## 18.25.32 Shift Light

**Condition**

- The motorcycle is stationary.
- **ODO** > 1,000 km (621 mi).
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Shift Light** is marked. Press the **SET** button to open the submenu.

The shift warning light can be configured in the **Shift Light** submenu.

## 18.25.33 Lights up



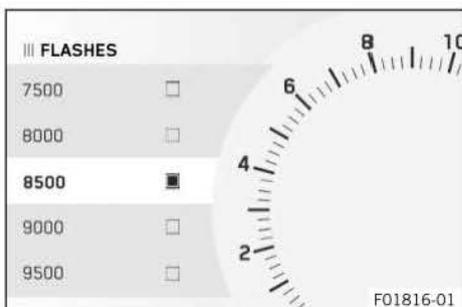
### Condition

- The motorcycle is stationary.
- **ODO** > 1,000 km (621 mi).
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Shift Light** is marked. Press the **SET** button to open the submenu.
- Press the **UP** or **DOWN** button until **Lights up** is marked. Press the **SET** button to open the submenu.
- Activate the menu item using the **UP** or **DOWN** button.
- Set the value for **SET** by pressing the **Lights up** button.

### Info

If the engine speed reaches the set value **Lights up**, the shift warning light flashes.

## 18.25.34 Flashes



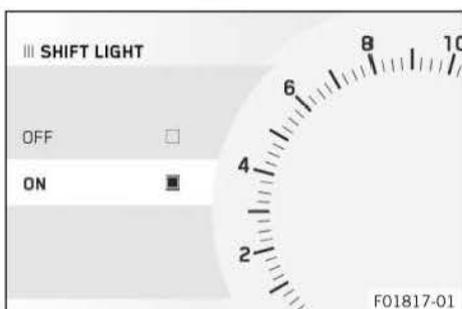
### Condition

- The motorcycle is stationary.
- **ODO** > 1,000 km (621 mi).
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Shift Light** is marked. Press the **SET** button to open the submenu.
- Press the **UP** or **DOWN** button until **Flashes** is marked. Press the **SET** button to open the submenu.
- Activate the menu item using the **UP** or **DOWN** button.
- Set the value for **SET** by pressing the **Flashes** button.

### Info

If the engine speed reaches the set value **Flashes**, the shift warning light flashes and the color changes.

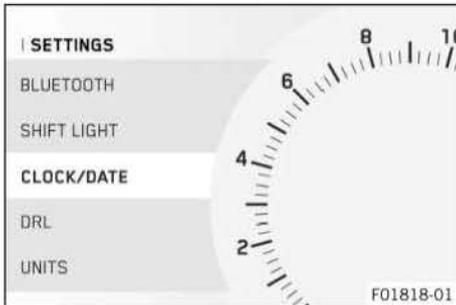
## 18.25.35 Shift Light



### Condition

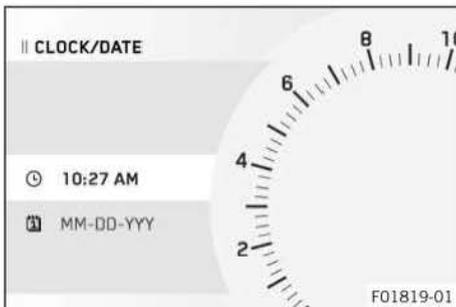
- The motorcycle is stationary.
- **ODO** > 1,000 km (621 mi).
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Shift Light** is marked. Press the **SET** button to open the submenu.
- Press the **UP** or **DOWN** button until **Shift Light** is marked. Press the **SET** button to open the submenu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to switch the shift warning light on or off.

## 18.25.36 Setting the time and date

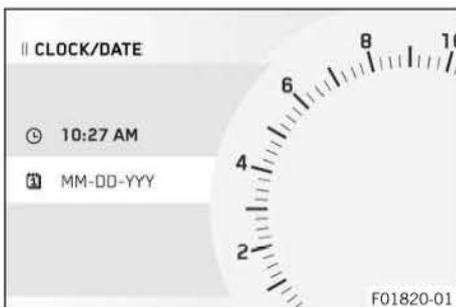
**Condition**

The motorcycle is stationary.

- Press the **SET** button when the menu is closed.
- Press **UP** or **DOWN** button until **Settings** appears. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Clock/Date** is marked. Press the **SET** button to open the submenu.

**Setting the clock**

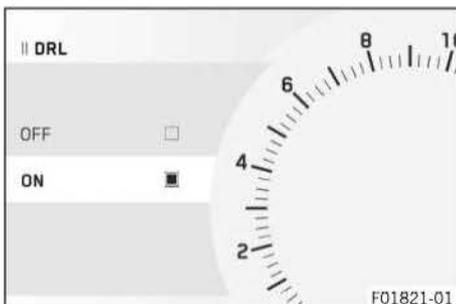
- Press **UP** or **DOWN** button until the time is marked.
- Press the **SET** button.
  - ✓ The hour flashes and is underlined.
- Press **UP** or **DOWN** button until the current hour is set.
- Press the **SET** button.
  - ✓ The minutes flash and are underlined.
- Press **UP** or **DOWN** button until the current minute is set.
- Press **SET** button.
  - ✓ The time is stored.

**Setting the date**

- Press **UP** or **DOWN** button until the date is marked.
- Press **SET** button.
  - ✓ The day flashes and is underlined.
- Press **UP** or **DOWN** button until the current day is set.
- Press **SET** button.
  - ✓ The month flashes and is underlined.
- Press **UP** or **DOWN** button until the current month is set.
- Press the **SET** button.
  - ✓ The year flashes and is underlined.
- Press **UP** or **DOWN** button until the current year is set.
- Press **SET** button.
  - ✓ The date is stored.



## 18.25.37 DRL

**Condition**

- The motorcycle is stationary.

- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **DRL** is marked. Press the **SET** button to open the submenu.



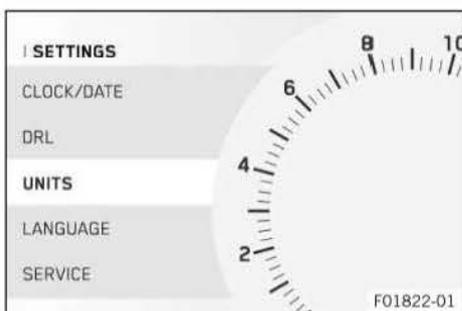
## Warning

**Danger of accidents** When visibility is poor, the daytime running light is not a substitute for the low beam. Automatic switching between the daytime running light and low beam may only be partially available when visibility is significantly impaired due to fog, snow or rain.

- Ensure that the appropriate type of lighting is always selected.
- If necessary switch off the daytime running lights using the menu before going on a ride or when stopped so that the low beam is switched on permanently.
- Note the legal regulations regarding the daytime running light.

- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to switch the daytime running light on or off.

### 18.25.38 Units

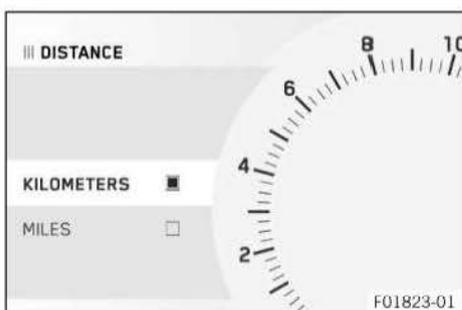


#### Condition

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Units** is marked. Press the **SET** button to open the submenu.

The **Units** submenu allows settings to be made for units or various values.

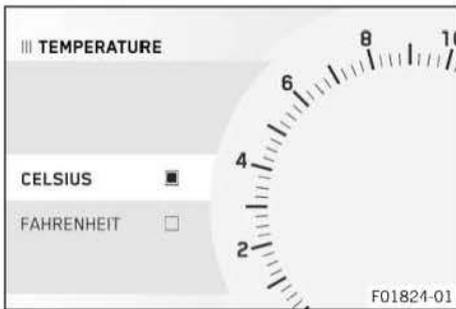
### 18.25.39 Distance



#### Condition

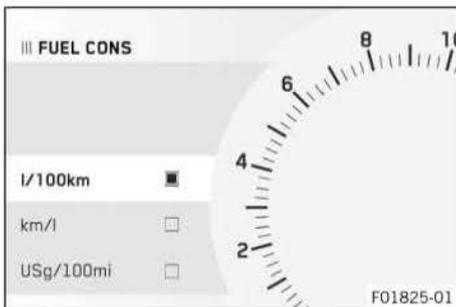
- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Units** is marked. Press the **SET** button to open the submenu.
- Press the **UP** or **DOWN** button until **Distance** is marked. Press the **SET** button to open the submenu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to confirm the desired unit.

## 18.25.40 Temperature

**Condition**

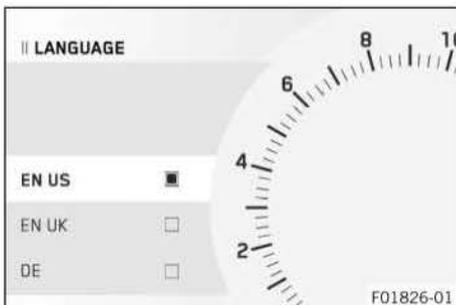
- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Units** is marked. Press the **SET** button to open the submenu.
- Press the **UP** or **DOWN** button until **Temperature** is marked. Press the **SET** button to open the submenu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to confirm the desired unit.

## 18.25.41 Fuel Cons

**Condition**

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Units** is marked. Press the **SET** button to open the submenu.
- Press the **UP** or **DOWN** button until **Fuel Cons** is marked. Press the **SET** button to open the submenu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to confirm the desired unit.

## 18.25.42 Language

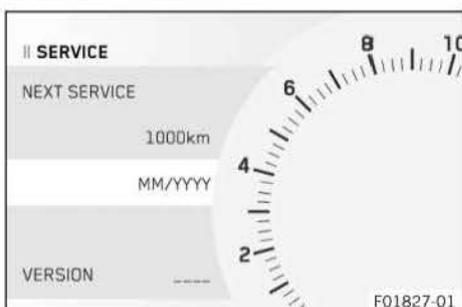
**Condition**

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Language** is marked. Press the **SET** button to open the submenu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to confirm the desired language.

**Info**

The menu languages are US English, UK English, German, Italian, French, and Spanish.

## 18.25.43 Service



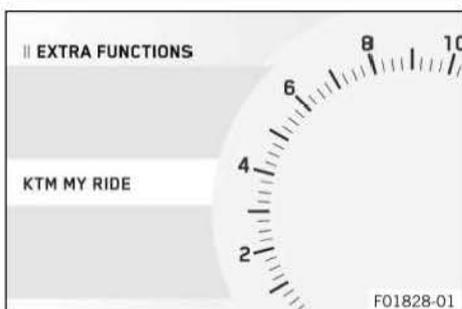
### Condition

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Service** is marked. Press the **SET** button to open the submenu.
- Use the **UP** or **DOWN** button to navigate through the information.

### Info

The remaining kilometers / duration until the next due service and the currently installed software version are displayed.

## 18.25.44 Extra Functions



### Condition

- The motorcycle is stationary.
- Motorcycle with optional supplementary function.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Extra Functions** is marked. Press the **SET** button to open the submenu.
- Use the **UP** or **DOWN** button to navigate through the extra functions.

### Info

The optional extra functions are listed. The current **KTM PowerParts** and the available software for your vehicle can be found on the KTM website.

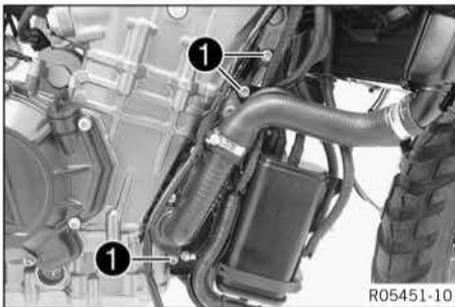
## 19.1 Removing the engine

### Preparatory work

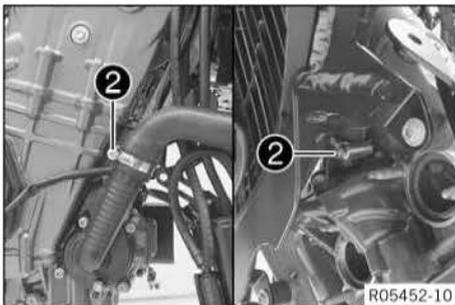
- Switch off the ignition by turning the ignition key to the position  $\otimes$ .
- Remove the seat. (p. 114)
- Disconnect the negative cable of the 12-V battery. (p. 185)
- Remove the main silencer. (p. 100)
- Raise motorcycle with rear lifting gear. (p. 15)
- Remove the left side cover. (p. 130)
- Remove the battery cover. (p. 131)
- Remove left fuel tank spoiler. (p. 132)
- Remove the right side cover. (p. 130)
- Remove right fuel tank spoiler. (p. 134)
- Remove engine guard. (p. 138)
- Remove the fuel tank. (p. 114)
- Remove the exhaust system. (p. 101)
- Drain the coolant. (p. 366)

### Main work

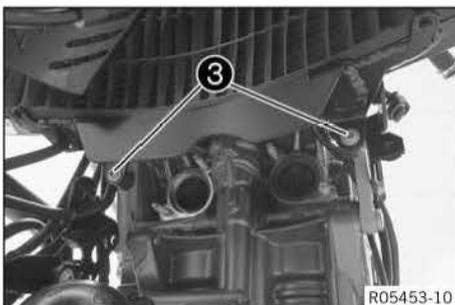
- Remove screws **1**.
- Hang the activated charcoal filter to the side.



- Loosen hose clips **2**.
- Pull off the radiator hoses.

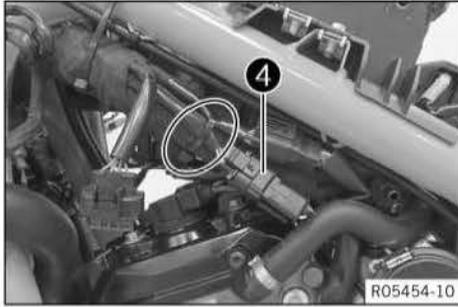


- Remove screws **3**.
- Swing the radiator forward.

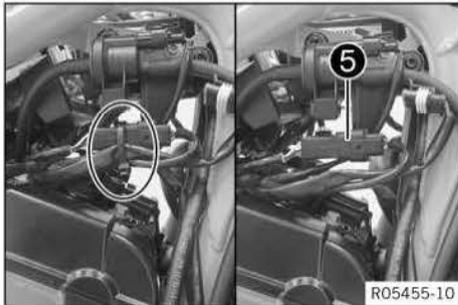


#### Info

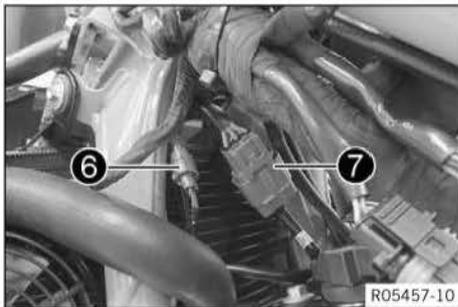
Pay attention to the cooling fins.



- Remove the cable ties.
- Disconnect plug-in connector 4.



- Remove the cable ties.
- Pull off and disconnect plug-in connector 5 from the holder.



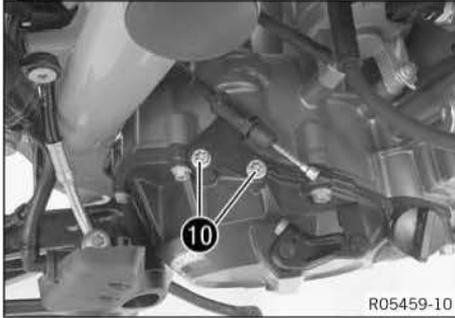
- Disconnect plug-in connectors 6 and 7.



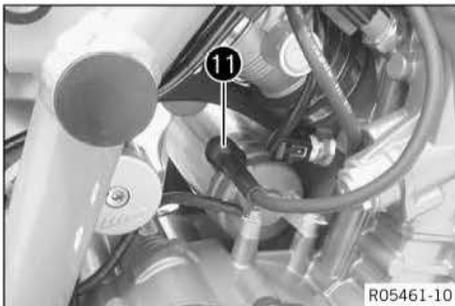
- Remove hose clamp 8 and pull off the vent hose.



- Swivel the clutch release lever **9** counterclockwise and detach the inner clutch cable.
- Remove screws **10**.
- Hang the inner clutch cable with bracket to the side.

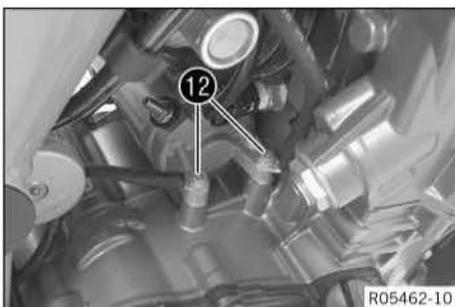


R05459-10



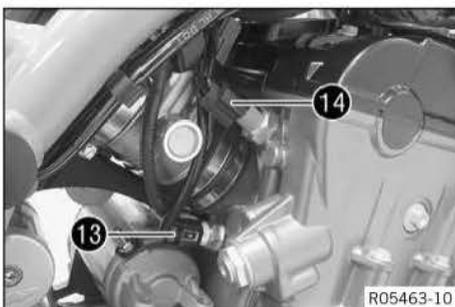
R05461-10

- Push back protection cap **11** and remove the nut.
- Hang the positive cable to the side.



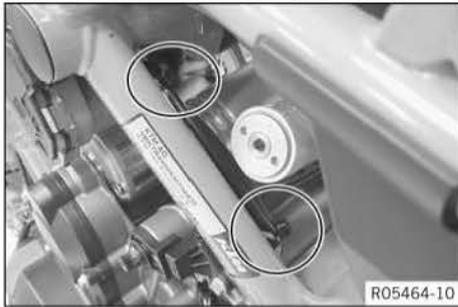
R05462-10

- Remove screws **12**.
- Hang the ground wire to the side.



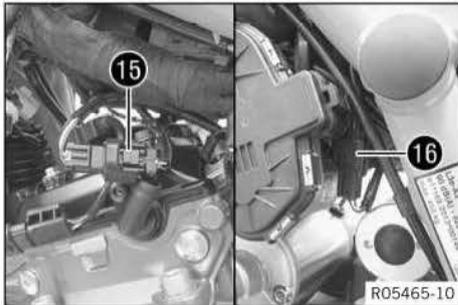
R05463-10

- Disconnect connector **13** from the coolant temperature sensor.
- Unplug connector **14** from the oil pressure sensor.



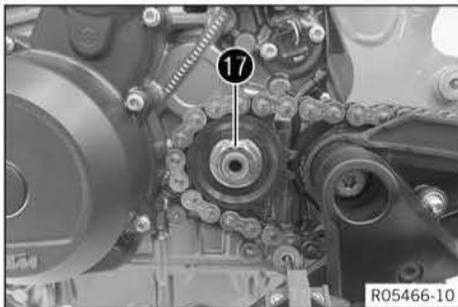
R05464-10

- Remove the cable ties.



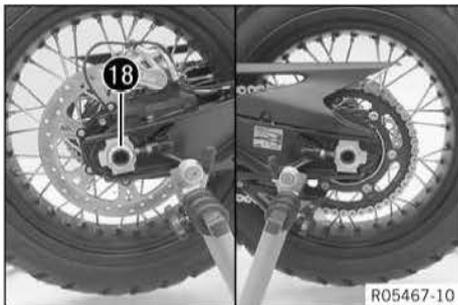
R05465-10

- Disconnect plug-in connectors 15 and 16.
- Expose the cable.



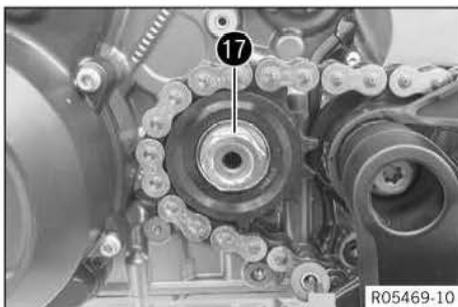
R05466-10

- Bend up the lock washer.
- Have an assistant operate the rear brake.
- Loosen nut 17.



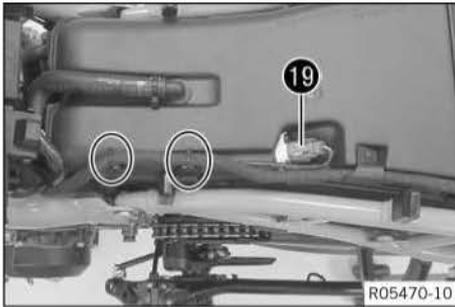
R05467-10

- Remove nut 18.
- Remove the chain adjuster.
- Push the rear wheel into the foremost position.

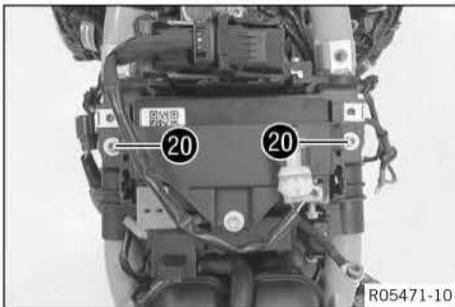


R05469-10

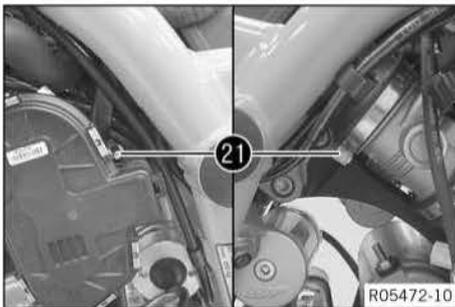
- Remove nut 17 with the lock washer.
- Take off the engine sprocket.



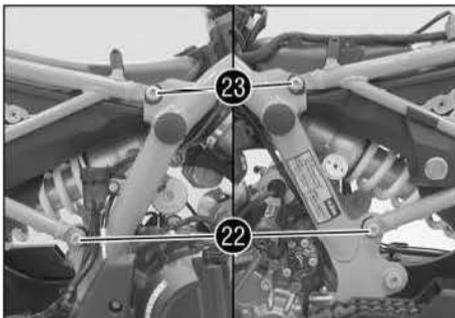
- Remove the cable ties.
- Unplug connector 19.



- Remove screws 20.

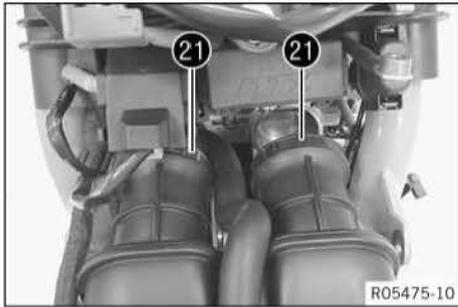


- Loosen hose clips 21.

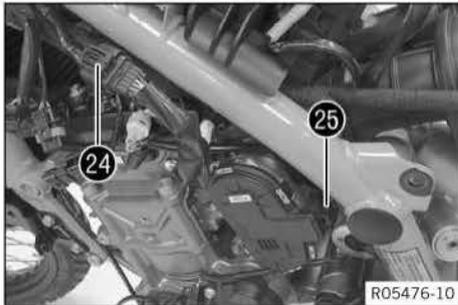


- Loosen screws 22.
- Remove screws 23.
- Swivel the subframe downward.

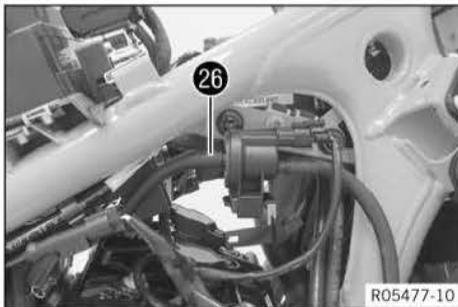




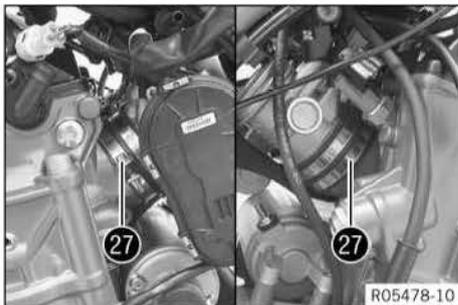
- Remove the hose clips 21.



- Disconnect plug-in connector 24.
- Unplug connector 25.



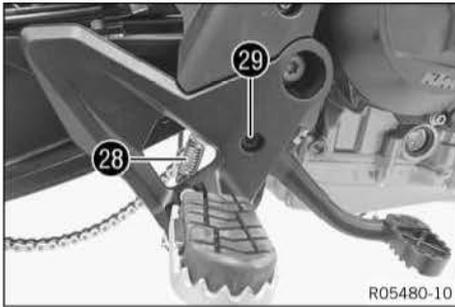
- Pull off hose 26.



- Loosen hose clips 27.



- Pull off the throttle valve body toward the rear and remove to the side.



- Detach spring 28.
- Remove fitting 29.
- Remove the foot brake lever.

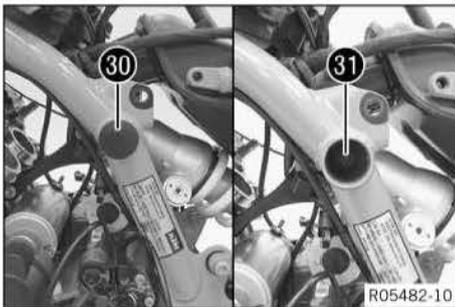


- Position the floor jack with the special tool.

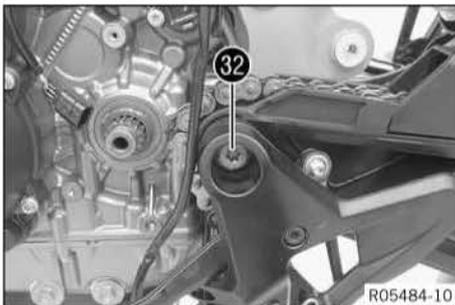
Floor jack attachment (63529055000) (p. 475)

**i Info**  
It is a good idea to have assistance when carrying out the following steps.

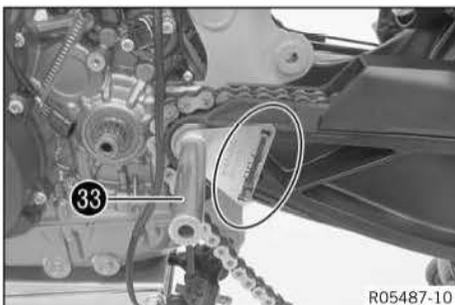
- Mount floor jack with suitable screws on the engine and align with the rubber supports.



- Remove covering cap 30.
- Loosen screw 31.



- Remove screw 32.
- Remove the footrest bracket.

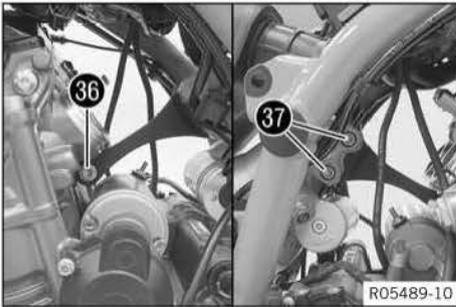


- Mount special tool 33 and secure with a cable tie.

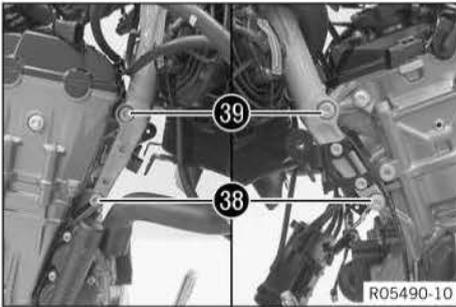
Socket pin (63529055090) (p. 476)



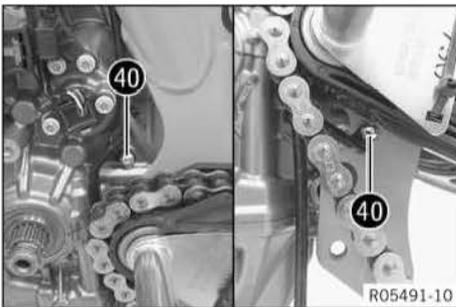
- Remove screw 34.
- Pull out swingarm pivot 35 far enough so that the engine is released but the link fork remains secured.



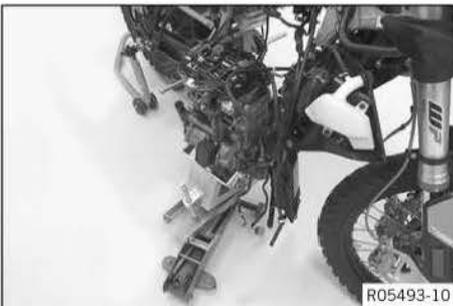
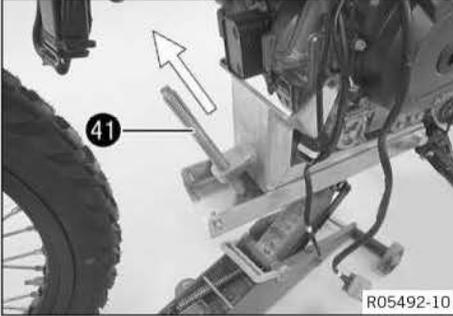
- Remove screw 36.
- Remove screws 37.
- Take off the engine bearer.



- Remove screws 38.
- Remove screws 39.



- Remove screws 40.



- Turn screw **41** to swivel the engine so that it is released from the frame.
- Lower the engine.

- Turn engine and remove to the side.



#### Info

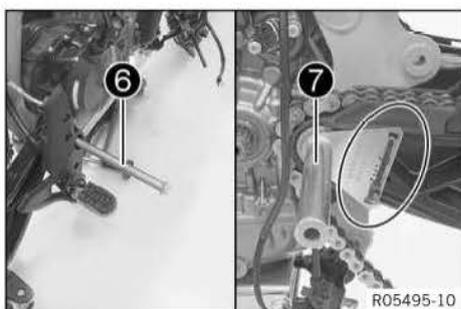
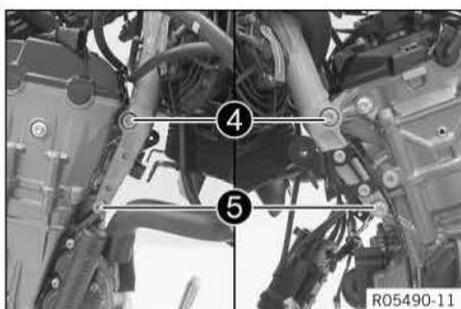
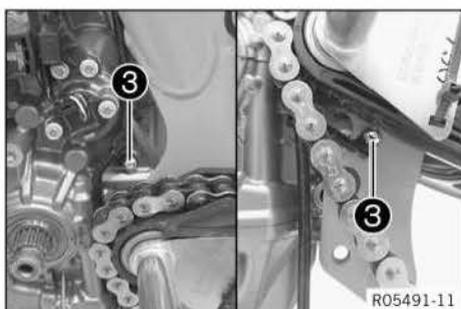
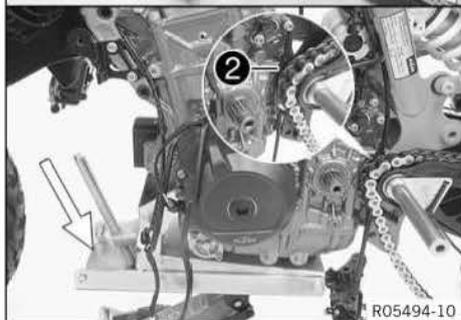
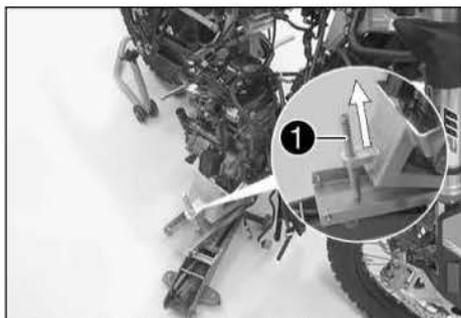
The help of an assistant is useful in this step.  
Make sure that the motorcycle is sufficiently secured against falling over.  
Cover the components to protect them against damage.

## 19.2 Installing the engine

### Preparatory work

- Lift the engine onto the special tool and secure it.

Floor jack attachment (63529055000) (📖 p. 475)
------------------------------------------------



### Main work

- Position the engine in the frame.

### Info

It is a good idea to have assistance when carrying out the following steps.  
Make sure that the motorcycle is sufficiently secured against falling over.  
Cover the components to protect them against damage.

- Turn the screw **1** to swivel the engine and position in the frame.
- Position cable guide **2** between the engine and the link fork.

- Mount and tighten screws **3**.

#### Guideline

Remaining screws, chassis	M5	5 Nm (3.7 lbf ft)
---------------------------	----	-------------------

- Mount screws **4**, but do not tighten yet.

#### Guideline

Screw, engine bracket	M10	45 Nm (33.2 lbf ft) <b>Loctite®243™</b>
-----------------------	-----	--------------------------------------------

- Mount screws **5**, but do not tighten yet.

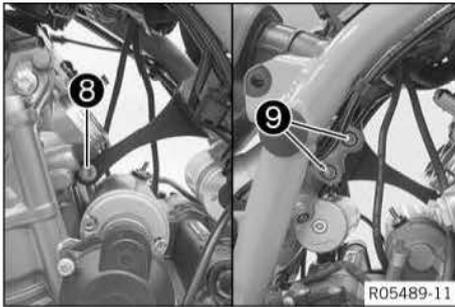
#### Guideline

Screw, engine bracket	M10	45 Nm (33.2 lbf ft) <b>Loctite®243™</b>
-----------------------	-----	--------------------------------------------

- Remove the cable ties.

- Mount swingarm pivot **6** and remove special tool **7**.

Socket pin (63529055090) (p. 476)
-----------------------------------



- Position the engine bearer.
- Mount screw **8**, but do not tighten yet.

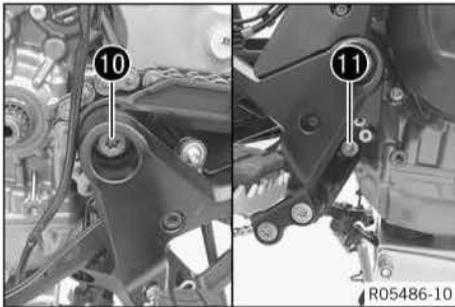
Guideline

Screw, engine bracket	M10	45 Nm (33.2 lbf ft) <b>Loctite®243™</b>
-----------------------	-----	--------------------------------------------

- Mount screws **9**, but do not tighten yet.

Guideline

Screw, engine fixing arm linkage bracket	M8	25 Nm (18.4 lbf ft) <b>Loctite®243™</b>
------------------------------------------	----	--------------------------------------------



- Position the footrest bracket.
- Mount screw **10**, but do not tighten yet.

Guideline

Screw, swingarm pivot	M12	100 Nm (73.8 lbf ft)
-----------------------	-----	----------------------

**i Info**

The left screw of the swingarm pivot is only tightened after installing the exhaust system.

- Mount and tighten screw **11**.

Guideline

Screw, front footrest bracket	M10x40	45 Nm (33.2 lbf ft) <b>Loctite®243™</b>
-------------------------------	--------	--------------------------------------------

- Tighten screws **9**.

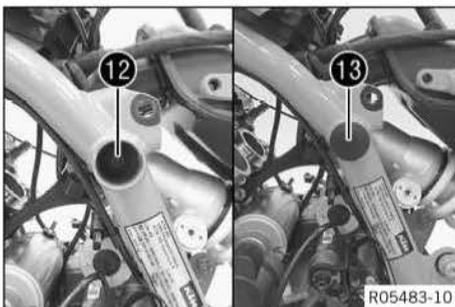
Guideline

Screw, engine fixing arm linkage bracket	M8	25 Nm (18.4 lbf ft) <b>Loctite®243™</b>
------------------------------------------	----	--------------------------------------------

- Tighten screws **8**, **5**, and **4**.

Guideline

Screw, engine bracket	M10	45 Nm (33.2 lbf ft) <b>Loctite®243™</b>
-----------------------	-----	--------------------------------------------



- Remove screw **12**.
- Mount and tighten screw **12**.

Guideline

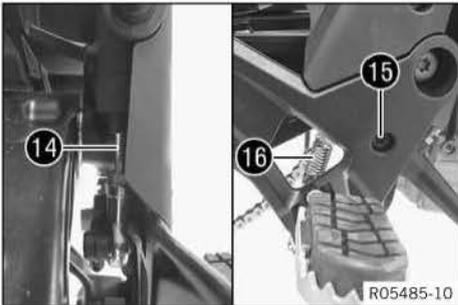
Screw, top shock absorber	M12	80 Nm (59 lbf ft) <b>Loctite®2701™</b>
---------------------------	-----	-------------------------------------------

- Mount covering cap **13**.



- Remove the floor jack with special tool.

Floor jack attachment (63529055000) (見 p. 475)



- Position the foot brake lever.
  - ✓ Push rod 14 engages in the foot brake cylinder.
- Mount and tighten screw cap 15.

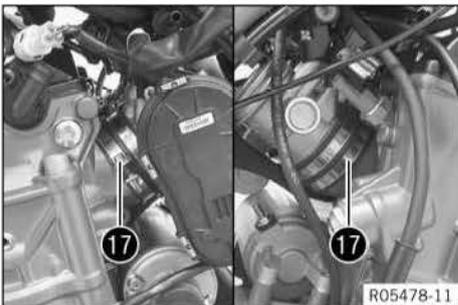
Guideline

Foot brake lever, fitting	M8	25 Nm (18.4 lbf ft) <b>Loctite®2701™</b>
---------------------------	----	---------------------------------------------

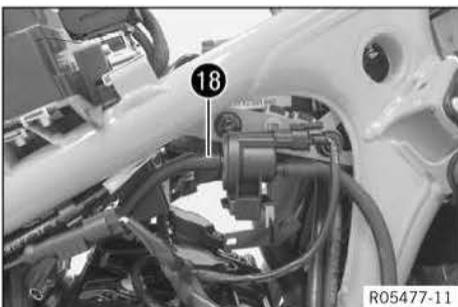
- Attach spring 16.



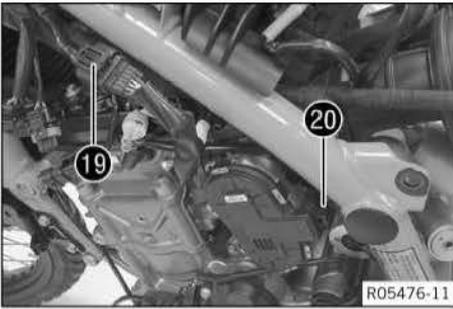
- Position the throttle valve body.



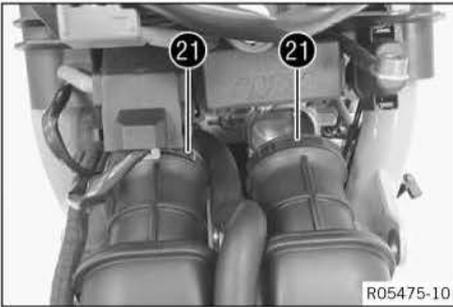
- Tighten hose clips 17.



- Mount hose 18.



- Join plug-in connector 19.
- Plug in connector 20.



- Position hose clips 21.



- Position the subframe.

**i Info**  
Watch out for the intake flanges.

- Mount and tighten screws 22.

Guideline

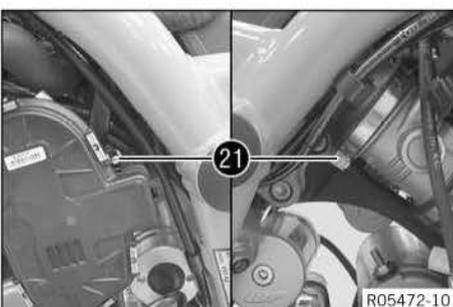
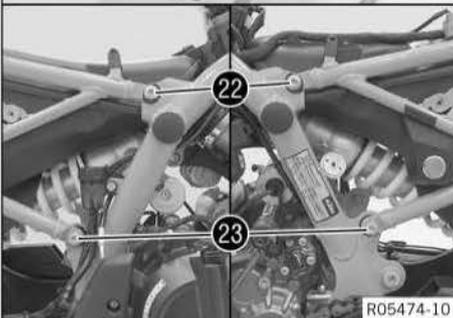
Screw, sub-frame	M10	50 Nm (36.9 lbf ft) <b>Loctite®243™</b>
------------------	-----	--------------------------------------------

- Remove screw 23.

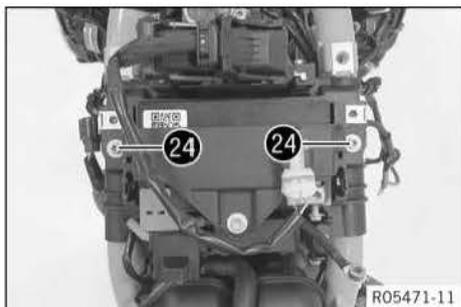
- Mount and tighten screw 23.

Guideline

Screw, sub-frame	M10	50 Nm (36.9 lbf ft) <b>Loctite®243™</b>
------------------	-----	--------------------------------------------



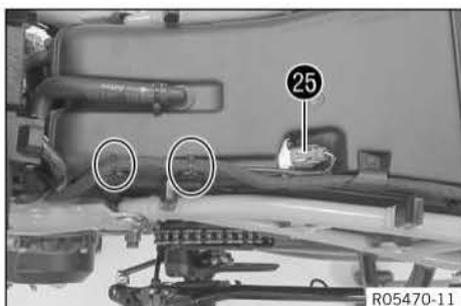
- Tighten hose clips 21.



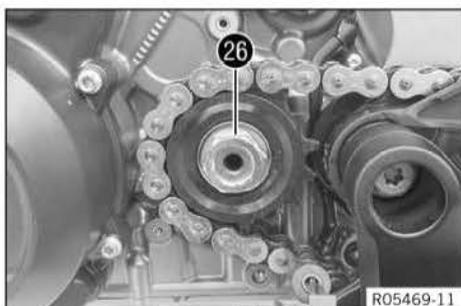
- Mount and tighten screws 24.

Guideline

Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
---------------------------	----	--------------------



- Plug in connector 25.
- Mount the cable ties.



- Mount the engine sprocket.
- Lay a chain over the engine sprocket.
- Mount nut 26 with the lock washer, but do not tighten yet.

Guideline

Nut, engine sprocket	M20x1.5	100 Nm (73.8 lbf ft) <b>Loctite®243™</b>
----------------------	---------	---------------------------------------------



- Slide the wheel spindle in as far as it will go.
- Mount the chain adjuster.
- Push the rear wheel forward so that the chain adjusters are in contact with the screws, and tighten nut 27.

Guideline

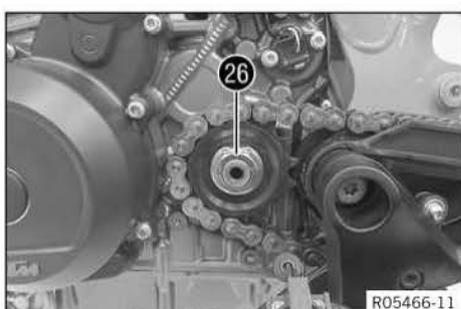
Nut, rear wheel spindle	M25x1.5	90 Nm (66.4 lbf ft) Thread and contact area of wheel spindle greased
-------------------------	---------	-------------------------------------------------------------------------

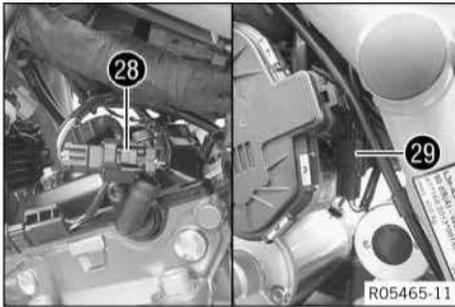
- Check the chain tension. (🔧 p. 171)
- Have an assistant operate the rear brake.
- Tighten nut 26.

Guideline

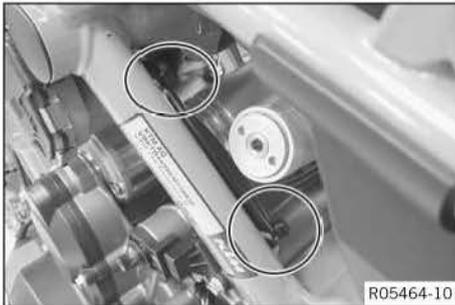
Nut, engine sprocket	M20x1.5	100 Nm (73.8 lbf ft) <b>Loctite®243™</b>
----------------------	---------	---------------------------------------------

- Secure the nut with a lock washer.

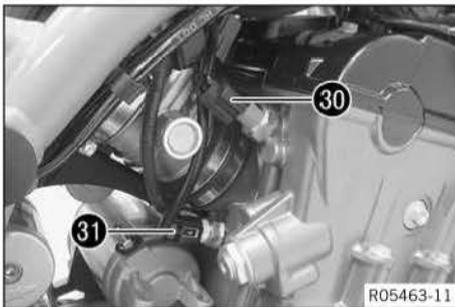




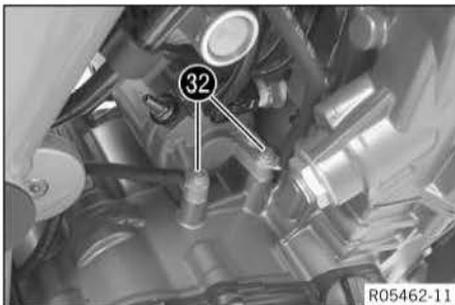
- Route the cables without tension.
- Join plug-in connectors 28 and 29.



- Mount the cable ties.



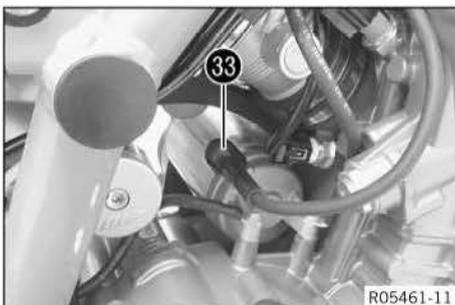
- Plug in connector 30 from the oil pressure sensor.
- Plug in connector 31 from the coolant temperature sensor.



- Position the ground wire.
- Mount and tighten screws 32.

Guideline

Screw, starter motor	M6	10 Nm (7.4 lbf ft)
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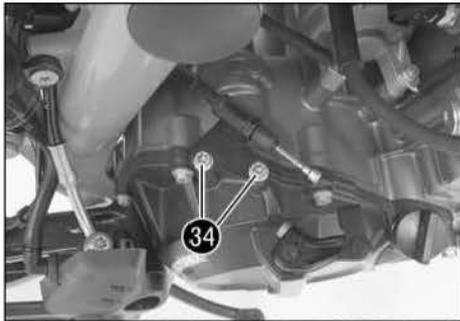


- Position the positive cable on the starter motor.
- Mount and tighten the nut.

Guideline

Remaining nuts, chassis	M6	10 Nm (7.4 lbf ft)
-------------------------	----	--------------------

- Position protection cap 33.

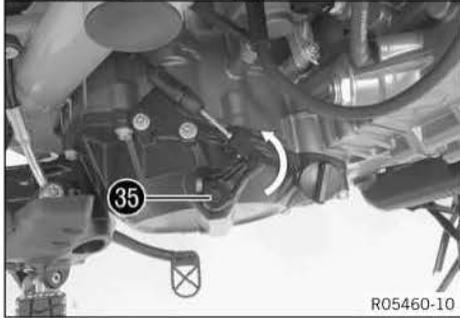


- Position inner clutch cable with bracket.
- Mount and tighten screws 34.

Guideline

Remaining screws, engine	M6	10 Nm (7.4 lbf ft)
--------------------------	----	--------------------

- Swivel clutch release lever 35 counterclockwise and hook in the inner clutch cable.
- Adjust the clutch release lever. (📖 p. 350)



R05460-10

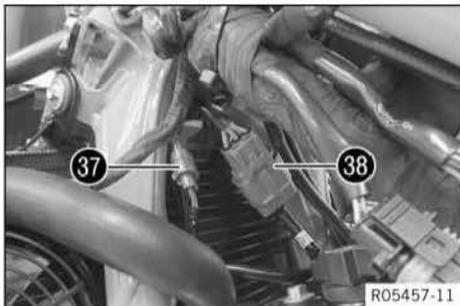
- Position the vent hose and mount hose clamp 36.

Hose clamp plier (60029057000) (📖 p. 472)
-------------------------------------------



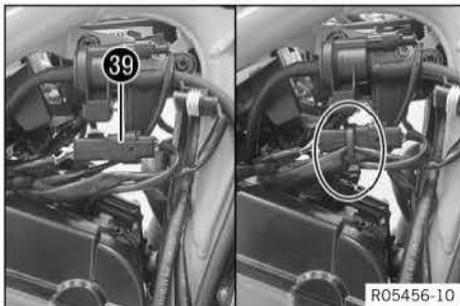
R05458-11

- Join plug-in connectors 37 and 38.

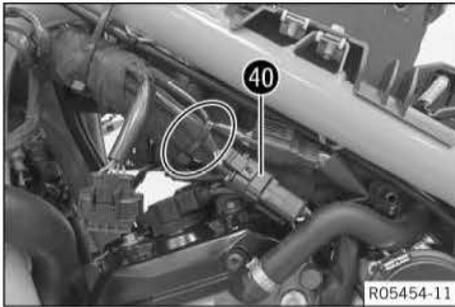


R05457-11

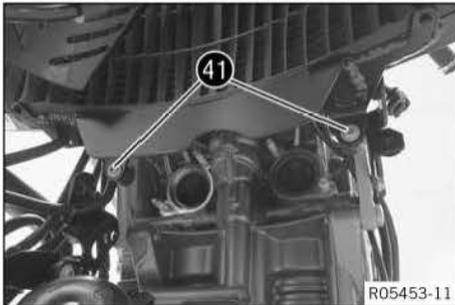
- Join plug-in connector 39 and position in the holder.
- Mount the cable ties.



R05456-10



- Join plug-in connector **40**.
- Mount the cable ties.



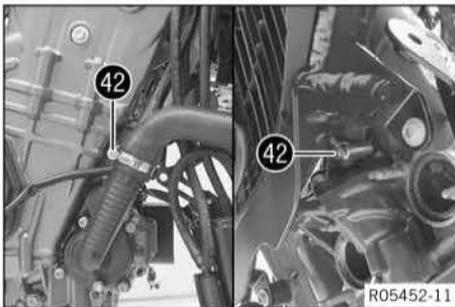
- Position the radiator.

**i Info**  
Pay attention to the cooling fins.

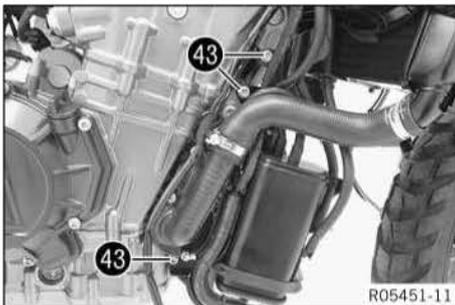
- Mount and tighten screws **41**.

Guideline

Screw, bottom radiator bracket	M6	5 Nm (3.7 lbf ft)
--------------------------------	----	-------------------



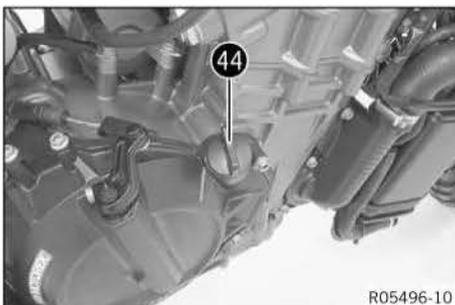
- Mount the radiator hoses.
- Position and tighten hose clips **42**.



- Position the activated charcoal filter.
- Mount and tighten screws **43**.

Guideline

Remaining screws, chassis	M8	25 Nm (18.4 lbf ft)
---------------------------	----	---------------------



- Remove filler plug **44** with the O-ring, and fill up with engine oil.

Engine oil	2.8 l (3 qt.)	Engine oil (SAE 10W/50) (p. 464)
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- Mount and tighten filler plug **44** with the O-ring.

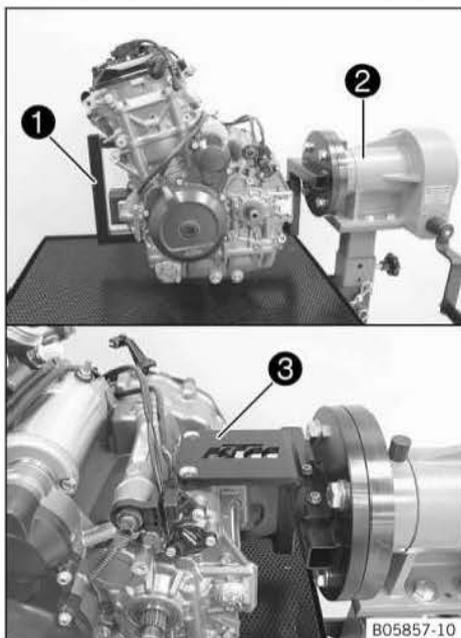
**Finishing work**

- Install the exhaust system. (p. 103)
- Install the fuel tank. (p. 117)
- Install the engine guard. (p. 138)
- Install the right fuel tank spoiler. (p. 135)

- Install the right side cover. (📖 p. 131)
- Install the left fuel tank spoiler. (📖 p. 133)
- Install the battery cover. (📖 p. 132)
- Install the left side cover. (📖 p. 130)
- Remove the rear of the motorcycle from the lifting gear. (📖 p. 15)
- Connect the negative cable of the 12-V battery. (📖 p. 185)
- Mount the seat. (📖 p. 114)
- Set the time and date.
- Fill/bleed the cooling system. (📖 p. 367)
- Read out the trouble code memory using the KTM diagnostics tool.
- Perform the initialization run. (📖 p. 396)
- Go for a short test ride.
- Check the engine for leak tightness.
- Check the engine oil level. (📖 p. 379)
- Check the coolant level in the compensating tank. (📖 p. 365)

## 19.3 Engine disassembly

### 19.3.1 Clamping the engine into the engine assembly stand



- Mount special tool **1** on engine assembly stand **2**.

Engine assembly stand (61229001000) (📖 p. 473)
------------------------------------------------

Engine bracket for engine work stand (63529002000) (📖 p. 475)
---------------------------------------------------------------

- Mount the motor on special tool **1**.

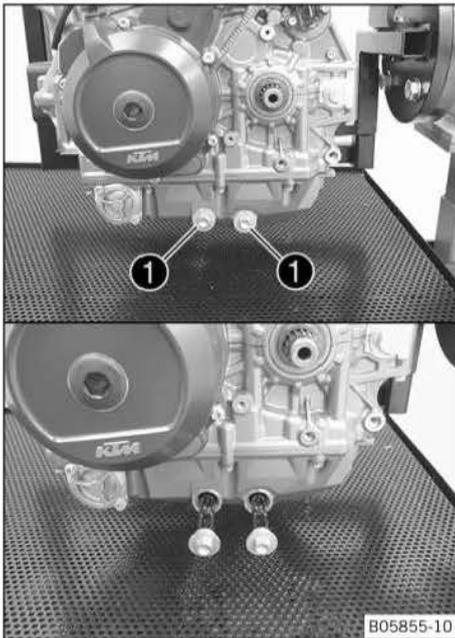


#### Info

Work with an assistant or a motorized hoist.

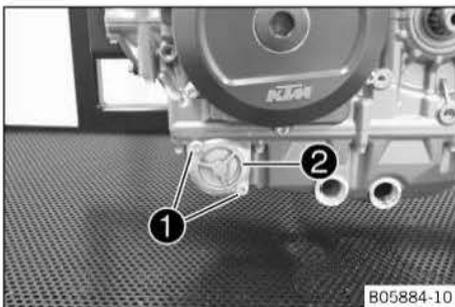
- Mount the retaining bracket **3** on the special tool **1**.

### 19.3.2 Draining the engine oil



- Remove oil drain plugs **1** with the magnet, O-rings, and oil screen.
- Completely drain the engine oil.

### 19.3.3 Removing the oil filter



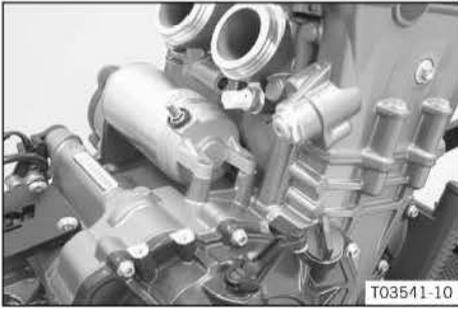
- Remove screws **1**.
- Take off oil filter cover **2** with the O-ring.



- Remove oil filter **3**.

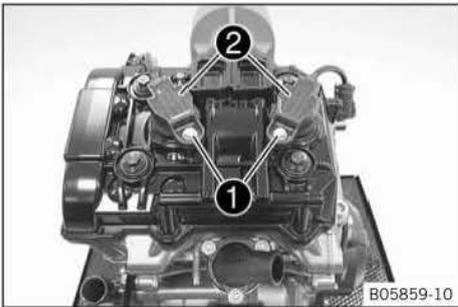
Lock ring plier (51012011000) (📖 p. 470)

## 19.3.4 Removing the starter motor

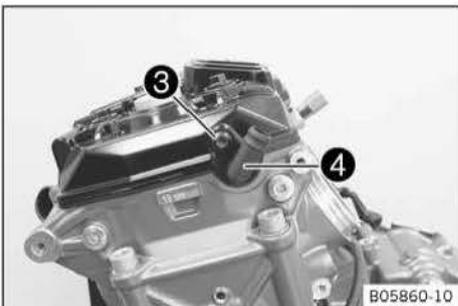


- Take off the starter motor.

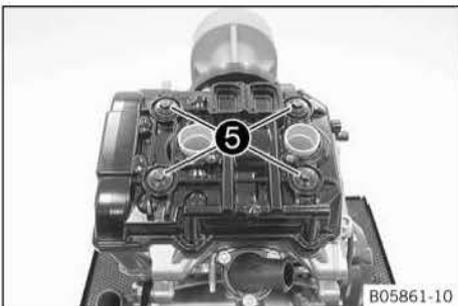
## 19.3.5 Removing the valve cover



- Remove screws **1**.
- Remove ignition coils **2**.

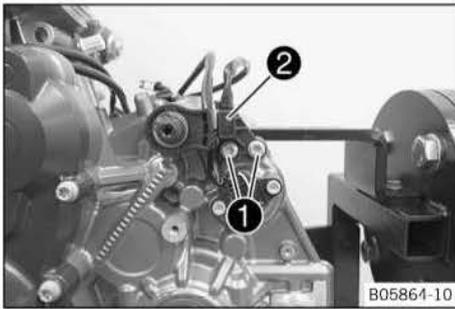


- Remove screw **3** with retaining bracket.
- Pull off bleeder flange **4**.

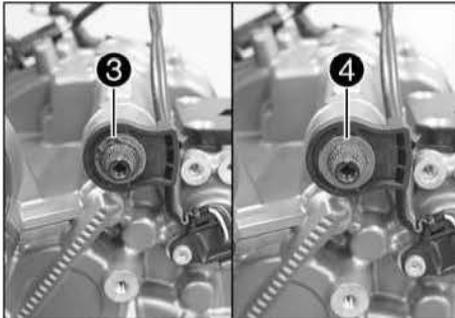


- Remove screws **5** with gaskets.
- Take off the valve cover with the valve cover seal.

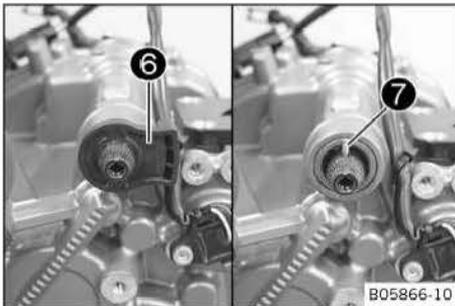
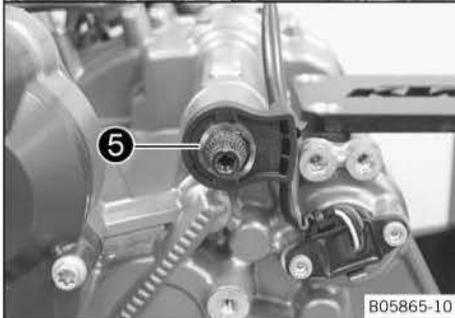
### 19.3.6 Removing shift shaft sensor



- Remove screws ①.
- Take off the shift shaft sensor ②.

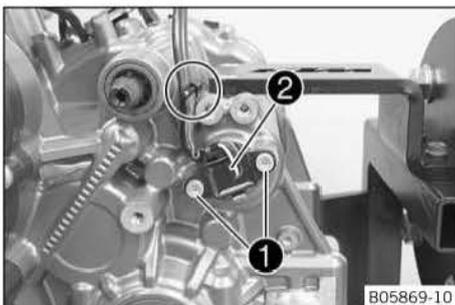


- Remove lock ring ③.
- Remove washer ④.
- Remove locating washer ⑤.



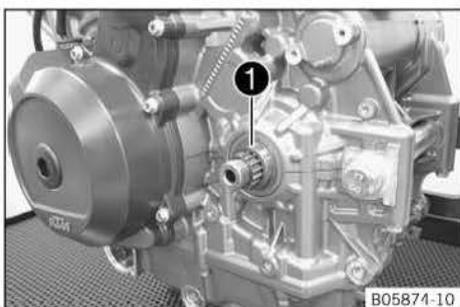
- Take off magnetic holder ⑥.
- Remove pin ⑦.

### 19.3.7 Removing the gear position sensor



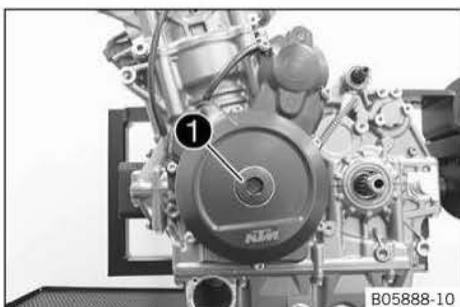
- Remove the cable tie.
- Remove screws ①.
- Take off gear position sensor ②.

## 19.3.8 Removing the spacer

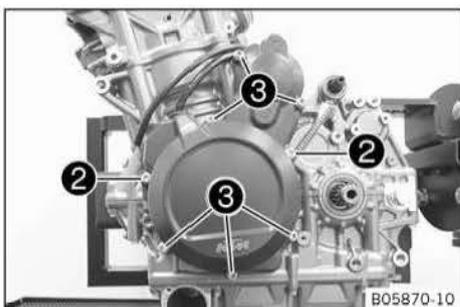


- Remove spacer **1** of the countershaft.
- Remove the O-ring.

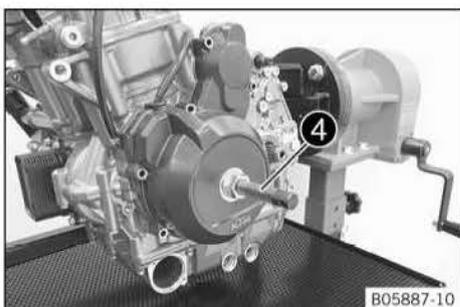
## 19.3.9 Removing the alternator cover



- Remove screw **1** of the alternator cover.

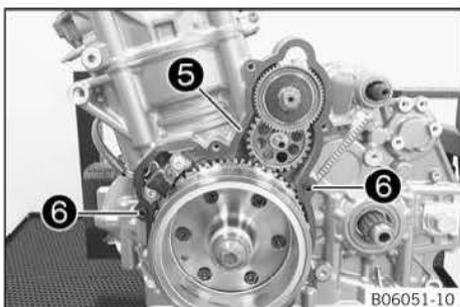


- Remove screws **2** and **3**.



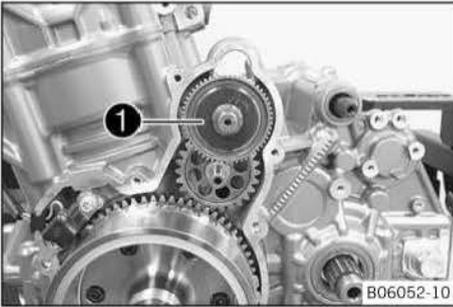
- Mount special tool **4** and pull off the alternator cover.

Puller (61229010000) (p. 474)



- Take off alternator cover gasket **5**.
- Remove dowels **6**.

### 19.3.10 Removing the torque limiter and starter idler gear

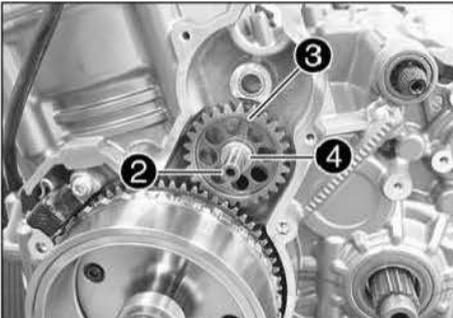


- Take off torque limiter ① with washer.



#### Info

The washer usually sticks to the engine case.

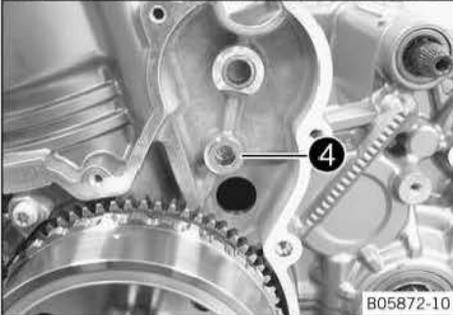


- Take off shaft ② and starter idler gear ③ with needle bearing and washers ④.

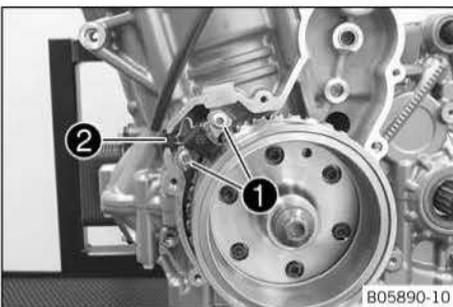


#### Info

The rear washer usually sticks to the engine case.

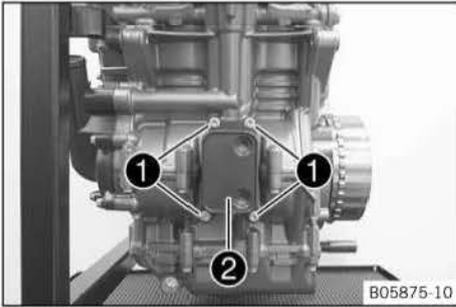


### 19.3.11 Removing the crankshaft speed sensor

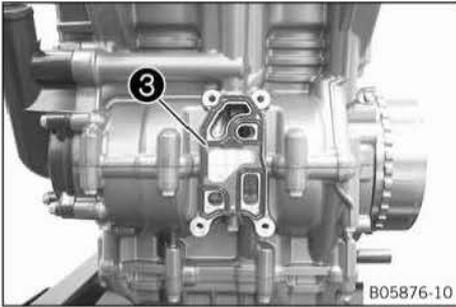


- Remove screws ①.
- Pull rubber grommet ② out of the engine case.
- Remove the crankshaft speed sensor.

## 19.3.12 Removing the heat exchanger

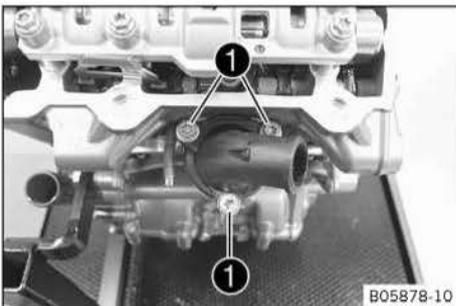


- Remove screws ①.
- Take off heat exchanger ②.

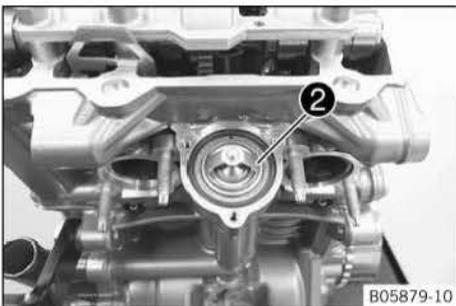


- Remove gasket ③.

## 19.3.13 Removing the thermostat

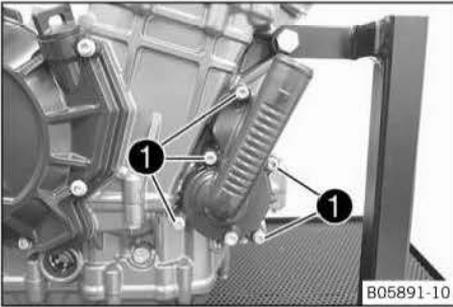


- Remove screws ①.
- Take off the thermostat case.

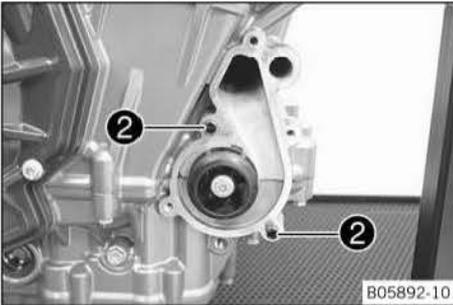


- Remove thermostat ②.

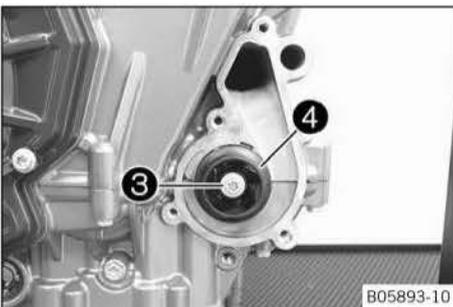
### 19.3.14 Removing the water pump impeller



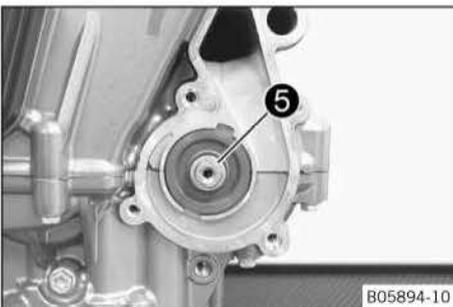
- Remove screws ①.
- Take off the water pump cover with the gasket.



- Remove dowels ②.

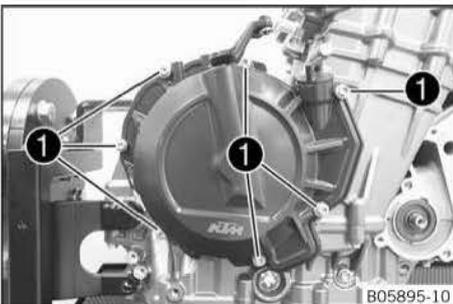


- Remove screw ③.
- Remove water pump impeller ④.

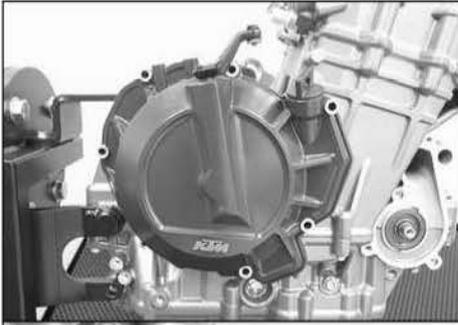


- Remove form washer ⑤.

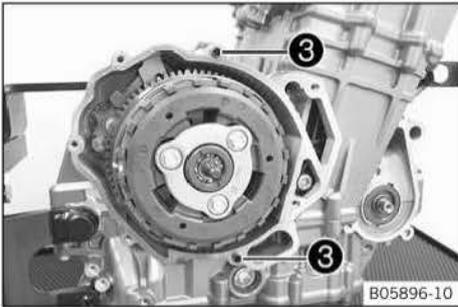
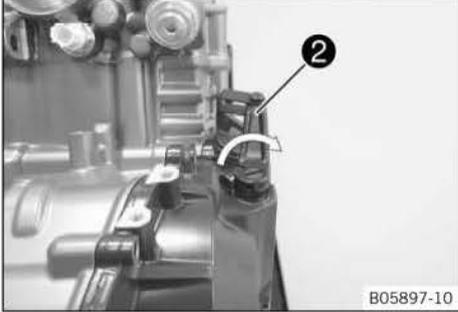
### 19.3.15 Removing the clutch cover



- Remove screws ①.

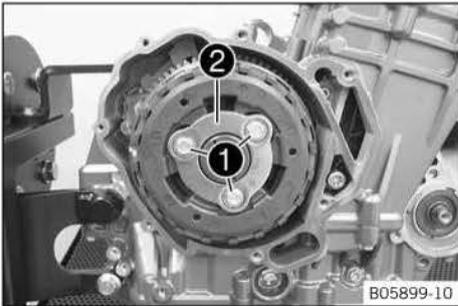


- Swivel the clutch release lever **2** clockwise and take off clutch cover with clutch cover gasket.

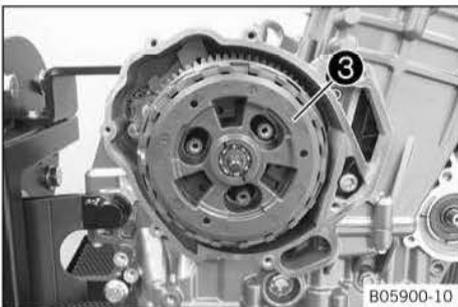


- Remove dowels **3**.

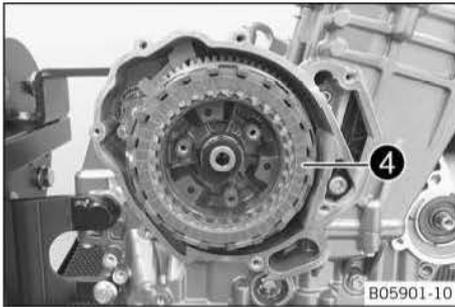
## 19.3.16 Removing the clutch discs



- Remove screws **1**.
- Take off clutch center **2** and the springs.

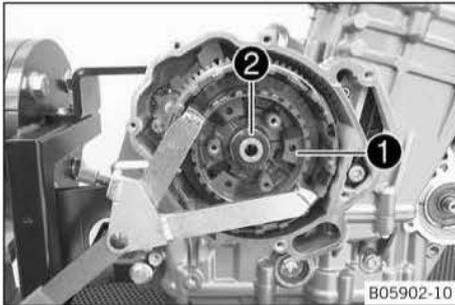


- Remove clutch pressure cap **3**.



- Remove clutch discs **4**, support ring, and pretension ring.

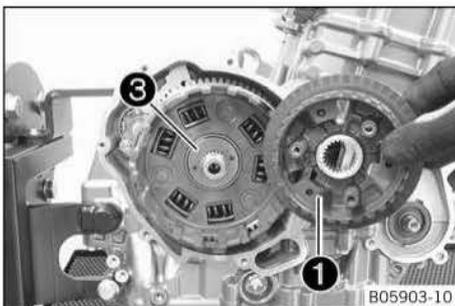
### 19.3.17 Removing the clutch basket



- Hold the inner clutch hub **1** with the special tool.

Holding wrench (51129003000) ( p. 470)

- Remove nut **2** with the washer.

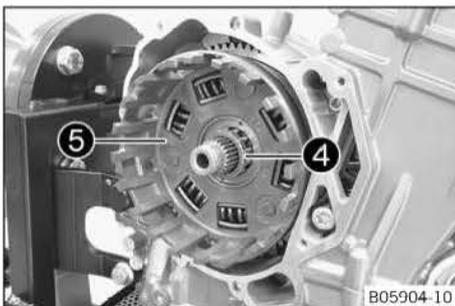


- Take off inner clutch hub **1** and washer **3**.



#### Info

The washer usually sticks to the inner clutch hub.



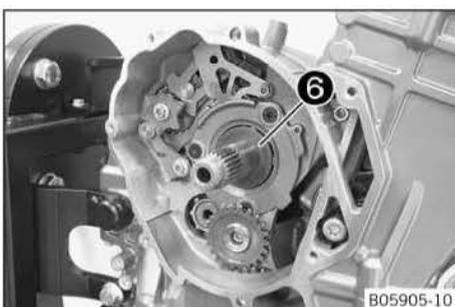
- Remove needle bearing **4**.



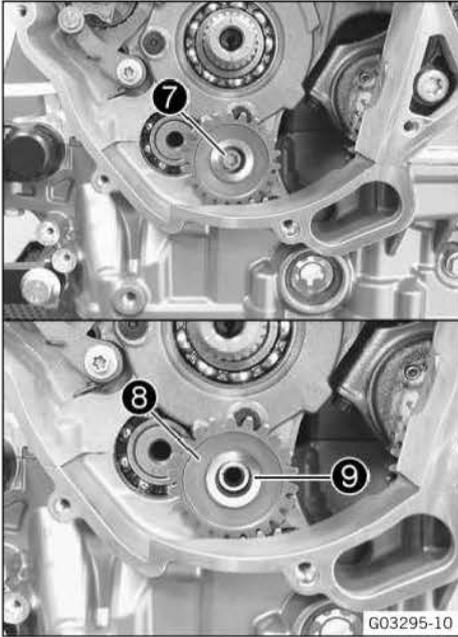
#### Info

Use a magnetic rod to make disassembly easier.  
Do not use pliers, as otherwise the needle bearing will be damaged.

- Take off clutch basket **5**.

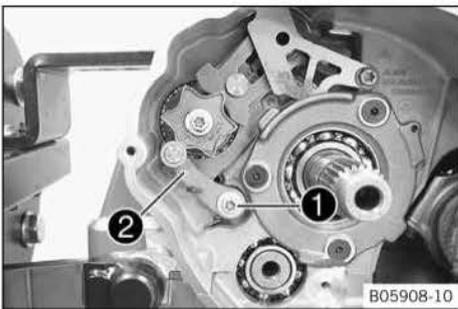


- Remove washer **6**.



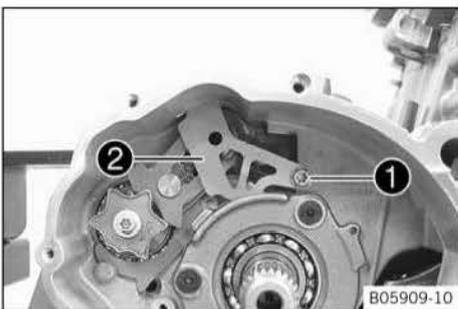
- Remove screw 7.
- Take off intermediate gear 8 with collar bushing 9.

### 19.3.18 Removing locking lever

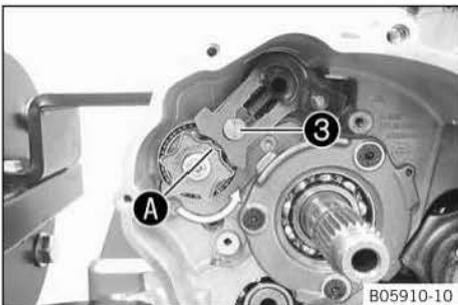


- Remove screw 1.
- Take off locking lever 2 with the sleeve and spring.

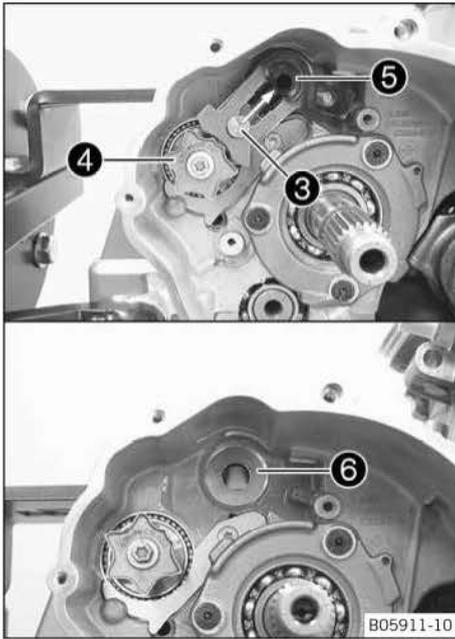
### 19.3.19 Removing the shift shaft



- Remove screw 1.
- Take off retaining bracket 2.



- Twist shift drum until the neutral position A is aligned with the sliding plate 3.



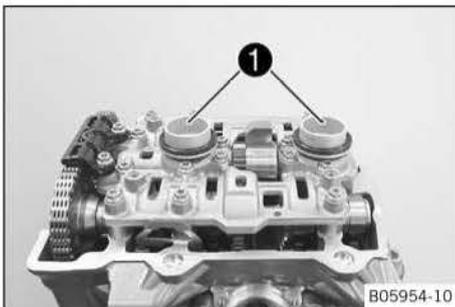
- Push sliding plate **3** away from shift drum locating unit **4**.
- Remove shift shaft **5** with washer **6**.



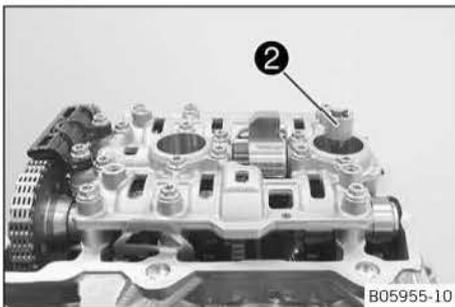
**Info**

The washer usually sticks to the engine case.

### 19.3.20 Removing the spark plugs



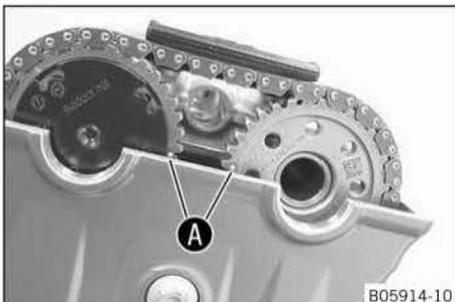
- Remove spark plug shaft inserts **1** with the gaskets.



- Remove the spark plugs using special tool **2**.

Spark plug wrench with link (77229172000) ( p. 479)

### 19.3.21 Removing the camshafts

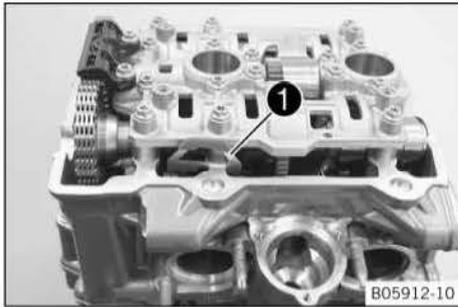


- Turn the crankshaft counterclockwise and set it to ignition top dead center of cylinder 2.
- ✓ The **0T2** markings **A** are aligned with the sealing surface.

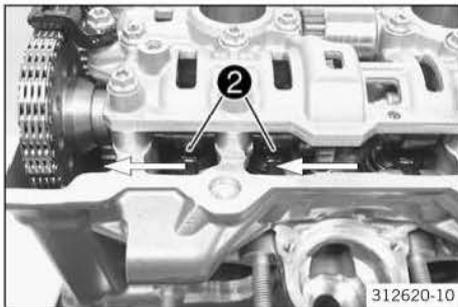


**Info**

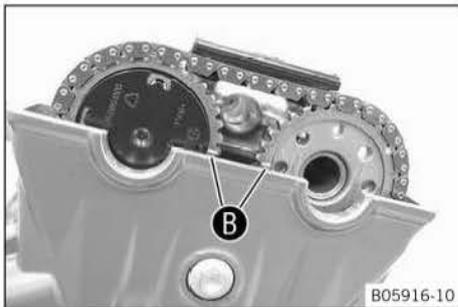
The **0T2** markings are dot markings.



- Remove cam lever clip **1**.



- Push exhaust cam lever **2** on cylinder 2 to the side.



- Turn the crankshaft counterclockwise by the specified value and set it to ignition top dead center of cylinder 1.

Guideline

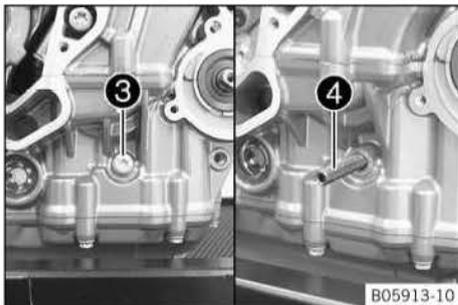
435°

- ✓ The **OT1** markings **B** are aligned with the sealing surface.



**Info**

The **OT1** markings are line markings.



- Remove screw **3** with the washer.

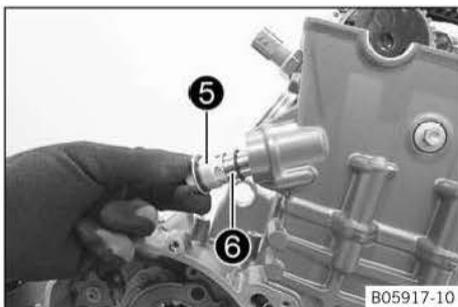


**Info**

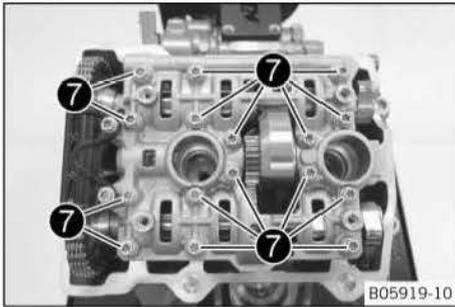
Look through the hole to check that the position hole of the crankshaft is visible.

- Mount special tool **4**.

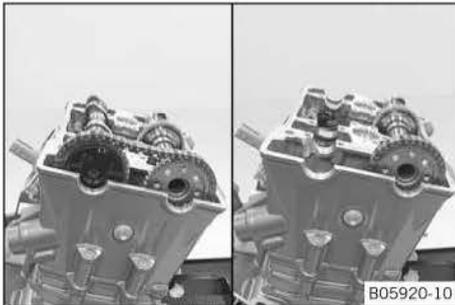
Locking screw (61229015000) (📖 p. 474)



- Remove screw **5** with the O-ring.
- Take off timing chain tensioner **6** with O-ring.

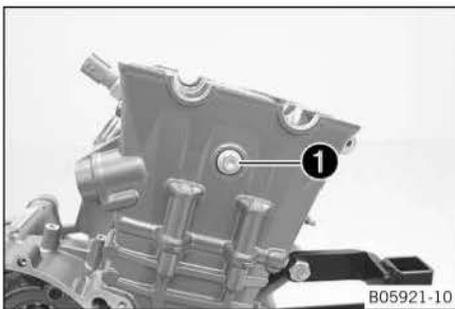


- Loosen and remove screws **7** from the outside to the inside.
- Take off camshaft bearing bridge with balancer shaft.

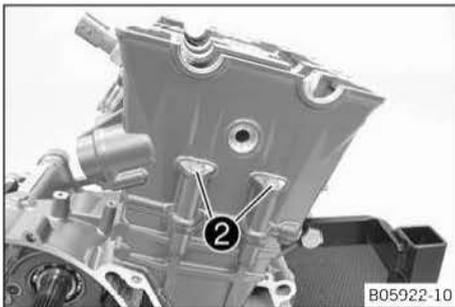


- Raise the camshafts at the rear and take the timing chain off the rear sprocket. Remove the camshafts.

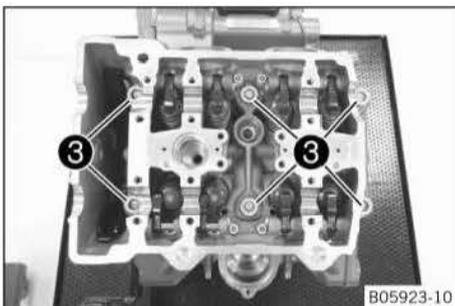
**19.3.22 Removing the cylinder head**



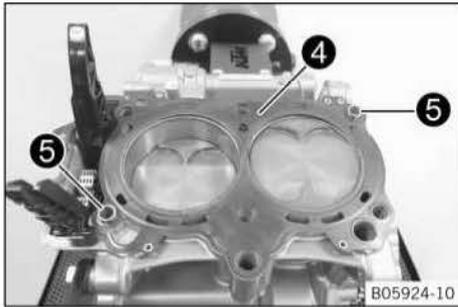
- Remove screw **1** with gasket.



- Remove screws **2**.

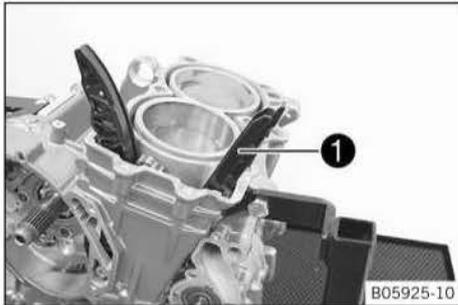


- Loosen screws **3** in a crisscross pattern and remove them with the washers.
- Take off the cylinder head.

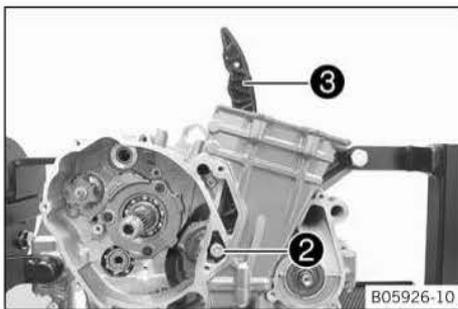


- Take off cylinder head gasket ④.
- Remove dowels ⑤.

## 19.3.23 Removing the timing chain rails

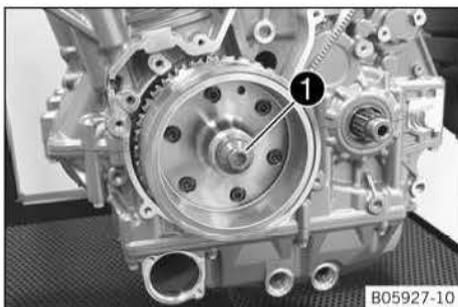


- Remove the timing chain guide rail ① from the top.



- Remove screw ②.
- Remove timing chain tensioning rail ③ with support bushing upward.

## 19.3.24 Removing the rotor



- Remove screw ①.



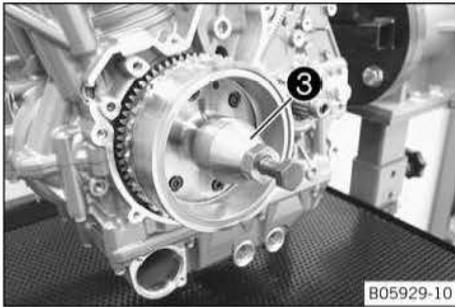
### Info

The crankshaft must be blocked.



- Mount special tool ②.

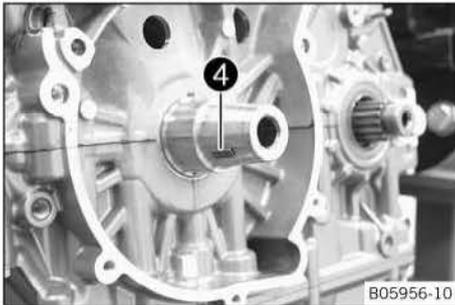
Pressing tool (61229008100) (📖 p. 473)



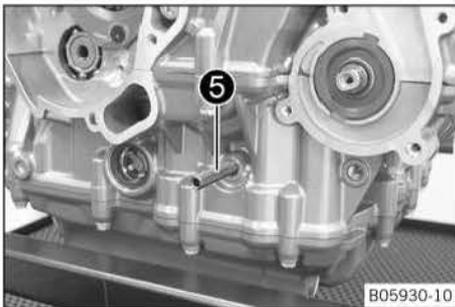
- Mount special tool **3** on the rotor.

Puller (75029021000) (p. 478)

- Hold it tight using the special tool and pull off the rotor by turning the screw in.
- Remove the special tool.

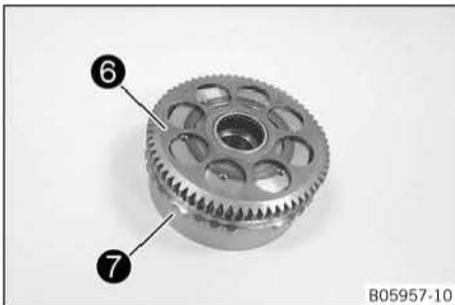


- Remove woodruff key **4**.



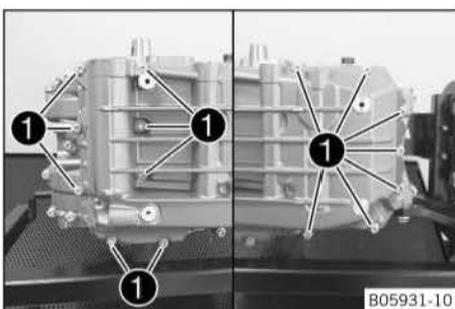
- Remove special tool **5**.

Locking screw (61229015000) (p. 474)

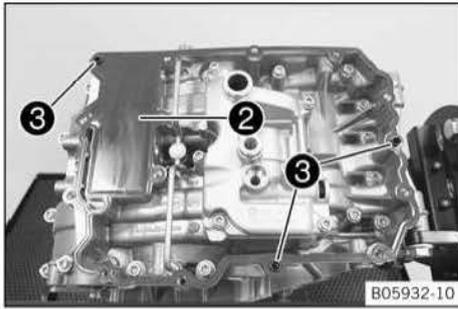


- Take off freewheel gear **6** from rotor **7**.

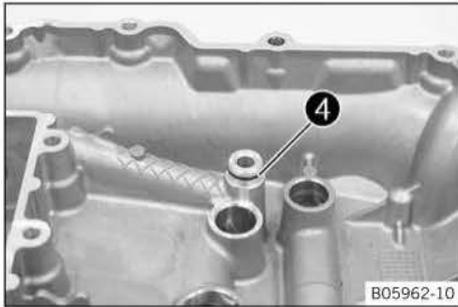
### 19.3.25 Removing the oil pan



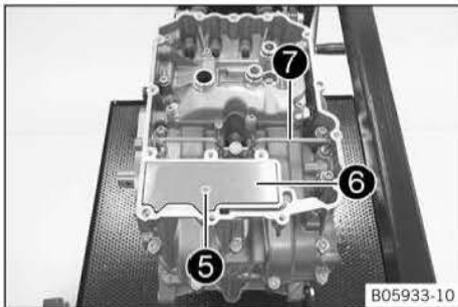
- Remove screws **1**.
- Take off oil pan.



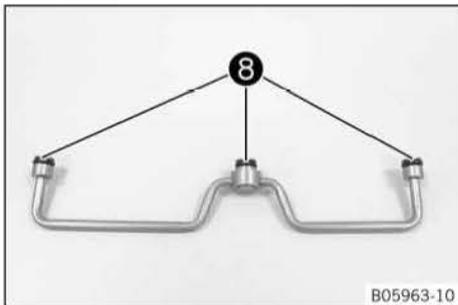
- Take off gasket ②.
- Remove dowels ③.



- Remove O-ring ④.

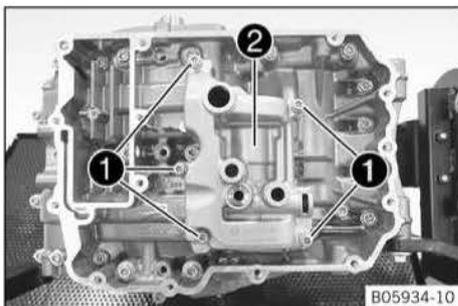


- Remove screw ⑤.
- Remove pressure plate ⑥.
- Take off oil line ⑦.

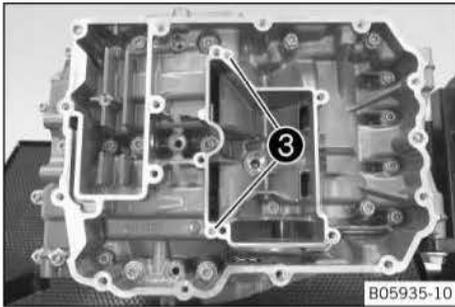


- Take off O-rings ⑧ from the oil line.

### 19.3.26 Removing the oil pump unit



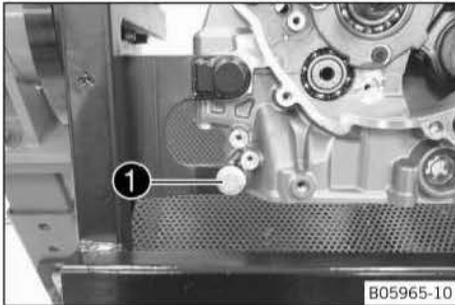
- Remove screws ①.
- Take off oil pump unit ②.



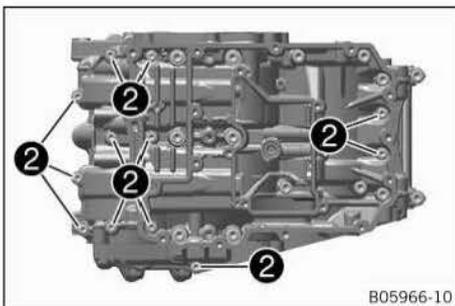
- Remove locating pins ③.



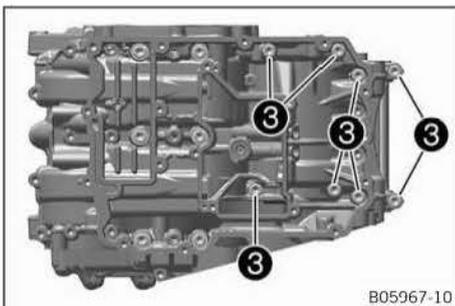
**19.3.27 Removing the engine case downwards**



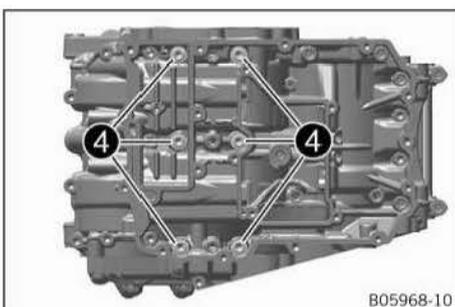
- Remove the screw ① of the engine fixing arm.
- Swing the lower section of the engine case upward.



- Remove screws ②.



- Remove screws ③.

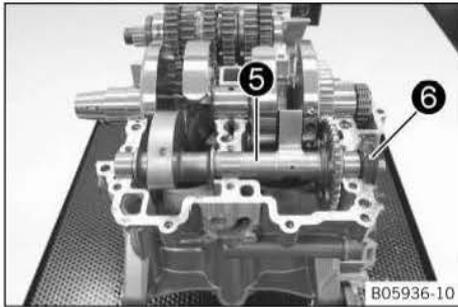


- Loosen screws ④ in a crisscross pattern and remove them with the washers.
- Take off lower section of the engine case.

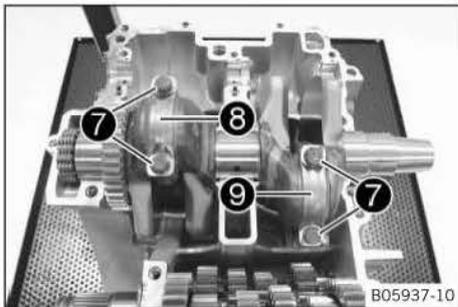


**Info**

Ensure that the bearing shells remain in place.



- Remove balancer shaft **5** with shaft seal ring **6**.

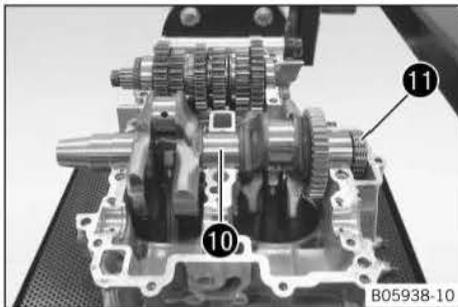


- Remove screws **7**.
- Take off conrod bearing covers **8** and **9**.



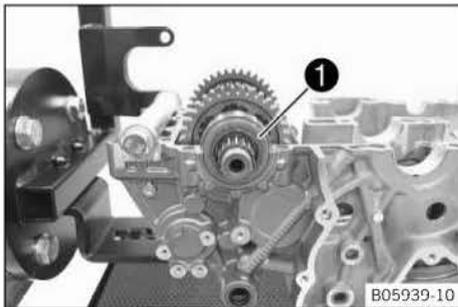
**Info**

The conrod bearing covers and connecting rods are marked together and must never be mixed up.

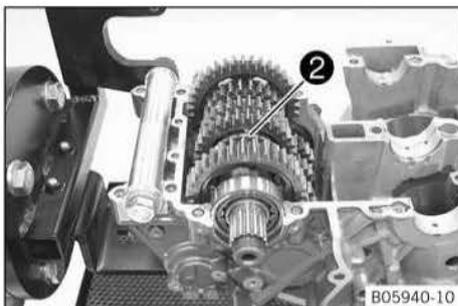


- Remove crankshaft **10** with timing chain **11**.

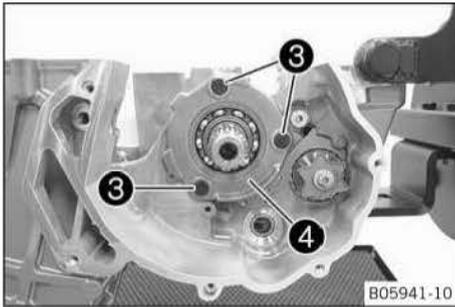
### 19.3.28 Removing the transmission shafts



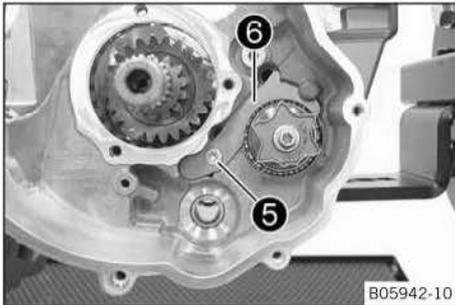
- Remove shaft seal ring **1**.



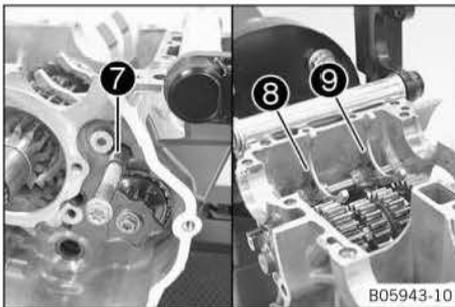
- Take off countershaft **2**.



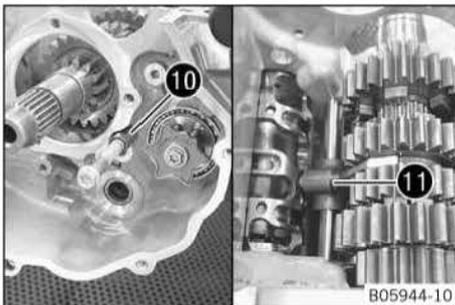
- Remove screws ③.
- Take off bearing support ④ with bearing.



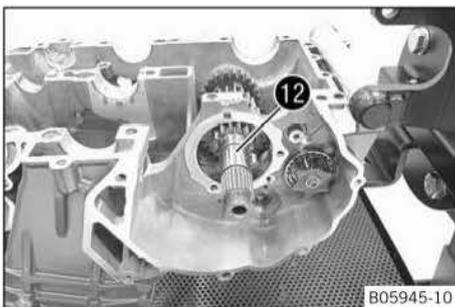
- Remove screw ⑤.
- Take off retaining bracket ⑥.



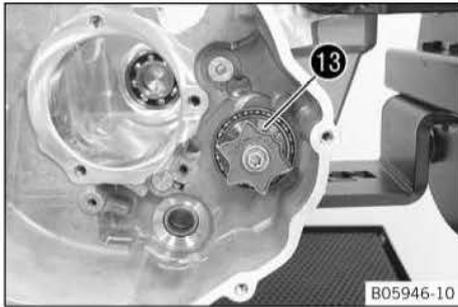
- Mount appropriate M8 screw in the shift rail ⑦.
- Remove shift rail ⑦.
- Remove shift forks ⑧ and ⑨.



- Mount appropriate M8 screw in the shift rail ⑩.
- Remove shift rail ⑩.
- Remove shift fork ⑪.

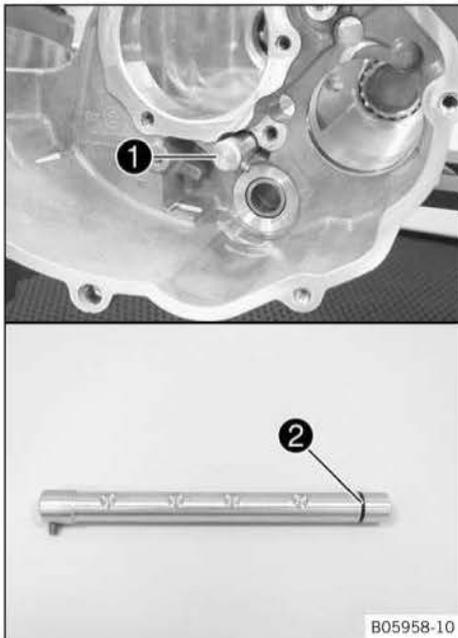


- Remove main shaft ⑫.



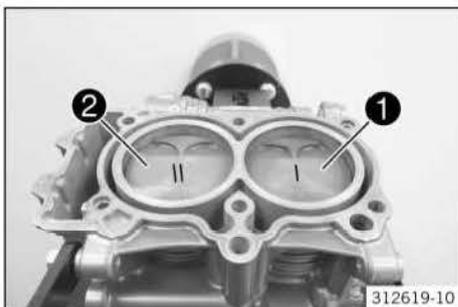
- Remove shift drum **13**.

## 19.3.29 Removing oil spray tube



- Remove oil spray tube **1**.
- Remove O-ring **2**.

## 19.3.30 Removing the piston

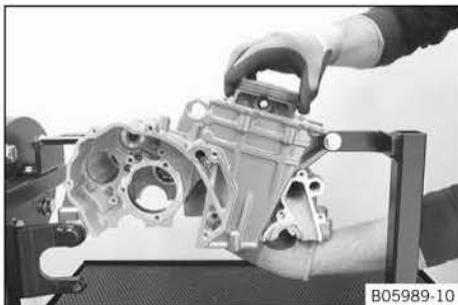


- Swing the upper section of the engine case upward.
- Mark the pistons **1** and **2**.
- Remove any deposits in the upper area of the cylinders.



### Info

Ensure that the cylinders are not damaged.

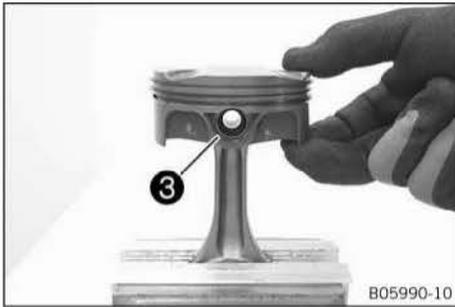


- Remove piston with connecting rod upward out of the cylinder.



### Info

Make sure that the connecting rod does not damage the cylinder.

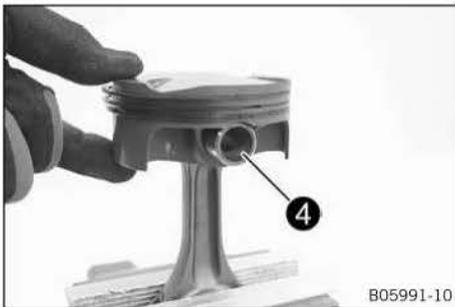


- Clamp connecting rod in the vise.

Guideline

Use soft jaws.

- Remove piston ring lock ③.



- Remove piston pin ④.
- Take off the piston.

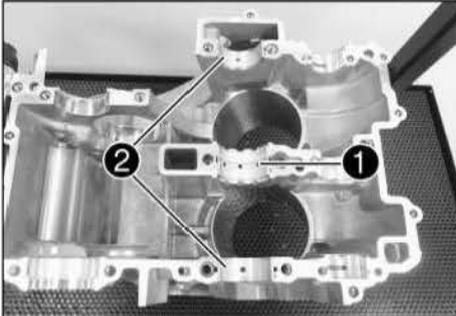


- Mark the pistons and connecting rods belonging together correspondingly.

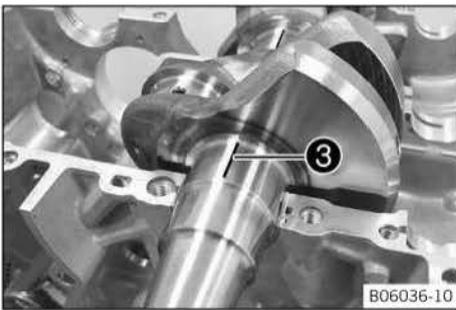
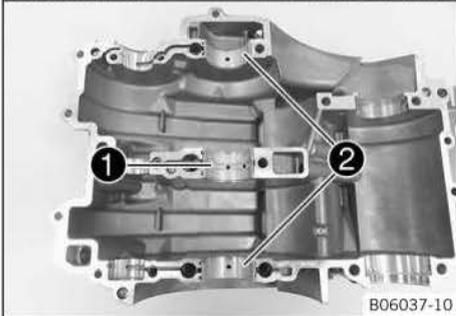


## 19.4 Working on individual parts

### 19.4.1 Checking the radial clearance of crankshaft bearings

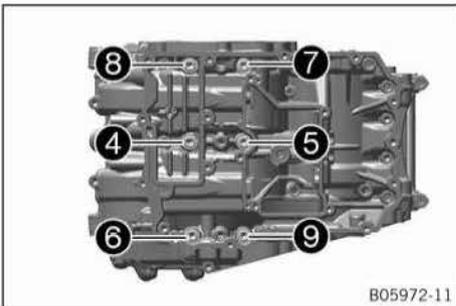


- Remove any remnants of sealing compound and clean the sections of the engine case thoroughly.
- Clean bearing shells ① and ②.



- Position crankshaft in the upper section of the engine case.
- Insert **Plastigauge** clearance gauge ③ 90° offset to the bearing joint.

**Plastigauge** clearance gauge (60029012000) (p. 471)



- Mount lower engine case.
- Mount screws with washers and tighten in the order ④ to ⑨.

#### Guideline

Screw, engine case	M8x90	25 Nm (18.4 lbf ft) Screw support greased
--------------------	-------	----------------------------------------------



#### Info

Do not twist crankshaft.



- Remove lower section of the engine case again. Compare **Plastigauge** clearance gauge with the data on the packaging.

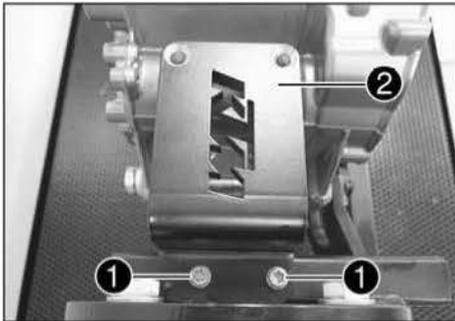
#### Guideline

Crankshaft bearing	
New condition	0.030 ... 0.060 mm (0.00118 ... 0.00236 in)
Wear limit	0.080 mm (0.00315 in)

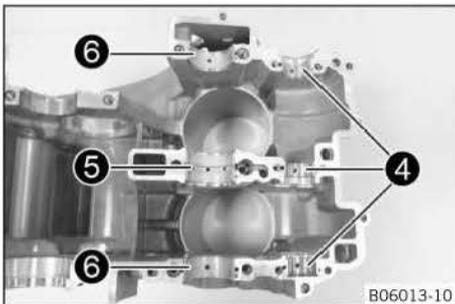
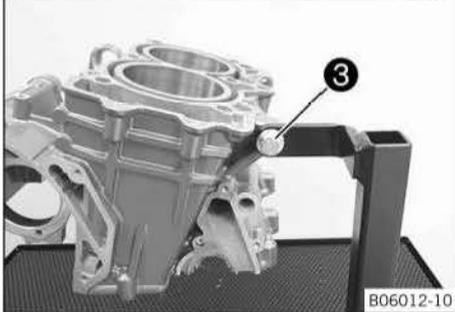
**Info**

The width of the **Plastigauge** clearance gauge indicates the bearing play.

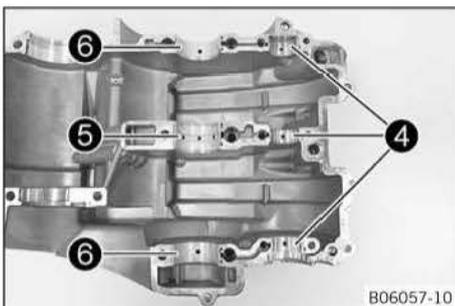
- Clean the parts.

**19.4.2 Changing the main bearing shells**

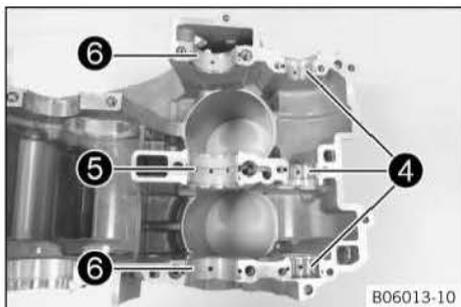
- Remove screws **1**.
- Take off retaining bracket **2**.
- Remove screw **3** and take off upper section of the engine case.



- Remove bearing shells **4** of the balancer shaft from the upper section of the engine case.
- Remove bearing shells **5** and **6** of the crankshaft from the upper section of the engine case.
- Clean seat of the bearing shells.



- Remove bearing shells **4** of the balancer shaft from the lower section of the engine case.
- Remove bearing shells **5** and **6** of the crankshaft from the lower section of the engine case.
- Clean seat of the bearing shells.
- Select the main bearing shells. (p. 287)
- Mount new bearing shells **5** and **6** in the lower section of the engine case.
- Mount new bearing shells **4** in the lower section of the engine case.



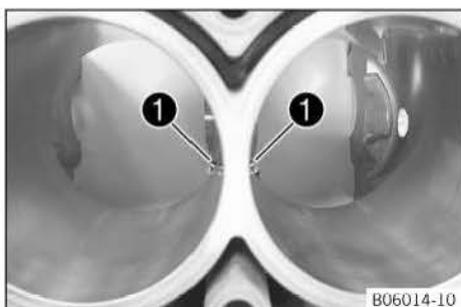
- Mount new bearing shells **5** and **6** in the upper section of the engine case.
- Mount new bearing shells and **4** in the upper section of the engine case.

### 19.4.3 Checking the balancer shaft

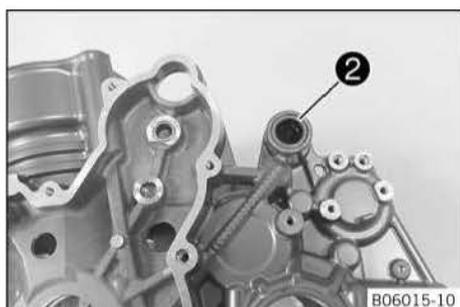


- Clean all parts well.
- Check the pivot points of the balancer shaft for damage and wear.
  - » If there is damage or wear:
    - Change the balancer shaft.
- Check the bearing shells of the balancer shaft for damage, abrasion and wear.
  - » If there is damage, abrasion or wear:
    - Change bearing shells.

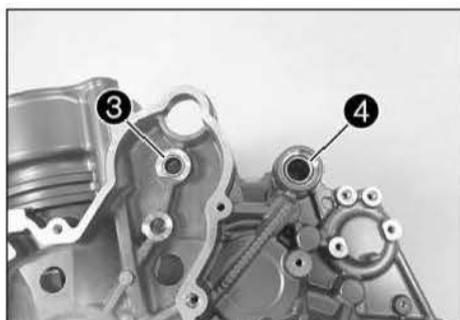
### 19.4.4 Working on the upper section of the engine case



- Remove oil nozzles **1**.



- Remove shaft seal ring **2** of the shift shaft.



- Remove any remnants of sealing compound and clean the section of the engine case thoroughly.
- Warm the section of the engine case in an oven.

Guideline

130 °C (266 °F)

- Knock the section of the engine case with the right and left side against a level wooden board. This will cause the bearings to drop out of the bearing seats.

**i** Info

Any bearings that remain in the section of the engine case must be removed using a suitable tool.  
A washer is located behind the bearing **7**. Make sure that this washer is not damaged.

- Warm the section of the engine case again.

Guideline

130 °C (266 °F)

- Insert the new cold bearings **3** and **4** in the bearing seat on the left side of the heated section of the engine case; if necessary, use a suitable press drift to push them all the way in and make them flush.

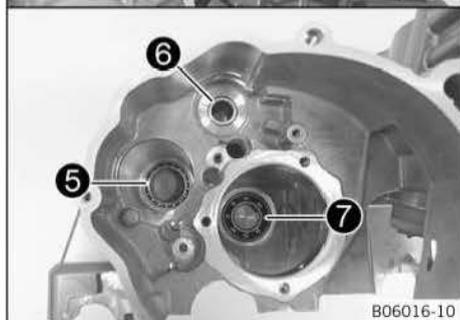
**i** Info

When pressing in, ensure that the section of the engine case lies flat in order prevent damage.  
Only press the bearings in using the outer bearing race; otherwise, the bearings will be damaged when they are pressed in.

- Insert the new cold bearings **5**, **6** and **7** in the bearing seat on the right side of the heated section of the engine case; if necessary, use a suitable press drift to push them all the way in and make them flush.

**i** Info

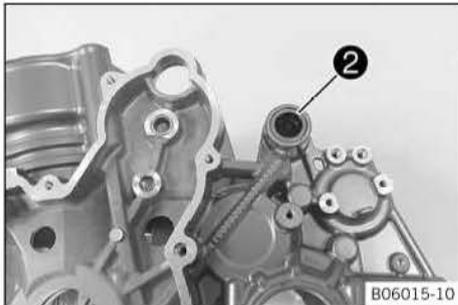
Do not forget the washer under the bearing **7**.  
When pressing in, ensure that the section of the engine case lies flat in order prevent damage.  
Only press the bearings in using the outer bearing race; otherwise, the bearings will be damaged when they are pressed in.



- After the section of the engine case has cooled, check that the bearings are firmly seated.

**i Info**

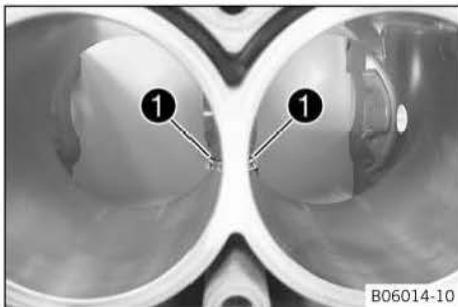
If the bearings are not firmly seated after cooling, it is likely that they will rotate in the engine case when warm. In this case, the engine case must be renewed.



- Press in new shaft seal ring (2) of the shift shaft from the outside to the inside with the open side facing in.

**i Info**

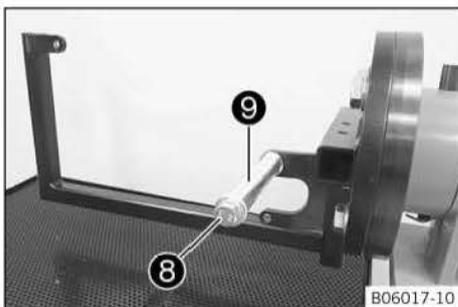
The shaft seal ring must be flush on the outside.



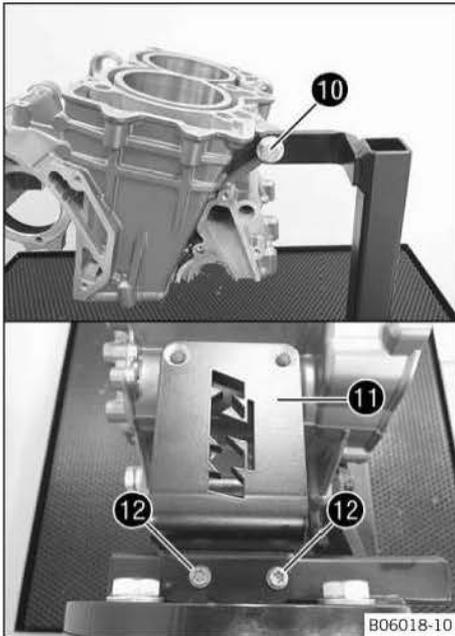
- Blow compressed air through all oil channels and oil nozzles, and check that they are clear.
- Mount and tighten oil nozzles (1).

Guideline

Oil nozzle for piston cooling	M5	2 Nm (1.5 lbf ft) <b>Loctite®243™</b>
-------------------------------	----	------------------------------------------



- Remove screw (8).
- Take off case bushing (9).
- Check the case bushing for damage and wear.
  - » If there is damage or wear:
    - Change case bushing.
- Position case bushing (9) on the engine assembly stand.
- Mount and tighten screw (8).



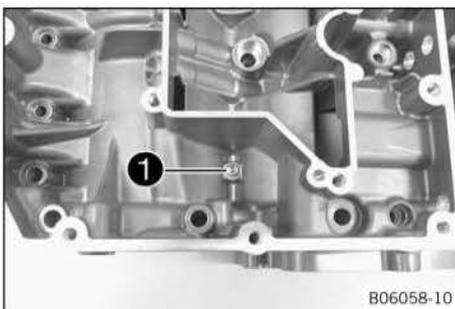
- Position upper section of the engine case in the engine assembly stand, mount screw 10 and tighten.

Engine assembly stand (61229001000) (p. 473)

Engine bracket for engine work stand (63529002000) (p. 475)

- Position retaining bracket 11.
- Mount and tighten screws 12.

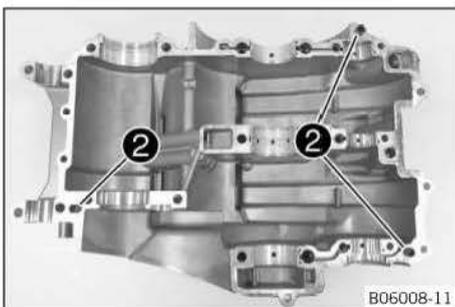
### 19.4.5 Working on the lower section of the engine case



- Remove oil nozzle 1.
- Blow compressed air through all oil channels and oil nozzles, and check that they are clear.
- Mount and tighten oil nozzle 1.

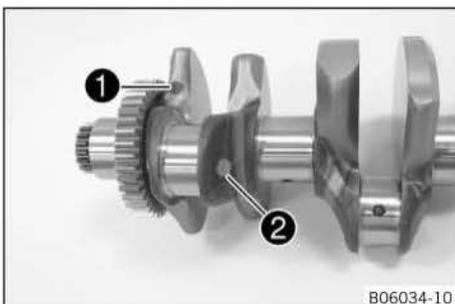
Guideline

Nozzle, engine vent	M5	2 Nm (1.5 lbf ft) <b>Loctite®243™</b>
---------------------	----	------------------------------------------



- Swivel section of the engine case.
- Check that dowels 2 are seated correctly.

### 19.4.6 Selecting the main bearing shells



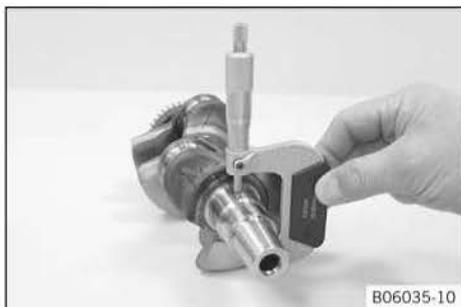
#### New crankshaft

- Select the new bearing shells according to color coding 1.



#### Info

Color coding 2 refers to the conrod bearing.



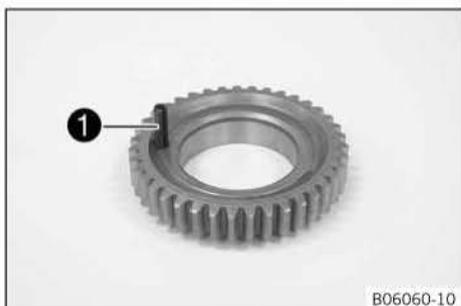
### Used crankshaft

- Measure all main bearing shells and select the new bearing shells accordingly.

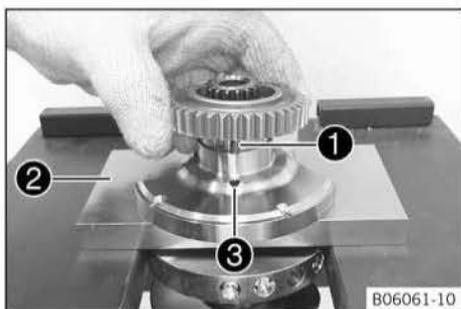
#### Guideline

Crankshaft - main bearing diameter	
Blue	37.985 ... 37.995 mm (1.49547 ... 1.49586 in)
Red	37.995 ... 38.005 mm (1.49586 ... 1.49626 in)

## 19.4.7 Installing the primary gear wheel



- Mount dowel pin **1** in the primary gear wheel.



- Position the crankshaft with special tool **2** in the press.

Separator plate (79429009000) (p. 479)

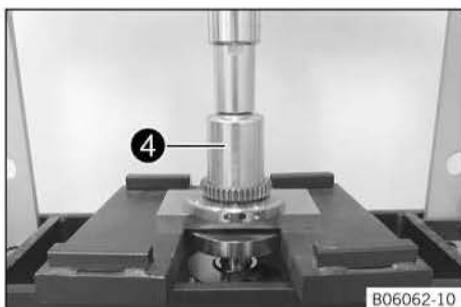
- Heat up primary gear wheel.

#### Guideline

150 °C (302 °F)

- Position primary gear wheel on the crankshaft.

✓ Dowel pin **1** engages in hole **3**.



- Mount primary gear wheel all the way with special tool **4**.

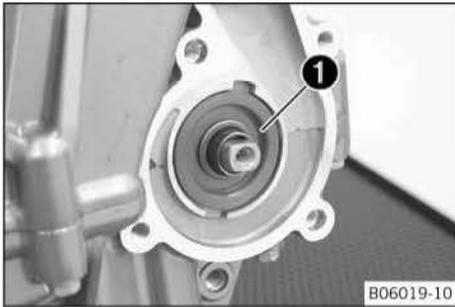
Pressing tool (61229016000) (p. 474)

✓ The marking is visible after mounting.

## 19.4.8 Changing the shaft seal ring of the water pump

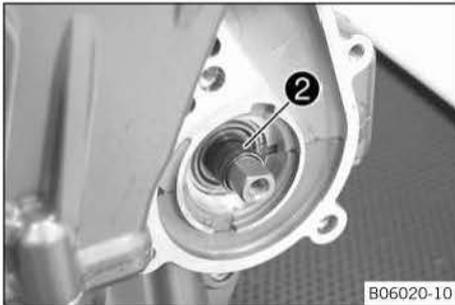
### Preparatory work

- Remove the water pump impeller. (p. 267)

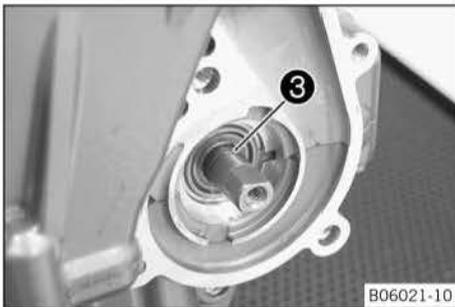


#### Main work

- Remove shaft seal ring **1** of the water pump.

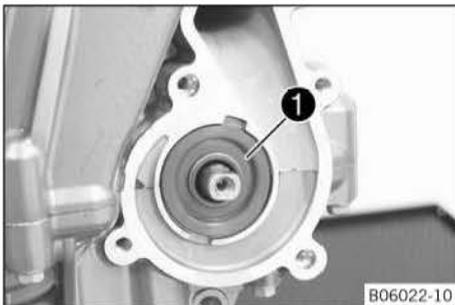


- Remove water pump impeller **2**.



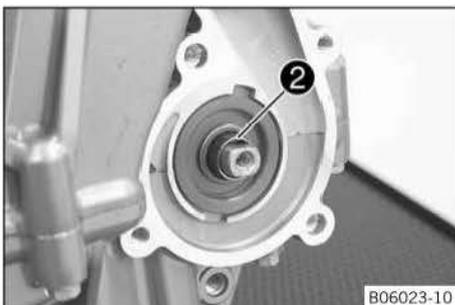
- Remove O-ring **3**.
- Grease and mount the new O-ring **3**.

Long-life grease (☞ p. 466)



- Grease and mount the new shaft seal ring **1**.

Long-life grease (☞ p. 466)



- Mount the new water pump impeller **2**.

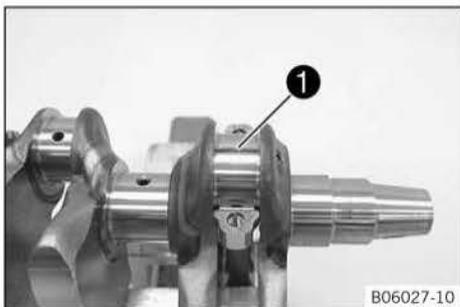
#### Finishing work

- Mount the water pump cover. (☞ p. 342)



## 19.4.9 Checking the radial clearance of lower conrod bearing

**i Info**  
Perform operations for both connecting rods.



- Position the bearing shells. Insert **Plastigauge** clearance gauge ① 90° offset to the bearing joint.

**Plastigauge** clearance gauge (60029012000) (📖 p. 471)



- Position the conrod bearing cover. Mount and tighten the screws.

Guideline

Screw, conrod bearing	M8	1st stage 5 Nm (3.7 lbf ft) 2nd stage 15 Nm (11.1 lbf ft) 3rd stage 90° Collar and thread oiled
-----------------------	----	-------------------------------------------------------------------------------------------------------------------

Multi-tooth wrench socket (63529075000) (📖 p. 476)

Angle disc (60029010000) (📖 p. 471)



- Remove the conrod bearing cover again. Compare **Plastigauge** clearance gauge with the data on the packaging.

Guideline

Connecting rod - radial clearance of lower conrod bearing	
New condition	0.030 ... 0.060 mm (0.00118 ... 0.00236 in)
Wear limit	0.080 mm (0.00315 in)

**i Info**  
The width of the **Plastigauge** clearance gauge indicates the bearing play.

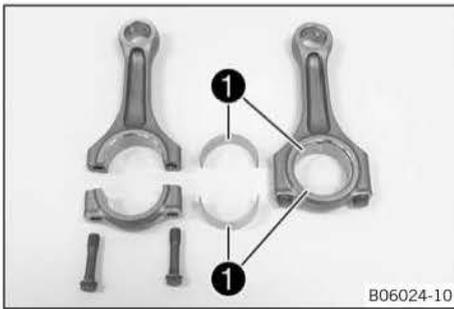
- Clean the parts.

## 19.4.10 Changing the conrod bearing

**i Info**  
Perform operations for both connecting rods.

**Condition**

Connecting rod removed



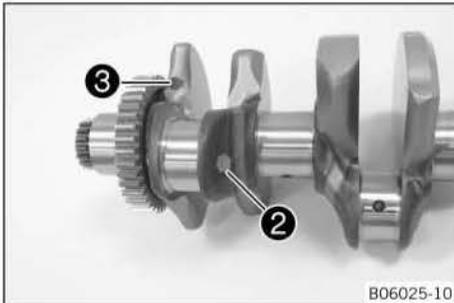
**Main work**

- Take off bearing cover and remove bearing shells ①.



**Info**

The conrod bearing cover and connecting rod are jointly marked. Make sure that each conrod bearing cover is mounted on the same connecting rod.



**New crankshaft**

- Select the new bearing shells according to color coding ②.



**Info**

Color coding ③ refers to the crankshaft bearing.



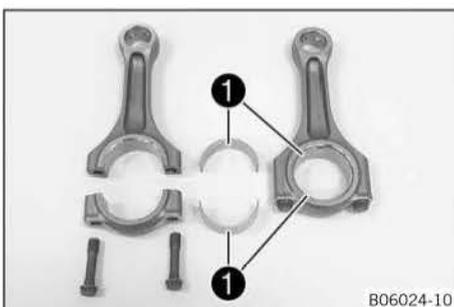
**Used crankshaft**

- Measure the crank pin diameter and select the new bearing shells accordingly.

Guideline

Crankshaft - crank pin diameter	
Blue	37.983 ... 37.993 mm (1.49539 ... 1.49578 in)
Red	37.993 ... 38.003 mm (1.49578 ... 1.49618 in)

- Check pivot points for damage and abrasion.
  - » If damage or abrasion is discernible:
    - Change the crankshaft.



- Mount new bearing shells ① on conrod bearing cover and connecting rod.



**Info**

The conrod bearing cover and connecting rod are jointly marked. Make sure that each conrod bearing cover is mounted on the same connecting rod.

**Finishing work**

- Check the radial clearance of lower conrod bearing. (p. 290)

## 19.4.11 Cylinder - Nikasil® coating

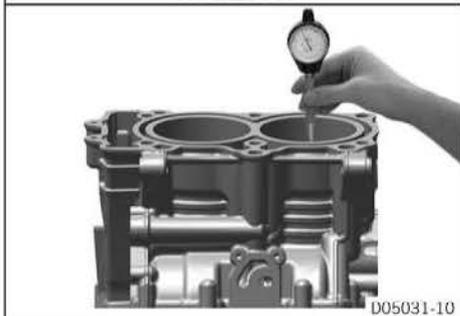
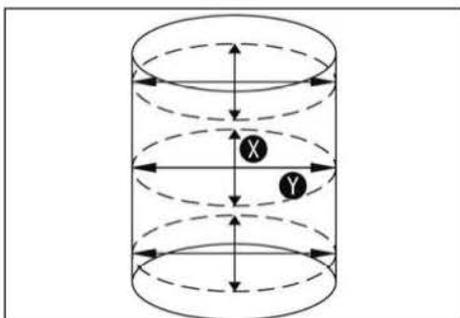


R03415-10

**Nikasil®** is a surface protection layer for a coating procedure developed by Mahle. The name is derived from the two materials used in this procedure - a layer of nickel into which is embedded the particularly hard silicone carbide.

The most important advantages of the **Nikasil®** coating are very good heat conductivity, resulting in much improved performance, low wear, and a lightweight cylinder.

## 19.4.12 Checking/measuring the cylinder

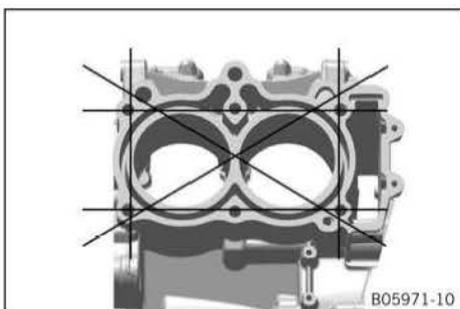


D05031-10

- Check the O-ring of the chain adjuster for damage and wear.
  - » If there is damage or wear:
    - Change the O-ring.
- Check the cylinder bearing surface for damage.
  - » If the cylinder bearing surface is damaged:
    - Change the cylinder and piston.
- Measure the bore diameter at several locations on the **X**- and **Y**-axes using a micrometer to identify oval wear.

Guideline

Cylinder - bore diameter	
Size	88.000 ... 88.012 mm (3.46456 ... 3.46503 in)



B05971-10

- Using a straightedge and the special tool, check the sealing surface of the cylinder head for distortion.

Feeler gauge (59029041100) (p. 471)

Cylinder/cylinder head - sealing area distortion	≤ 0.05 mm (≤ 0.002 in)
--------------------------------------------------	------------------------

- » If the measured value does not meet specifications:
  - Change engine case.

19.4.13 Checking/measuring the piston

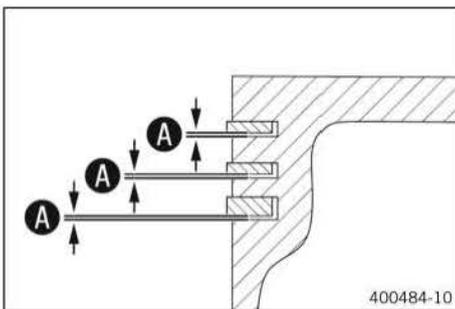


- Check the piston bearing surface for damage.
  - » If the piston bearing surface is damaged:
    - Replace the piston and, if necessary, the cylinder.
- Check that the piston rings move easily in the piston ring grooves.
  - » If the piston ring is stiff:
    - Clean the piston ring groove.

**i Tip**  
An old piston ring can be used to clean the piston ring groove.

- Check the piston rings for damage.
  - » If the piston ring is damaged:
    - Change the piston ring.

**i Info**  
Mount the piston ring with the marking facing upward.



- Use the special tool to measure clearance **A** of the piston rings in the piston ring groove.

Guideline

Piston ring - groove clearance	
First ring (rectangular ring)	≤ 0.08 mm (≤ 0.0031 in)
Second ring (lower compression ring)	≤ 0.08 mm (≤ 0.0031 in)
Oil scraper ring	≤ 0.06 mm (≤ 0.0024 in)

Feeler gauge (59029041100) (p. 471)

- » If clearance **A** is larger than the specified value:
  - Change the piston and piston rings.
  - Check/measure the cylinder. (p. 292)
- Check piston pin for discoloration, signs of wear or flaking of the coating.
  - » If the piston pin exhibits significant discoloration/signs of wear, or the coating is flaking:
    - Change the piston pin.
- Place the piston pin in the connecting rod and check the seating for play.
  - » If the piston pin seating has excessive play:
    - Change the connecting rod and piston pin.

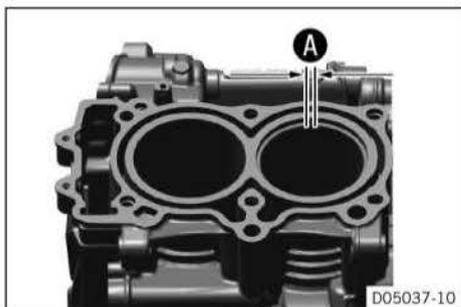


- Measure the piston at the piston skirt, at right angles to the piston pin, at a distance **B**.

Guideline

Piston - diameter	
Size	87.920 ... 87.980 mm (3.46141 ... 3.46377 in)
Distance <b>B</b>	6 mm (0.24 in)

## 19.4.14 Checking the piston ring end gap



- Remove the piston ring from the piston.
- Place the piston ring in the cylinder and align with the piston.

Guideline

Below the upper edge of the cylinder	10 mm (0.39 in)
--------------------------------------	-----------------

- Measure end gap **A** with a feeler gauge.

Guideline

Piston ring end gap	
Compression rings	≤ 0.80 mm (≤ 0.0315 in)
Oil scraper ring	≤ 1.00 mm (≤ 0.0394 in)

- » If the end gap is greater than the specified value:
  - Check/measure the cylinder. (p. 292)
- » If cylinder wear lies within the specified tolerance:
  - Change the piston ring.
- Mount the piston ring with the marking facing toward the piston head.

## 19.4.15 Determining the piston/cylinder mounting clearance

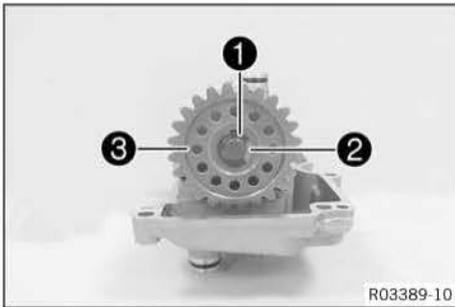


- Check/measure the cylinder. (p. 292)
- Check/measure the piston. (p. 293)
- The smallest piston/cylinder mounting clearance is the result of the smallest cylinder bore diameter minus the largest piston diameter. The largest piston/cylinder mounting clearance is the result of the largest cylinder bore diameter minus the smallest piston diameter.

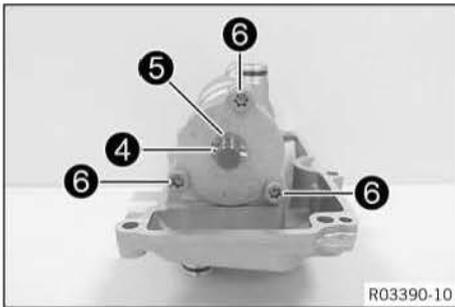
Guideline

Piston/cylinder - mounting clearance	
New condition	0.035 ... 0.070 mm (0.00138 ... 0.00276 in)
Wear limit	0.10 mm (0.0039 in)

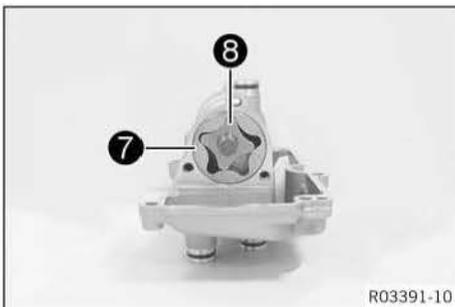
19.4.16 Removing the oil pumps



- Remove lock ring **1** and washer **2**.
- Take off oil pump gear wheel **3**.



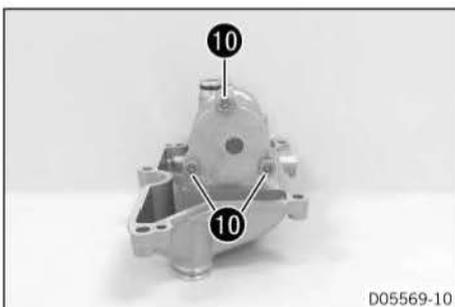
- Remove pin **4** and washer **5**.
- Remove screws **6**.
- Take off the oil pump cover.



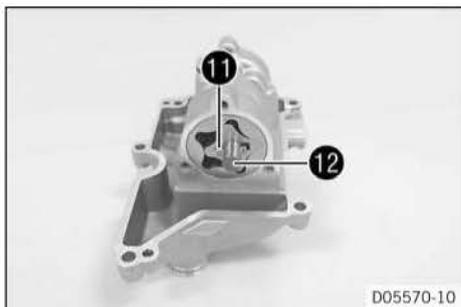
- Remove external rotor **7**.
- Remove internal rotor **8**.



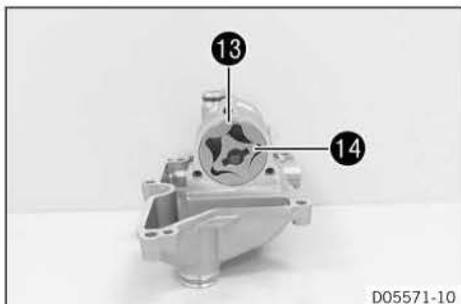
- Remove pin **9**.



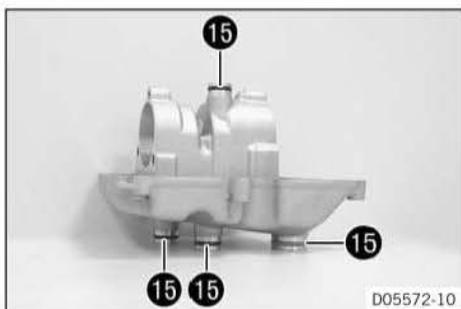
- Remove screws **10**.
- Take off the oil pump cover.



- Remove pin 11 and oil pump shaft 12.

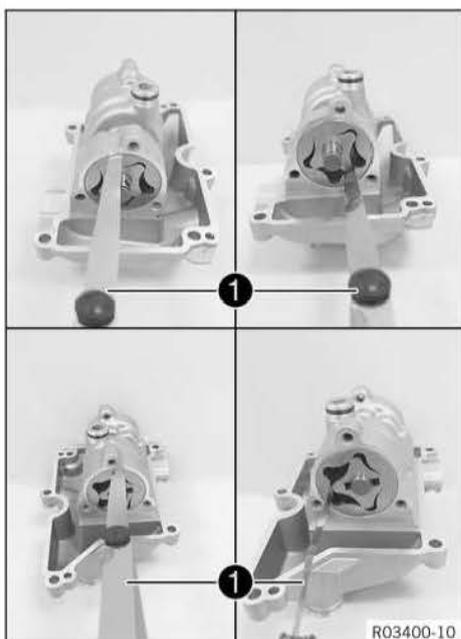


- Remove external rotor 13 and internal rotor 14.



- Remove O-rings 15.

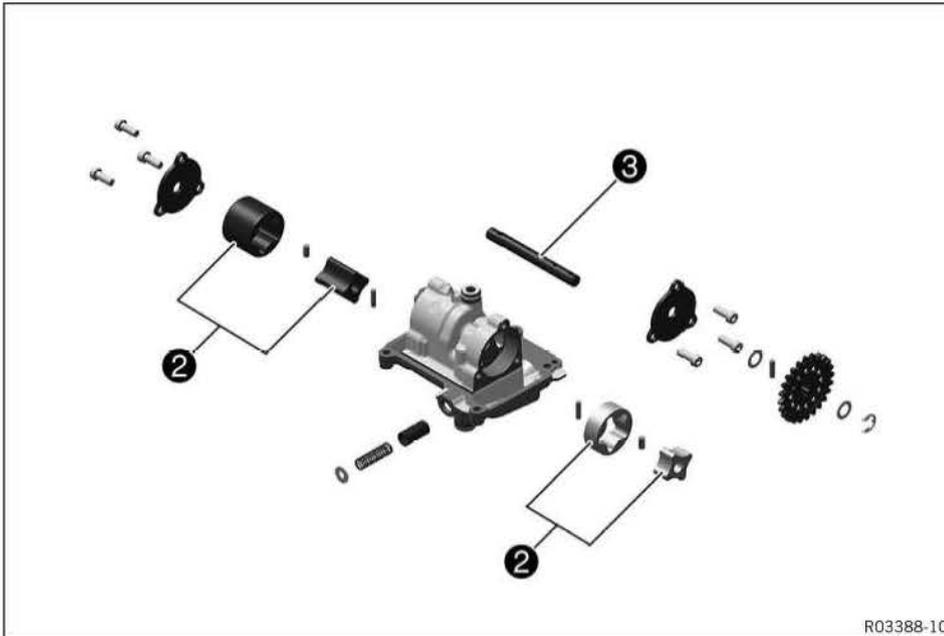
### 19.4.17 Checking the oil pumps for wear



- Use a feeler gauge 1 to measure the play between the external rotor and oil pump housing as well as between the external rotor and internal rotor.

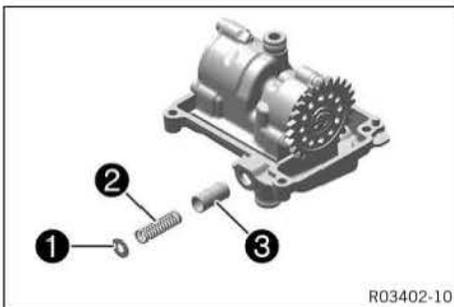
Oil pump	
Play between external rotor and oil pump housing	$\leq 0.15 \text{ mm}$ ( $\leq 0.0059 \text{ in}$ )
Clearance, external rotor/internal rotor	$\leq 0.20 \text{ mm}$ ( $\leq 0.0079 \text{ in}$ )
Axial play	$0.03 \dots 0.08 \text{ mm}$ ( $0.0012 \dots 0.0031 \text{ in}$ )

- » If the measured value does not meet specifications:
  - Change the oil pump and, if necessary, the oil pump housing.



- Check the internal rotor and external rotor of oil pumps ② for damage and wear.
  - » If there is damage or wear:
    - Change the oil pumps.
- Check oil pump shaft ③ for damage and wear.
  - » If there is damage or wear:
    - Change the oil pump shaft.
- Check both oil pump covers for damage and wear.
  - » If there is damage or wear:
    - Change the oil pump cover.

#### 19.4.18 Checking the oil pressure control valve

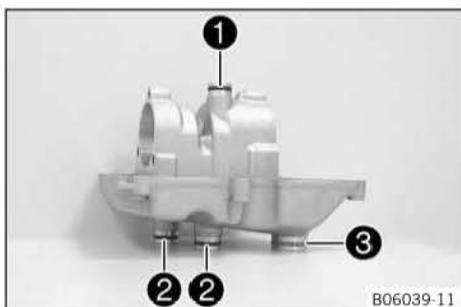


- Remove washer ①.
- Remove spring ②.
- Measure the length of spring ②.

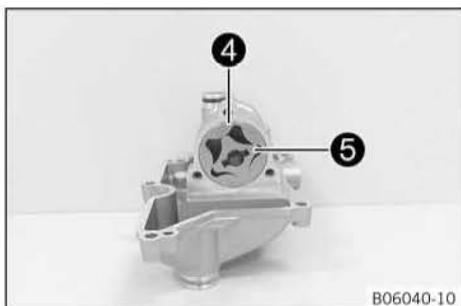
Oil pressure regulator valve - minimum length spring	40.0 mm (1.575 in)
---------------------------------------------------------	--------------------

- » If the measured length is less than the specified value:
  - Change the spring.
- Check control piston ③ for damage and wear.
  - » If there is damage or wear:
    - Change the control piston.
- Check the control piston for smooth operation in the oil pump housing.
  - » If the control piston is stiff:
    - Change the control piston or the oil pump housing.
- Thoroughly oil control piston ③ and spring ② and mount them.
- Mount washer ①.

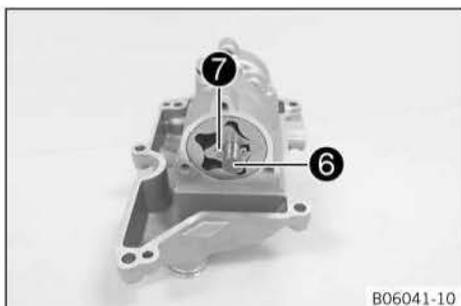
## 19.4.19 Installing the oil pumps



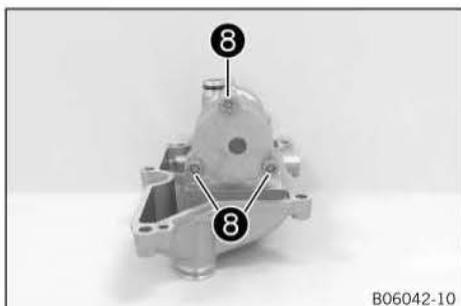
- Mount and grease the new O-rings 1, 2 and 3.



- Mount external rotor 4 and internal rotor 5.
- ✓ The rounded side of the external rotor must face the oil pump housing.
- Oil the parts.



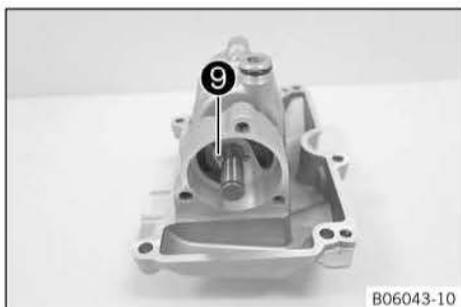
- Mount oil pump shaft 6 with pin 7.



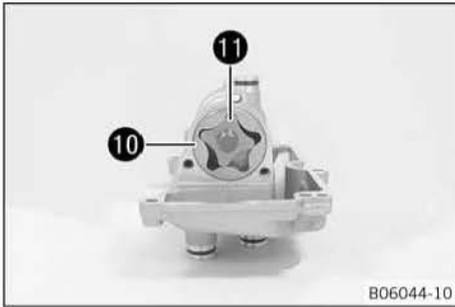
- Position the oil pump cover.
- Mount and tighten screws 8.

### Guideline

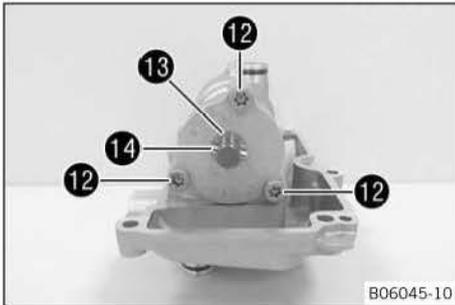
Screw, oil pump cover	M6	10 Nm (7.4 lbf ft) <b>Loctite®243™</b>
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- Mount pin 9.



- Mount external rotor **10** and internal rotor **11**.
- ✓ The rounded side of the external rotor must face the oil pump housing.
- Oil the parts.

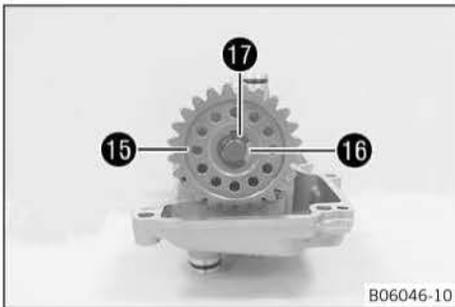


- Position the oil pump cover.
- Mount and tighten screws **12**.

Guideline

Screw, oil pump cover	M6	10 Nm (7.4 lbf ft) <b>Loctite®243™</b>
-----------------------	----	-------------------------------------------

- Mount washer **13**.
- Mount pin **14**.



- Mount oil pump gear wheel **15**.
- Mount washer **16** and lock ring **17**.

### 19.4.20 Preparing timing chain tensioner for installation



- Fully compress the timing chain tensioner.

**i Info**  
This requires considerable force since the oil has to be pressed out.

- Release the timing chain tensioner.
- ✓ Without pressure, the timing chain tensioner expands fully.



- Place two compensating disks or similar aids next to the piston of the timing chain tensioner. This should ensure that when pushed down, the piston does not fully withdraw.

Guideline

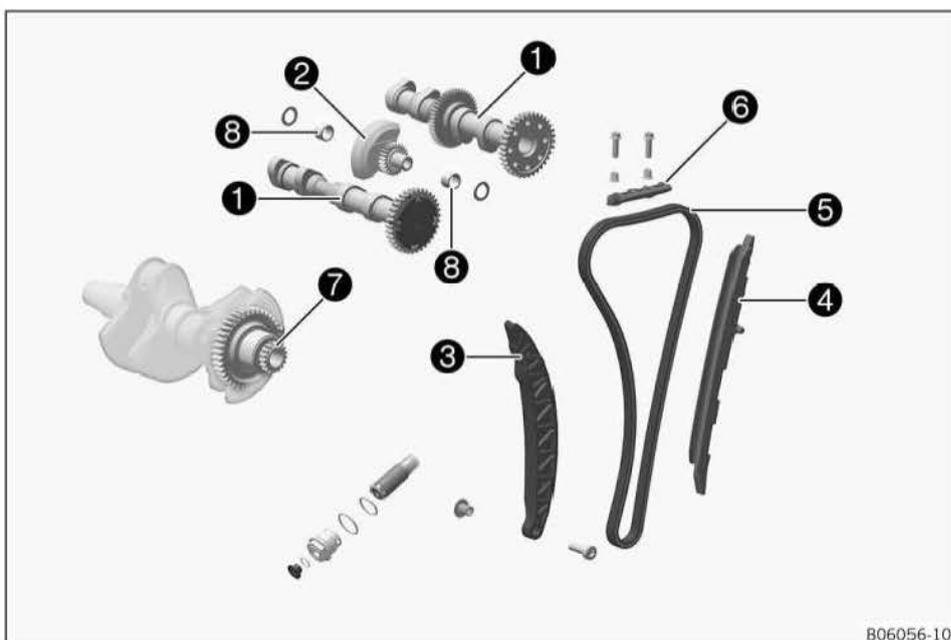
Thickness of the compensating disks	2 ... 2.5 mm (0.08 ... 0.098 in)
-------------------------------------	----------------------------------

- Release the timing chain tensioner.
- ✓ The latching system locks and the piston stops moving.

End position of piston after latching	3 mm (0.12 in)
---------------------------------------	----------------

**i Info**

This position is necessary for installation. If the timing chain tensioner is now pressed in once more (while it is installed) and then pulled out no more than halfway (preventing it from coming out fully), the latching system locks and the timing chain tensioner can no longer be compacted; this function is necessary to ensure sufficient tension of the timing chain, even at low oil pressure.

**19.4.21 Checking the timing assembly**

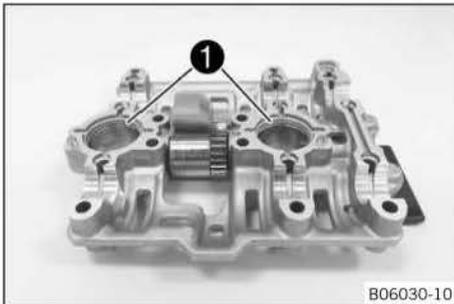
B06056-10

- Clean all parts well.
- Check camshafts **1** for damage and wear.
  - » If there is damage or wear:
    - Change the camshafts.
- Check balancer shaft **2** for damage and wear.
  - » If there is damage or wear:
    - Change the balancer shaft.
- Check timing chain tensioning rail **3** for damage and wear.
  - » If there is damage or wear:
    - Replace the timing chain tensioning rail.
- Check timing chain guide rail **4** for damage and wear.
  - » If there is damage or wear:
    - Replace the timing chain guide rail.
- Check timing chain **5** for damage and wear.
  - » If there is damage or wear:
    - Change the timing chain.
- Check the timing chain links for smooth operation. Let the timing chain hang down freely.
  - » The chain links no longer align in a straight line:
    - Change the timing chain.

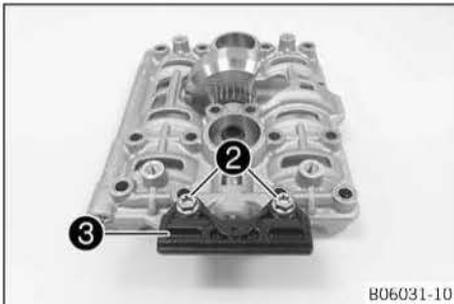
- Check slide rail **6** for damage and wear.
  - » If there is damage or wear:
    - Change slide rail.
- Check timing chain sprocket **7** for damage and wear.
  - » If there is damage or wear:
    - Change the crankshaft.
- Check balancer shaft bearing **8** for damage and wear.
  - » If there is damage or wear:
    - Change the balancer bearing.



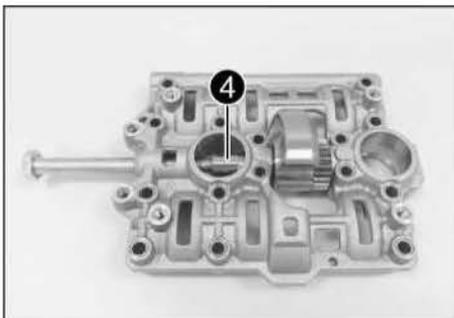
## 19.4.22 Working on the camshaft bearing bridge



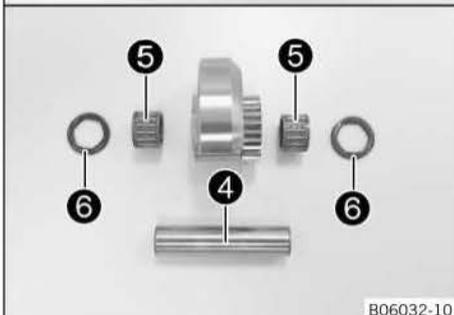
- Remove O-rings **1**.

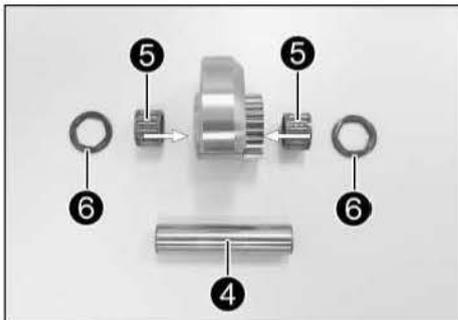


- Remove screws **2**.
- Take off slide rail **3**.

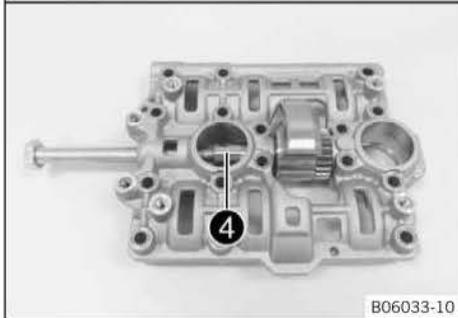


- Pull out spindle **4** of the balancer shaft with appropriate screw M10.
- Remove balancer shaft with needle bearings **5** and washers **6**.

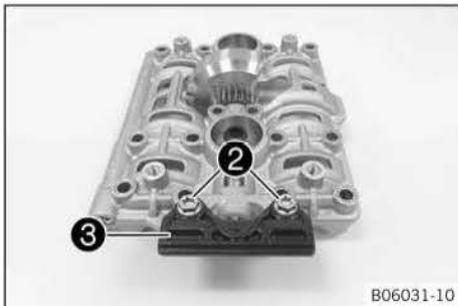




- Mount new needle bearings **5** in the balancer shaft and oil.
- Position balancer shaft with washers **6** in the camshaft bearing bridge.
- Mount spindle **4** of the balancer shaft in the center between the spark plug shafts.
- Remove screw M10.



B06033-10

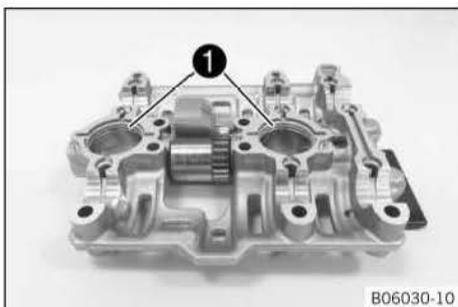


B06031-10

- Position slide rail **3**.
- Mount and tighten screws **2**.

Guideline

Screw, upper guide rail	M6x20	8 Nm (5.9 lbf ft) <b>Loctite®243™</b>
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B06030-10

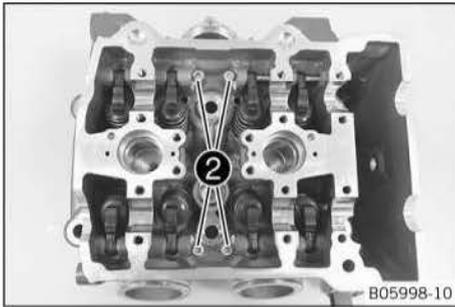
- Mount and grease the new O-rings **1**.

## 19.4.23 Working on the cylinder head

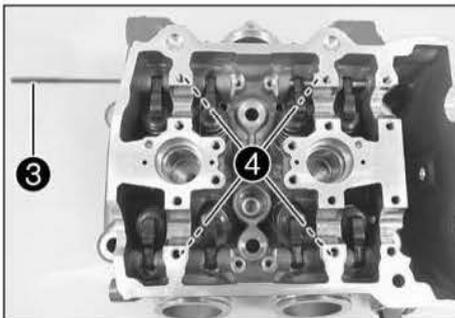


B05997-10

- Remove screw plugs **1** with the O-rings.



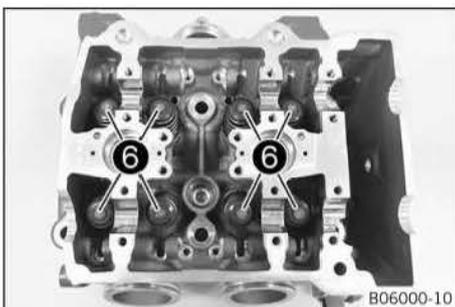
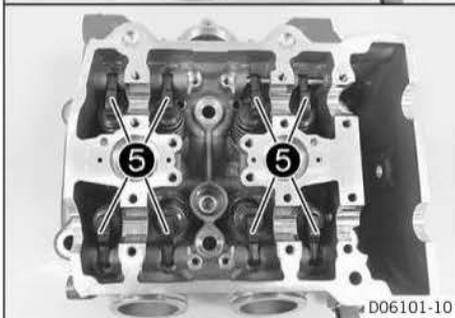
- Remove screws **2**.



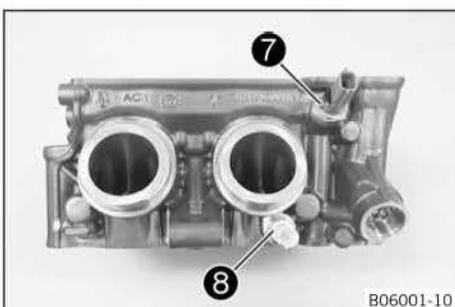
- Mount disassembly tool M4 e.g. a spoke **3**.

Spoke (26110071159)

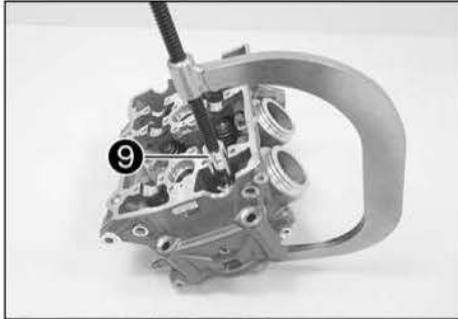
- Remove cam lever shafts **4**.
- Take off cam lever **5**.



- Remove shims **6** and label according to their normal built-in position.



- Remove oil pressure sensor **7** with O-ring.
- Remove coolant temperature sensor **8** with O-ring.

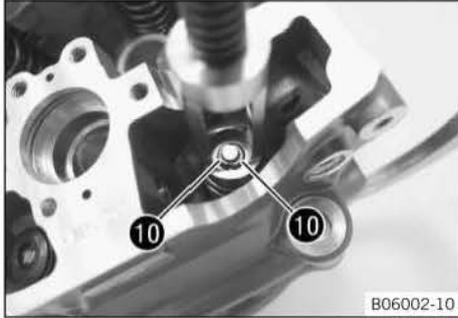


- Tension valve spring with special tool ⑨.

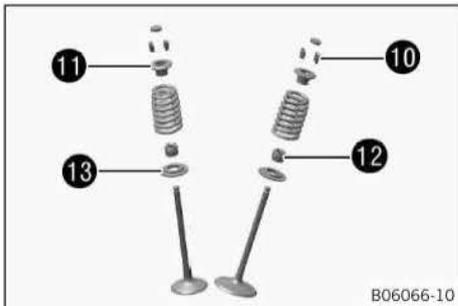
Valve spring mounter (59029019000) (📖 p. 471)
-----------------------------------------------

Insert for valve spring lever (63529060000) (📖 p. 476)
--------------------------------------------------------

- Remove valve keys ⑩ and release tension on the valve spring.



B06002-10

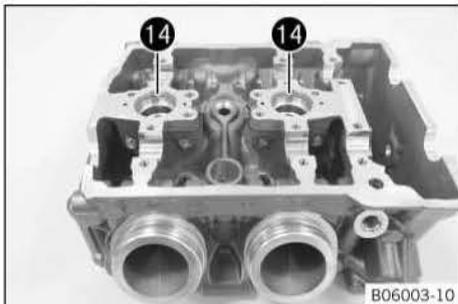


B06066-10

- Remove valve spring retainers ⑪, valve springs, valve stem seals ⑫ and valve spring seats ⑬.

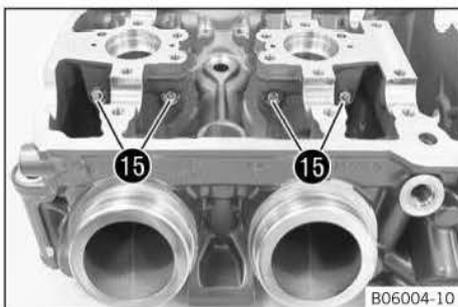
**i Info**

Place the valves in a box according to their normal built-in position and label them.



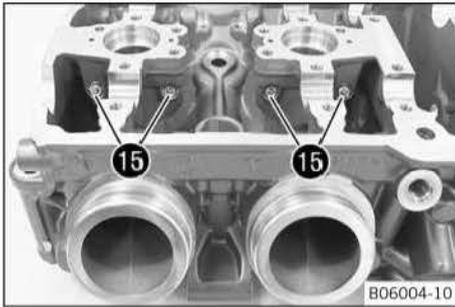
B06003-10

- Remove O-rings ⑭.



B06004-10

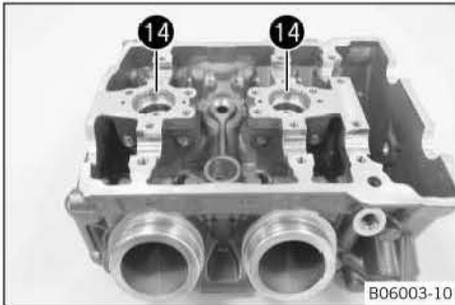
- Remove oil nozzles ⑮.
- Check the cylinder head. (📖 p. 307)



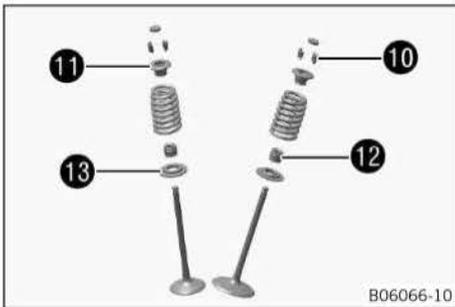
- Mount oil nozzles **15**.

Guideline

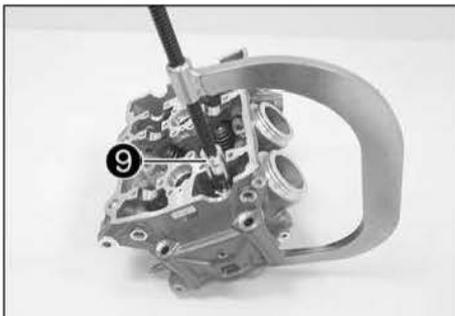
Oil nozzle in cylinder head	M5	2 Nm (1.5 lbf ft) <b>Loctite®243™</b>
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- Mount and grease O-rings **14**.



- Mount valve spring seats **13** and new valve stem seals **12**.
- Mount valve spring retainers **11** and valve springs.



- Tension valve spring with special tool **9**.

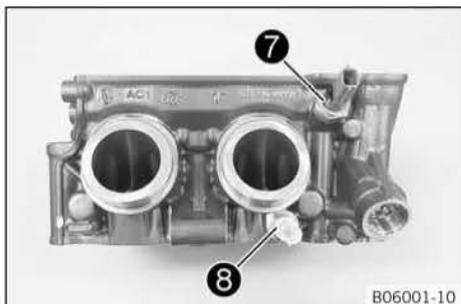
Valve spring mounter (59029019000) (🔧 p. 471)
Insert for valve spring lever (63529060000) (🔧 p. 476)

- Mount valve keys **10**. Release the tension on the valve spring.



**Info**

When mounting the valve keys, check that they are seated correctly; preferably, fix the valve keys to the valve with a little grease.



- Mount coolant temperature sensor **8** with new O-ring.

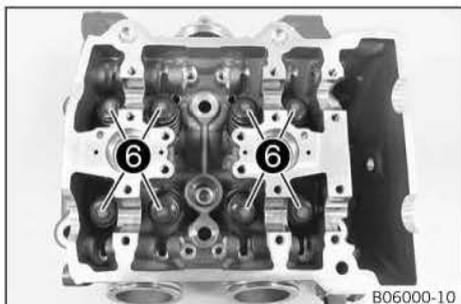
Guideline

Coolant temperature sensor	M10x1.25	10 Nm (7.4 lbf ft)
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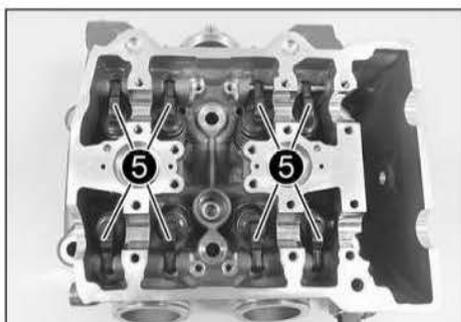
- Mount oil pressure sensor **7** with new O-ring.

Guideline

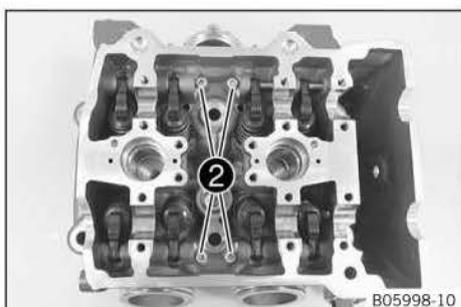
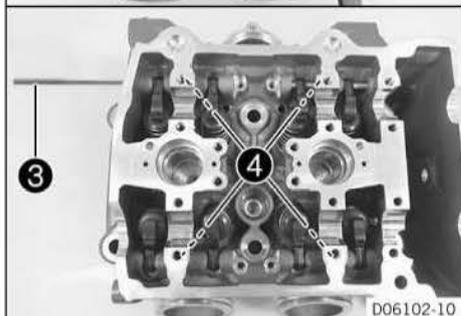
Oil pressure sensor	M10x1	10 Nm (7.4 lbf ft)
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- Place shims **6** into the valve spring retainer according to their normal built-in position.



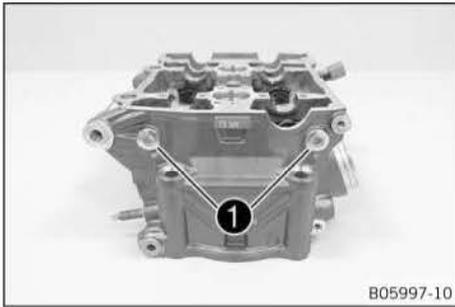
- Position cam levers **5**.
- Mount cam lever shafts **4**.
- Remove disassembly tool **3**.



- Mount and tighten screws **2**.

Guideline

Screw, cam lever axial lock	M5	6 Nm (4.4 lbf ft) <b>Loctite®243™</b>
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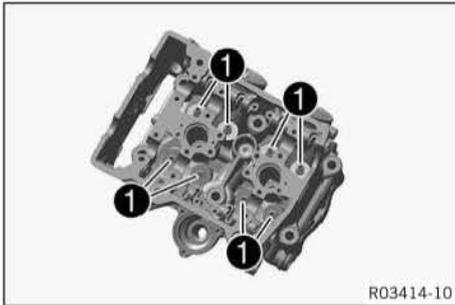
B05997-10

- Mount screw plugs **1** with new O-rings.

Guideline

Screw plug, cam lever axis	M10x1	10 Nm (7.4 lbf ft)
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19.4.24 Checking the cylinder head



R03414-10

- Check valve guides **1** using the special tool.

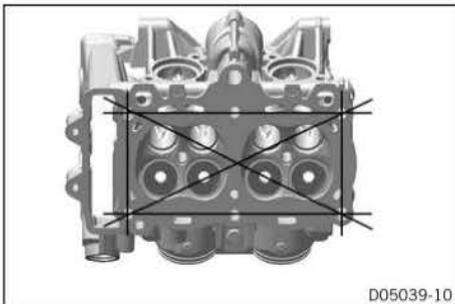
Limit plug gauge (77029026000) (p. 479)
-----------------------------------------

- » If the special tool is easy to insert into the valve guide:
  - Change the valve guide and valve.

- Check the sealing area of the spark plug thread and the valve seats for damage and tearing.

- » If there is damage or cracking:
  - Change the cylinder head.

- Check the sealing area of the cylinder for distortion using a straight edge and the special tool.

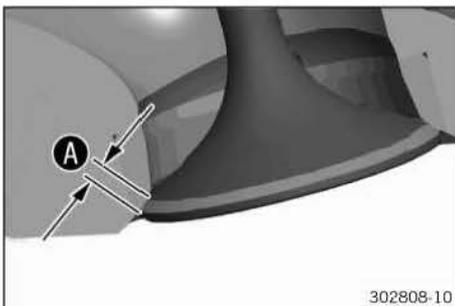


D05039-10

Feeler gauge (59029041100) (p. 471)
-------------------------------------

Cylinder/cylinder head - sealing area distortion	≤ 0.05 mm (≤ 0.002 in)
--------------------------------------------------	------------------------

- » If the measured value does not meet specifications:
  - Change the cylinder head.



302808-10

- Check sealing seat **A** of the valves.

Valve - sealing seat width	
Intake	2.80 mm (0.1102 in)

Valve - sealing seat width	
Exhaust	3.00 mm (0.1181 in)

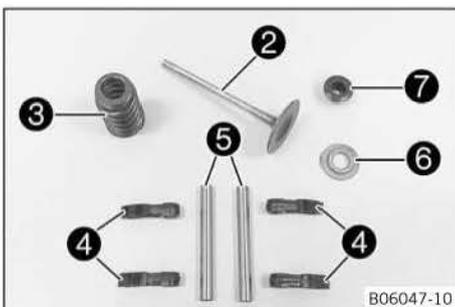
- » If the measured value does not meet specifications:
  - Machine the valve seat.

- Blow compressed air through all oil channels and oil nozzles, and check that they are clear.

- Check valve **2** for damage and wear.

- » If there is damage or wear:
  - Change the valve.

- Check the valve for run-out.



B06047-10

Valve - run-out	
On the valve plate	≤ 0.05 mm (≤ 0.002 in)
On the valve stem	≤ 0.05 mm (≤ 0.002 in)

- » If the measured value does not meet specifications:
  - Change the valve.

- Check the valve stem diameter.

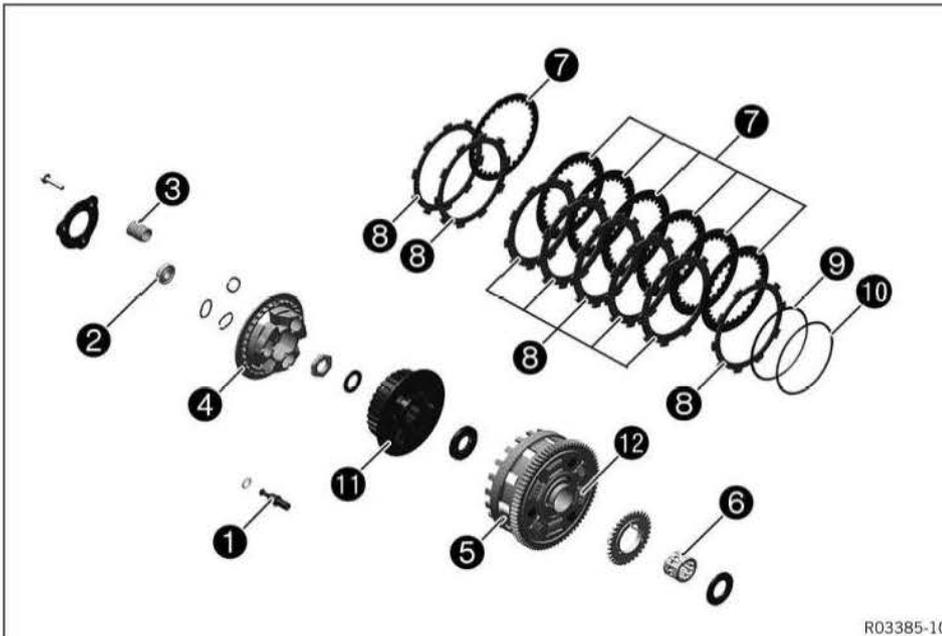
Valve - valve stem diameter	
Exhaust	4.95 ... 4.97 mm (0.1949 ... 0.1957 in)
Intake	4.97 ... 4.99 mm (0.1957 ... 0.1965 in)

- » If the measured value does not meet specifications:
  - Change the valve.
- Check valve spring **3** for damage and wear.
  - » If there is damage or wear:
    - Change the valve spring.
- Measure the length of the valve springs.

Valve spring	
Minimum length (without valve spring seat)	44.0 mm (1.732 in)

- » If the measured value does not meet specifications:
  - Change the valve springs.
- Check cam levers **4** for damage and wear.
  - » If there is damage or wear:
    - Change the cam lever.
- Check cam lever shafts **5** for damage and wear.
  - » If there is damage or wear:
    - Change the cam lever shaft.
- Check valve spring seat **6** for damage and wear.
  - » If there is damage or wear:
    - Change the valve spring seat.
- Check valve spring retainer **7** for damage and wear.
  - » If there is damage or wear:
    - Change the valve spring retainer.

## 19.4.25 Checking the clutch



R03385-10

- Check clutch push rod **1** for damage and wear.
  - » If there is damage or wear:
    - Change clutch push rod.
- Check axial bearing **2** for damage and wear.
  - » If there is damage or wear:
    - Change the axial bearing.
- Check the length of clutch springs **3**.

Clutch spring - length	$\geq 43.0$ mm ( $\geq 1.693$ in)
------------------------	-----------------------------------

- » If the clutch spring length is shorter than specified:
      - Change all clutch springs.
- Check the contact surface of clutch pressure cap **4** for damage and wear.
  - » If there is damage or wear:
    - Change the clutch pressure cap.
- Check the thrust surfaces of the clutch facing discs in clutch basket **5** for wear.

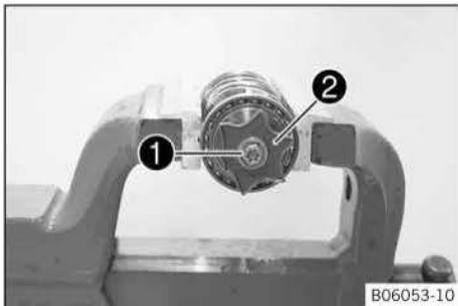
Clutch basket - contact surface of clutch facing discs	$\leq 0.5$ mm ( $\leq 0.02$ in)
--------------------------------------------------------	---------------------------------

- » If the thrust surface exhibits excessive wear:
        - Change the clutch disc pack and the clutch basket.
- Check needle bearing **6** for damage and wear.
  - » If there is damage or wear:
    - Change the needle bearing.
- Check intermediate clutch discs **7** for damage and wear.
  - » If the intermediate clutch discs are not level and are pitted:
    - Change the clutch disc pack.
- Check clutch facing discs **8** for discoloration and scoring.
  - » If there is discoloration or scoring:
    - Change the clutch disc pack.
- Check the thickness of the clutch disc pack.

Clutch disc pack - thickness	
New condition	35.60 ... 36.50 mm (1.4016 ... 1.437 in)
Wear limit	34.80 mm (1.3701 in)

- » If the clutch disc pack does not meet specifications:
  - Change the clutch disc pack.
- Check pretension ring **9** and support ring **10** for damage and wear.
  - » If there is damage or wear:
    - Change the pretension ring and support ring.
- Check inner clutch hub **11** for damage and wear.
  - » If there is damage or wear:
    - Change the inner clutch hub.
- Check springs **12** of the clutch basket for damage and wear.
  - » If there is damage, wear or play in the direction of rotation:
    - Change the clutch basket.

## 19.4.26 Removing the shift drum locating unit

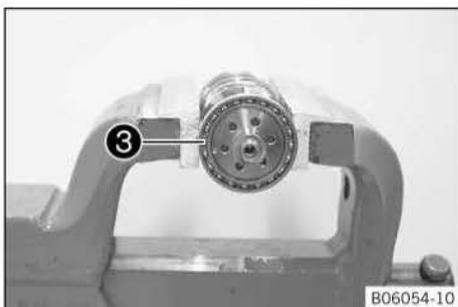


- Clamp shift drum.

Guideline

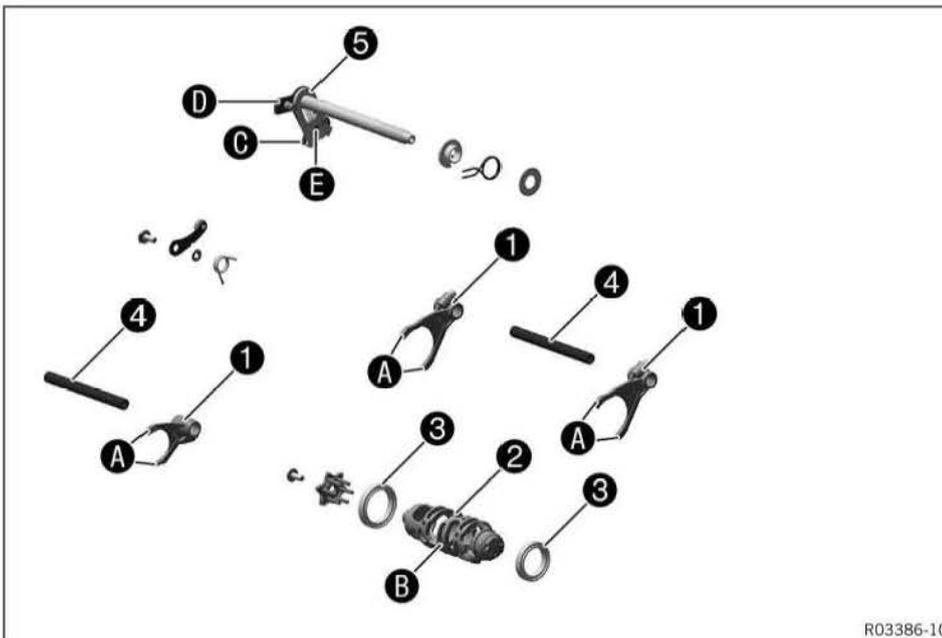
Use soft jaws.

- Remove screw **1**.
- Take off the shift drum locating unit **2**.



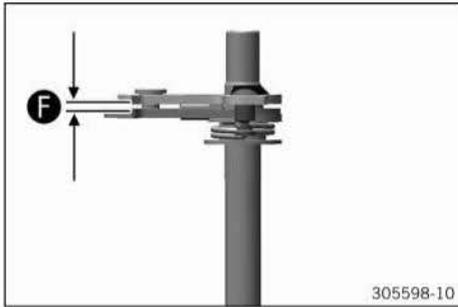
- Remove bearing **3**.

## 19.4.27 Checking the shift mechanism



R03386-10

- Check shift forks **1** on plate **A** for damage and wear (visual check).
  - » If there is damage or wear:
    - Change the shift fork and gear wheel pair.
- Check shift grooves **B** of shift drum **2** for wear.
  - » If the shift groove is worn:
    - Change the shift drum.
- Check the seat of the shift drum in bearings **3**.
  - » If the shift drum is not seated correctly:
    - Change the shift drum and/or the bearing.
- Check bearings **3** for ease of movement and wear.
  - » If the bearings are stiff or are worn:
    - Change the bearings.
- Check shift rails **4** on a flat surface for run-out.
  - » If there is run-out:
    - Change the shift rail.
- Check the shift rails for scoring, wear and smooth operation in the shift forks.
  - » If there is scoring or corrosion, or if the shift fork is stiff:
    - Change the shift rail.
- Check sliding plate **5** in contact areas **C** for wear.
  - » If the sliding plate is worn:
    - Change the sliding plate.
- Check return surface **D** on the sliding plate for wear.
  - » If deep notches are present:
    - Change the sliding plate.
- Check guide pin **E** for looseness and wear.
  - » If the guide pin is loose and/or worn:
    - Change the sliding plate.
- Preassemble the shift shaft. (📖 p. 312)

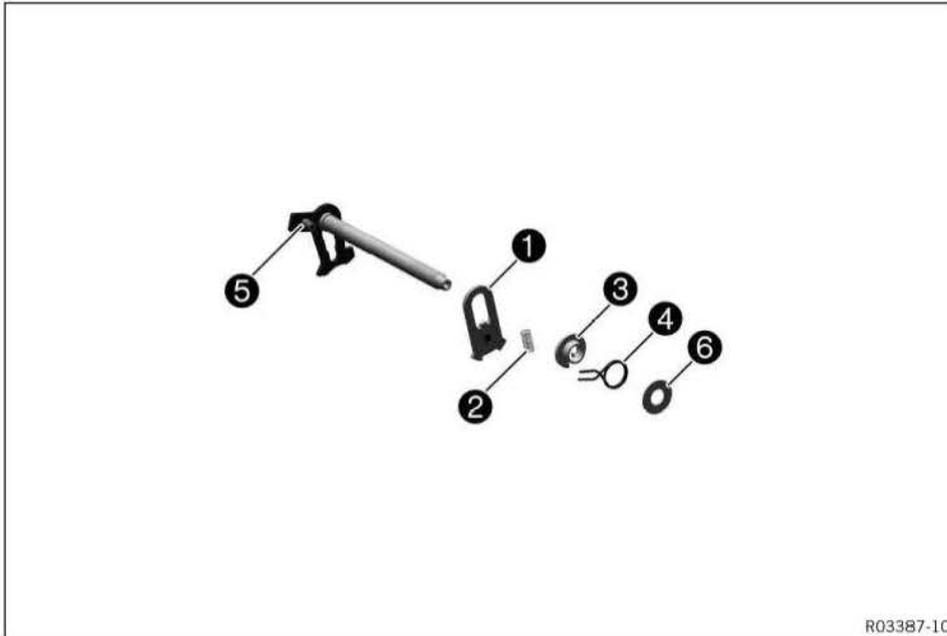


- Check clearance **F** between the sliding plate and the shift quadrant.

Shift shaft - play in sliding plate/shift quadrant	0.40 ... 0.80 mm (0.0157 ... 0.0315 in)
----------------------------------------------------	-----------------------------------------

- » If the measured value does not meet specifications:
  - Change the sliding plate.

## 19.4.28 Preassembling the shift shaft



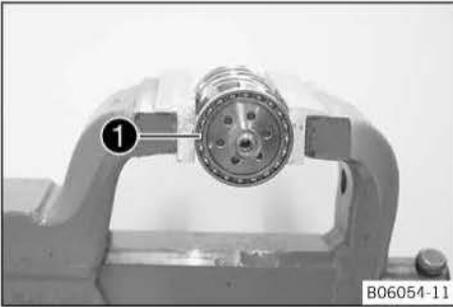
- Fix the short end of the shift shaft in a vise.

Guideline

Use soft jaws.

- Mount sliding plate **1** with the guide pin facing down and attach the guide pin to the shift quadrant.
- Mount pressure spring **2**.
- Push on spring guide **3**, push return spring **4** over the spring guide with the offset end facing upward and lift the offset end over abutment bolt **5**.
- Mount stop disk **6**.

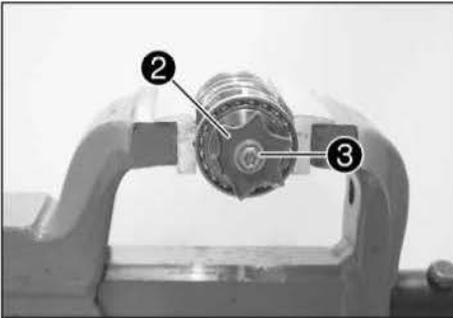
19.4.29 Installing the shift drum locating unit



- Clamp shift drum.
- Guideline

Use soft jaws.
----------------

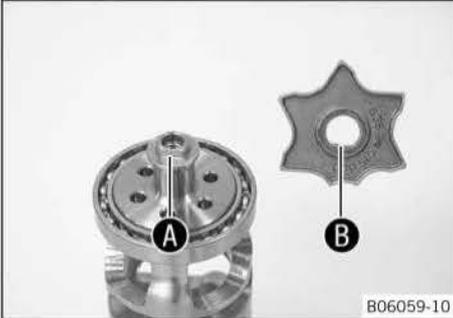
- Mount bearing 1.



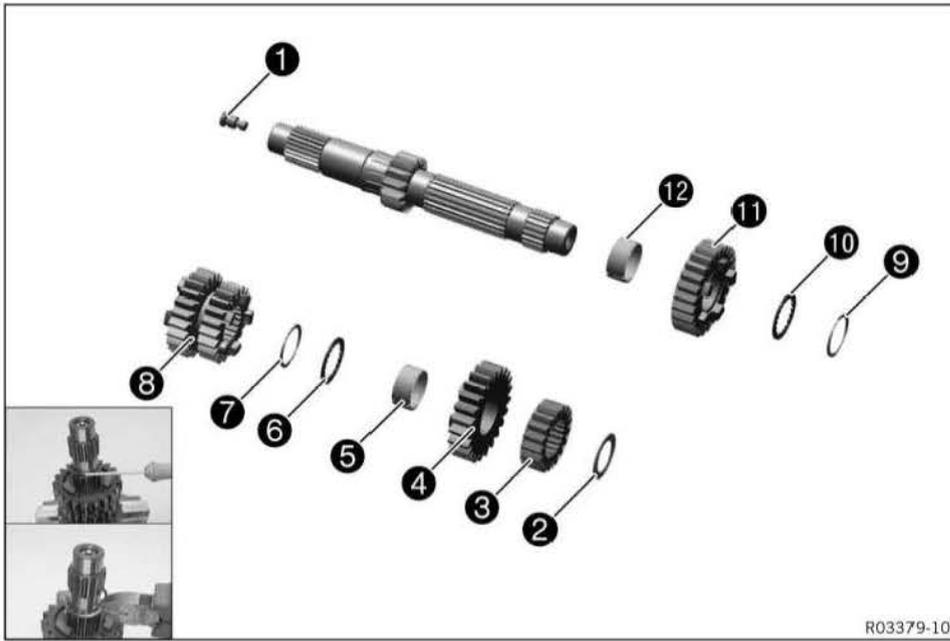
- Position shift drum locating unit 2.
- ✓ The flat surface A of the shift drum engages in the flat surface B of the shift drum locating unit.
- Mount and tighten screw 3.

Guideline

Screw, shift drum locating	M6	10 Nm (7.4 lbf ft) <b>Loctite®243™</b>
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## 19.4.30 Disassembling the main shaft



R03379-10

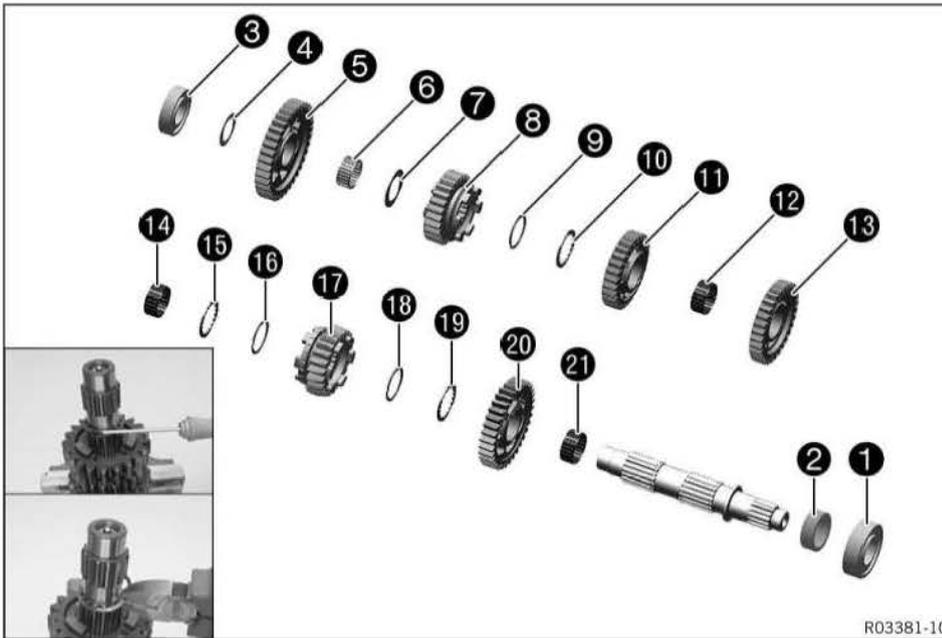
- Remove oil nozzle **1**.
- Secure the main shaft in the vise with the gear teeth facing downward.

### Guideline

Use soft jaws.

- Remove stop disk **2** and second-gear fixed gear **3**.
- Remove sixth-gear idler gear **4**.
- Remove needle bearing **5** and stop disk **6**.
- Remove lock ring **7**.
- Remove third/fourth-gear sliding gear **8**.
- Remove lock ring **9**.
- Remove stop disk **10** and fifth-gear idler gear **11**.
- Remove needle bearing **12**.

## 19.4.31 Disassembling the countershaft



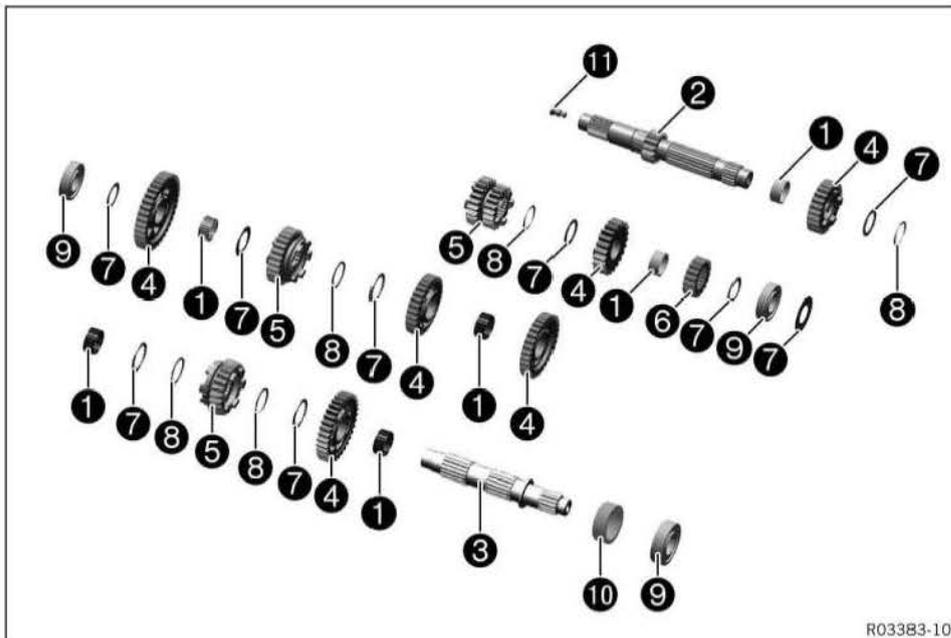
- Remove bearing **1** with distance sleeve **2**.
- Secure the countershaft in the bench vise with the toothed end facing downward.

## Guideline

Use soft jaws.

- Remove bearing **3**.
- Remove stop disk **4** and first-gear idler gear **5**.
- Remove needle bearing **6** and stop disk **7**.
- Remove the fifth-gear sliding gear **8** and lock ring **9**.
- Remove stop disk **10** and fourth-gear idler gear **11**.
- Remove needle bearing **12** and third-gear idler gear **13**.
- Remove needle bearing **14** and stop disk **15**.
- Remove lock ring **16** and sixth-gear sliding gear **17**.
- Remove lock ring **18** and stop disk **19**.
- Remove second-gear idler gear **20** and needle bearing **21**.

## 19.4.32 Checking the transmission



R03383-10

- Check needle bearings **1** for damage and wear.
  - » If there is damage or wear:
    - Change the needle bearing.
- Check the pivot points of main shaft **2** and countershaft **3** for damage and wear.
  - » If there is damage or wear:
    - Change the main shaft and/or countershaft.
- Check the tooth profiles of main shaft **2** and countershaft **3** for damage and wear.
  - » If there is damage or wear:
    - Change the main shaft and/or countershaft.
- Check the pivot points of idler gears **4** for damage and wear.
  - » If there is damage or wear:
    - Change the gear wheel pair.
- Check the shift dogs of idler gears **4** and sliding gears **5** for damage and wear.
  - » If there is damage or wear:
    - Change the gear wheel pair.
- Check the tooth faces of idler gears **4**, sliding gears **5**, and fixed gear **6** for damage and wear.
  - » If there is damage or wear:
    - Change the gear wheel pair.
- Check the tooth profiles of sliding gears **5** for damage and wear.
  - » If there is damage or wear:
    - Change the gear wheel pair.
- Check sliding gear **5** for smooth operation in the profile of main shaft **2**.
  - » If the fixed gear is stiff:
    - Change the sliding gear or the main shaft.
- Check sliding gears **5** for smooth operation in the profile of countershaft **3**.
  - » If the fixed gear is stiff:
    - Change the sliding gear or the countershaft.
- Check stop disks **7** for damage and wear.

- » If there is damage or wear:
  - Change the stop disks.
- Use new lock rings **8** with every repair.
- Check bearings **9** for damage and wear.
  - » If there is damage or wear:
    - Change the bearings.
- Check distance sleeve **10** for damage and wear.
  - » If there is damage or wear:
    - Change distance sleeve.
- Check oil nozzle **11** to ensure that they are free.
  - » If the oil nozzle is blocked:
    - Clean the oil nozzle and change as necessary.



**19.4.33 Assembling the main shaft**

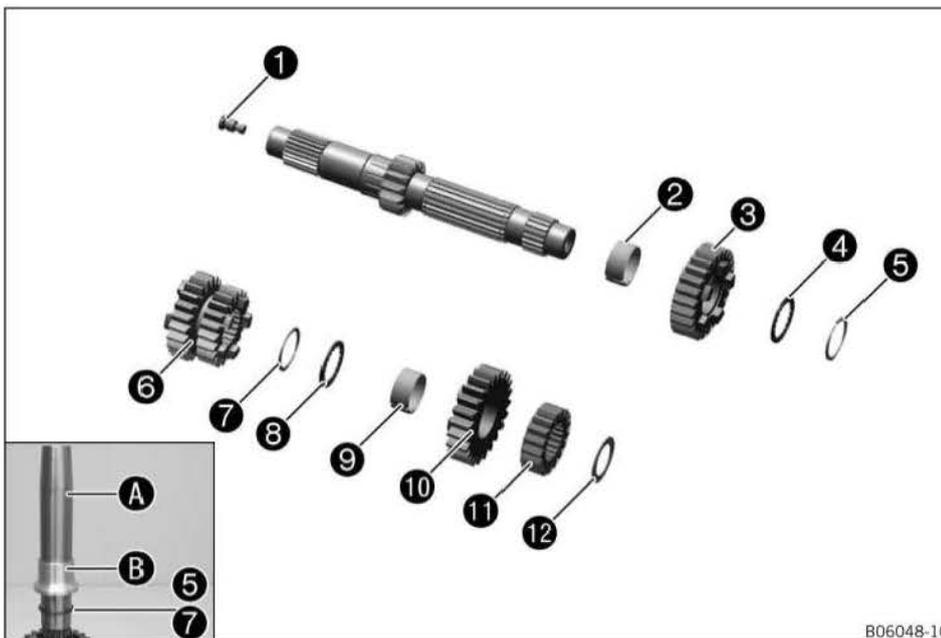


**Info**

Use new lock rings with every repair.

**Preparatory work**

- Carefully lubricate all parts before assembling.
- Check the transmission. (📖 p. 316)



**Main work**

- Mount and tighten oil nozzle **1**.

Guideline

Oil nozzle for clutch lubrication	M8	5 Nm (3.7 lbf ft)	Loctite®243™
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**Info**

Ensure that there is no thread locker in the hole.

- Secure the main shaft in the vise with the gear teeth facing downward.

Guideline

Use soft jaws.

- Mount needle bearing ②, and mount fifth-gear idler gear ③ with the shift dogs facing up.
- Mount stop disk ④.
- Position special tool A on the transmission shaft.

Mounting tool for lock ring (76629032000) (📖 p. 478)

- Position new lock ring ⑤ on special tool A and push down with sleeve B.
- ✓ The lock ring engages in the groove of the transmission shaft.
- Attach third/fourth-gear sliding gear ⑥ with the small gear wheel facing up.
- Position special tool A on the transmission shaft.

Mounting tool for lock ring (76629032000) (📖 p. 478)

- Position new lock ring ⑦ on special tool A and push down with sleeve B.
- ✓ The lock ring engages in the groove of the transmission shaft.
- Mount stop disk ⑧ and needle bearing ⑨.
- Mount sixth-gear idler gear ⑩ with the shift dogs facing downward.
- Mount second-gear fixed gear ⑪ with the collar facing downward and mount stop disk ⑫.
- Finally, check all the gear wheels for smooth operation.

## 19.4.34 Assembling the countershaft

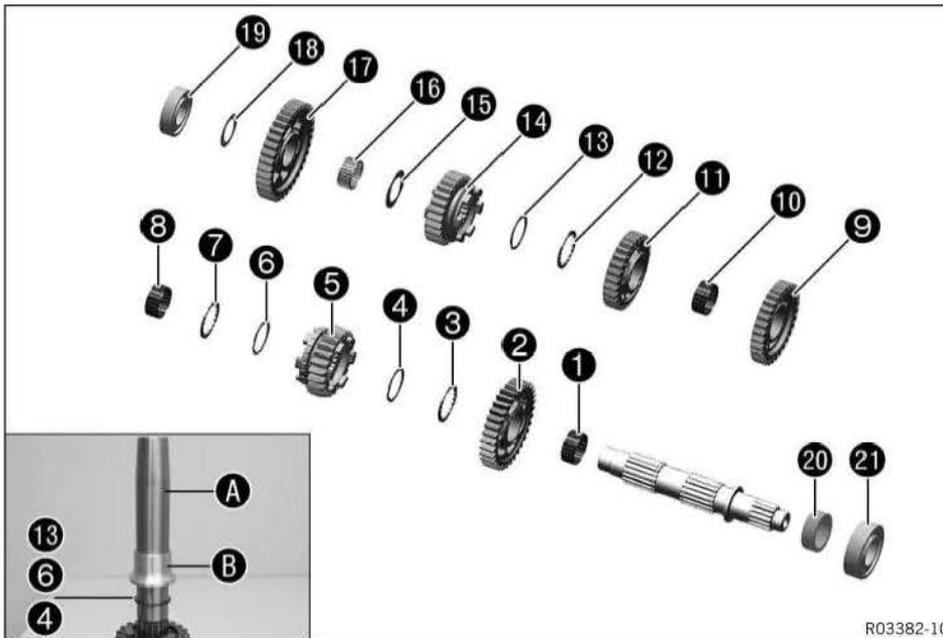


**Info**

Use new lock rings with every repair.

**Preparatory work**

- Carefully lubricate all parts before assembling.
- Check the transmission. (📖 p. 316)



R03382-10

**Main work**

- Secure the countershaft in the bench vise with the toothed end facing downward.

## Guideline

Use soft jaws.

- Mount needle bearing **1** and second-gear idler gear **2** onto the countershaft with the protruding collar facing downward.
- Mount stop disk **3**.
- Position special tool **A** on the transmission shaft.

Mounting tool for lock ring (63529032000) (图 p. 475)

- Position new lock ring **4** on special tool **A** and push down with sleeve **B**.  
✓ The lock ring engages in the groove of the transmission shaft.
- Mount the sixth-gear sliding gear **5** with the shift groove facing up.
- Position special tool **A** on the transmission shaft.

Mounting tool for lock ring (63529032000) (图 p. 475)

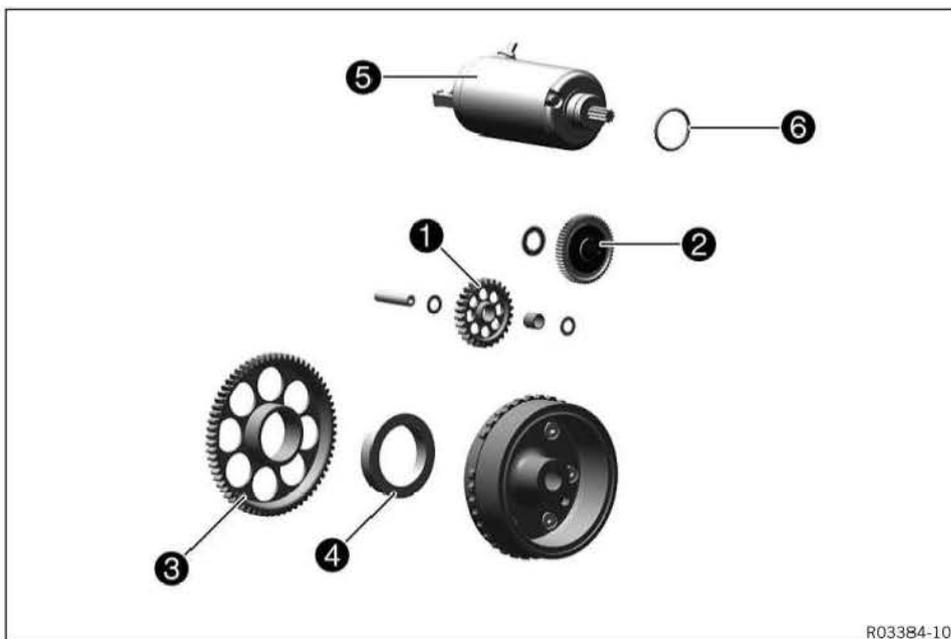
- Position new lock ring **6** on special tool **A** and push down with sleeve **B**.  
✓ The lock ring engages in the groove of the transmission shaft.
- Mount stop disk **7**.
- Mount needle bearing **8** and the third-gear idler gear **9** with the collar facing up.
- Mount needle bearing **10** and the fourth-gear idler gear **11** with the collar facing down.
- Mount stop disk **12**.
- Position special tool **A** on the transmission shaft.

Mounting tool for lock ring (63529032000) (图 p. 475)

- Position new lock ring **13** on special tool **A** and push down with sleeve **B**.  
✓ The lock ring engages in the groove of the transmission shaft.
- Mount the fifth-gear sliding gear **14** with the shift groove facing down and stop disk **15**.
- Mount needle bearing **16** and first-gear idler gear **17** with the recess facing down, and stop disk **18**.
- Mount bearing **19**.

- Take the countershaft out of the vise.
- Mount distance sleeve 20 with bearing 21.
- Finally, check all the gear wheels for smooth operation.

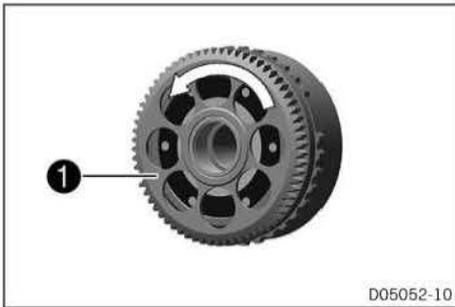
## 19.4.35 Checking the electric starter drive



R03384-10

- Check the gear mesh and bearing of starter idler gear 1 for damage and wear.
  - » If there is damage or wear:
    - Change the starter idler gear.
- Check the gear teeth and bearing of torque limiter 2 for damage and wear.
  - » If there is damage or wear:
    - Change the torque limiter.
- Check the gear mesh and bearing of freewheel gear 3 for damage and wear.
  - » If there is damage or wear:
    - Change the freewheel gear or bearing.
- Check freewheel 4 for damage and wear.
  - » If there is damage or wear:
    - Change the freewheel.
- Check the gear teeth of the starter motor 5 for damage and wear.
  - » If there is damage or wear:
    - Change the starter motor.
- Change O-ring 6 of the starter motor.
- Connect the negative cable of a 12-volt power supply to the housing of the starter motor. Connect the positive cable of the power supply briefly with the connector of the starter motor.
  - » If the starter motor does not turn when the circuit is closed:
    - Change the starter motor.

## 19.4.36 Checking the freewheel

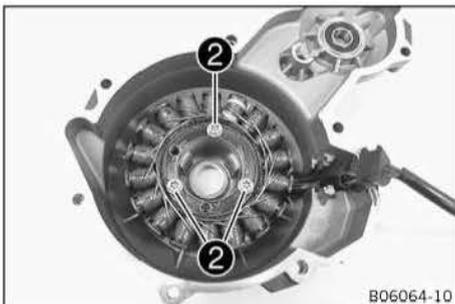


- Insert freewheel gear **1** into the freewheel hub while turning the freewheel gear counterclockwise; do not wedge it.
- Check the locking action of freewheel gear **1**.
  - » The freewheel gear cannot be turned counterclockwise and does not block clockwise:
    - Change the freewheel.

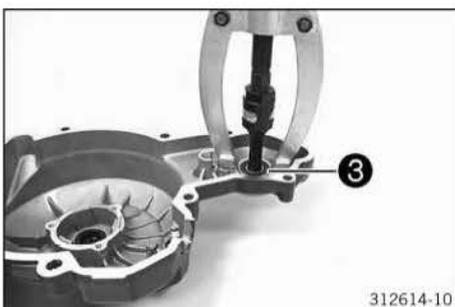
## 19.4.37 Working on the alternator cover



- Remove the cable retainer **1**.
- Pull the rubber grommet out of the engine case.



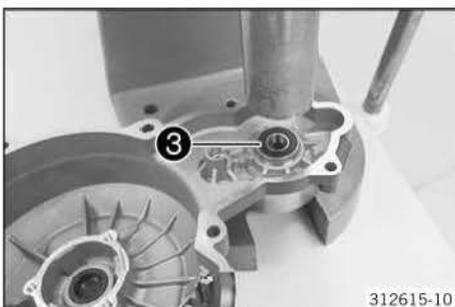
- Remove screws **2**.
- Remove the stator.



- Remove bearing **3** using the special tool.

Bearing puller (15112017000) (p. 469)
---------------------------------------

Internal bearing puller (15112018000) (p. 470)
------------------------------------------------

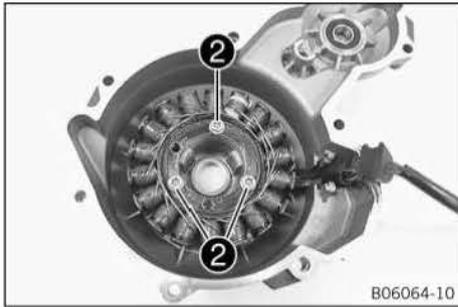


- Press in new bearing **3** all the way using a suitable tool.



### Info

Provide suitable support for the alternator cover while pressing in.



- Position the stator.
- Mount and tighten screws **2**.

Guideline

Screw, stator	M6	10 Nm (7.4 lbf ft) <b>Loctite®243™</b>
---------------	----	-------------------------------------------



- Apply sealing compound lightly in the area of the rubber grommet.

**Loctite® 5910**

- Position the rubber grommet in the alternator cover.
- Position the cable retainer **1**.
- ✓ The retaining bracket engages in the attachment **A**.

## 19.5 Engine assembly

### 19.5.1 Installing the piston

#### **i** Info

The operations are the same for both pistons.

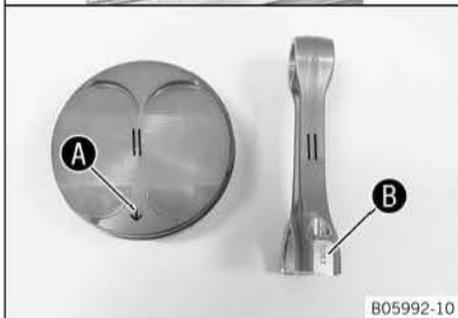


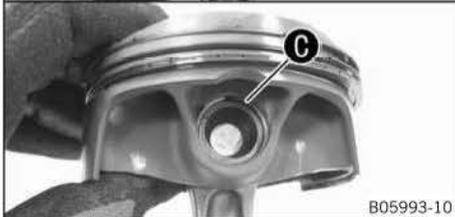
- Clamp connecting rod in the vise.

Guideline

Use soft jaws.

- Position piston on the associated connecting rod.
- Mount piston pin **1**.
- ✓ The piston marking **A** and lettering **B** of the connecting rod point forward after assembly.

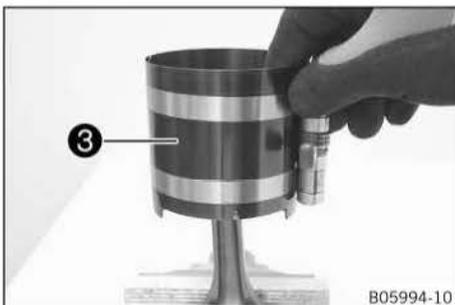




- Position the new piston ring lock ②.
- Insert the special tool and press it with force towards the piston.
- Turn the special tool clockwise, thereby pushing the piston ring lock into the groove.

Insertion for piston ring lock (77629030000) (📖 p. 479)

- Ensure that the piston ring lock is in the correct position on both sides.
- ✓ The open side ① of the piston ring lock faces upwards.



- Oil the cylinder and piston.
- Shift the gap of the piston rings by 120°.
- Mount special tool ③ on the piston.

Piston ring compressor (60029015000) (📖 p. 472)

- Clamp the piston rings together using the special tool.



- Position the piston with the special tool on the cylinder.
- Tap lightly on the piston ring compressor from the top with a plastic hammer so that it lies flush with the cylinder.



### Info

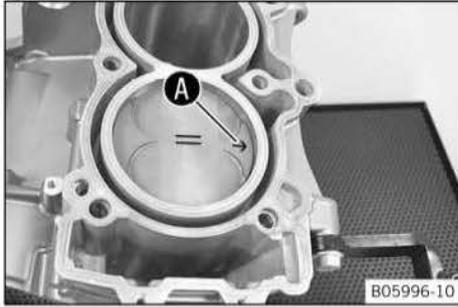
The special tool must press the piston rings together properly and lie flush with the cylinder.

- Drive the piston into the cylinder by striking it carefully with the hammer handle.



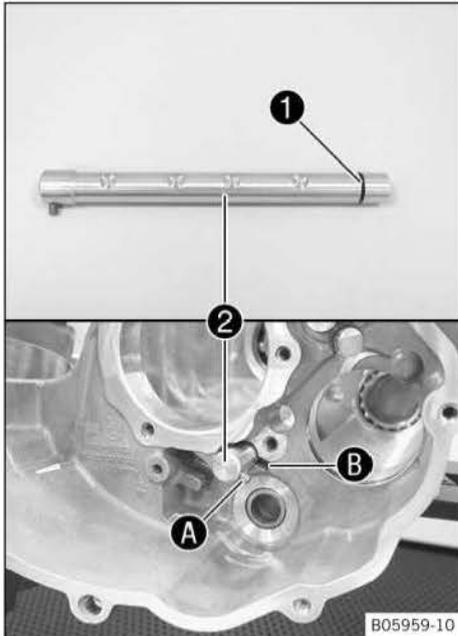
### Info

The piston rings should not catch or they will be damaged.



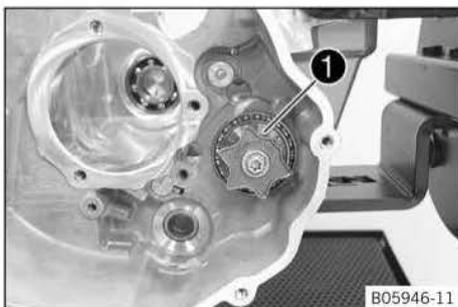
- Ensure that piston marking **A** faces the exhaust side.

## 19.5.2 Installing the oil spray tube



- Mount the new O-ring **1** on the oil spray tube **2**.
- Mount the oil spray tube.
- ✓ The pin **A** engages in the recess **B**.

## 19.5.3 Installing the transmission shafts

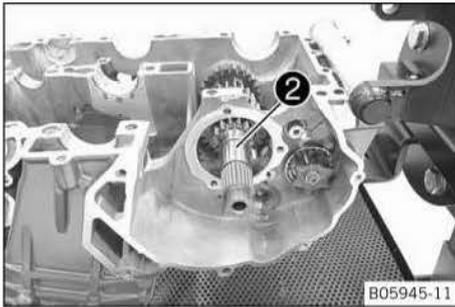


### Preparatory work

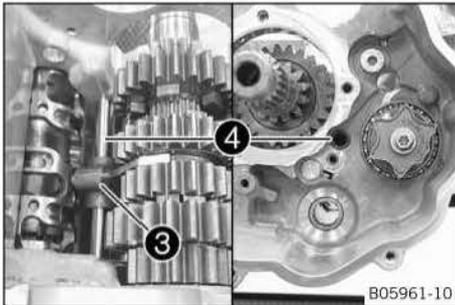
- Oil all bearings.

### Main work

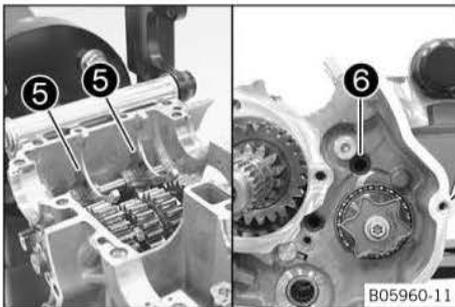
- Mount shift drum **1**.



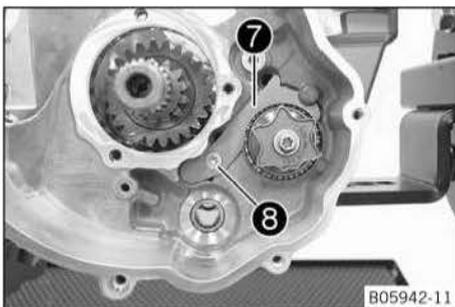
- Mount main shaft ②.



- Position shift fork ③.
- Mount shift rail ④.



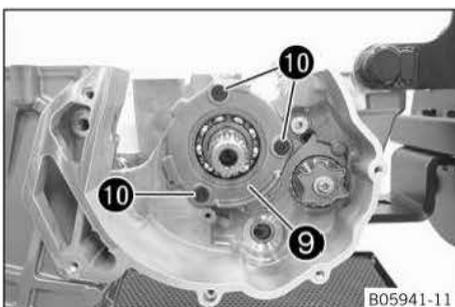
- Position shift forks ⑤.
- Mount shift rail ⑥.



- Position retaining bracket ⑦.
- Mount and tighten screw ⑧.

Guideline

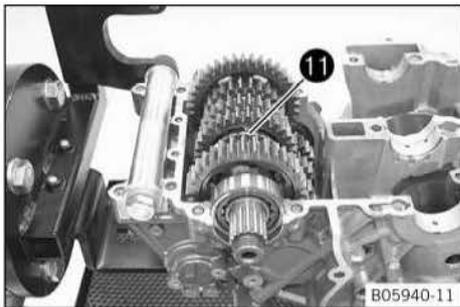
Screw, shift drum retaining bracket	M5	6 Nm (4.4 lbf ft) <b>Loctite®243™</b>
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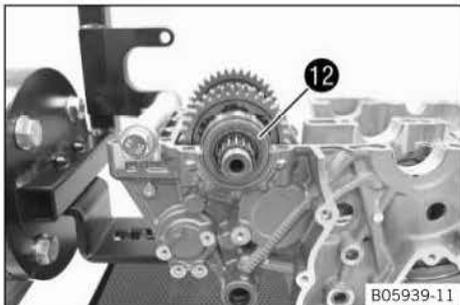
- Position bearing support ⑨ with bearing.
- Mount and tighten screws ⑩.

Guideline

Screw, main shaft bearing support	M6	10 Nm (7.4 lbf ft) <b>Loctite®243™</b>
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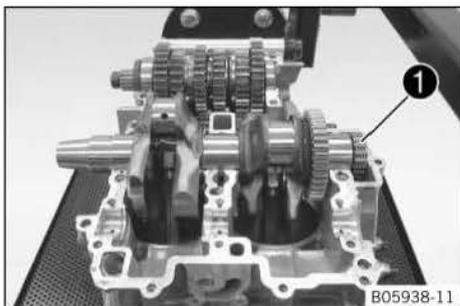


- Position countershaft **11**.

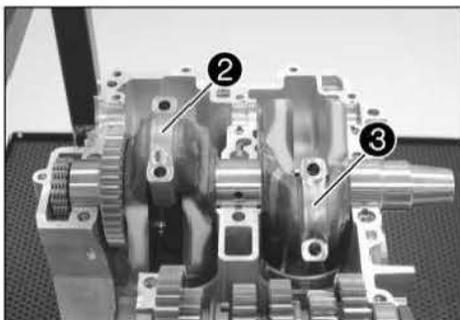


- Mount shaft seal ring **12**.

## 19.5.4 Installing the lower engine case



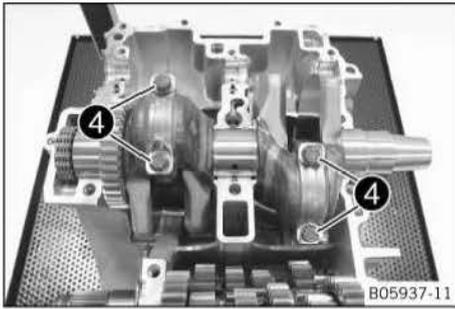
- Oil the bearing shells.
- Position crankshaft with timing chain **1**.



- Oil the bearing shells.
- ✓ There is no oil or grease on the connecting rod joint face.
- Position conrod bearing covers **2** and **3** on the associated connecting rod.

### **i** Info

The markings **A** on the connecting rod and conrod bearing cover must be identical and legible from the front.



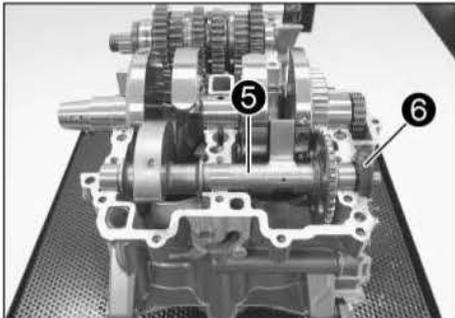
- Mount and tighten new screws **4**.

Guideline

Screw, conrod bearing	M8	1st stage 5 Nm (3.7 lbf ft) 2nd stage 15 Nm (11.1 lbf ft) 3rd stage 90° Collar and thread oiled
-----------------------	----	-------------------------------------------------------------------------------------------------------------------

Multi-tooth wrench socket (63529075000) (🔧 p. 476)

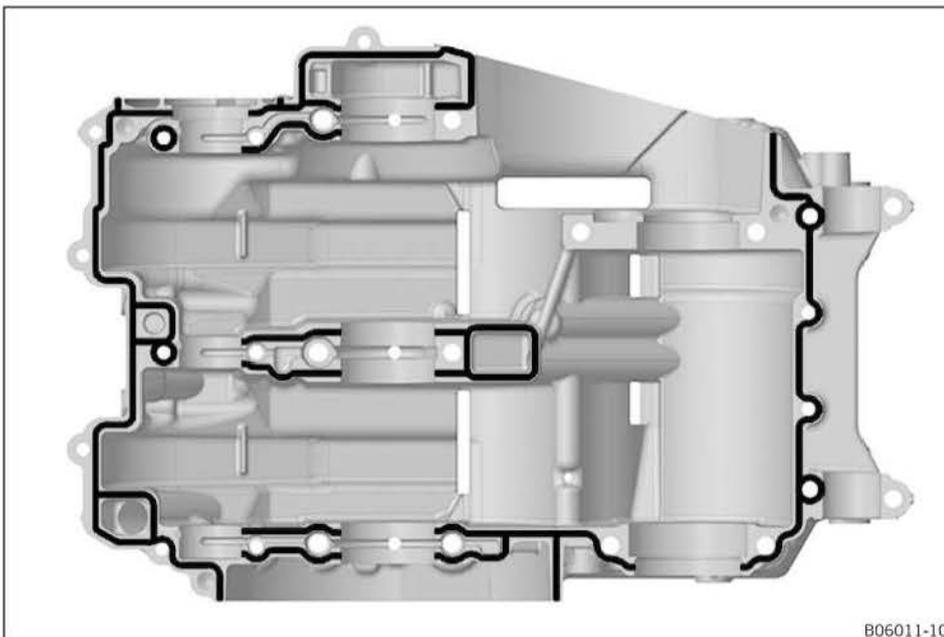
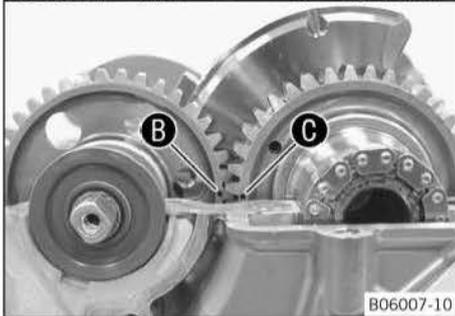
Angle disc (60029010000) (🔧 p. 471)



- Oil the bearing shells.
- Position balancer shaft **5** with the new greased shaft seal ring **6**.

Long-life grease (🔧 p. 466)

- ✓ Align markings **B** and **C**.



B06011-10

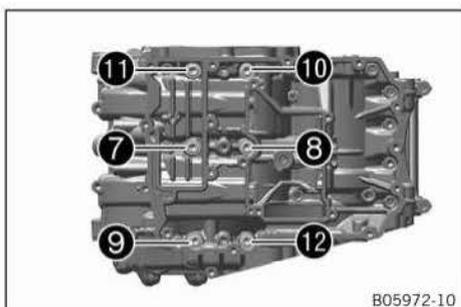
- Degrease the sealing surface. Apply sealing compound to the lower section of the engine case.

Loctite® 5910



**Info**

Ensure that the dowels are seated properly.



- Mount lower engine case. If necessary, strike lightly again with a rubber mallet.



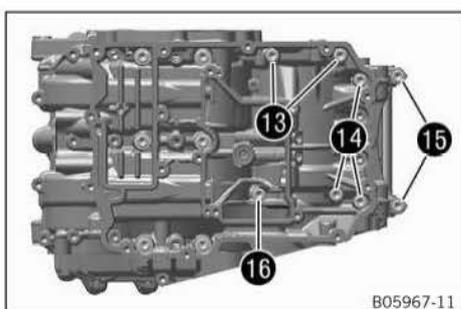
**Info**

Do not use the screws to pull the two sections of the engine case together.

- Mount screws with washers and tighten in the order 7 to 12.

Guideline

Screw, engine case	M8x90	25 Nm (18.4 lbf ft) Screw support greased
--------------------	-------	----------------------------------------------



- Mount and tighten screws 13.

Guideline

Screw, engine case	M8x90	25 Nm (18.4 lbf ft) Screw support greased
--------------------	-------	----------------------------------------------

- Mount and tighten screws 14.

Guideline

Screw, engine case	M8x65	25 Nm (18.4 lbf ft) Screw support greased
--------------------	-------	----------------------------------------------

- Mount and tighten screws 15.

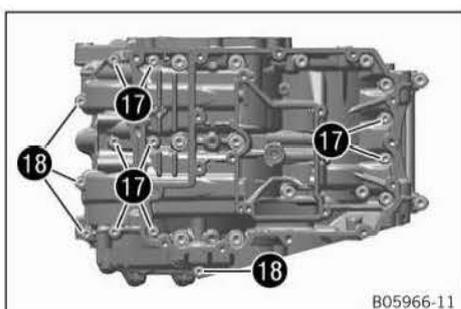
Guideline

Screw, engine case	M8x55	25 Nm (18.4 lbf ft) Screw support greased
--------------------	-------	----------------------------------------------

- Mount and tighten screw 16.

Guideline

Screw, engine case	M8x45	25 Nm (18.4 lbf ft) Screw support greased
--------------------	-------	----------------------------------------------



- Mount and tighten screws 17.

Guideline

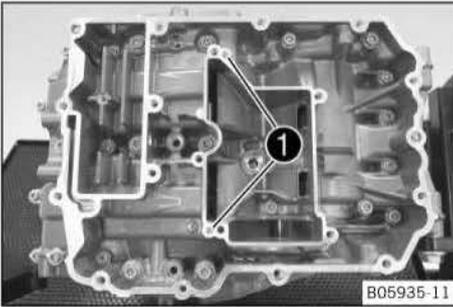
Screw, engine case	M6x60	12 Nm (8.9 lbf ft)
--------------------	-------	--------------------

- Mount and tighten screws 18.

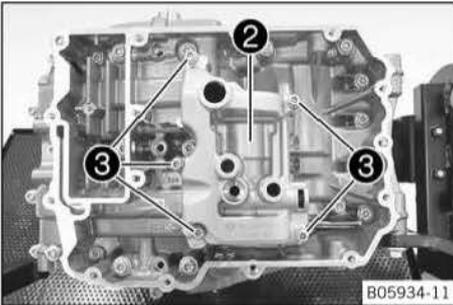
Guideline

Screw, engine case	M6x30	12 Nm (8.9 lbf ft)
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19.5.5 Installing the oil pump unit



- Mount locating pins **1**.

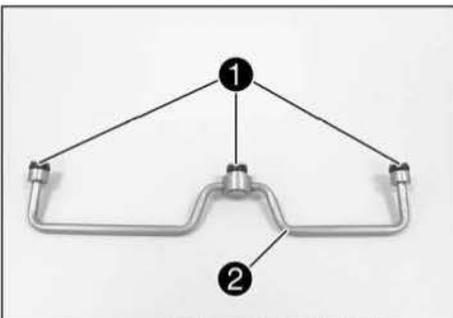


- Grease O-rings of the oil pump.
- Position oil pump unit **2**.
- Mount and tighten screws **3**.

Guideline

Screw, oil pump unit	M6	10 Nm (7.4 lbf ft)
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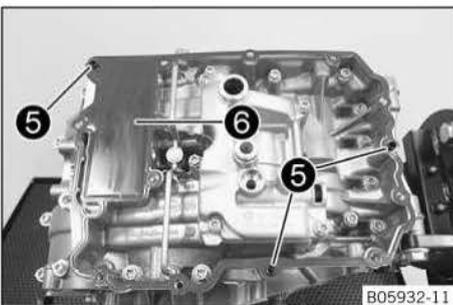
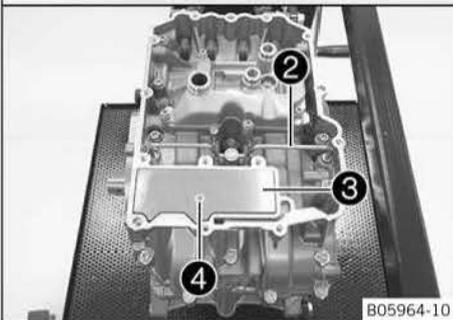
19.5.6 Installing the oil pan



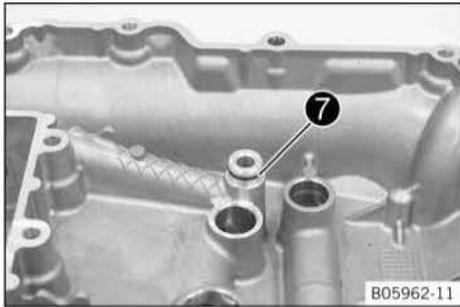
- Grease the new O-rings **1** and mount on the oil line **2**.
- Mount oil line **2**.
- Position pressure plate **3**.
- Mount and tighten screw **4**.

Guideline

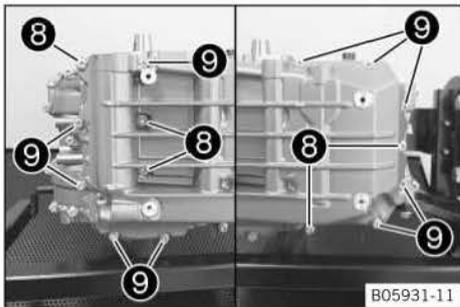
Screw, pressure plate	M5	3 Nm (2.2 lbf ft) <b>Loctite®243™</b>
-----------------------	----	------------------------------------------



- Mount dowels **5**.
- Mount gasket **6**.



- Grease and mount the new O-ring **7**.



- Position oil pan.
- Mount screws **8** but do not tighten yet.

Guideline

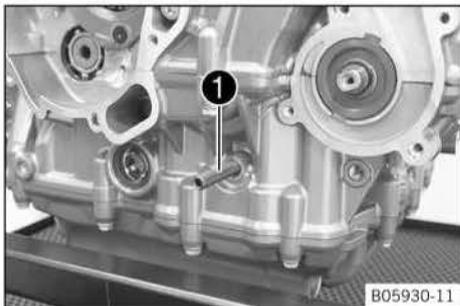
Screw, oil pan	M6x35	10 Nm (7.4 lbf ft)
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- Mount screws **9** and tighten all screws in a crisscross pattern.

Guideline

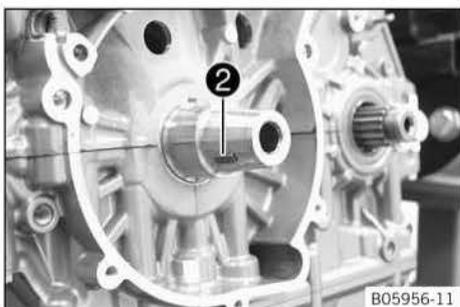
Screw, oil pan	M6x30	10 Nm (7.4 lbf ft)
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## 19.5.7 Installing the rotor

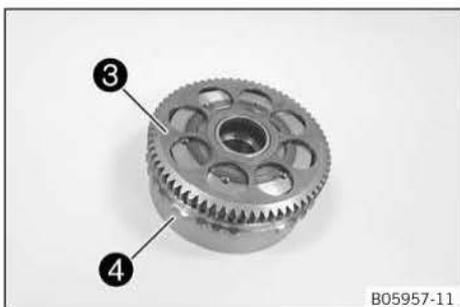


- Position crankshaft to cylinder 1 TDC and lock with special tool **1**.

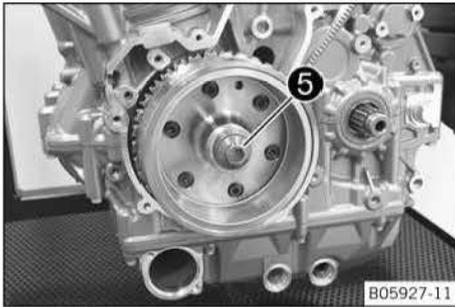
Locking screw (61229015000) (📖 p. 474)
----------------------------------------



- Mount woodruff key **2**.



- Turn the freewheel gear **3** counterclockwise and mount in the rotor **4**.



- Mount the rotor with the freewheel gear.

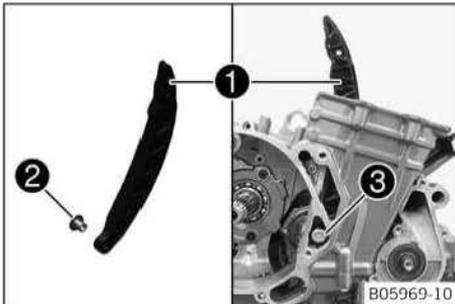
**i Info**  
Ensure that the woodruff key is seated properly.

- Mount and tighten screw **5**.

Guideline

Screw, rotor	M12x1.5	90 Nm (66.4 lbf ft) <b>Loctite®243™</b>
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### 19.5.8 Installing the timing chain rails



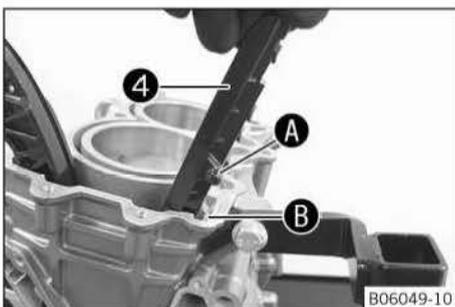
- Position timing chain tensing rail **1** with support bushing **2**.
- Mount and tighten screw **3**.

Guideline

Screw, timing chain tensing rail	M8	15 Nm (11.1 lbf ft) <b>Loctite®243™</b>
----------------------------------	----	--------------------------------------------

**i Info**  
Ensure that there is no thread locker on the collar of the screw; otherwise the timing chain tensing rail may lock and break.

- Check timing chain tensing rail for freedom of movement.
- Position timing chain guide rail **4** from above in the engine case.
  - ✓ The holder **A** engages in the recess **B**.

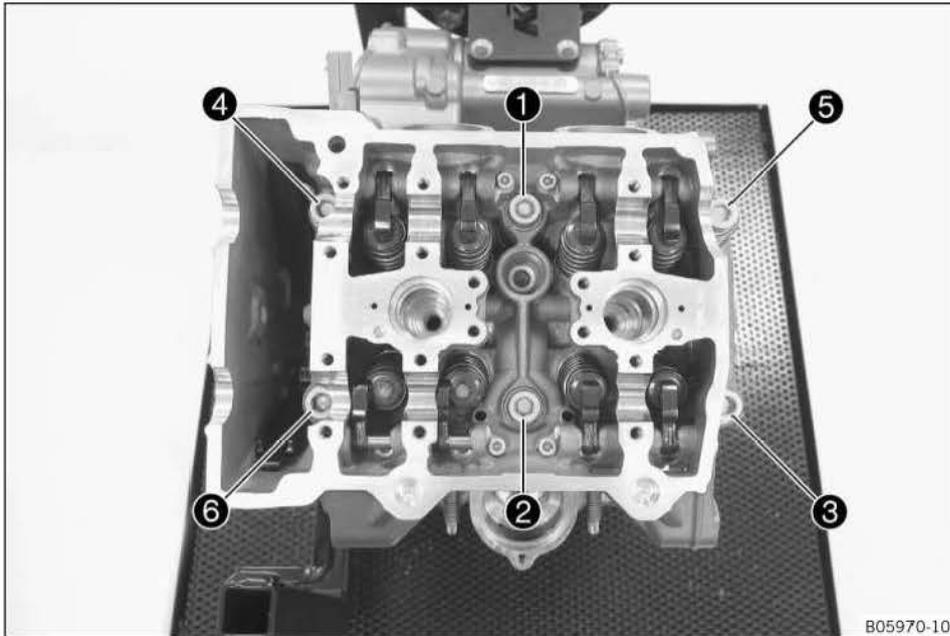


### 19.5.9 Installing the cylinder head



- Put the new cylinder head gasket in place.

**i Info**  
Ensure that the dowels are seated properly.



B05970-10

- Position the cylinder head.
- Mount cylinder head screws with washers and tighten step by step in the order from ① to ⑥.

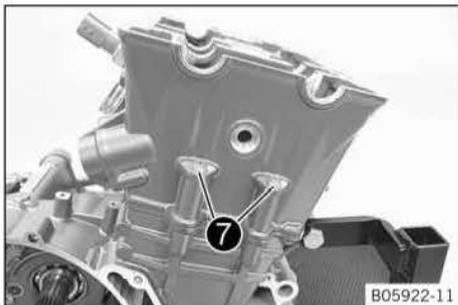
Guideline

Screw, cylinder head	M10x1.25	Tightening sequence: Observe tightening sequence. 1st stage 5 Nm (3.7 lbf ft) 2nd stage 15 Nm (11.1 lbf ft) 3rd stage 90° 4th stage 90° Collar greased / thread oiled
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**Info**

Always use new cylinder head screws.

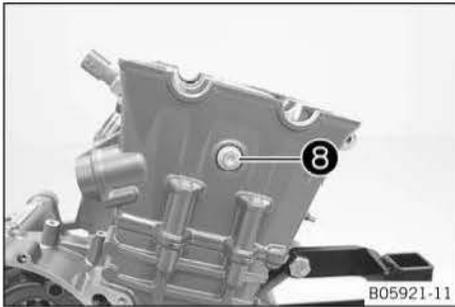


B05922-11

- Mount and tighten screws ⑦.

Guideline

Screw, cylinder head	M6	10 Nm (7.4 lbf ft)
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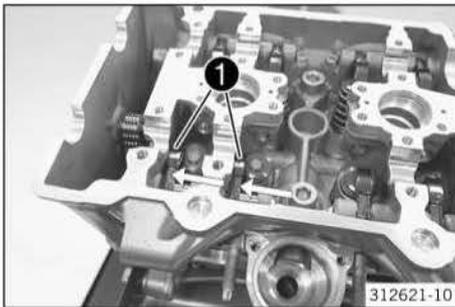


- Mount and tighten screw 8 with gasket.

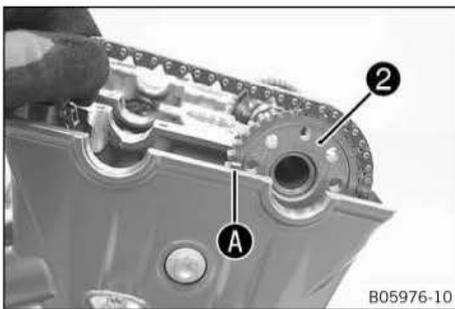
Guideline

Screw, timing chain shaft	M6	10 Nm (7.4 lbf ft)
---------------------------	----	--------------------

### 19.5.10 Installing the camshafts



- Push exhaust cam lever 1 on cylinder 2 to the side.



- Pull up the timing chain and position the exhaust camshaft 2.

---

**i Info**  
The drive gear wheel for the balancer shaft is located in the exhaust camshaft.

---

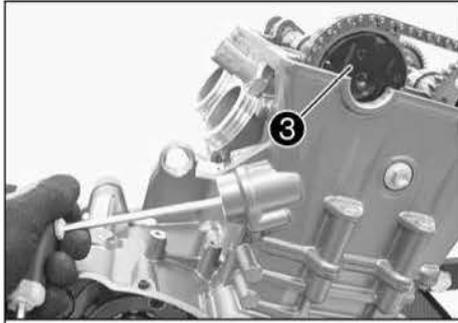
- Place timing chain over rear sprocket of the exhaust camshaft and keep taut.

✓ The **OT1** marking **A** is aligned with the sealing surface.

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**i Info**  
The **OT1** markings are line markings.

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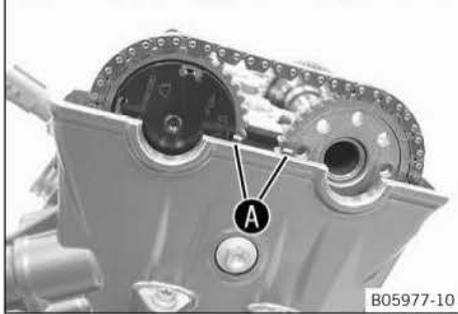


- Slip in intake camshaft **3**.



**Info**

The centrifuge of the engine vent is located on the intake camshaft.



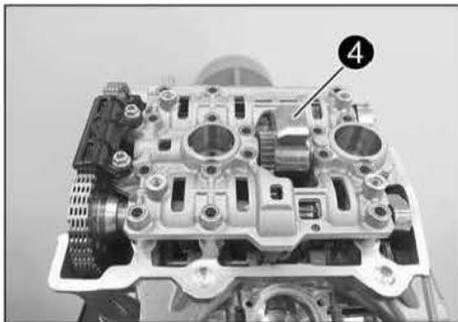
- Keep the timing chain taut.

- ✓ The **OT1** markings **A** are aligned with the sealing surface.



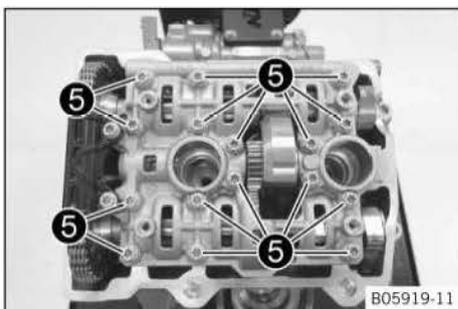
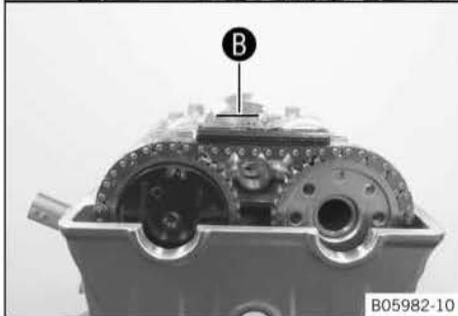
**Info**

The **OT1** markings are line markings.



- Mount camshaft bearing bridge with balancer shaft **4**.

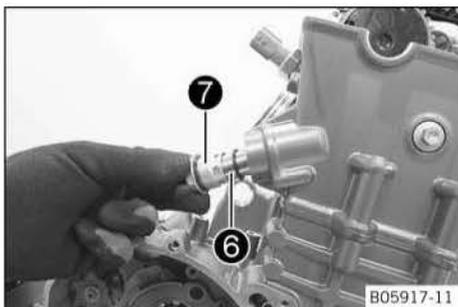
- ✓ The marking **B** of the balancer shaft is aligned parallel to the sealing surface.



- Mount screws **5** and tighten them from the inside to the outside.

**Guideline**

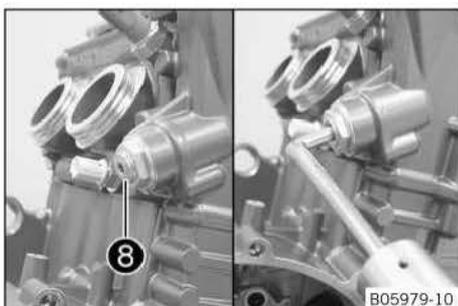
Screw, camshaft bearing bridge	M6	10 Nm (7.4 lbf ft)
--------------------------------	----	--------------------



- After it has been positioned in the installation location, insert timing chain tensioner **6** with a new O-ring.
- Mount and tighten screw plug **7** with new O-ring.

Guideline

Plug, timing chain tensioner	M24x1.5	25 Nm (18.4 lbf ft)
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- Remove screw **8** with the O-ring and use a special tool to push the timing chain tensioner toward the timing chain.

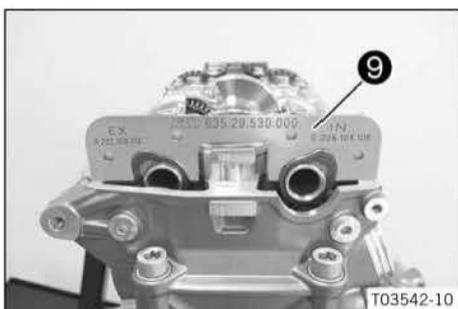
Release device for timing chain tensioner (61229021000) (p. 474)

✓ The timing chain tensioner unlocks.

- Mount and tighten screw **8** with the O-ring.

Guideline

Screw, unlocking of timing chain tensioner	M10x1	10 Nm (7.4 lbf ft)
--------------------------------------------	-------	--------------------



- Remove the special tool.

Locking screw (61229015000) (p. 474)

- Crank the engine several times.
- Turn the crankshaft counterclockwise to ignition top dead center of cylinder 1 and lock it using special tool.

Locking screw (61229015000) (p. 474)

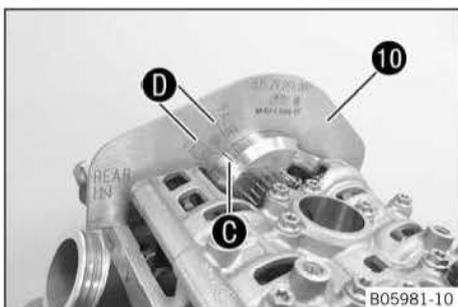
- Check position of the camshafts with special tool **9**.

Setting gauge (63529530000) (p. 477)

- Check position of the balancer shaft with special tool **10**.

Setting gauge (63529059000) (p. 476)

✓ The marking **C** of the balancer shaft is located in the **D** area of the adjusting gauge.



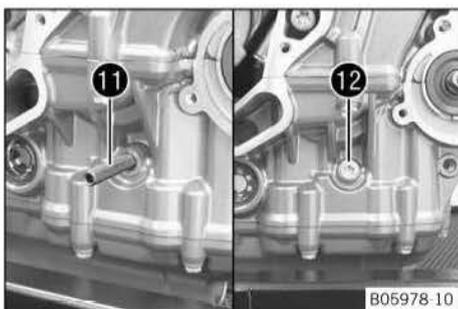
- Remove special tool **11**.

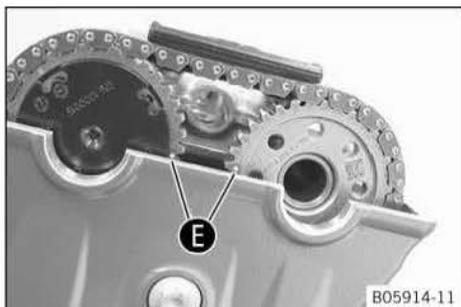
Locking screw (61229015000) (p. 474)

- Mount and tighten screw **12** with the washer.

Guideline

Screw plug, locking screw	M8	15 Nm (11.1 lbf ft)
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- Turn the crankshaft counterclockwise by the specified value and set it to ignition top dead center of cylinder 2.

Guideline

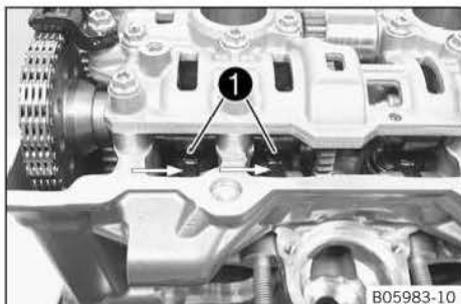
435°

- ✓ The **OT2** markings **E** are aligned with the sealing surface.

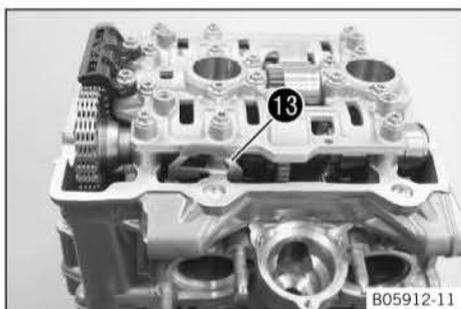


**Info**

The **OT2** markings are dot markings.

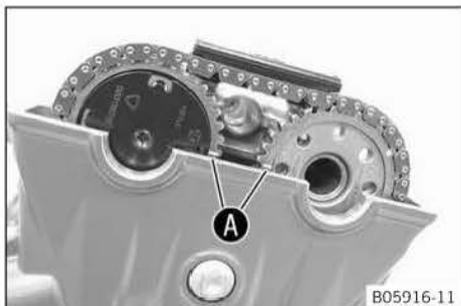


- Position exhaust cam lever **1** on cylinder 2.



- Mount cam lever clip **13**.

## 19.5.11 Checking the valve clearance



- Crank the engine several times.
- Turn the crankshaft counterclockwise and set it to ignition top dead center of cylinder 1.

- ✓ The **OT1** markings **A** are aligned with the sealing surface.



**Info**

The **OT1** markings are line markings.



- Check the valve clearance at the exhaust valves and the intake valves between the camshaft and cam lever using the special tool **1**.

Guideline

Valve play, cold	
Intake at: 20 °C (68 °F)	0.10 ... 0.15 mm (0.0039 ... 0.0059 in)
Exhaust at: 20 °C (68 °F)	0.15 ... 0.20 mm (0.0059 ... 0.0079 in)

Feeler gauge (59029041100) (📖 p. 471)

- » If the valve clearance does not meet specifications:
  - Adjust the valve clearance. (📖 p. 337)
- Turn the crankshaft counterclockwise by the specified value and set it to ignition top dead center of cylinder 2.

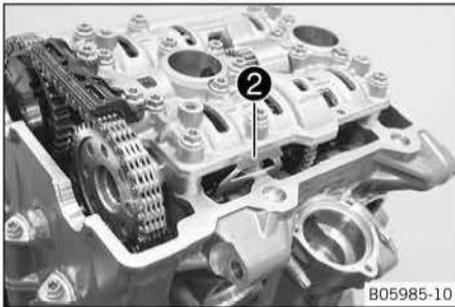
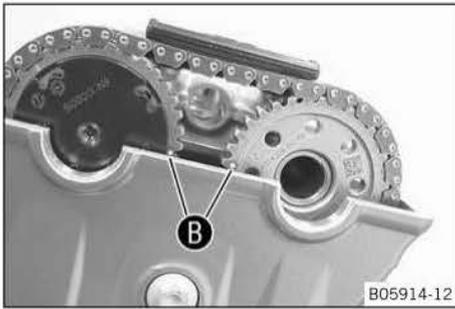
Guideline

435°

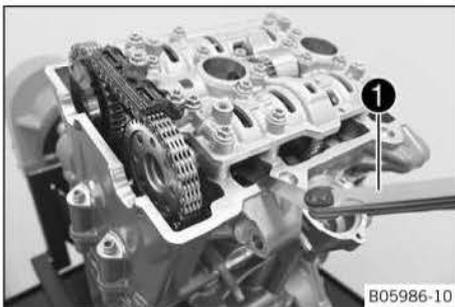
- ✓ The **OT2** markings **B** are aligned with the sealing surface.

**i** **Info**

The **OT2** markings are dot markings.



- Remove cam lever clip **2**.



- Check the valve clearance at the exhaust valves and the intake valves between the camshaft and cam lever using the special tool **1**.

Guideline

Valve play, cold	
Intake at: 20 °C (68 °F)	0.10 ... 0.15 mm (0.0039 ... 0.0059 in)
Exhaust at: 20 °C (68 °F)	0.15 ... 0.20 mm (0.0059 ... 0.0079 in)

Feeler gauge (59029041100) (📖 p. 471)

- » If the valve clearance does not meet specifications:
  - Adjust the valve clearance. (📖 p. 337)

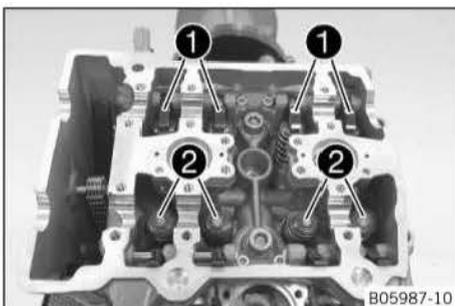
### 19.5.12 Adjusting the valve clearance

**Preparatory work**

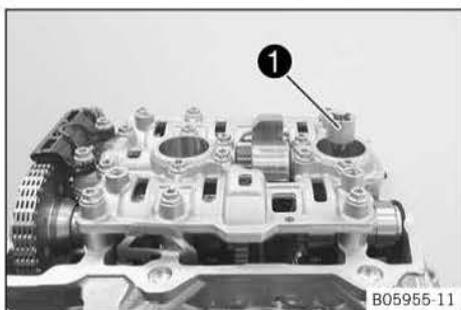
- Remove the camshafts. (📖 p. 271)

**Main work**

- Swing up cam lever **1**.
- Remove shims **2** and set them down according to the installation position.
- Correct the shims based on the results of the valve clearance check.
- Insert suitable shims.
- Install the camshafts. (📖 p. 333)
- Check the valve clearance. (📖 p. 336)



## 19.5.13 Installing the spark plugs

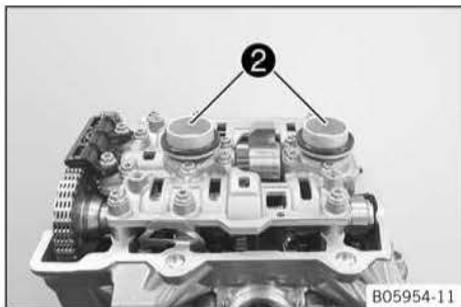


- Mount and tighten the spark plugs using a special tool **1**.

Guideline

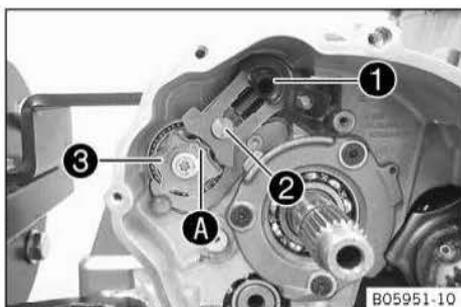
Spark plug	M10	10 Nm (7.4 lbf ft)
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Spark plug wrench with link (77229172000) (p. 479)		
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- Grease the O-rings and mount spark plug shaft inserts **2** with gasket.

## 19.5.14 Installing the shift shaft

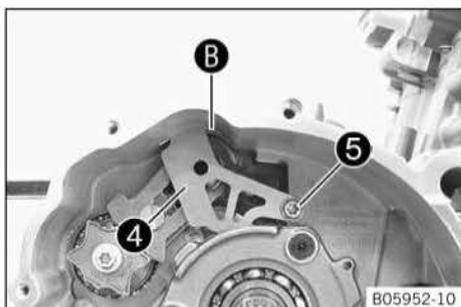


- Slide shift shaft **1** with the washer into the bearing seat.
- Push sliding plate **2** away from shift drum locating unit **3**. Insert the shift shaft all the way.

**i** Info

The neutral position **A** must be aligned with the sliding plate **2** for assembly.

- Let the sliding plate engage in the shift drum locating unit.
- Shift through the transmission.

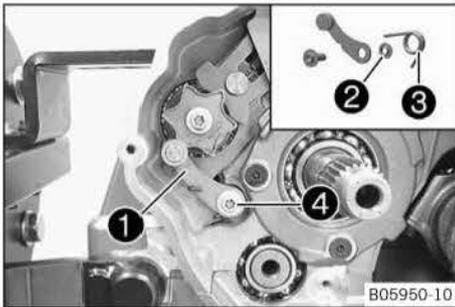


- Position retaining bracket **4** in the groove **B**.
- Mount and tighten screw **5**.

Guideline

Screw, shift shaft retaining bracket	M6	10 Nm (7.4 lbf ft) <b>Loctite®243™</b>
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19.5.15 Installing the locking lever

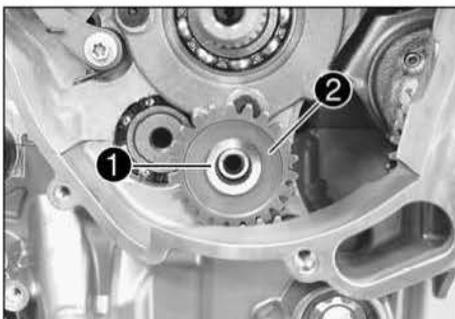


- Position locking lever 1 with sleeve 2 and spring 3.
- Mount and tighten screw 4.

Guideline

Screw, locking lever	M6	10 Nm (7.4 lbf ft) <b>Loctite®243™</b>
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19.5.16 Installing the clutch basket



- Oil collar bushing 1 thoroughly.
- Position collar bushing 1 with oil pump idler gear 2.
- Mount and tighten screw 3.

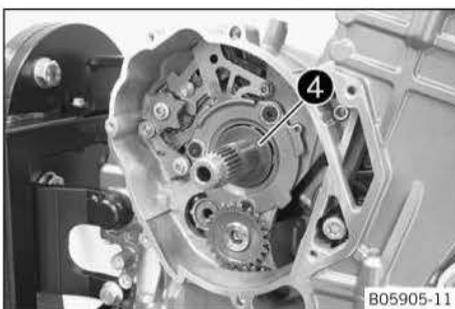
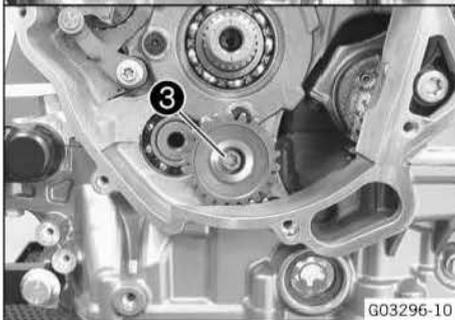
Guideline

Screw, oil pump idler gear	M8	15 Nm (11.1 lbf ft) <b>Loctite®243™</b>
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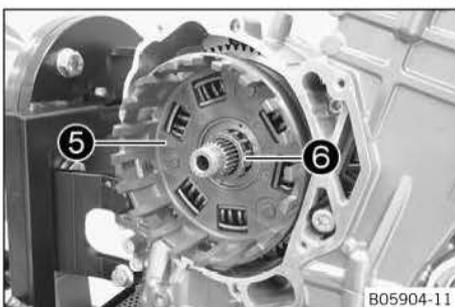


**Info**

The screw 3 must always be replaced.



- Mount washer 4.



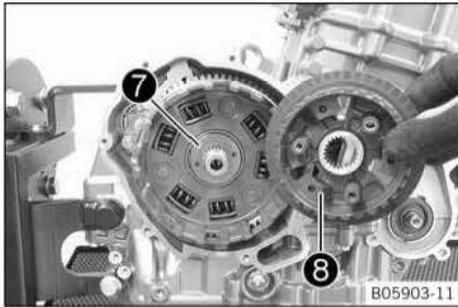
- Position the clutch basket 5.



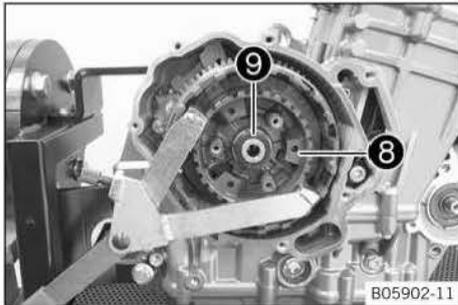
**Info**

Turn the clutch basket and oil pump idler gear backwards and forwards slightly to help them mesh more easily.

- Mount needle bearing 6.



- Mount washer **7** and inner clutch hub **8**.



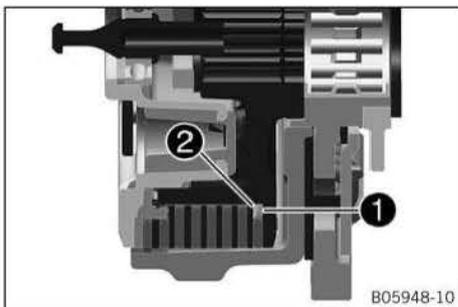
- Mount nut **9** with the washer.
- Use a special tool to hold the inner clutch hub **8** and tighten the nut **9**.

Guideline

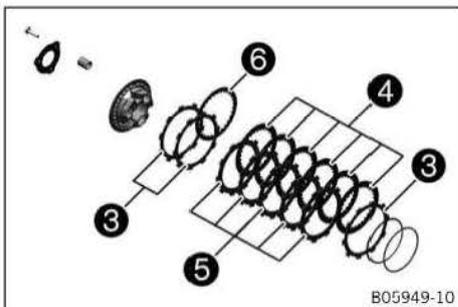
Nut, inner clutch hub	M20x1.5	90 Nm (66.4 lbf ft) <b>Loctite®243™</b>
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Holding wrench (51129003000) (p. 470)

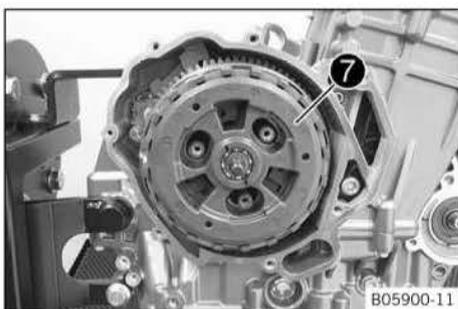
### 19.5.17 Installing the clutch discs



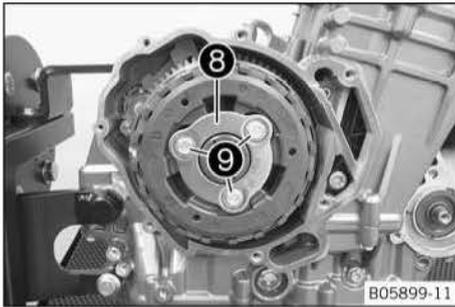
- Mount support ring **1** and pretension ring **2**.  
✓ The pretension ring rests against the support ring on the inside and the outside faces away from the support ring.



- Thoroughly oil the clutch facing discs.
- Mount a clutch facing disc **3** with a larger inside diameter.
- Alternately mount 6 intermediate clutch discs **4** and 5 of the same clutch facing discs **5**.
- Alternately mount 2 clutch facing discs **3** and an intermediate clutch disc **6** with a larger inside diameter.
- The outer clutch facing disc must be mounted offset by one mesh.



- Position clutch pressure cap **7**.  
✓ The gear teeth of the outer intermediate clutch disc engage in the clutch pressure cap.  
✓ The clutch pressure cap rests flush against the outer clutch facing disc.

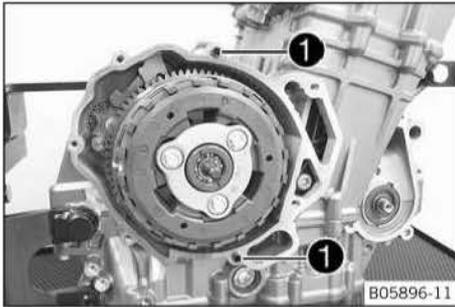


- Position clutch center **8** and the springs.
- Mount and tighten screws **9**.

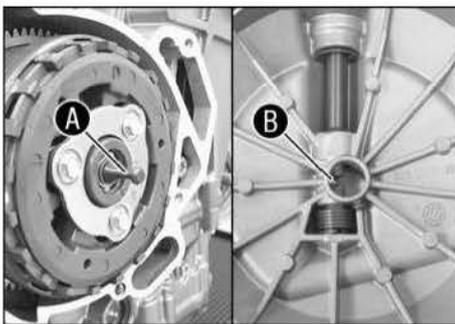
Guideline

Screw, clutch spring	M6	10 Nm (7.4 lbf ft)
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**19.5.18 Installing the clutch cover**



- Mount dowels **1**.

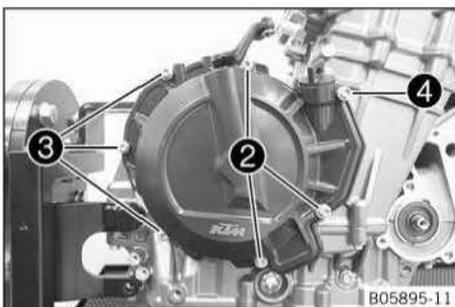
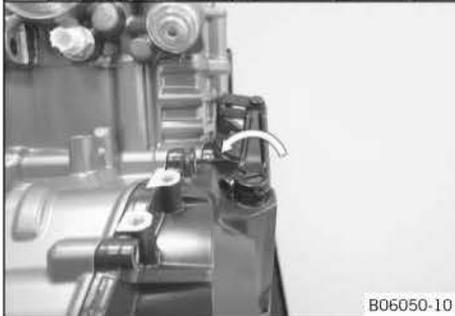


- Position the clutch cover with the clutch cover gasket.
- ✓ Clutch push rod **A** engages in groove **B**.



**Info**

Swivel clutch release lever counterclockwise.



- Mount screws **2**, but do not tighten yet.

Guideline

Screw, clutch cover	M6x30	10 Nm (7.4 lbf ft)
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- Mount screws **3**, but do not tighten yet.

Guideline

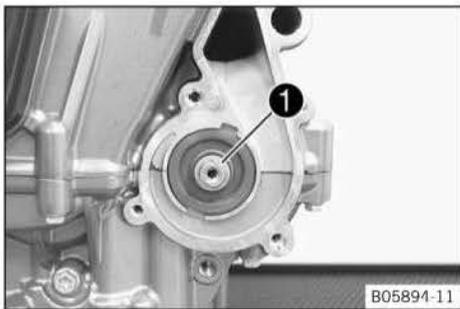
Screw, clutch cover	M6x25	10 Nm (7.4 lbf ft)
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- Mount screw **4** and tighten all screws in a crisscross pattern.

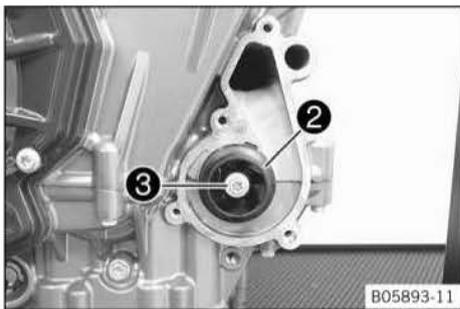
Guideline

Screw, clutch cover	M6x35	10 Nm (7.4 lbf ft)
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## 19.5.19 Mounting the water pump cover



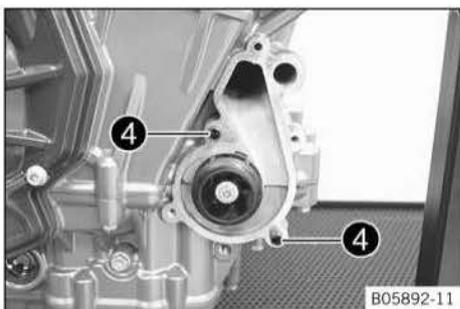
- Mount form washer **1**.



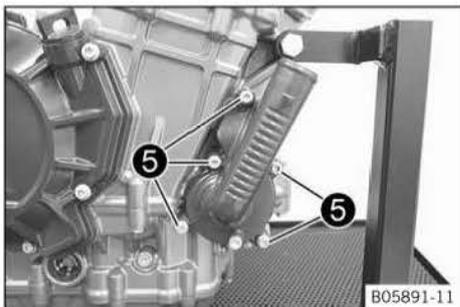
- Mount water pump impeller **2**.
- Mount and tighten screw **3**.

Guideline

Screw, water pump wheel	M6	10 Nm (7.4 lbf ft) <b>Loctite®243™</b>
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- Mount dowels **4**.

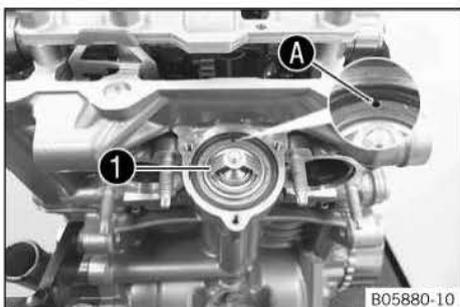


- Position water pump cover with the gasket.
- Mount and tighten screws **5**.

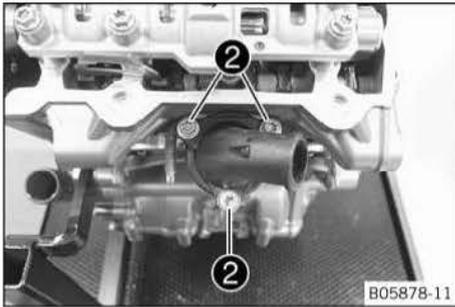
Guideline

Screw, water pump cover	M6	10 Nm (7.4 lbf ft)
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## 19.5.20 Installing the thermostat



- Position thermostat **1** with the gasket.
- ✓ Drill hole **A** must face upward.

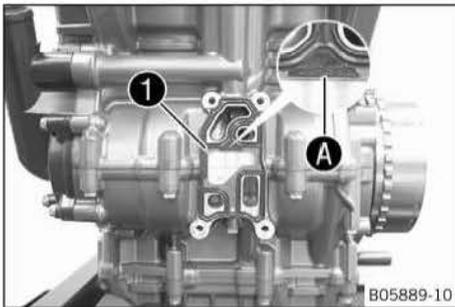


- Position the thermostat case.
- Mount and tighten screws ②.

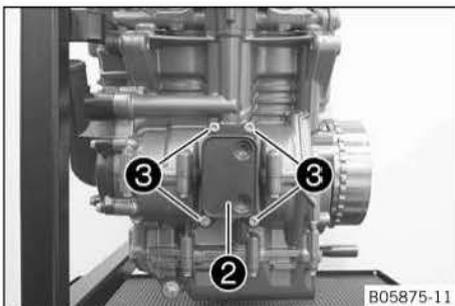
Guideline

Screw, thermostat case	M5	6 Nm (4.4 lbf ft) <b>Loctite®243™</b>
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### 19.5.21 Installing the heat exchanger



- Position gasket ①.
- ✓ The **OUTSIDE** marking ① is legible.

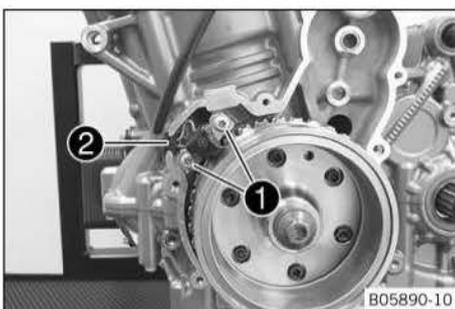


- Position heat exchanger ②.
- Mount and tighten screws ③.

Guideline

Screw, heat exchanger	M6	10 Nm (7.4 lbf ft)
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### 19.5.22 Installing the crankshaft speed sensor



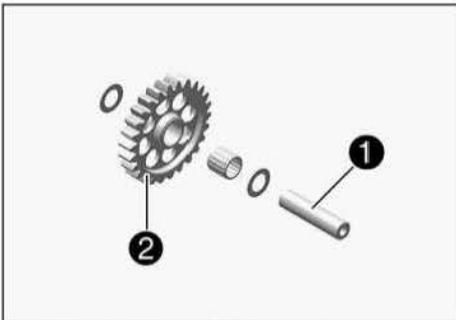
- Position the crankshaft speed sensor.
- Mount and tighten screws ①.

Guideline

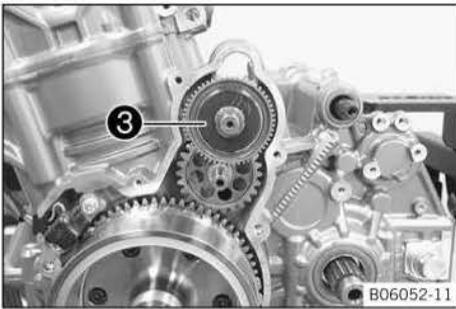
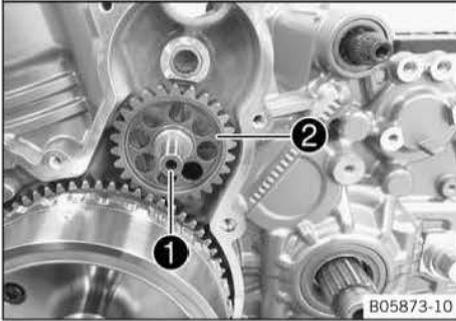
Screw, crankshaft speed sensor	M5	6 Nm (4.4 lbf ft) <b>Loctite®243™</b>
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- Position the cable and position rubber grommet ② in the engine case.

## 19.5.23 Installing torque limiter and starter idler gear

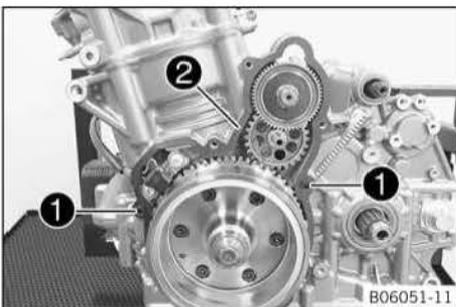


- Mount shaft **1** and starter idler gear **2** with needle bearing and washers.



- Mount torque limiter **3** with the rear washer.

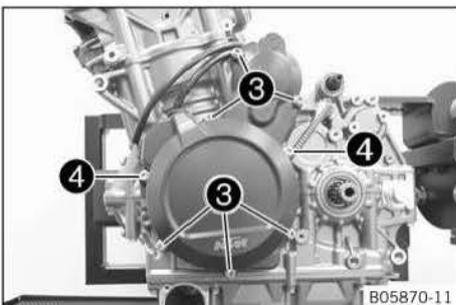
## 19.5.24 Installing the alternator cover



- Apply sealing compound lightly in the area of the rubber grommet.

**Loctite® 5910**

- Mount dowels **1** and put alternator cover gasket **2** in place.



- Position the alternator cover.
- Mount and tighten screws **3**.

Guideline

Screw, alternator cover	M6x30	10 Nm (7.4 lbf ft)
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- Mount and tighten screws **4**.

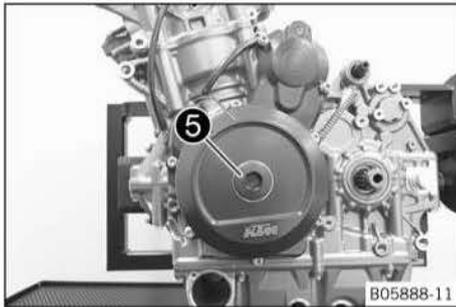
Guideline

Screw, alternator cover	M6x35	10 Nm (7.4 lbf ft)
-------------------------	-------	--------------------

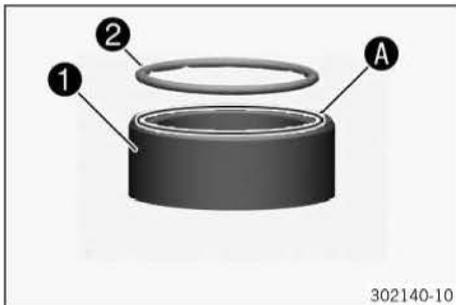
- Mount screw **5** with the O-ring and tighten.

Guideline

Screw in alternator cover	M24x1.5	8 Nm (5.9 lbf ft)
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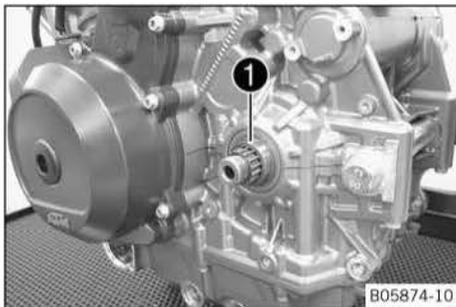
19.5.25 Installing the spacer



- Before mounting, grease spacer **1** in area **A** and O-ring **2**.

Long-life grease (p. 466)

- Position the O-ring in the recess of the spacer.

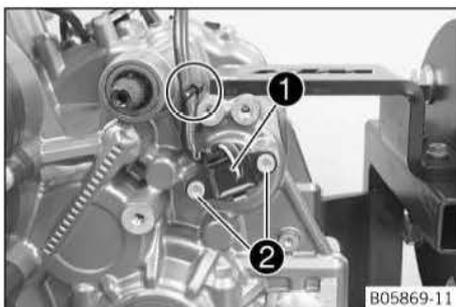


- Grease the shaft seal ring.

Long-life grease (p. 466)

- Push spacer **1** with the O-ring onto the countershaft with a twisting motion.
  - ✓ The recess with the O-ring faces inward.
  - ✓ The shaft seal ring rests against the spacer along its entire circumference.

19.5.26 Installing the gear position sensor



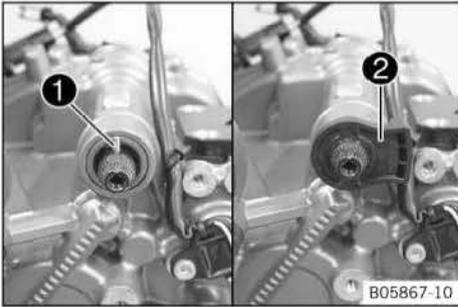
- Position gear position sensor **1**.
- Mount and tighten screws **2**.

Guideline

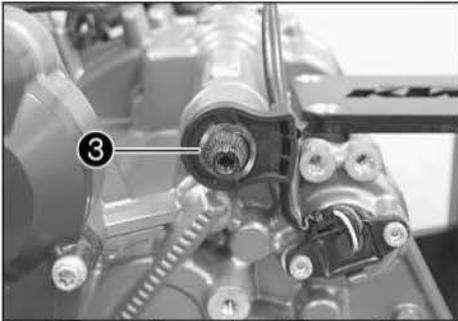
Screw, gear position sensor	M5	6 Nm (4.4 lbf ft) <b>Loctite®243™</b>
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- Secure the cable with a cable tie.

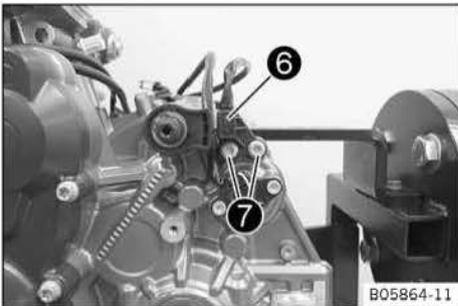
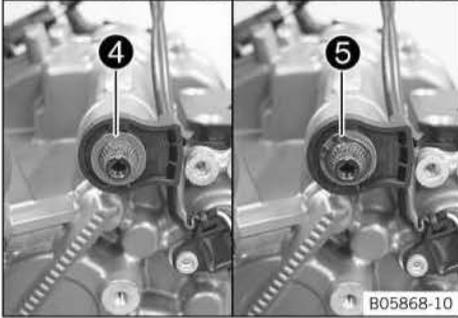
## 19.5.27 Installing the shift shaft sensor



- Mount pin ①.
- Mount magnetic holder ②.



- Mount locating washer ③.
- Mount washer ④.
- Mount lock ring ⑤.

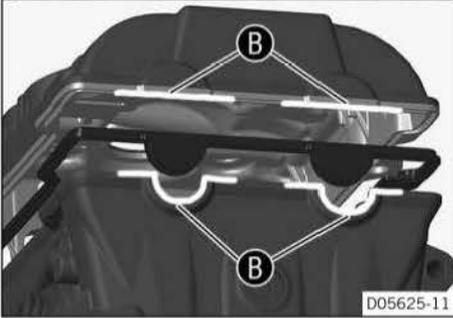
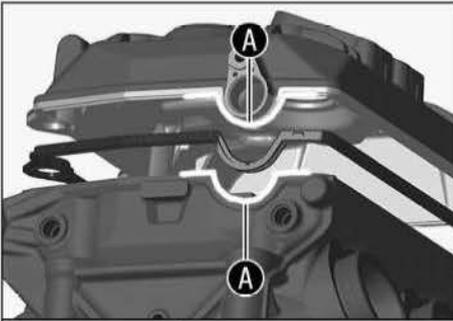


- Position the shift shaft sensor ⑥.
- Mount and tighten screws ⑦.

Guideline

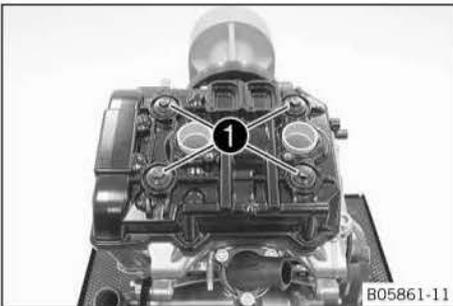
Screw, shift shaft sensor	M5	6 Nm (4.4 lbf ft) <b>Loctite®243™</b>
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19.5.28 Installing the valve cover



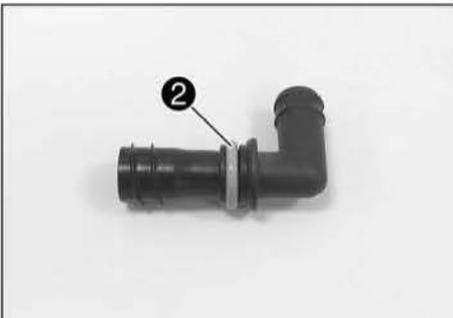
- Clean and degrease the valve cover seal.
- Apply a thin layer of sealing compound to area **A** and **B**.

Loctite® 5910
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- Position the valve cover with the valve cover seal.
- Mount and tighten screws **1** with the gaskets.

Guideline		
Screw, valve cover	M6	10 Nm (7.4 lbf ft)

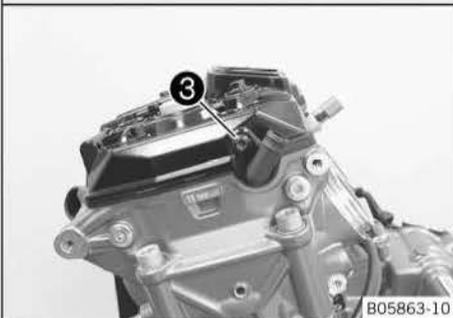


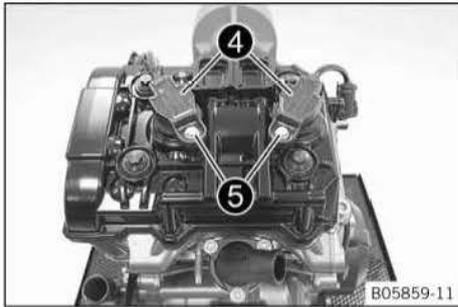
- Grease O-ring **2**.

Long-life grease (📄 p. 466)
-----------------------------

- Position the bleeder flange in the valve cover.
- Mount and tighten screw **3** with retaining bracket.

Guideline		
Screw, bleeder flange	EJOTALtracs® M6x12	8 Nm (5.9 lbf ft) <b>Loctite®243™</b>



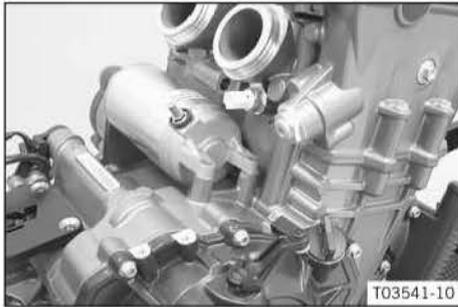


- Mount ignition coils ④.
- Mount and tighten screws ⑤.

Guideline

Screw, ignition coil	M6	8 Nm (5.9 lbf ft)
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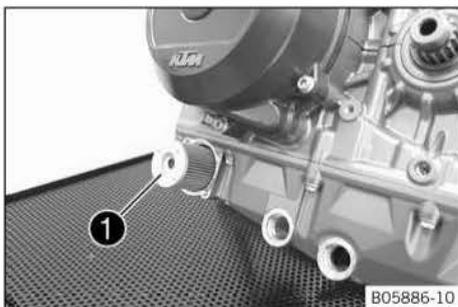
## 19.5.29 Installing the starter motor



- Grease the O-ring and mount the starter motor.

Long-life grease ( p. 466)

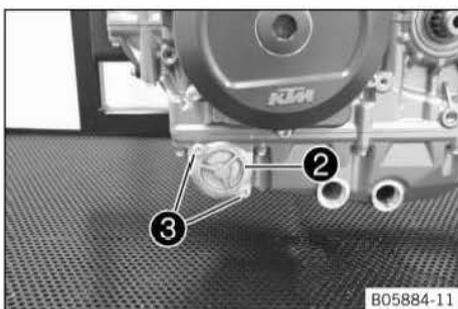
## 19.5.30 Installing the oil filter



- Tilt the motorcycle to one side and fill the oil filter housing to about 1/3 full with engine oil.

Engine oil (SAE 10W/50) ( p. 464)

- Mount oil filter ①.

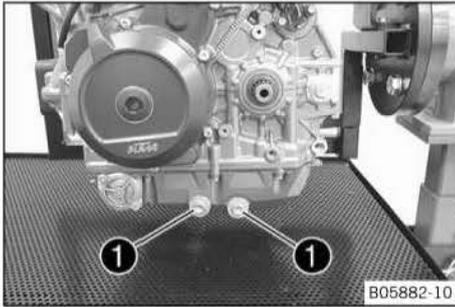


- Oil the O-ring of oil filter cover ②. Mount the oil filter cover.
- Mount and tighten screws ③.

Guideline

Screw, oil filter cover	M5	6 Nm (4.4 lbf ft)
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### 19.5.31 Installing the oil drain plug



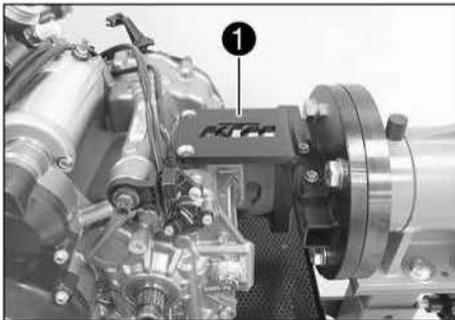
- Mount the new O-rings.
- Mount and tighten the oil drain plugs ① with the magnet, O-rings, and oil screen.

#### Guideline

Plug, oil screen	M20x1.5	20 Nm (14.8 lbf ft)
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### 19.5.32 Removing the engine from the engine assembly stand



- Remove retaining bracket ①.
- Remove the engine from the engine assembly stand.

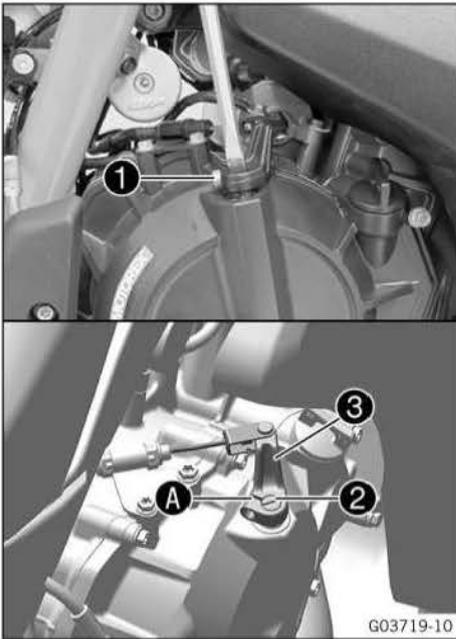


#### Info

Work with an assistant or a motorized hoist.



## 20.1 Adjusting the clutch release lever

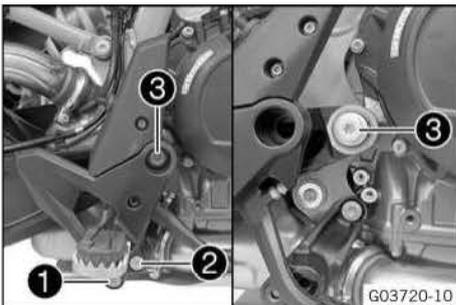


- Remove screw ①.
- Use a screwdriver to turn clutch release shaft ② counter-clockwise as far as it will go and hold.
- Position clutch release lever ③.
- ✓ Align clamping slot A 90° to the direction of travel.
- Mount and tighten screw ①.

### Guideline

Screw, clutch release lever	M6	10 Nm (7.4 lbf ft) <b>Loctite®243™</b>
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## 20.2 Checking the clutch



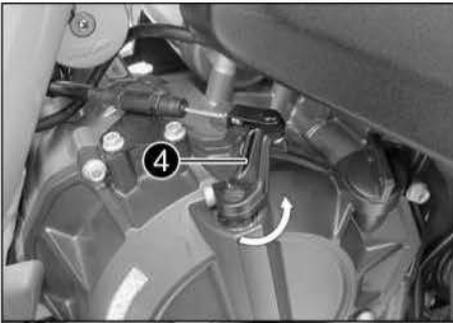
### Main work

- Remove screw ① with the bushing.
- Remove screw ②.
- Remove screw ③.
- Take off footrest bracket and hang to the side.

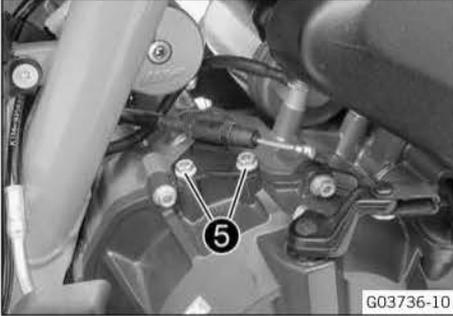
### Info

Cover the components to protect them against damage.

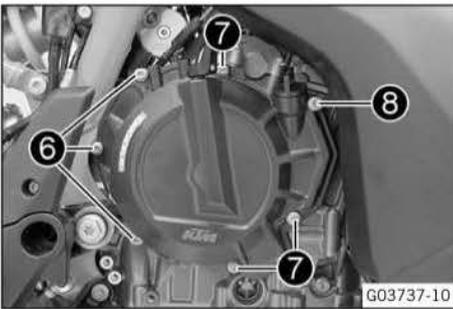
- Mount screw ③, but do not tighten.



- Swivel the clutch release lever **4** counterclockwise and detach the inner clutch cable.
- Remove screws **5**.
- Hang the inner clutch cable with bracket to the side.



G03736-10



- Remove screws **6** and **7**.
- Remove screw **8**.

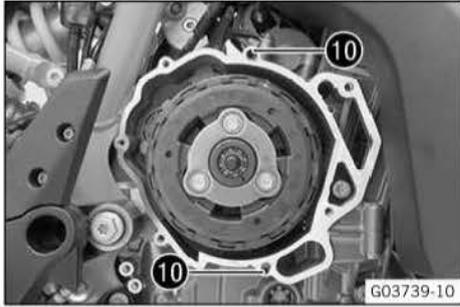
G03737-10



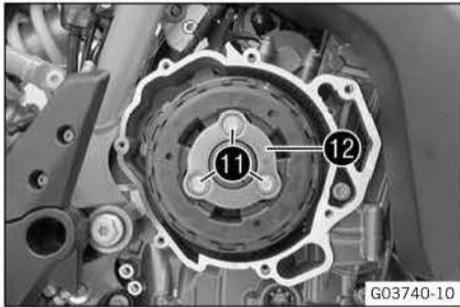
- Swivel the clutch release lever **9** clockwise and take off clutch cover with clutch cover gasket.



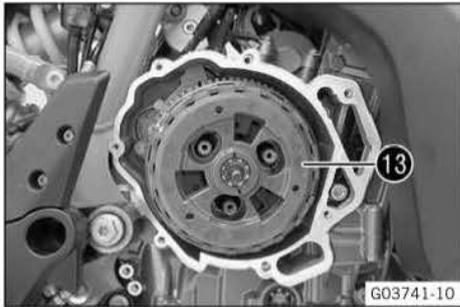
G03738-10



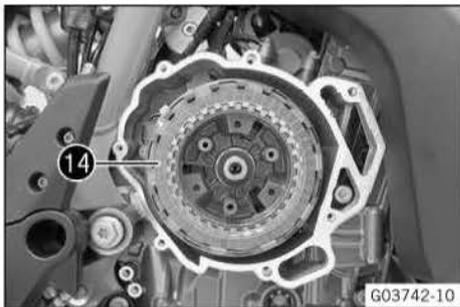
- Remove dowels 10.



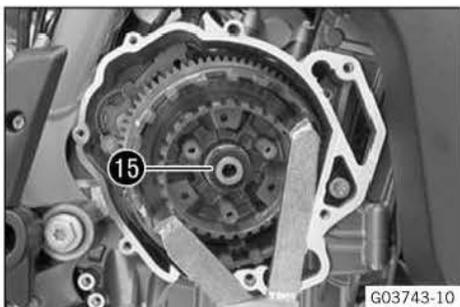
- Remove screws 11.
- Take off clutch center 12 and the springs.



- Take off clutch pressure cap 13.



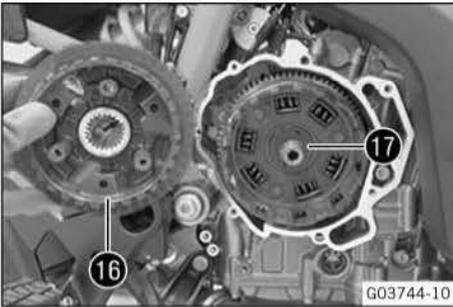
- Remove clutch discs 14, support ring, and pretension ring.



- Hold the inner clutch hub with the special tool.

Holding wrench (51129003000) (📖 p. 470)

- Remove nut 15 with the washer.

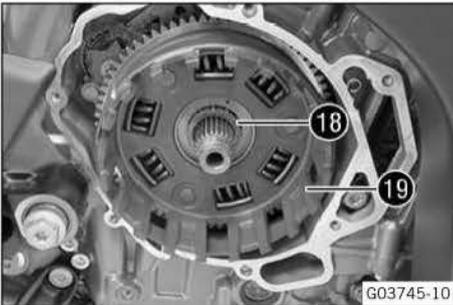


- Take off inner clutch hub **16** and washer **17**.



**Info**

The washer usually sticks to the inner clutch hub.



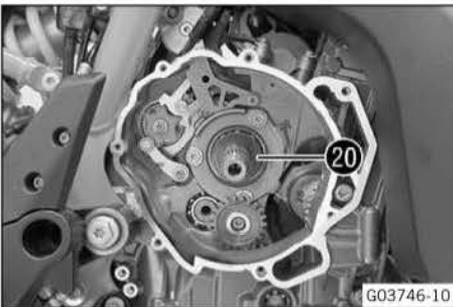
- Remove needle bearing **18**.



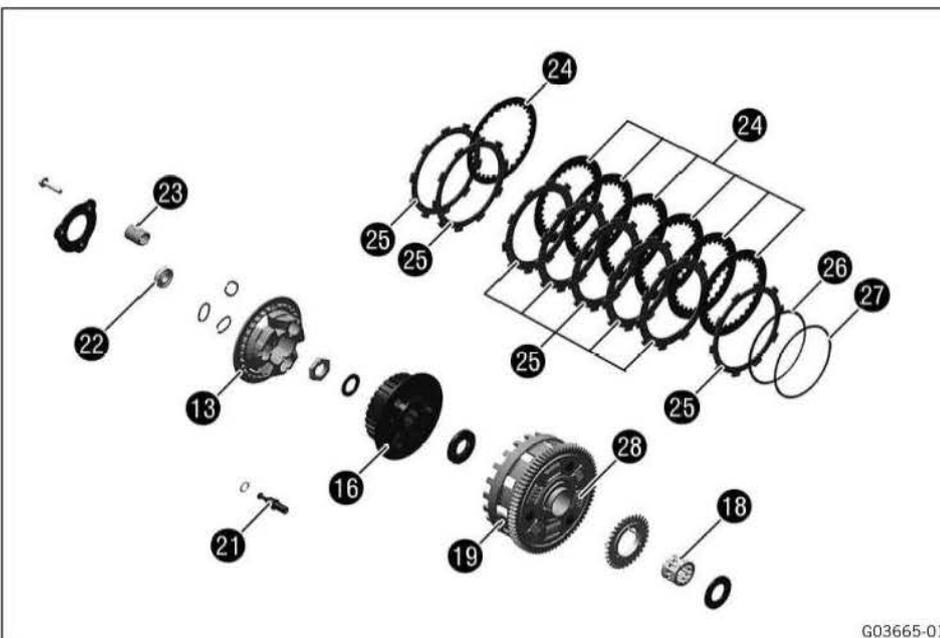
**Info**

Use a magnetic rod to make disassembly easier.  
Do not use pliers, as otherwise the needle bearing will be damaged.

- Take off clutch basket **19**.



- Remove washer **20**.



- Check clutch push rod **21** for damage and wear.
  - » If there is damage or wear:
    - Change clutch push rod.
- Check axial bearing **22** for damage and wear.

- » If there is damage or wear:
  - Change the axial bearing.
- Check length of clutch springs **23**.

Clutch spring - length	≥ 43.0 mm (≥ 1.693 in)
------------------------	------------------------

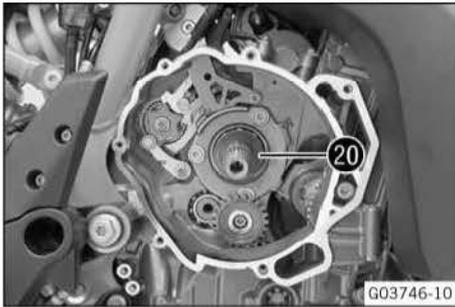
- » If the clutch spring length is shorter than specified:
  - Change all clutch springs.
- Check the contact surface of clutch pressure cap **13** for damage and wear.
  - » If there is damage or wear:
    - Change the clutch pressure cap.
- Check the thrust surfaces of the clutch facing discs in clutch basket **19** for wear.

Clutch basket - contact surface of clutch facing discs	≤ 0.5 mm (≤ 0.02 in)
--------------------------------------------------------	----------------------

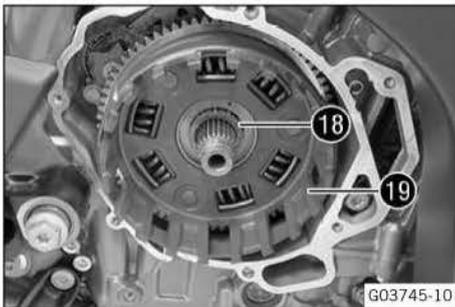
- » If the thrust surface exhibits excessive wear:
  - Change the clutch disc pack and clutch basket.
- Check needle bearing **18** for damage and wear.
  - » If there is damage or wear:
    - Change the needle bearing.
- Check intermediate clutch discs **24** for damage and wear.
  - » If the intermediate clutch discs are not level and are pitted:
    - Change the clutch disc pack.
- Check clutch facing discs **25** for discoloration and scoring.
  - » If there is discoloration or scoring:
    - Change the clutch disc pack.
- Check the thickness of the clutch disc pack.

Clutch disc pack - thickness	
New condition	35.60 ... 36.50 mm (1.4016 ... 1.437 in)
Wear limit	34.80 mm (1.3701 in)

- » If the clutch disc pack does not meet specifications:
  - Change the clutch disc pack.
- Check pretension ring **26** and support ring **27** for damage and wear.
  - » If there is damage or wear:
    - Change the pretension ring and support ring.
- Check inner clutch hub **16** for damage and wear.
  - » If there is damage or wear:
    - Change the inner clutch hub.
- Check springs **28** of the clutch basket for damage and wear.
  - » If there is damage, wear or play in the direction of rotation:
    - Change the clutch basket.



- Mount washer **20**.



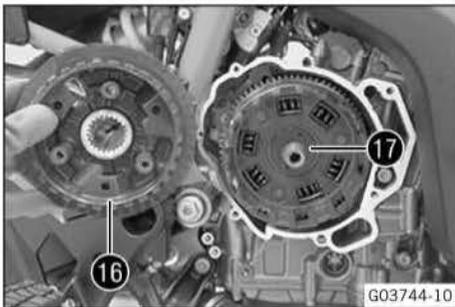
- Position the clutch basket **19**.



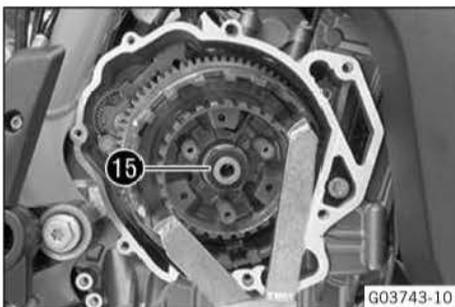
**Info**

Turn the clutch basket and oil pump idler gear backwards and forwards slightly to help them mesh more easily.

- Mount needle bearing **18**.



- Mount washer **17** and inner clutch hub **16**.

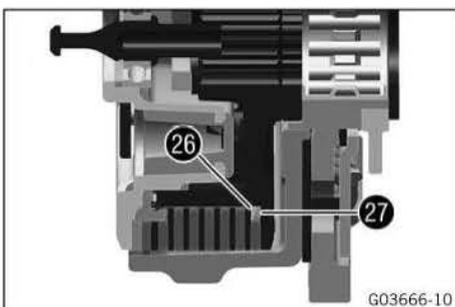


- Mount nut **15** with the washer.
- Hold the inner clutch hub with the special tool and tighten the nut.

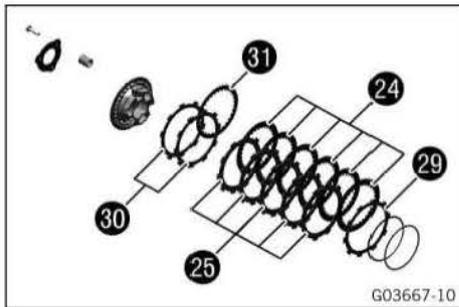
Guideline

Nut, inner clutch hub	M20x1.5	90 Nm (66.4 lbf ft) <b>Loctite®243™</b>
-----------------------	---------	--------------------------------------------

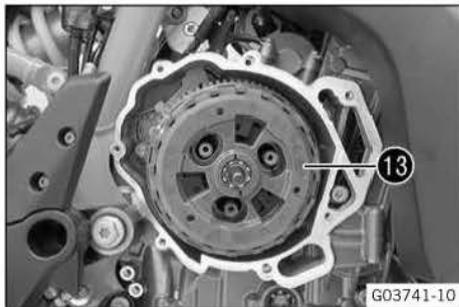
Holding wrench (51129003000) (p. 470)



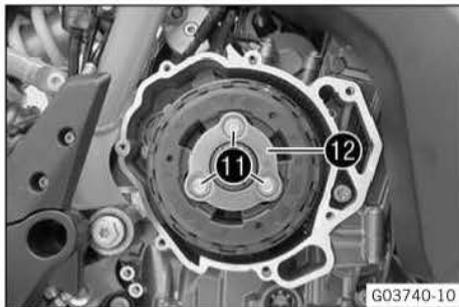
- Mount support ring **27** and pretension ring **26**.
- ✓ The pretension ring rests against the support ring on the inside and the outside faces away from the support ring.



- Thoroughly oil the clutch facing discs.
- Mount a clutch facing disc 29 with a larger inside diameter.
- Alternately mount 6 intermediate clutch discs 24 and 5 of the same clutch facing discs 25.
- Alternately mount 2 clutch facing discs 30 and an intermediate clutch disc 31 with a larger inside diameter.
- The outer clutch facing disc must be mounted offset by one mesh.



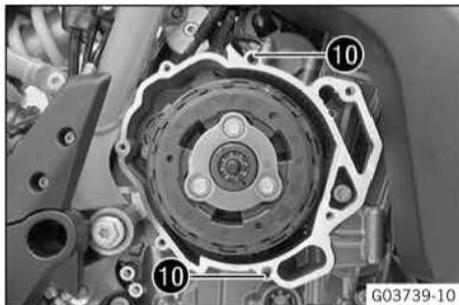
- Position clutch pressure cap 13.
  - ✓ The gear teeth of the outer intermediate clutch disc engage in the clutch pressure cap.
  - ✓ The clutch pressure cap rests flush against the outer clutch facing disc.



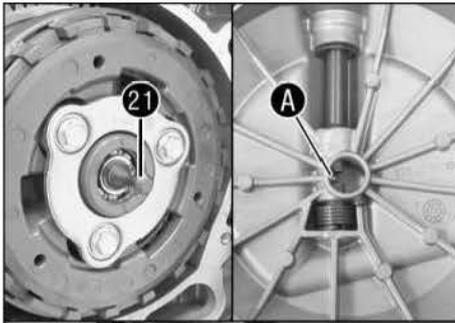
- Position clutch center 12 and the springs.
- Mount and tighten screws 11.

Guideline

Screw, clutch spring	M6	10 Nm (7.4 lbf ft)
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- Mount dowels 10.

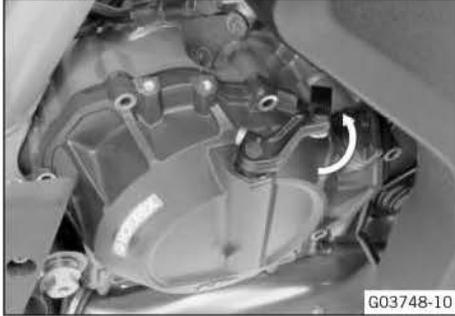


- Position the clutch cover with the clutch cover gasket.
- ✓ Clutch push rod **21** engages in groove **A**.

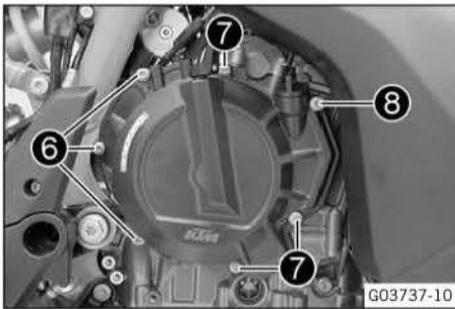


**Info**

Swivel clutch release lever counterclockwise.



G03748-10



G03737-10

- Mount screws **7**, but do not tighten yet.

Guideline

Screw, clutch cover	M6x30	10 Nm (7.4 lbf ft)
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- Mount screws **6**, but do not tighten yet.

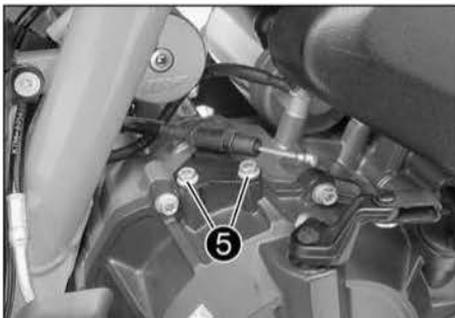
Guideline

Screw, clutch cover	M6x25	10 Nm (7.4 lbf ft)
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- Mount screw **8** and tighten all screws in a crisscross pattern.

Guideline

Screw, clutch cover	M6x35	10 Nm (7.4 lbf ft)
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- Position inner clutch cable with bracket.
- Mount and tighten screws **5**.

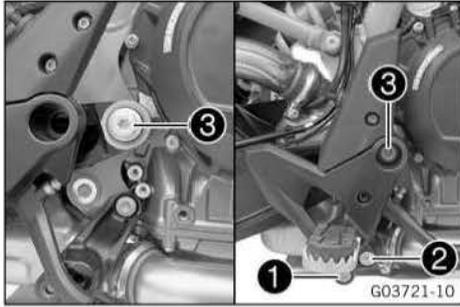
Guideline

Remaining screws, engine	M6	10 Nm (7.4 lbf ft)
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G03747-10

- Swivel clutch release lever **4** counterclockwise and hook in the inner clutch cable.



- Remove screw ③ from the swingarm pivot.
- Position the footrest bracket.
- Mount and tighten screw ③.

Guideline

Screw, swingarm pivot	M12	100 Nm (73.8 lbf ft)
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- Mount and tighten screw ②.

Guideline

Screw, front footrest bracket	M10x30	45 Nm (33.2 lbf ft) <b>Loctite®243™</b>
-------------------------------	--------	--------------------------------------------

- Mount and tighten screw ① with the bushing.

Guideline

Screw, front footrest bracket	M10x40	45 Nm (33.2 lbf ft) <b>Loctite®243™</b>
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**Finishing work**

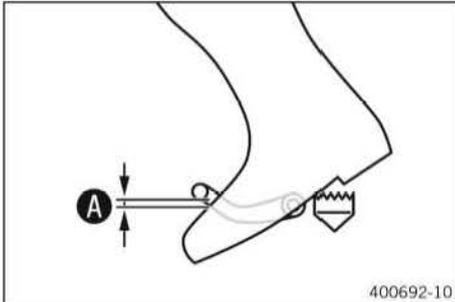
- Adjust the clutch release lever. (📖 p. 350)
- Check the engine oil level. (📖 p. 379)



## 21.1 Checking the basic position of the shift lever

### **i** Info

When driving, the shift lever must not touch the rider's boot when in the basic position. If the shift lever is permanently touching the boot, the transmission will be subject to excessive load; this can cause a malfunction of the quickshifter + (optional).

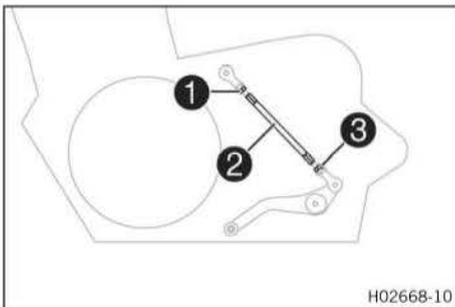


- Sit on the vehicle in the riding position and determine distance **A** between the upper edge of your boot and the shift lever.

Distance between shift lever and upper edge of boot	10 ... 20 mm (0.39 ... 0.79 in)
-----------------------------------------------------	---------------------------------

- » If the distance does not meet specifications:
  - Adjust the basic position of the shift lever. (p. 359)

## 21.2 Adjusting the basic position of the shift lever



- Loosen nut **1**, holding threaded rod **2**.
- Loosen nut **3**, holding threaded rod **2**.

**i** Info  
Nut **3** has a left-handed thread.

- Turn threaded rod **2** to adjust the shift lever.

**i** Info  
The range of adjustment is limited. The shift lever must not come into contact with any other vehicle components during the shift procedure.

- Tighten nut **3** while holding threaded rod **2**.

Guideline

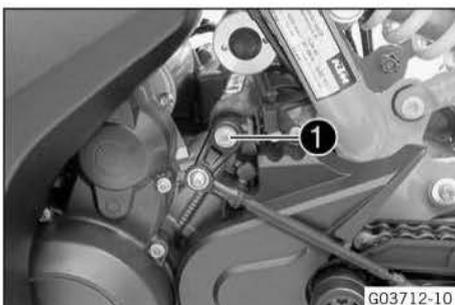
Nut, shift rod	M6LH	6 Nm (4.4 lbf ft)
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- Tighten nut **1** while holding threaded rod **2**.

Guideline

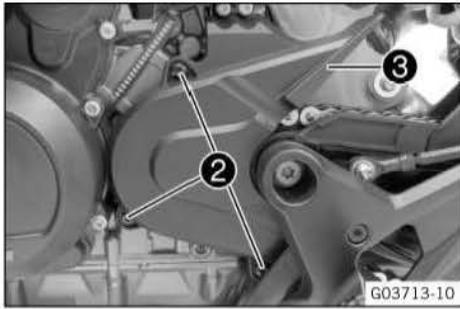
Nut, shift rod	M6	6 Nm (4.4 lbf ft)
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## 21.3 Changing the gear position sensor

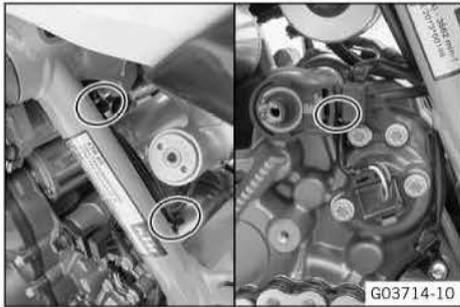


### Main work

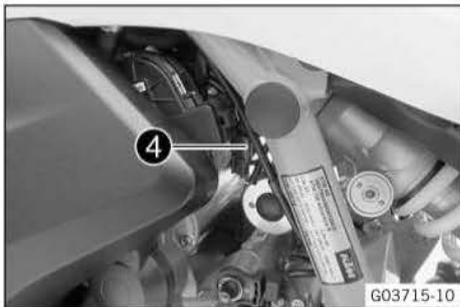
- Remove screw **1** with the washers.
- Hang the bell crank with the shift linkage to the side.



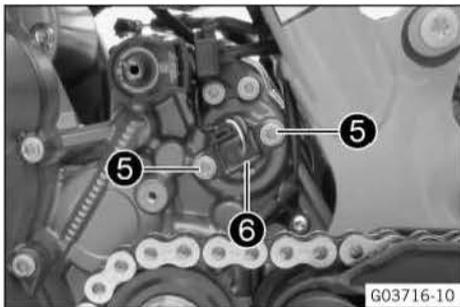
- Remove screws ②.
- Take off engine sprocket cover ③.



- Remove the cable ties.



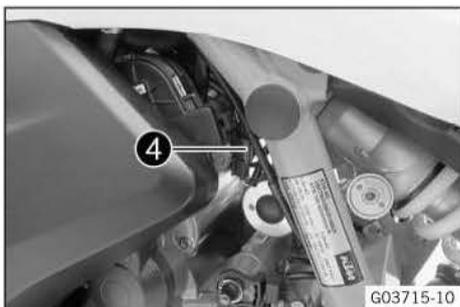
- Disconnect plug-in connector ④.
- Expose the cable.



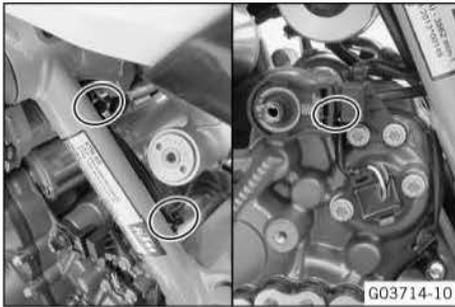
- Remove screws ⑤.
- Take off gear position sensor ⑥.
- Position a new gear position sensor.
- Mount and tighten screws ⑤.

Guideline

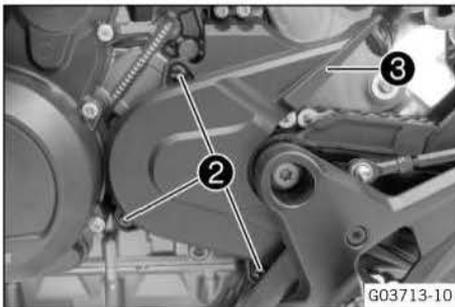
Screw, gear position sensor	M5	6 Nm (4.4 lbf ft) <b>Loctite®243™</b>
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- Route the cable without tension.
- Join plug-in connector ④.



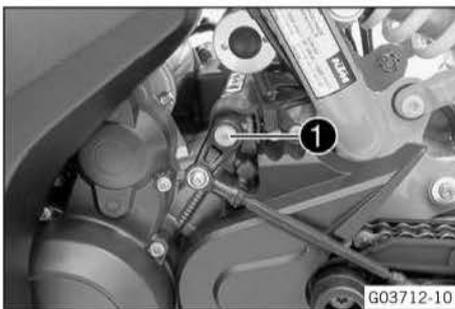
- Mount the cable ties.



- Position engine sprocket cover ③.
- Mount and tighten screws ②.

Guideline

Screw, engine sprocket cover	M5	5 Nm (3.7 lbf ft) <b>Loctite®243™</b>
------------------------------	----	------------------------------------------



- Position the bell crank.

**i Info**

The shift lever must not come into contact with any other vehicle components during the shift procedure.

- Locate and tighten screw ① with the washers.

Guideline

Screw, shift lever	M6	14 Nm (10.3 lbf ft) <b>Loctite®243™</b>
--------------------	----	--------------------------------------------

**Finishing work**

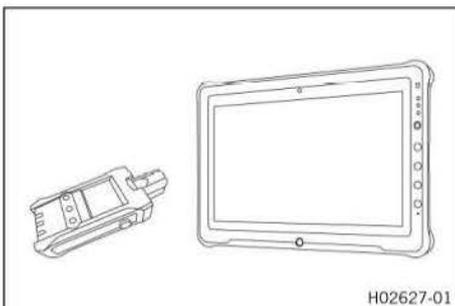
- Program the gear position sensor. (p. 361)

## 21.4 Programming the gear position sensor

**Condition**

The diagnostic tool is connected and running.

- Execute "**Engine electronics**" > "**Functions**" > "**Program the gear position sensor**".
- Switch the ignition off and on again.
  - ✓ The green idle indicator lamp **N** lights up.



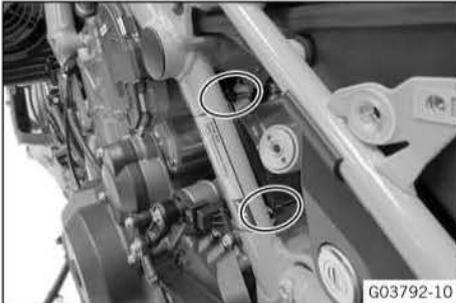
## 21.5 Changing the shift shaft sensor

### Preparatory work

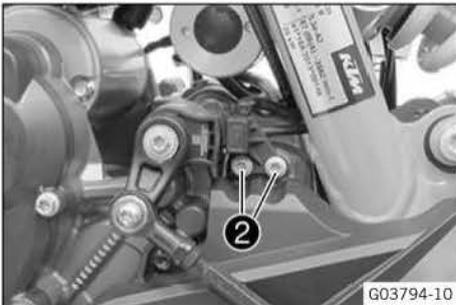
- Remove the seat. (📖 p. 114)
- Remove the left side cover. (📖 p. 130)
- Remove the battery cover. (📖 p. 131)
- Remove left fuel tank spoiler. (📖 p. 132)
- Remove the right side cover. (📖 p. 130)
- Remove right fuel tank spoiler. (📖 p. 134)
- Remove engine guard. (📖 p. 138)
- Remove the fuel tank. (📖 p. 114)

### Main work

- Remove the cable ties.



- Disconnect plug-in connector **1**.
- Expose the cable.



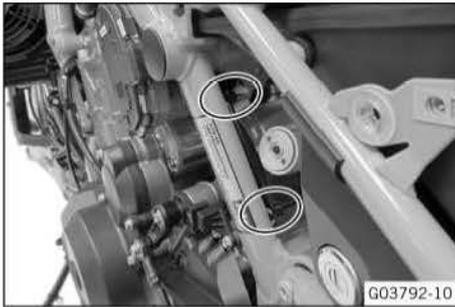
- Remove screws **2**.
- Take off the shift shaft sensor.
- Position the new shift shaft sensor.
- Mount and tighten the screws.

### Guideline

Screw, shift shaft sensor	M5	6 Nm (4.4 lbf ft) <b>Loctite®243™</b>
---------------------------	----	------------------------------------------



- Route the cable without tension.
- Join plug-in connector **1**.



- Mount the cable ties.

#### Finishing work

- Install the fuel tank. (p. 117)
- Install the engine guard. (p. 138)
- Install the right fuel tank spoiler. (p. 135)
- Install the right side cover. (p. 131)
- Install the left fuel tank spoiler. (p. 133)
- Install the battery cover. (p. 132)
- Install the left side cover. (p. 130)
- Mount the seat. (p. 114)
- Program the shift shaft sensor. (p. 363)



## 21.6 Programming the shift shaft sensor

#### Condition

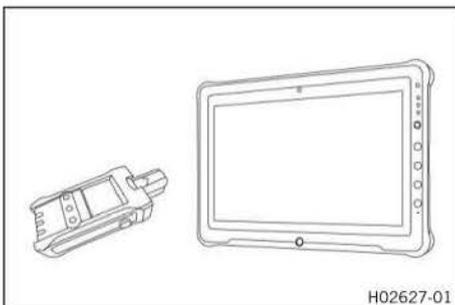
The diagnostic tool is connected and running.

#### Preliminary work

- Program the gear position sensor. (p. 361)

#### Main work

- Execute "Engine electronics" > "Functions" > "Program shift shaft sensor".



## 22.1 Checking the coolant fill level and antifreeze



### Warning

**Danger of scalding** During motorcycle operation, the coolant gets very hot and is under pressure.

- Do not open the radiator, the radiator hoses or other cooling system components if the engine or the cooling system are at operating temperature.
- Allow the cooling system and the engine to cool down before you open the radiator, the radiator hoses or other components of the cooling system.
- In the event of scalding, rinse the area affected immediately with lukewarm water.



### Warning

**Danger of poisoning** Coolant is toxic and a health hazard.

- Keep coolant out of the reach of children.
- Do not allow coolant to come into contact with the skin, the eyes and clothing.
- Consult a doctor immediately if coolant is swallowed.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly with water and consult a doctor immediately if coolant gets into the eyes.
- Change clothing if coolant spills onto your clothing.

### Condition

The engine is cold.

### Preparatory work

- Park the motorcycle on a horizontal surface.
- Remove the seat. (📖 p. 114)
- Remove the right side cover. (📖 p. 130)
- Remove the battery cover. (📖 p. 131)
- Remove right fuel tank spoiler. (📖 p. 134)

### Main work

- Remove radiator cap ❶ and the cover of the compensating tank.
- Check the antifreeze in the coolant.

-25 ... -45 °C (-13 ... -49 °F)

- » If the antifreeze in the coolant does not match the specified value:
  - Correct the antifreeze in the coolant.

- Check the coolant level.

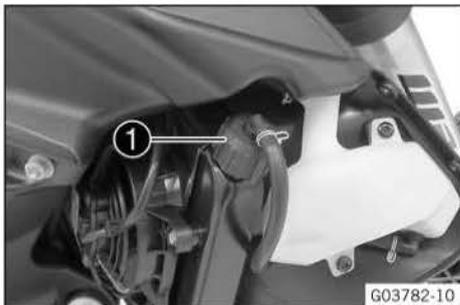
The radiator must be filled completely.

The coolant level in the compensating tank must be between **MIN** and **MAX**.

- » If the coolant level does not match the specified value:
  - Check the coolant level and the reason for the loss.
- Mount the radiator cap and the cover of the compensating tank.

### Finishing work

- Install the right fuel tank spoiler. (📖 p. 135)
- Install the battery cover. (📖 p. 132)
- Install the right side cover. (📖 p. 131)



- Mount the seat. (📖 p. 114)

## 22.2 Checking the coolant level in the compensating tank



### Warning

**Danger of scalding** During motorcycle operation, the coolant gets very hot and is under pressure.

- Do not open the radiator, the radiator hoses or other cooling system components if the engine or the cooling system are at operating temperature.
- Allow the cooling system and the engine to cool down before you open the radiator, the radiator hoses or other components of the cooling system.
- In the event of scalding, rinse the area affected immediately with lukewarm water.



### Warning

**Danger of poisoning** Coolant is toxic and a health hazard.

- Keep coolant out of the reach of children.
- Do not allow coolant to come into contact with the skin, the eyes and clothing.
- Consult a doctor immediately if coolant is swallowed.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly with water and consult a doctor immediately if coolant gets into the eyes.
- Change clothing if coolant spills onto your clothing.

### Condition

The engine is cold.

The radiator is completely full.

- Park the motorcycle on a horizontal surface.
- Check the coolant level in the compensating tank.

The coolant level must be between **MIN** and **MAX**.

- » If there is no coolant in the compensating tank:
  - Check the cooling system for leaks.



### Info

Do not start up the motorcycle!

- Fill/bleed the cooling system. (📖 p. 367)
- » If the coolant level in the compensating tank is not at the required level, but the tank is not empty:
  - Correct the coolant level in the compensating tank. (📖 p. 370)



## 22.3 Draining the coolant



### Warning

**Danger of scalding** During motorcycle operation, the coolant gets very hot and is under pressure.

- Do not open the radiator, the radiator hoses or other cooling system components if the engine or the cooling system are at operating temperature.
- Allow the cooling system and the engine to cool down before you open the radiator, the radiator hoses or other components of the cooling system.
- In the event of scalding, rinse the area affected immediately with lukewarm water.



### Warning

**Danger of poisoning** Coolant is toxic and a health hazard.

- Keep coolant out of the reach of children.
- Do not allow coolant to come into contact with the skin, the eyes and clothing.
- Consult a doctor immediately if coolant is swallowed.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly with water and consult a doctor immediately if coolant gets into the eyes.
- Change clothing if coolant spills onto your clothing.

### Condition

The engine is cold.

### Preparatory work

- Remove engine guard. (📖 p. 138)
- Remove the seat. (📖 p. 114)
- Remove the right side cover. (📖 p. 130)
- Remove the battery cover. (📖 p. 131)
- Remove right fuel tank spoiler. (📖 p. 134)

### Main work

- Position the motorcycle upright.
- Place an appropriate container under the engine.
- Remove screw ❶ with the seal ring.
- Remove the radiator cap.
- Completely drain the coolant.
- Mount and tighten screw ❶ with a new seal ring.

### Guideline

Screw, water pump cover	M6	10 Nm (7.4 lbf ft)
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- Mount the radiator cap.



## 22.4 Filling/bleeding the cooling system



### Warning

**Danger of poisoning** Coolant is toxic and a health hazard.

- Keep coolant out of the reach of children.
- Do not allow coolant to come into contact with the skin, the eyes and clothing.
- Consult a doctor immediately if coolant is swallowed.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly with water and consult a doctor immediately if coolant gets into the eyes.
- Change clothing if coolant spills onto your clothing.

### Condition

The fuel tank spoiler has been removed on the left and right.



- Remove radiator cap ①.



- Remove bleeder screw ②.
- Tilt the vehicle slightly to the right.
- Pour in coolant until it emerges without bubbles at the vent hole, and then mount and tighten bleeder screw ② immediately.

Coolant	1.60 l (1.69 qt.)	Coolant (☞ p. 464)
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- Completely fill the radiator with coolant.
- Mount radiator cap ①.
- Check the coolant level in the compensating tank. (☞ p. 365)
- Rest the vehicle on the side stand.



### Danger

**Danger of poisoning** Exhaust gases are toxic and inhaling them may result in unconsciousness and death.

- Always make sure there is sufficient ventilation when running the engine.
- Use effective exhaust extraction when starting or running the engine in an enclosed space.

- Start the engine and run it until the 5th bar of the temperature indicator lights up.
- Stop the engine and allow it to cool down.

- After the engine has cooled down, check the coolant level in the radiator and in the compensating tank again and add more coolant if necessary.

### 22.5 Changing the coolant



#### Warning

**Danger of scalding** During motorcycle operation, the coolant gets very hot and is under pressure.

- Do not open the radiator, the radiator hoses or other cooling system components if the engine or the cooling system are at operating temperature.
- Allow the cooling system and the engine to cool down before you open the radiator, the radiator hoses or other components of the cooling system.
- In the event of scalding, rinse the area affected immediately with lukewarm water.



#### Warning

**Danger of poisoning** Coolant is toxic and a health hazard.

- Keep coolant out of the reach of children.
- Do not allow coolant to come into contact with the skin, the eyes and clothing.
- Consult a doctor immediately if coolant is swallowed.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly with water and consult a doctor immediately if coolant gets into the eyes.
- Change clothing if coolant spills onto your clothing.

#### Condition

The engine is cold.

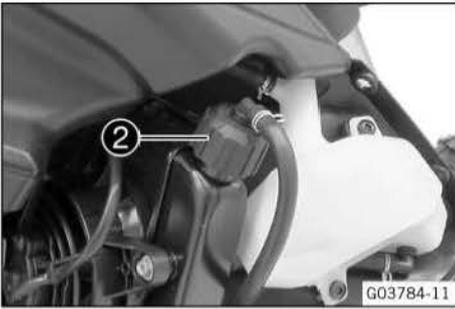
#### Preparatory work

- Remove engine guard. (🔗 p. 138)
- Remove the seat. (🔗 p. 114)
- Remove the left side cover. (🔗 p. 130)
- Remove the battery cover. (🔗 p. 131)
- Remove left fuel tank spoiler. (🔗 p. 132)
- Remove the right side cover. (🔗 p. 130)
- Remove right fuel tank spoiler. (🔗 p. 134)

#### Main work

- Position the motorcycle upright.
- Place an appropriate container under the engine.
- Remove screw **1** with the seal ring.





- Remove radiator cap ②.
- Completely drain the coolant.
- Mount and tighten screw ① with a new seal ring.

Guideline

Screw plug, water pump drain hole	<b>EJOTALtracs® Plus 60x14</b>	8 Nm (5.9 lbf ft) <b>Loctite®243™</b>
-----------------------------------	--------------------------------	------------------------------------------



- Remove bleeder screw ③.
- Tilt the vehicle slightly to the right.
- Pour in coolant until it emerges without bubbles at the vent hole, and then mount and tighten bleeder screw ③ immediately.

Coolant	1.60 l (1.69 qt.)	Coolant (📖 p. 464)
---------	----------------------	--------------------

- Completely fill the radiator with coolant.
- Mount radiator cap ②.
- Check the coolant level in the compensating tank. (📖 p. 365)
- Rest the vehicle on the side stand.



**Danger**

**Danger of poisoning** Exhaust gases are toxic and inhaling them may result in unconsciousness and death.

- Always make sure there is sufficient ventilation when running the engine.
- Use effective exhaust extraction when starting or running the engine in an enclosed space.

- Start the engine and run it until the 5th bar of the temperature indicator lights up.
- Stop the engine and allow it to cool down.
- After the engine has cooled down, check the coolant level in the radiator and in the compensating tank again and add more coolant if necessary.

**Finishing work**

- Install the right fuel tank spoiler. (📖 p. 135)
- Install the right side cover. (📖 p. 131)
- Install the left fuel tank spoiler. (📖 p. 133)
- Install the battery cover. (📖 p. 132)
- Install the left side cover. (📖 p. 130)
- Mount the seat. (📖 p. 114)
- Install the engine guard. (📖 p. 138)

## 22.6 Correcting the coolant level in the compensating tank



### Warning

**Danger of scalding** During motorcycle operation, the coolant gets very hot and is under pressure.

- Do not open the radiator, the radiator hoses or other cooling system components if the engine or the cooling system are at operating temperature.
- Allow the cooling system and the engine to cool down before you open the radiator, the radiator hoses or other components of the cooling system.
- In the event of scalding, rinse the area affected immediately with lukewarm water.



### Warning

**Danger of poisoning** Coolant is toxic and a health hazard.

- Keep coolant out of the reach of children.
- Do not allow coolant to come into contact with the skin, the eyes and clothing.
- Consult a doctor immediately if coolant is swallowed.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly with water and consult a doctor immediately if coolant gets into the eyes.
- Change clothing if coolant spills onto your clothing.

### Condition

The engine is cold.

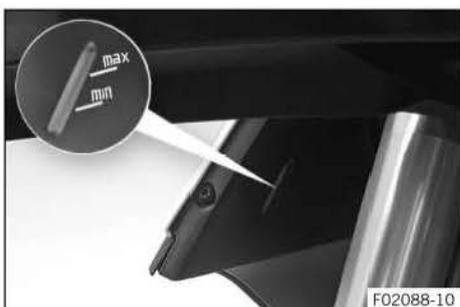
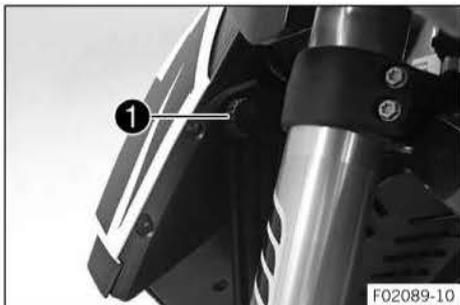
The radiator is completely full.

### Preparatory work

- Check the coolant level in the compensating tank. (📖 p. 365)

### Main work

- Remove cover ❶ of the compensating tank.



- Add coolant until the coolant reaches the specified level.

### Guideline

The coolant level must be between **MIN** and **MAX**.

Coolant (📖 p. 464)

- Mount the cover of the compensating tank.

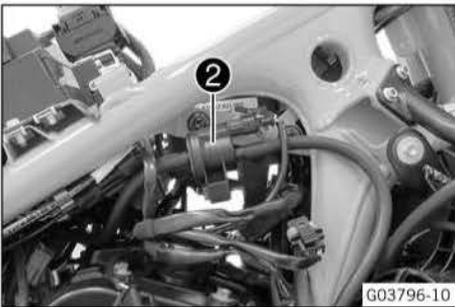
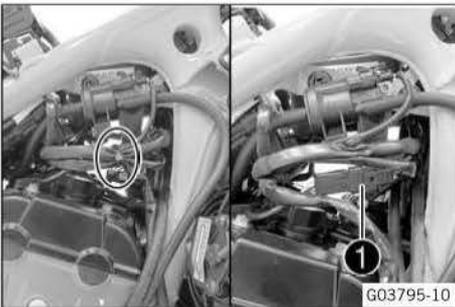
## 23.1 Checking the valve clearance

### Preparatory work

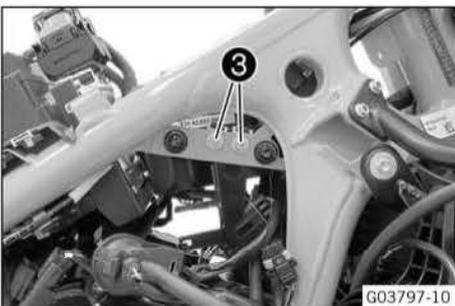
- Remove the seat. (p. 114)
- Remove the left side cover. (p. 130)
- Remove the battery cover. (p. 131)
- Remove left fuel tank spoiler. (p. 132)
- Remove the right side cover. (p. 130)
- Remove right fuel tank spoiler. (p. 134)
- Remove engine guard. (p. 138)
- Remove the fuel tank. (p. 114)
- Raise motorcycle with rear lifting gear. (p. 15)

### Main work

- Remove the cable ties.
- Pull off and disconnect plug-in connector **1** from the holder.



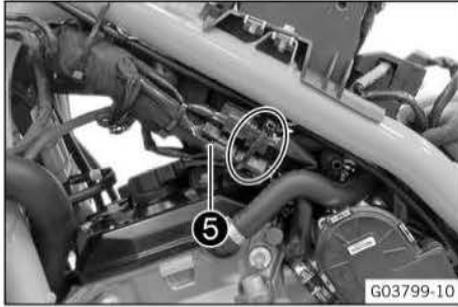
- Pull fuel evaporation valve **2** off the holder and hang it to the side.



- Remove screws **3**.
- Hang the holder to the side.



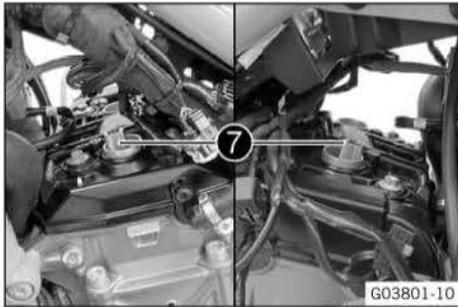
- Remove screw **4**.
- Remove the ignition coil.



- Remove the cable ties.
- Disconnect plug-in connector **5**.

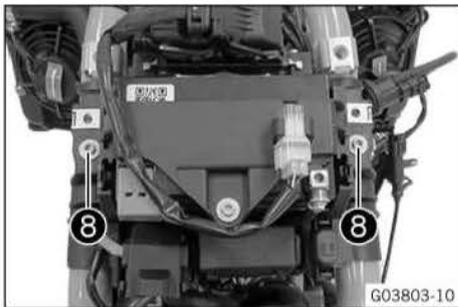


- Remove screw **6**.
- Remove the ignition coil.

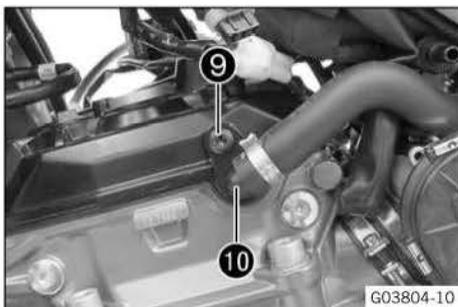


- Remove spark plugs using special tool **7**.

Spark plug wrench with link (77229172000) (📖 p. 479)



- Remove screws **8**.
- Press the battery compartment upwards.



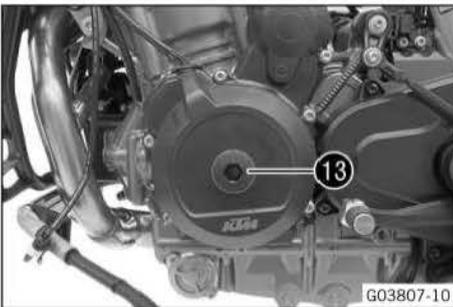
- Remove screw **9** with the retaining bracket.
- Pull off bleeder flange **10** and hang it to the side.



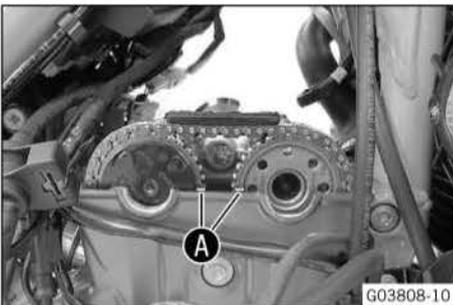
- Remove screws **11** with the gaskets.
- Take off the valve cover with the valve cover seal.



- Remove spark plug shaft inserts **12** with the gaskets.



- Remove screw plug **13** with the O-ring.



- Crank the engine several times.
- Turn the crankshaft counterclockwise and set it to ignition top dead center of cylinder 1.
- ✓ The **0T1** markings **A** are aligned with the sealing surface.

**i Info**  
The **0T1** markings are line markings.



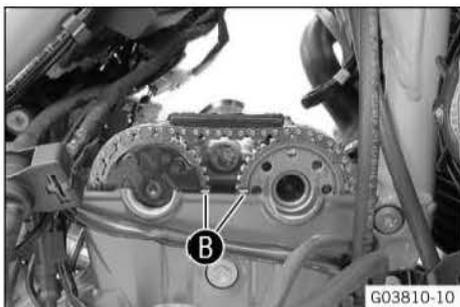
- Check the valve clearance at the exhaust valves and the intake valves between the camshaft and cam lever using the special tool **14**.

**Guideline**

Valve play, cold	
Intake at: 20 °C (68 °F)	0.10 ... 0.15 mm (0.0039 ... 0.0059 in)
Exhaust at: 20 °C (68 °F)	0.15 ... 0.20 mm (0.0059 ... 0.0079 in)

Feeler gauge (59029041100) (🔧 p. 471)

- » If the valve clearance does not meet specifications:
  - Adjust the valve clearance. (🔧 p. 378)



- Turn the crankshaft counterclockwise by the specified value and set it to ignition top dead center of cylinder 2.

Guideline

435°

- ✓ The **OT2** markings **B** are aligned with the sealing surface.

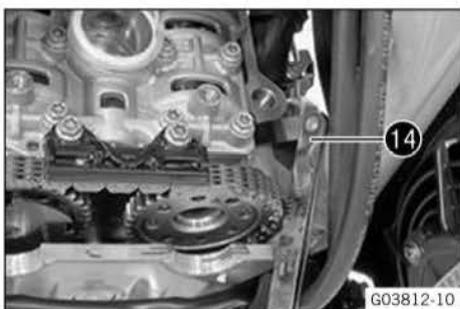


**Info**

The **OT2** markings are dot markings.



- Remove cam lever clip **15**.



- Check the valve clearance at the exhaust valves and the intake valves between the camshaft and cam lever using the special tool **14**.

Guideline

Valve play, cold	
Intake at: 20 °C (68 °F)	0.10 ... 0.15 mm (0.0039 ... 0.0059 in)
Exhaust at: 20 °C (68 °F)	0.15 ... 0.20 mm (0.0059 ... 0.0079 in)

Feeler gauge (59029041100) (📖 p. 471)

- » If the valve clearance does not meet specifications:
  - Adjust the valve clearance. (📖 p. 378)

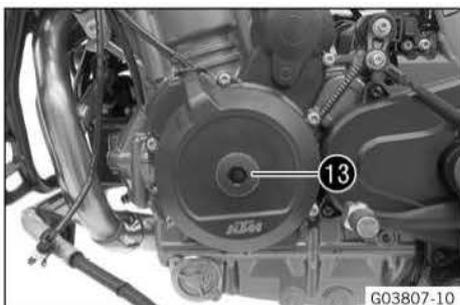


- Mount cam lever clip **15**.



**Info**

Check for correct positioning of the exhaust cam lever.



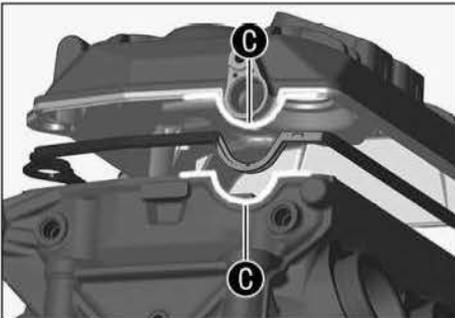
- Mount and tighten screw plug **13** with the O-ring.

Guideline

Screw in alternator cover	M24x1.5	8 Nm (5.9 lbf ft)
---------------------------	---------	-------------------

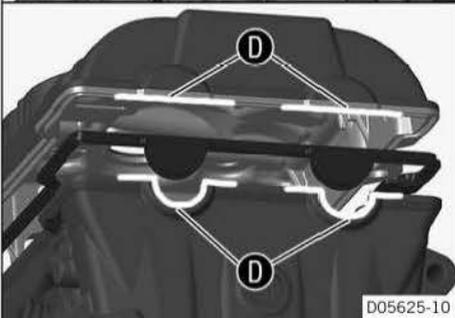


- Grease the O-rings and mount spark plug shaft inserts **12** with the gaskets.



- Clean and degrease the sealing surfaces.
- Apply a thin layer of sealing compound to areas **C** and **D**.

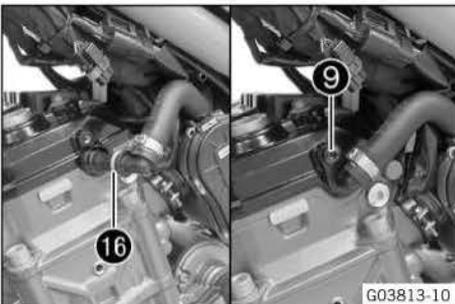
Loctite® 5910



- Position the valve cover with the valve cover seal.
- Mount and tighten screws **11** with the gaskets.

Guideline

Screw, valve cover	M6	10 Nm (7.4 lbf ft)
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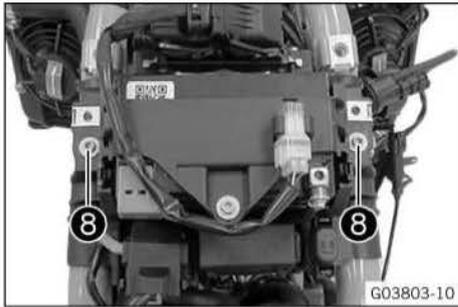
- Grease O-ring **16**.

Long-life grease (p. 466)

- Position the bleeder flange in the valve cover.
- Mount and tighten screw **9** with retaining bracket.

Guideline

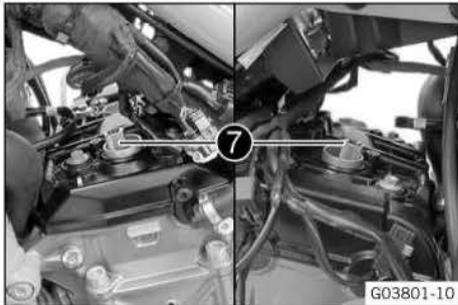
Screw, bleeder flange	<b>EJOTALtracs®</b> M6x12	8 Nm (5.9 lbf ft) <b>Loctite®243™</b>
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- Position the battery compartment.
- Mount and tighten screws **8**.

Guideline

Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
---------------------------	----	--------------------



- Mount and tighten the spark plugs using special tool **7**.

Guideline

Spark plug	M10	10 Nm (7.4 lbf ft)
------------	-----	--------------------

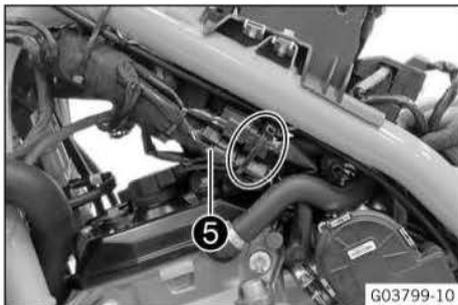
Spark plug wrench with link (77229172000) ( p. 479)		
-----------------------------------------------------	--	--



- Mount the ignition coil.
- Mount and tighten screw **6**.

Guideline

Screw, ignition coil	M6	8 Nm (5.9 lbf ft)
----------------------	----	-------------------



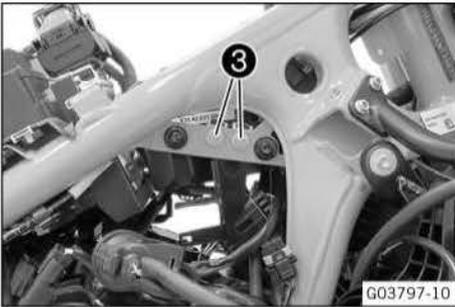
- Join plug-in connector **5**.
- Route the cable without tension and secure with cable ties.



- Mount the ignition coil.
- Mount and tighten screw **4**.

Guideline

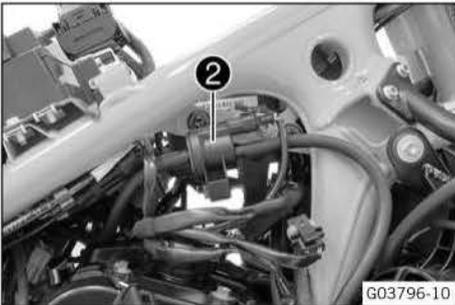
Screw, ignition coil	M6	8 Nm (5.9 lbf ft)
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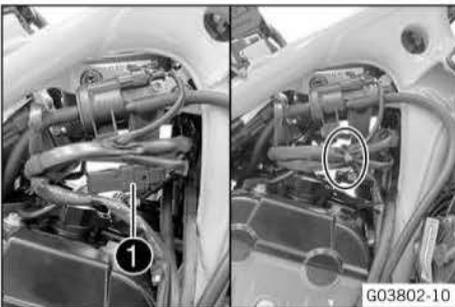
- Position the holder.
- Mount and tighten screws **3**.

Guideline

Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
------------------------------	----	--------------------



- Position fuel evaporation valve **2** on the holder.



- Join plug-in connector **1** and position it on the holder.
- Route the cable without tension and secure with cable ties.

**Finishing work**

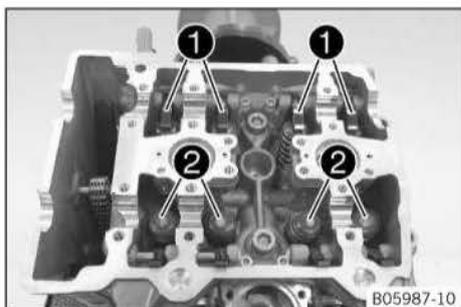
- Remove the rear of the motorcycle from the lifting gear. (p. 15)
- Install the fuel tank. (p. 117)
- Install the engine guard. (p. 138)
- Install the right fuel tank spoiler. (p. 135)
- Install the right side cover. (p. 131)
- Install the left fuel tank spoiler. (p. 133)
- Install the battery cover. (p. 132)
- Install the left side cover. (p. 130)
- Mount the seat. (p. 114)



## 23.2 Adjusting the valve clearance

### **i** Info

For purposes of illustration, the following operations are shown with the engine removed. Removal is not necessary.



### **Preparatory work**

- Remove the camshafts. (📖 p. 271)

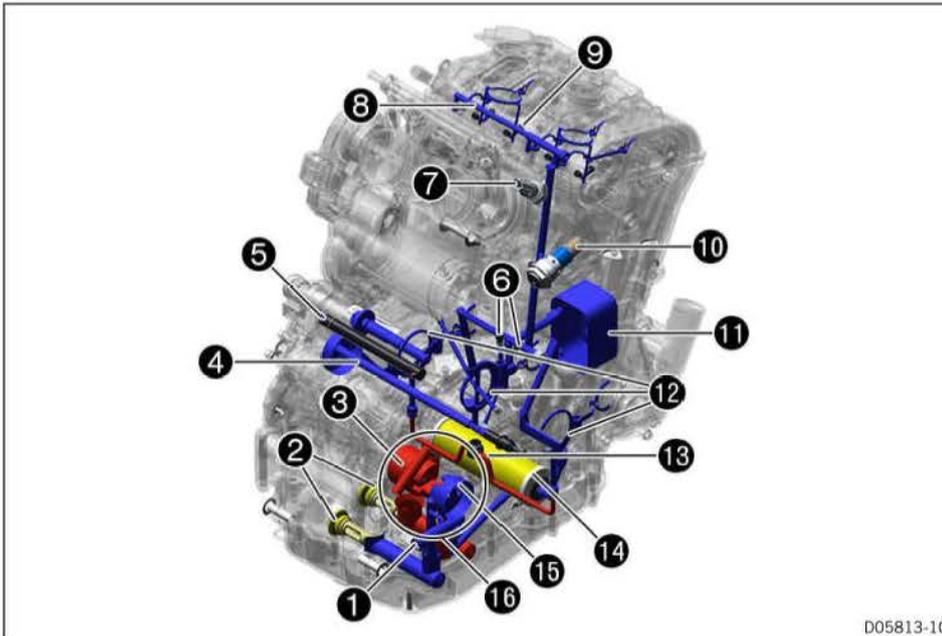
### **Main work**

- Swing up cam lever ①.
- Remove shims ② and set them down according to the installation position.
- Correct the shims based on the results of the valve clearance check.
- Insert suitable shims.

### **Finishing work**

- Install the camshafts. (📖 p. 333)

## 24.1 Oil circuit



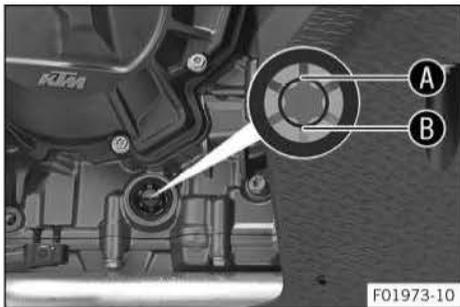
D05813-10

- ① Oil pressure control valve
- ② Oil screens
- ③ Suction pump
- ④ Clutch lubrication
- ⑤ Oil spray tube
- ⑥ Oil nozzles for piston cooling
- ⑦ Oil pressure sensor
- ⑧ Cam lever shaft
- ⑨ Oil nozzles for cam follower lubrication
- ⑩ Timing chain tensioner
- ⑪ Heat exchanger
- ⑫ Conrod bearing lubrication
- ⑬ Oil line
- ⑭ Oil filter
- ⑮ Force pump
- ⑯ Oil pump unit

## 24.2 Checking the engine oil level

**Info**

The engine oil level must be checked at normal engine operating temperature.



- Stand motorcycle upright on a horizontal surface.
- Check the engine oil level.

**i Info**

After switching off the engine, wait one minute before checking the level.

The engine oil must be between marking **A** and marking **B** of the oil level viewer.

- » If the engine oil level is below the marking **B**:
  - Add engine oil. (📖 p. 383)
- » If the engine oil level is above the marking **A**:
  - Correct engine oil level.

## 24.3 Checking the oil pressure



**Warning**

**Danger of scalding** Engine and gear oil get very hot when the motorcycle is ridden.

- Wear suitable protective clothing and safety gloves.
- In the event of scalding, rinse the area affected immediately with lukewarm water.



**Note**

**Environmental hazard** Hazardous substances cause environmental damage.

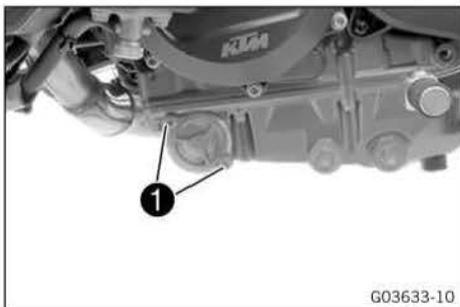
- Dispose of oils, grease, filters, fuel, cleaning agents, brake fluid, etc., correctly and in compliance with the applicable regulations.

**Preparatory work**

- Remove engine guard. (📖 p. 138)

**Main work**

- Place an appropriate container under the engine.
- Remove screws **1**.
- Remove the oil filter cover with the O-ring.
- Remove the oil filter.



Lock ring plier (51012011000) (📖 p. 470)

- Position the special tool with the O-ring.

Oil pressure adapter (75029094000) (📖 p. 478)

- Mount and tighten the screws.

**Guideline**

Screw, oil filter cover	M5	6 Nm (4.4 lbf ft)
-------------------------	----	-------------------

- Connect the pressure testing tool to the special tool without the T-plate.

Pressure testing tool (61029094000) (📖 p. 473)



- Check the engine oil level. (📖 p. 379)



**Danger**

**Danger of poisoning** Exhaust gases are toxic and inhaling them may result in unconsciousness and death.

- Always make sure there is sufficient ventilation when running the engine.
- Use effective exhaust extraction when starting or running the engine in an enclosed space.

- Start the engine and allow it to warm up.
- Check the oil pressure.

Oil pressure	
Coolant temperature: ≥ 60 °C (≥ 140 °F)	1.8 ... 4.5 bar (26 ... 65 psi)
Idle speed	

- » If the measured value is less than the specification:
  - Check the oil pumps for wear. Check that all oil holes are clear.
- Switch off the engine.



**Warning**

**Danger of burns** Some vehicle components get very hot when the machine is driven.

- Wear appropriate protective clothing and safety gloves. In case of burns, rinse immediately with lukewarm water.

- Remove the special tools.
- Grease the O-ring of the oil filter cover.
- Mount the oil filter cover.
- Mount and tighten the screws.

Guideline

Screw, oil filter cover	M5	6 Nm (4.4 lbf ft)
-------------------------	----	-------------------

**Finishing work**

- Check the engine oil level. (📖 p. 379)
- Install the engine guard. (📖 p. 138)



**24.4 Changing the engine oil and oil filter, cleaning the oil screens**



**Warning**

**Danger of scalding** Engine and gear oil get very hot when the motorcycle is ridden.

- Wear suitable protective clothing and safety gloves.
- In the event of scalding, rinse the area affected immediately with lukewarm water.



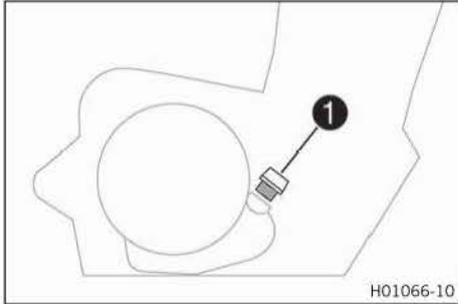
**Note**

**Environmental hazard** Hazardous substances cause environmental damage.

- Dispose of oils, grease, filters, fuel, cleaning agents, brake fluid, etc., correctly and in compliance with the applicable regulations.

**i Info**

Drain the engine oil while the engine is at operating temperature.

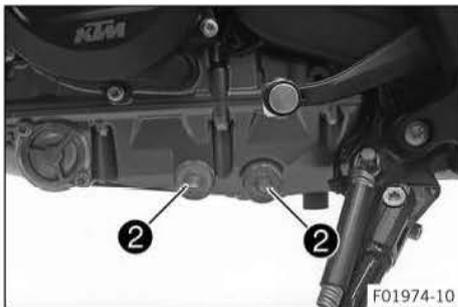


**Preparatory work**

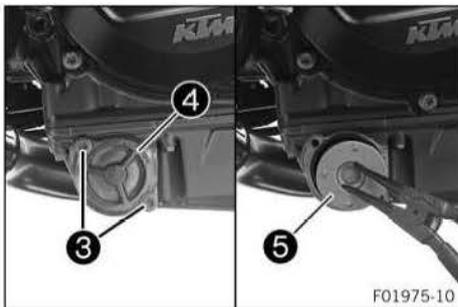
- Remove engine guard. (📖 p. 138)

**Main work**

- Rest the motorcycle on its side stand on a horizontal surface.
- Place an appropriate container under the engine.
- Remove filler plug **1** with the O-ring.



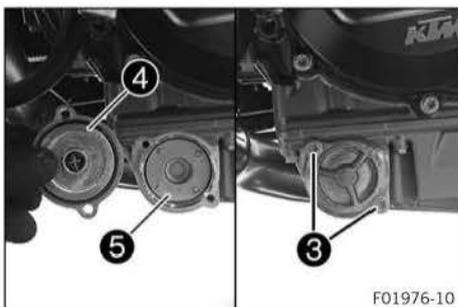
- Remove oil drain plugs **2** with the magnets, O-rings, and oil screens.



- Remove screws **3**. Take off oil filter cover **4** with the O-ring.
- Pull oil filter **5** out of the oil filter housing.

Lock ring plier (51012011000) (📖 p. 470)

- Completely drain the engine oil.
- Thoroughly clean the parts and sealing surfaces.



- Insert new oil filter **5**.

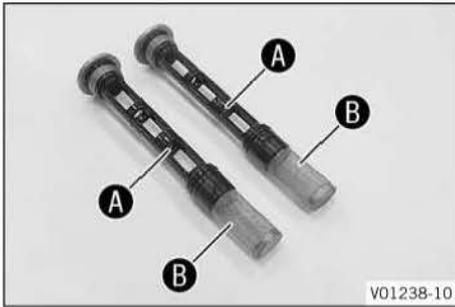
**i Info**

Only insert the oil filter by hand.

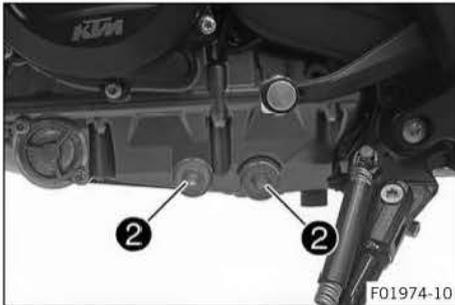
- Oil the new O-ring of the oil filter cover. Position oil filter cover **4**.
- Mount and tighten screws **3**.

**Guideline**

Screw, oil filter cover	M5	6 Nm (4.4 lbf ft)
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- Thoroughly clean magnets **A** and oil screens **B** of the oil drain plugs.



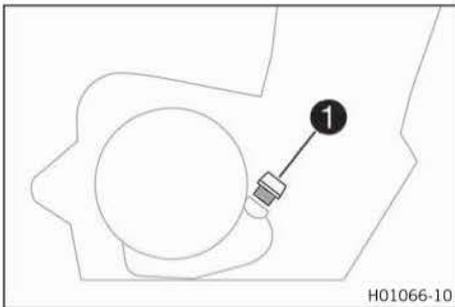
- Mount the oil drain plugs **2** with magnets and new seal rings, and tighten.

Guideline

Plug, oil screen	M20x1.5	20 Nm (14.8 lbf ft)
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- Fill up with engine oil at the clutch cover.

Engine oil	2.8 l (3 qt.)	Engine oil (SAE 10W/50) (p. 464)
------------	---------------	----------------------------------



- Mount and tighten filler plug **1** with the O-ring.



**Danger**

**Danger of poisoning** Exhaust gases are toxic and inhaling them may result in unconsciousness and death.

- Always make sure there is sufficient ventilation when running the engine.
- Use effective exhaust extraction when starting or running the engine in an enclosed space.

- Start the engine and check that it is oil-tight.

**Finishing work**

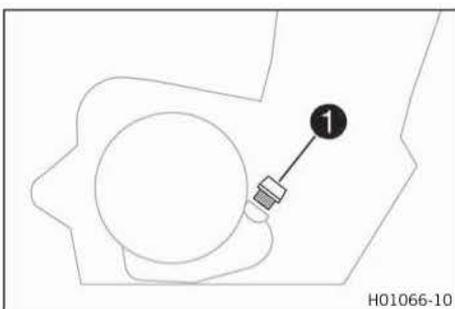
- Check the engine oil level. (p. 379)
- Install the engine guard. (p. 138)

**24.5 Adding engine oil**



**Info**

Too little engine oil or poor-quality engine oil will result in premature wear of the engine.



**Main work**

- Remove filler plug **1** with the O-ring.
- Fill engine oil to the middle of the level viewer.

Engine oil (SAE 10W/50) (p. 464)
----------------------------------



**Info**

In order to achieve optimal engine oil performance, it is not advisable to mix different engine oils. We recommend changing the engine oil when necessary.

- Mount and tighten filler plug **1** with the O-ring.



## Danger

**Danger of poisoning** Exhaust gases are toxic and inhaling them may result in unconsciousness and death.

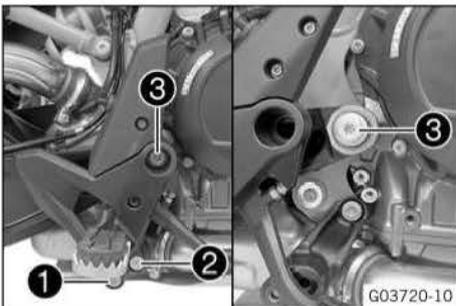
- Always make sure there is sufficient ventilation when running the engine.
- Use effective exhaust extraction when starting or running the engine in an enclosed space.

- Start the engine and check that it is oil-tight.

### Finishing work

- Check the engine oil level. (📖 p. 379)

## 24.6 Checking/cleaning the oil nozzle for clutch lubrication



### Main work

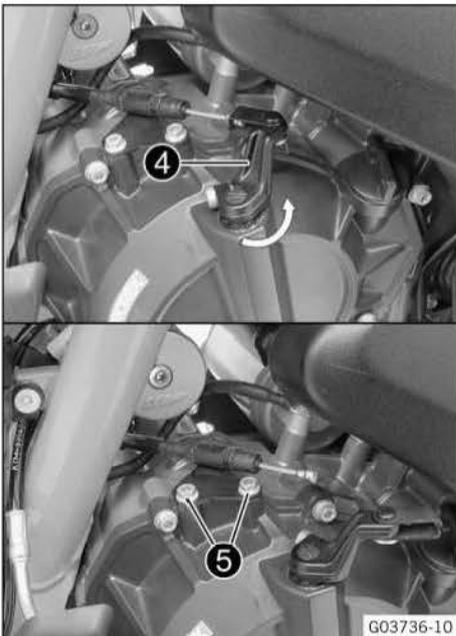
- Remove screw ① with the bushing.
- Remove screw ②.
- Remove screw ③.
- Take off footrest bracket and hang to the side.

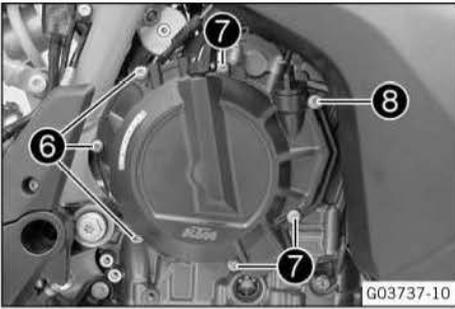


### Info

Cover the components to protect them against damage.

- Mount screw ③, but do not tighten.
- Swivel the clutch release lever ④ counterclockwise and detach the inner clutch cable.
- Remove screws ⑤.
- Hang the inner clutch cable with bracket to the side.

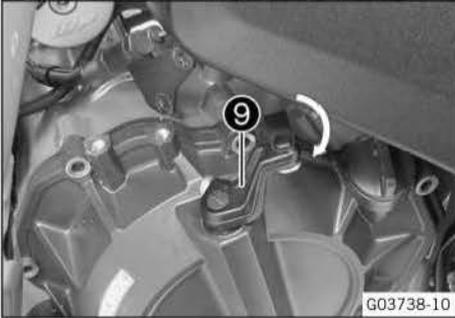




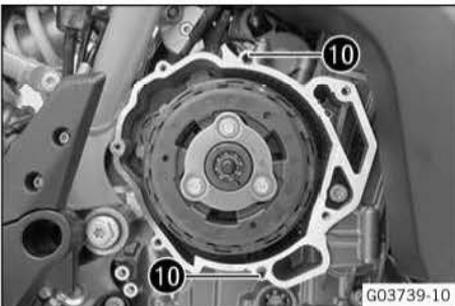
- Remove screws 6 and 7.
- Remove screw 8.



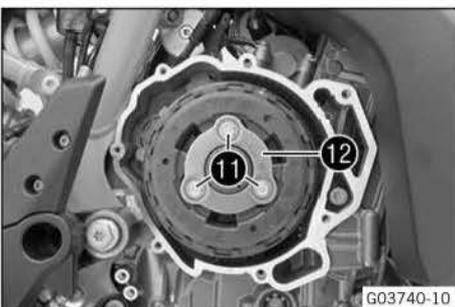
- Swivel the clutch release lever 9 clockwise and take off clutch cover with clutch cover gasket.

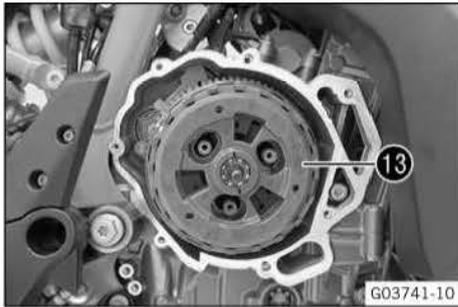


- Remove dowels 10.

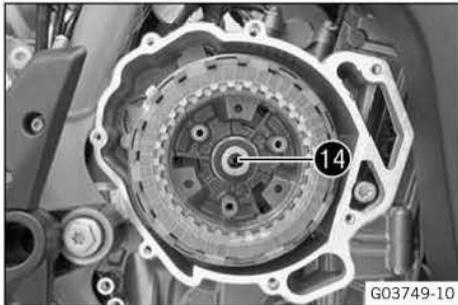


- Remove screws 11.
- Take off clutch center 12 and the springs.





- Take off clutch pressure cap 13.



- Remove oil nozzle 14.
- Clean the thread of the main shaft.



**Info**

Ensure that there is no thread locking material in the hole.

- Check that the oil nozzle for clutch lubrication is not blocked.
  - » If the oil nozzle is blocked:
    - Clean the oil nozzle and change as necessary.
- Mount and tighten oil nozzle 14.

Guideline

Oil nozzle for clutch lubrication	M8	5 Nm (3.7 lbf ft) <b>Loctite®243™</b>
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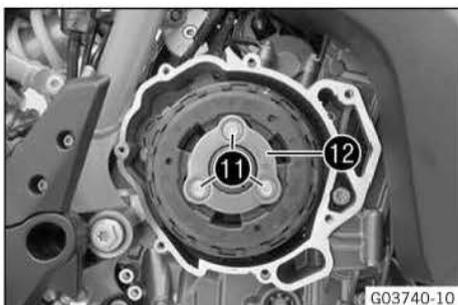


**Info**

Ensure that there is no thread locking material in the hole.



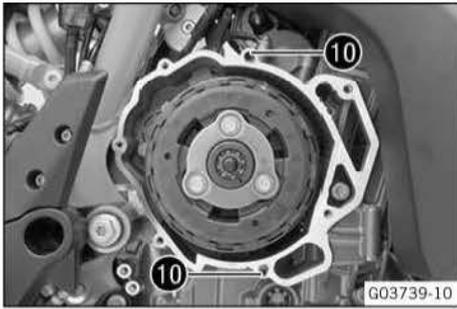
- Position clutch pressure cap 13.
  - ✓ The gear teeth of the outer intermediate clutch disc engage in the clutch pressure cap.
  - ✓ The clutch pressure cap rests flush against the outer clutch facing disc.



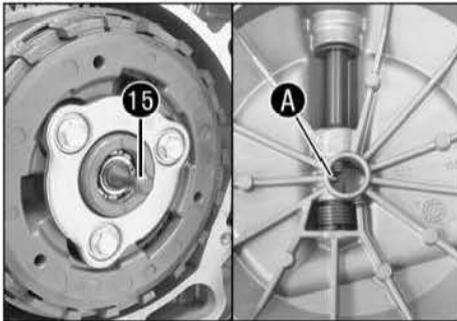
- Position clutch center 12 and the springs.
- Mount and tighten screws 11.

Guideline

Screw, clutch spring	M6	10 Nm (7.4 lbf ft)
----------------------	----	--------------------



- Mount dowels 10.

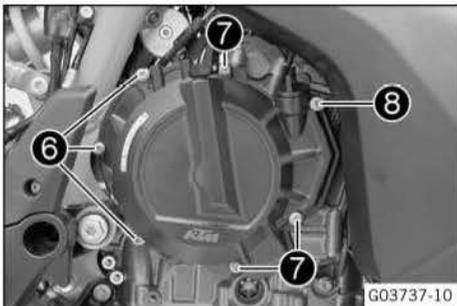


- Position the clutch cover with the clutch cover gasket.
- ✓ Clutch push rod 15 engages in groove A.



**Info**

Swivel clutch release lever counterclockwise.



- Mount screws 7, but do not tighten yet.

Guideline

Screw, clutch cover	M6x30	10 Nm (7.4 lbf ft)
---------------------	-------	--------------------

- Mount screws 6, but do not tighten yet.

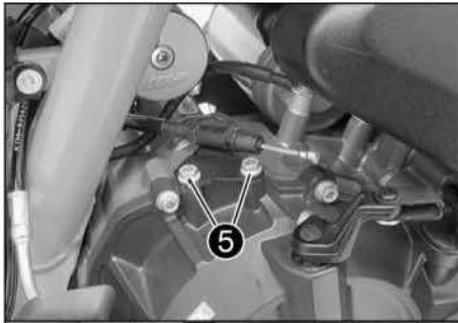
Guideline

Screw, clutch cover	M6x25	10 Nm (7.4 lbf ft)
---------------------	-------	--------------------

- Mount screw 8 and tighten all screws in a crisscross pattern.

Guideline

Screw, clutch cover	M6x35	10 Nm (7.4 lbf ft)
---------------------	-------	--------------------

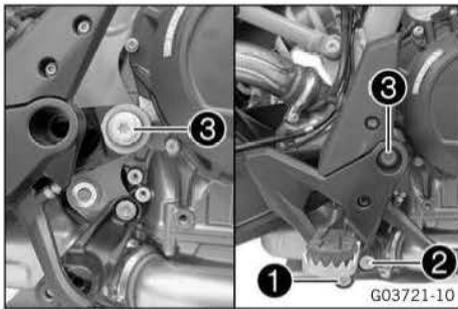


- Position inner clutch cable with bracket.
- Mount and tighten screws **5**.

Guideline

Remaining screws, engine	M6	10 Nm (7.4 lbf ft)
--------------------------	----	--------------------

- Swivel clutch release lever **4** counterclockwise and hook in the inner clutch cable.



- Remove screw **3** from the swingarm pivot.
- Position the footrest bracket.
- Mount and tighten screw **3**.

Guideline

Screw, swingarm pivot	M12	100 Nm (73.8 lbf ft)
-----------------------	-----	----------------------

- Mount and tighten screw **2**.

Guideline

Screw, front footrest bracket	M10x30	45 Nm (33.2 lbf ft) <b>Loctite®243™</b>
-------------------------------	--------	--------------------------------------------

- Mount and tighten screw **1** with the bushing.

Guideline

Screw, front footrest bracket	M10x40	45 Nm (33.2 lbf ft) <b>Loctite®243™</b>
-------------------------------	--------	--------------------------------------------

**Finishing work**

- Check the engine oil level. (📖 p. 379)

25.1 Alternator - checking the stator winding



**Condition**

The stator is disconnected.

**Stator winding measurement I - check the resistance.**

- $\Omega$  Measure the resistance between the specified points.  
Stator, connector **HQ** pin **1** – Stator, connector **HQ** pin **2**

Alternator	
Stator winding resistance at: 20 °C (68 °F)	0.18 ... 0.22 $\Omega$

- » If the indicated value does not correspond to the setpoint value:

- Change the stator.

**Stator winding measurement II - check the resistance.**

- $\Omega$  Measure the resistance between the specified points.  
Stator, connector **HQ** pin **1** – Stator, connector **HQ** pin **3**

Alternator	
Stator winding resistance at: 20 °C (68 °F)	0.18 ... 0.22 $\Omega$

- » If the indicated value does not correspond to the setpoint value:

- Change the stator.

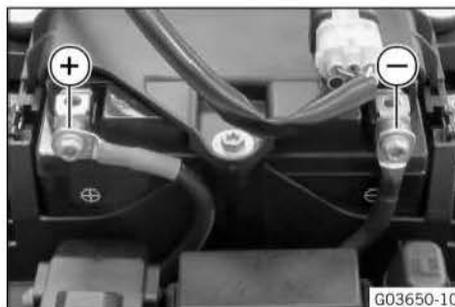
**Stator winding measurement III - check resistance.**

- $\Omega$  Measure the resistance between the specified points.  
Stator, connector **HQ** pin **2** – Stator, connector **HQ** pin **3**

Alternator	
Stator winding resistance at: 20 °C (68 °F)	0.18 ... 0.22 $\Omega$

- » If the indicated value does not correspond to the setpoint value:

- Change the stator.



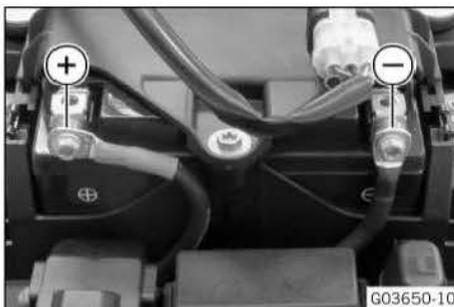
**Stator winding I - check short circuit to ground (terminal 31).**

- $\Omega$  Measure the resistance between the specified points.  
Stator, connector **HQ** pin **1** – Measuring point **Ground (-)**

Resistance	$\infty \Omega$
------------	-----------------

- » If the indicated value does not correspond to the setpoint value:

- Change the stator.

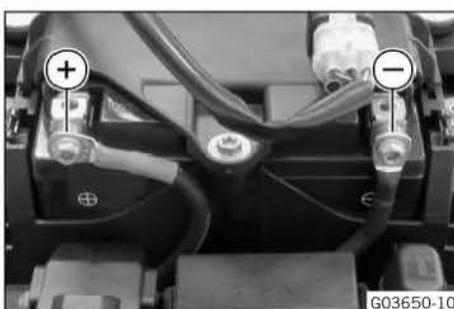
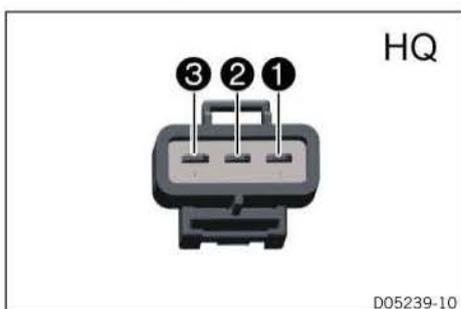


### Stator winding II - check short circuit to ground (terminal 31).

- Measure the resistance between the specified points.  
Stator, connector **HQ** pin **2** – Measuring point **Ground (-)**

Resistance	$\infty \Omega$
------------	-----------------

- » If the indicated value does not correspond to the setpoint value:
  - Change the stator.



### Stator winding III - check short circuit to ground (terminal 31).

- Measure the resistance between the specified points.  
Stator, connector **HQ** pin **3** – Measuring point **Ground (-)**

Resistance	$\infty \Omega$
------------	-----------------

- » If the indicated value does not correspond to the setpoint value:
  - Change the stator.

- Start the motorcycle to check the function. (📖 p. 19)



### Stator winding measurement I - check voltage.

- Measure the voltage between the specified points.  
Stator, connector **HQ** pin **1** – Stator, connector **HQ** pin **2**

**Info**  
The results of the measurements on the individual coils must not deviate significantly.

Alternator	
Alternating voltage stator winding at 4000 rpm: 20 °C (68 °F)	$\geq 50 \text{ V}$

- » If the indicated value does not correspond to the setpoint value:
  - Change the stator.

**Stator winding measurement II - check voltage.**

- **V** Measure the voltage between the specified points.  
Stator, connector **HQ** pin 1 – Stator, connector **HQ** pin 3

**i Info**  
The results of the measurements on the individual coils must not deviate significantly.

Alternator	
Alternating voltage stator winding at 4000 rpm: 20 °C (68 °F)	≥ 50 V

- » If the indicated value does not correspond to the setpoint value:
  - Change the stator.

**Stator winding measurement III - check voltage.**

- **V** Measure the voltage between the specified points.  
Stator, connector **HQ** pin 2 – Stator, connector **HQ** pin 3

**i Info**  
The results of the measurements on the individual coils must not deviate significantly.

Alternator	
Alternating voltage stator winding at 4000 rpm: 20 °C (68 °F)	≥ 50 V

- » If the indicated value does not correspond to the setpoint value:
  - Change the stator.



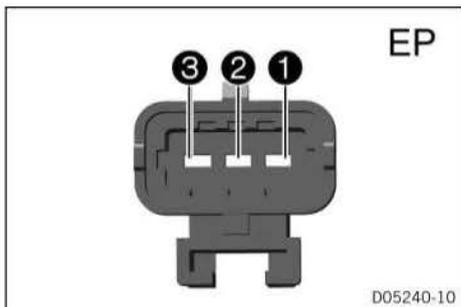
**25.2 Ignition coil - checking the primary winding**

**Preparatory work**

- Remove the seat. (📖 p. 114)
- Remove the left side cover. (📖 p. 130)
- Remove the battery cover. (📖 p. 131)
- Remove left fuel tank spoiler. (📖 p. 132)
- Remove the right side cover. (📖 p. 130)
- Remove right fuel tank spoiler. (📖 p. 134)
- Remove engine guard. (📖 p. 138)
- Remove the fuel tank. (📖 p. 114)

**Main work**

- Disconnect ignition coil 1, cylinder 1.



### Ignition coil, cylinder 1 - check the primary winding resistance.

-  Measure the resistance between the specified points.  
Ignition coil pin 1 – Ignition coil pin 3

Ignition coil	
Primary winding resistance at: 20 °C (68 °F)	0.70 ... 0.90 Ω

- » If the displayed value does not correspond to nominal value:

- Change the ignition coil.

- Disconnect ignition coil 2, cylinder 2.

### Ignition coil, cylinder 2 - check the primary winding resistance.

-  Measure the resistance between the specified points.  
Ignition coil pin 1 – Ignition coil pin 3

Ignition coil	
Primary winding resistance at: 20 °C (68 °F)	0.70 ... 0.90 Ω

- » If the displayed value does not correspond to nominal value:

- Change the ignition coil.

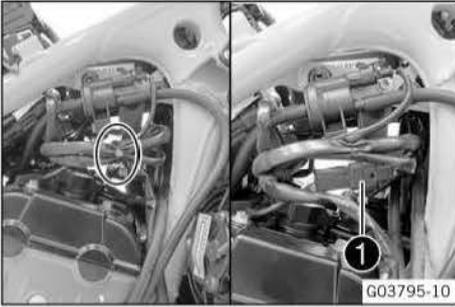
### Finishing work

- Install the fuel tank. (🔗 p. 117)
- Install the engine guard. (🔗 p. 138)
- Install the right fuel tank spoiler. (🔗 p. 135)
- Install the right side cover. (🔗 p. 131)
- Install the left fuel tank spoiler. (🔗 p. 133)
- Install the battery cover. (🔗 p. 132)
- Install the left side cover. (🔗 p. 130)
- Mount the seat. (🔗 p. 114)

## 25.3 Changing the spark plugs

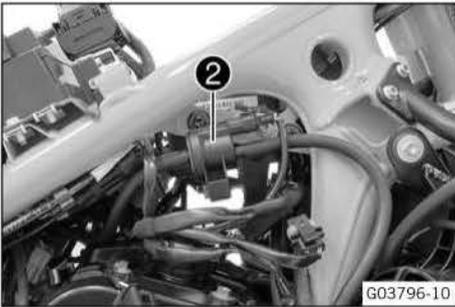
### Preparatory work

- Remove the seat. (🔗 p. 114)
- Remove the left side cover. (🔗 p. 130)
- Remove the battery cover. (🔗 p. 131)
- Remove left fuel tank spoiler. (🔗 p. 132)
- Remove the right side cover. (🔗 p. 130)
- Remove right fuel tank spoiler. (🔗 p. 134)
- Remove engine guard. (🔗 p. 138)
- Remove the fuel tank. (🔗 p. 114)

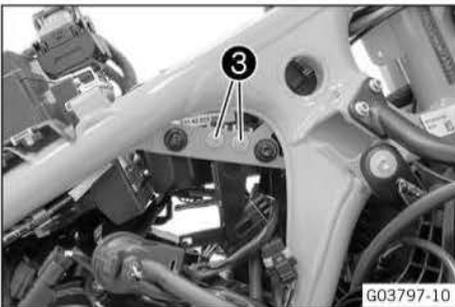


### Main work

- Remove the cable ties.
- Pull off and disconnect plug-in connector **1** from the holder.



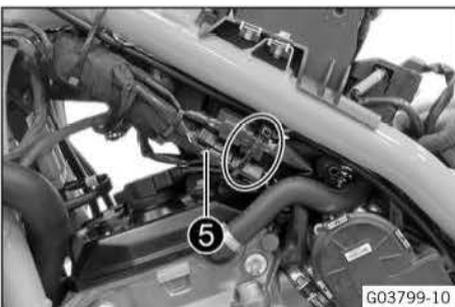
- Pull fuel evaporation valve **2** off the holder and hang it to the side.



- Remove screws **3**.
- Hang the holder to the side.



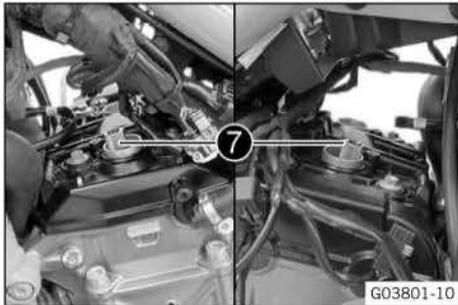
- Remove screw **4**.
- Remove the ignition coil.



- Remove the cable ties.
- Disconnect plug-in connector **5**.



- Remove screw **6**.
- Remove the ignition coil.



- Remove spark plugs using special tool **7**.

Spark plug wrench with link (77229172000) (📖 p. 479)

- Mount and tighten the new spark plugs using the special tool.

Guideline

Spark plug	M10	10 Nm (7.4 lbf ft)
------------	-----	--------------------

Spark plug wrench with link (77229172000) (📖 p. 479)



- Mount the ignition coil.
- Mount and tighten screw **6**.

Guideline

Screw, ignition coil	M6	8 Nm (5.9 lbf ft)
----------------------	----	-------------------



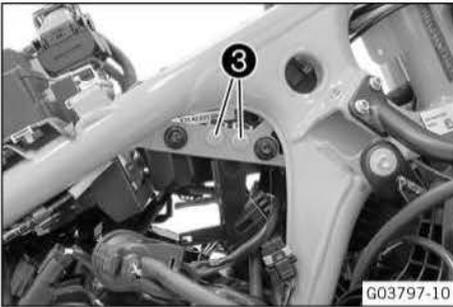
- Join plug-in connector **5**.
- Route the cable without tension and secure with cable ties.



- Mount the ignition coil.
- Mount and tighten screw **4**.

Guideline

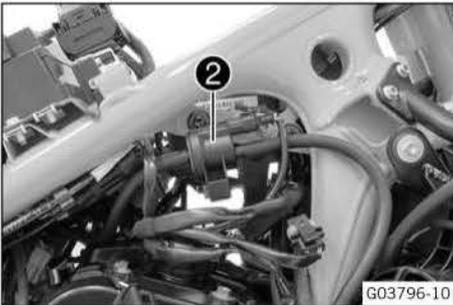
Screw, ignition coil	M6	8 Nm (5.9 lbf ft)
----------------------	----	-------------------



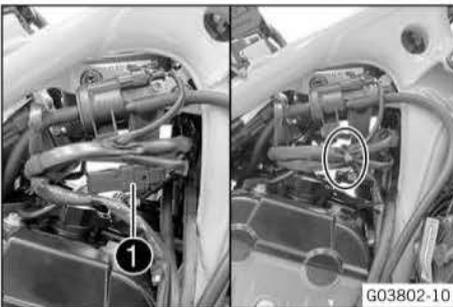
- Position the holder.
- Mount and tighten screws **3**.

Guideline

Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
---------------------------	----	--------------------



- Position fuel evaporation valve **2** on the holder.



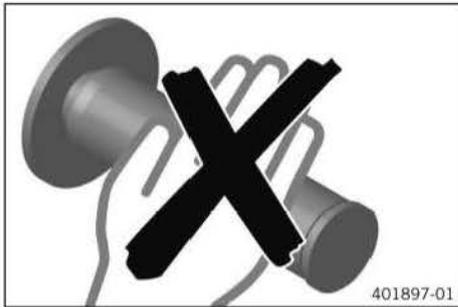
- Join plug-in connector **1** and position it on the holder.
- Route the cable without tension and secure with cable ties.

**Finishing work**

- Install the fuel tank. (p. 117)
- Install the engine guard. (p. 138)
- Install the right fuel tank spoiler. (p. 135)
- Install the right side cover. (p. 131)
- Install the left fuel tank spoiler. (p. 133)
- Install the battery cover. (p. 132)
- Install the left side cover. (p. 130)
- Mount the seat. (p. 114)



## 26.1 Performing the initialization run



### Condition

The diagnostic tool is connected and running.

- Execute "**Engine electronics**" > "**Functions**" > "**Clear adaptation values**".
  - ✓ The adaptation values are deleted.
- Program the gear position sensor. (📖 p. 361)
- Program the shift shaft sensor. (📖 p. 363)
- Switch off the ignition.
- Disconnect the diagnostics tool.



### Danger

**Danger of poisoning** Exhaust gases are toxic and inhaling them may result in unconsciousness and death.

- Always make sure there is sufficient ventilation when running the engine.
- Use effective exhaust extraction when starting or running the engine in an enclosed space.

- Start the engine without operating the throttle grip.

### Guideline

Coolant temperature	< 25 °C (< 77 °F)
---------------------	-------------------

- Let the engine run at idle speed for at least 10 minutes (600 seconds).



### Info

Do not operate the throttle grip during the initialization process.

- Switch off the ignition after 10 minutes (600 seconds).



### Info

If initialization is not completed or if the initialization process was interrupted, the entire process must be restarted.

## 26.2 Adjusting service display with KTM diagnostics tool

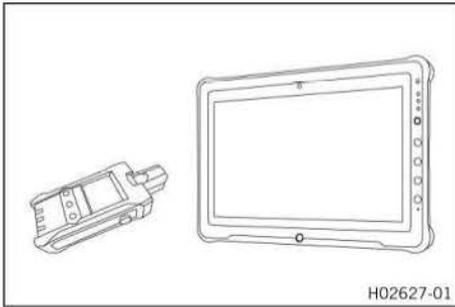


### Info

The steps for adjusting the service display are the same for units **Km** and **Meilen**.

### Condition

The diagnostic tool is connected and running.



- Select "**Combination instrument**" > "**Functions**" > "**Service interval**".
- Enter the distance until the next service is due.
- Quit the process using "**Execute**".



## 27.1 Engine

Design	2-cylinder 4-stroke in-line engine, water-cooled
Displacement	799 cm <sup>3</sup> (48.76 cu in)
Stroke	65.7 mm (2.587 in)
Bore	88 mm (3.46 in)
Compression ratio	12.7:1
Control	DOHC, 4 valves per cylinder controlled via cam lever, chain drive
Valve diameter, intake	36 mm (1.42 in)
Valve diameter, exhaust	29 mm (1.14 in)
Valve play, cold	
Intake at: 20 °C (68 °F)	0.10 ... 0.15 mm (0.0039 ... 0.0059 in)
Exhaust at: 20 °C (68 °F)	0.15 ... 0.20 mm (0.0059 ... 0.0079 in)
Crankshaft bearing	Slide bearing
Conrod bearing	Slide bearing
Pistons	Forged light alloy
Piston rings	1 compression ring, 1 lower compression ring, 1 oil ring with spring expander
Engine lubrication	Semi-dry sump lubrication system with two rotor pumps
Primary transmission	39:75
Clutch	Slipper clutch in oil bath/mechanically operated
Transmission	6-gear transmission, claw shifted
Transmission ratio	
First gear	13:37
Second gear	17:34
Third gear	20:31
Fourth gear	22:28
Fifth gear	24:26
Sixth gear	23:22
Mixture preparation	Electronic fuel injection
Ignition	Contactless controlled fully electronic ignition with digital ignition adjustment
Alternator	12 V, 400 W
Spark plug	NGK LMAR9AI-10
Spark plug electrode gap	1.0 mm (0.039 in)
Cooling	Water cooling, permanent circulation of coolant by water pump
Idle speed	1,400 rpm
Starting aid	Starter motor

**27.2 Tolerance, engine wear limits**

Camshafts - pivot point diameter	21.980 ... 22.041 mm (0.86535 ... 0.86775 in)
Valve spring	
Minimum length (without valve spring seat)	44.0 mm (1.732 in)
Valve spring cap - thickness	1.15 ... 1.35 mm (0.0453 ... 0.0531 in)
Valve - valve stem diameter	
Exhaust	4.95 ... 4.97 mm (0.1949 ... 0.1957 in)
Intake	4.97 ... 4.99 mm (0.1957 ... 0.1965 in)
Valve guide - diameter	
New condition	5.004 ... 5.016 mm (0.19701 ... 0.19748 in)
Wear limit	5.050 mm (0.19882 in)
Valve - sealing seat width	
Intake	2.80 mm (0.1102 in)
Exhaust	3.00 mm (0.1181 in)
Valve - run-out	
On the valve plate	≤ 0.05 mm (≤ 0.002 in)
On the valve stem	≤ 0.05 mm (≤ 0.002 in)
Cylinder/cylinder head - sealing area distortion	≤ 0.05 mm (≤ 0.002 in)
Cylinder - bore diameter	
Size	88.000 ... 88.012 mm (3.46456 ... 3.46503 in)
Piston - diameter	
Size	87.920 ... 87.980 mm (3.46141 ... 3.46377 in)
Piston/cylinder - mounting clearance	
New condition	0.035 ... 0.070 mm (0.00138 ... 0.00276 in)
Wear limit	0.10 mm (0.0039 in)
Piston ring - groove clearance	≤ 0.08 mm (≤ 0.0031 in)
Piston ring end gap	
Compression rings	≤ 0.80 mm (≤ 0.0315 in)
Oil scraper ring	≤ 1.00 mm (≤ 0.0394 in)
Piston - piston pin hole diameter	20.010 ... 20.020 mm (0.78779 ... 0.78819 in)
Piston pin - diameter	19.995 ... 20.000 mm (0.7872 ... 0.7874 in)
Connecting rod - axial clearance of lower conrod bearing	0.15 ... 0.30 mm (0.0059 ... 0.0118 in)
Connecting rod - radial clearance of lower conrod bearing	
New condition	0.030 ... 0.060 mm (0.00118 ... 0.00236 in)
Wear limit	0.080 mm (0.00315 in)
Crankshaft bearing	
New condition	0.030 ... 0.060 mm (0.00118 ... 0.00236 in)
Wear limit	0.080 mm (0.00315 in)
Crankshaft - axial clearance	0.15 ... 0.25 mm (0.0059 ... 0.0098 in)
Crankshaft run-out at bearing pin	≤ 0.10 mm (≤ 0.0039 in)
Balancer shaft axial clearance	0.05 ... 0.20 mm (0.002 ... 0.0079 in)
Clutch disc pack - thickness	
New condition	35.60 ... 36.50 mm (1.4016 ... 1.437 in)
Wear limit	34.80 mm (1.3701 in)

Clutch spring - length	≥ 43.0 mm (≥ 1.693 in)
Clutch basket - contact surface of clutch facing discs	≤ 0.5 mm (≤ 0.02 in)
Oil pressure regulator valve - minimum length spring	40.0 mm (1.575 in)
Oil pump	
Play between external rotor and oil pump housing	≤ 0.15 mm (≤ 0.0059 in)
Clearance, external rotor/internal rotor	≤ 0.20 mm (≤ 0.0079 in)
Axial play	0.03 ... 0.08 mm (0.0012 ... 0.0031 in)
Oil pressure	
Coolant temperature: ≥ 60 °C (≥ 140 °F) Idle speed	1.8 ... 4.5 bar (26 ... 65 psi)
Main shaft axial clearance	0.10 ... 0.40 mm (0.0039 ... 0.0157 in)
Transmission shaft run-out	≤ 0.025 mm (≤ 0.00098 in)
Shift shaft - play in sliding plate/shift quadrant	0.40 ... 0.80 mm (0.0157 ... 0.0315 in)
Fuel pressure	
When the fuel pump is active	3.8 ... 4.2 bar (55 ... 61 psi)

### 27.3 Engine tightening torques

Screw plug, water pump drain hole	<b>EJOTALtracs®Plus</b> 60x14	8 Nm (5.9 lbf ft)	<b>Loctite®243™</b>
Screw, bleeder flange	<b>EJOTALtracs®</b> M6x12	8 Nm (5.9 lbf ft)	<b>Loctite®243™</b>
Hose clamp, intake flange	M4	2.5 Nm (1.84 lbf ft)	
Nozzle, engine vent	M5	2 Nm (1.5 lbf ft)	<b>Loctite®243™</b>
Oil nozzle for piston cooling	M5	2 Nm (1.5 lbf ft)	<b>Loctite®243™</b>
Oil nozzle in cylinder head	M5	2 Nm (1.5 lbf ft)	<b>Loctite®243™</b>
Remaining screws, engine	M5	6 Nm (4.4 lbf ft)	
Screw, cam lever axial lock	M5	6 Nm (4.4 lbf ft)	<b>Loctite®243™</b>
Screw, crankshaft speed sensor	M5	6 Nm (4.4 lbf ft)	<b>Loctite®243™</b>
Screw, gear position sensor	M5	6 Nm (4.4 lbf ft)	<b>Loctite®243™</b>
Screw, oil filter cover	M5	6 Nm (4.4 lbf ft)	
Screw, pressure plate	M5	3 Nm (2.2 lbf ft)	<b>Loctite®243™</b>
Screw, shift drum retaining bracket	M5	6 Nm (4.4 lbf ft)	<b>Loctite®243™</b>
Screw, shift shaft sensor	M5	6 Nm (4.4 lbf ft)	<b>Loctite®243™</b>
Screw, thermostat case	M5	6 Nm (4.4 lbf ft)	<b>Loctite®243™</b>
Remaining screws, engine	M6	10 Nm (7.4 lbf ft)	
Screw, alternator cover	M6x30	10 Nm (7.4 lbf ft)	
Screw, alternator cover	M6x35	10 Nm (7.4 lbf ft)	

Screw, bearing bridge of balancer shaft bearing	M6	12 Nm (8.9 lbf ft)	
Screw, camshaft bearing bridge	M6	10 Nm (7.4 lbf ft)	
Screw, clutch cable retaining bracket	M6	10 Nm (7.4 lbf ft)	
Screw, clutch cover	M6	10 Nm (7.4 lbf ft)	
Screw, clutch release lever	M6	10 Nm (7.4 lbf ft)	<b>Loctite®243™</b>
Screw, clutch spring	M6	10 Nm (7.4 lbf ft)	
Screw, cylinder head	M6	10 Nm (7.4 lbf ft)	
Screw, engine case	M6x30	12 Nm (8.9 lbf ft)	
Screw, engine case	M6x60	12 Nm (8.9 lbf ft)	
Screw, heat exchanger	M6	10 Nm (7.4 lbf ft)	
Screw, ignition coil	M6	8 Nm (5.9 lbf ft)	
Screw, locking lever	M6	10 Nm (7.4 lbf ft)	<b>Loctite®243™</b>
Screw, main shaft bearing support	M6	10 Nm (7.4 lbf ft)	<b>Loctite®243™</b>
Screw, oil pan	M6x30	10 Nm (7.4 lbf ft)	
Screw, oil pan	M6x35	10 Nm (7.4 lbf ft)	
Screw, oil pump cover	M6	10 Nm (7.4 lbf ft)	<b>Loctite®243™</b>
Screw, oil pump unit	M6	10 Nm (7.4 lbf ft)	
Screw, shift drum locating	M6	10 Nm (7.4 lbf ft)	<b>Loctite®243™</b>
Screw, shift lever	M6	14 Nm (10.3 lbf ft)	<b>Loctite®243™</b>
Screw, shift shaft retaining bracket	M6	10 Nm (7.4 lbf ft)	<b>Loctite®243™</b>
Screw, starter motor	M6	10 Nm (7.4 lbf ft)	
Screw, stator	M6	10 Nm (7.4 lbf ft)	<b>Loctite®243™</b>
Screw, timing chain shaft	M6	10 Nm (7.4 lbf ft)	
Screw, upper guide rail	M6x20	8 Nm (5.9 lbf ft)	<b>Loctite®243™</b>
Screw, valve cover	M6	10 Nm (7.4 lbf ft)	
Screw, water pump cover	M6	10 Nm (7.4 lbf ft)	
Screw, water pump wheel	M6	10 Nm (7.4 lbf ft)	<b>Loctite®243™</b>
Freewheel ring bolt	M8	14 Nm (10.3 lbf ft)	<b>Loctite®243™</b>
Nut, exhaust flange	M8	15 Nm (11.1 lbf ft)	Copper paste
Oil nozzle for clutch lubrication	M8	5 Nm (3.7 lbf ft)	<b>Loctite®243™</b>
Remaining screws for engine	M8	20 Nm (14.8 lbf ft)	
Screw plug, locking screw	M8	15 Nm (11.1 lbf ft)	

Screw, conrod bearing	M8	1st stage 5 Nm (3.7 lbf ft) 2nd stage 15 Nm (11.1 lbf ft) 3rd stage 90° Collar and thread oiled
Screw, engine case	M8x45	25 Nm (18.4 lbf ft) Screw support greased
Screw, engine case	M8x55	25 Nm (18.4 lbf ft) Screw support greased
Screw, engine case	M8x65	25 Nm (18.4 lbf ft) Screw support greased
Screw, engine case	M8x90	25 Nm (18.4 lbf ft) Screw support greased
Screw, oil pump idler gear	M8	15 Nm (11.1 lbf ft) <b>Loctite®243™</b>
Screw, timing chain tensioning rail	M8	15 Nm (11.1 lbf ft) <b>Loctite®243™</b>
Stud, exhaust flange	M8	15 Nm (11.1 lbf ft) <b>Loctite®243™</b>
Spark plug	M10	10 Nm (7.4 lbf ft)
Oil pressure sensor	M10x1	10 Nm (7.4 lbf ft)
Screw plug, bearing support	M10x1	12 Nm (8.9 lbf ft) <b>Loctite®243™</b>
Screw plug, cam lever axis	M10x1	10 Nm (7.4 lbf ft)
Screw plug, oil hole, timing chain shaft	M10x1	12 Nm (8.9 lbf ft) <b>Loctite®243™</b>
Screw, unlocking of timing chain tensioner	M10x1	10 Nm (7.4 lbf ft)
Coolant temperature sensor	M10x1.25	10 Nm (7.4 lbf ft)
Screw, cylinder head	M10x1.25	Tightening sequence: Observe tightening sequence. 1st stage 5 Nm (3.7 lbf ft) 2nd stage 15 Nm (11.1 lbf ft) 3rd stage 90° 4th stage 90° Collar greased / thread oiled
Screw plug, cylinder head oil drain	M12x1.5	15 Nm (11.1 lbf ft)
Screw, rotor	M12x1.5	90 Nm (66.4 lbf ft) <b>Loctite®243™</b>
Screw plug, water jacket	M16x1.5	20 Nm (14.8 lbf ft)
Nut, engine sprocket	M20x1.5	100 Nm (73.8 lbf ft) <b>Loctite®243™</b>
Nut, inner clutch hub	M20x1.5	90 Nm (66.4 lbf ft) <b>Loctite®243™</b>
Plug, oil screen	M20x1.5	20 Nm (14.8 lbf ft)
Plug, timing chain tensioner	M24x1.5	25 Nm (18.4 lbf ft)

Screw in alternator cover	M24x1.5	8 Nm (5.9 lbf ft)
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## 27.4 Capacities

### 27.4.1 Engine oil

Engine oil	2.8 l (3 qt.)	Engine oil (SAE 10W/50) (  p. 464)
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### 27.4.2 Coolant

Coolant	1.60 l (1.69 qt.)	Coolant (  p. 464)
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### 27.4.3 Fuel

Total fuel tank capacity, approx.	20 l (5.3 US gal)	Super unleaded (ROZ 95/RON 95/PON 91) (  p. 465)
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Fuel reserve, approx.	3 l (3 qt.)
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## 27.5 Chassis

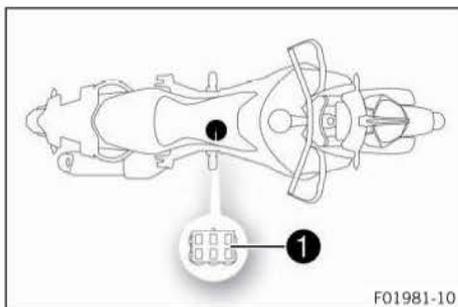
Frame	Lattice frame made of chrome molybdenum steel tubing, powder-coated
Fork	<b>WP SuspensionXPLOR 5548</b>
Shock absorber	<b>WP SuspensionXPLOR 5746</b>
Suspension travel	
front	240 mm (9.45 in)
rear	240 mm (9.45 in)
Brake system	
front	Double disc brake with radially mounted four-piston brake calipers, floating brake discs
rear	Single disc brake with dual-piston brake caliper, floating brake disc
Brake discs - diameter	
front	320 mm (12.6 in)
rear	260 mm (10.24 in)
Brake discs - wear limit	
front	4.5 mm (0.177 in)
rear	4.5 mm (0.177 in)
Tire pressure solo / with passenger	
front	2.4 bar (35 psi)
rear	2.4 bar (35 psi)
Tire pressure full payload	
front	2.6 bar (38 psi)
rear	2.9 bar (42 psi)
Secondary drive ratio	16:45
Chain	5/8 x 1/4" (520) X-ring
Steering head angle	63.7°
Wheelbase	1,528 mm (60.16 in)

Seat height, unloaded	880 mm (34.65 in)
Ground clearance, unloaded	263 mm (10.35 in)
Weight without fuel, approx.	196 kg (432 lb.)
Maximum permissible front axle load	175 kg (386 lb.)
Maximum permissible rear axle load	275 kg (606 lb.)
Maximum permissible total weight	450 kg (992 lb.)

## 27.6 Electrical system

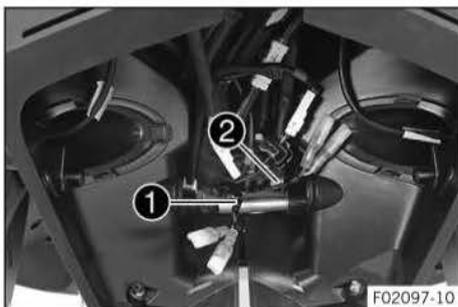
12-V battery	HTZ12A-BS	Battery voltage: 12 V Nominal capacity: 10 Ah Maintenance-free
Fuse	75011088010	10 A
Fuse	75011088015	15 A
Fuse	75011088025	25 A
Fuse	58011109130	30 A
Low beam/high beam	LED	
Daytime running light/position light	LED	
Combination instrument lighting and indicator lamps	LED	
Turn signal (EU)	LED	
Turn signal (US)	RY10W / socket BAU15s	12 V 10 W
Brake/tail light	LED	
License plate lamp	LED	

### 27.6.1 Diagnostics connector



Diagnostics connector **1** is located under the battery cover.

### 27.6.2 Front ACC1 and ACC2



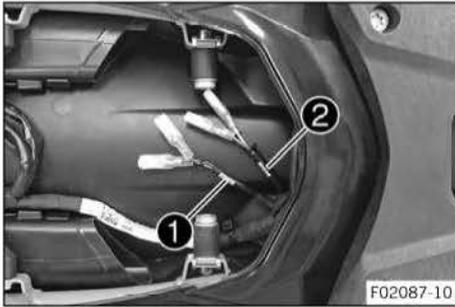
#### Installation location

- The front power supplies ACC1 **1** and ACC2 **2** are located behind the headlight.

#### **i** Info

The front power supplies ACC1 and ACC2 can be accessed under the cable cover of the headlight mask.

**27.6.3 ACC1 and ACC2 rear**



**Installation location**

- Power supplies ACC1 **1** and ACC2 **2** rear are located under the seat.

**27.7 Tires**

Front tire	Rear tire
<b>90/90 - 21 M/C 54R M+S TL</b> Metzeler Karoo 3	<b>150/70 - 18 M/C 70R M+S TL</b> Metzeler Karoo 3
The tires specified represent one of the possible series production tires. Additional information is available in the Service section under: <a href="http://www.ktm.com">http://www.ktm.com</a>	

**27.8 Fork**

Fork article number	14.18.8S.54
Fork	<b>WP SuspensionXPLOR 5548</b>
Compression damping	
Comfort	20 clicks
Standard	15 clicks
Sport	10 clicks
Full payload	15 clicks
Rebound damping	
Comfort	18 clicks
Standard	15 clicks
Sport	10 clicks
Full payload	15 clicks
Spring preload - <b>Preload Adjuster</b>	
Comfort	<b>+0</b>
Standard	<b>+0</b>
Sport	<b>+0</b>
Full payload	<b>+3</b>
Spring length with preload spacer(s)	464 mm (18.27 in)
Spring rate	
Weight of rider: 75 ... 85 kg (165 ... 187 lb.)	6.7 N/mm (38.3 lb/in)
Fork length	912 mm (35.91 in)
Fork oil per fork leg	630 ± 5 ml (21.3 ± 0.17 fl. oz.)
	Fork oil (SAE 4) (48601166S1) ( p. 465)

## 27.9 Shock absorber

Shock absorber article number	01.18.7S.54	
Shock absorber	<b>WP SuspensionXPLOR 5746</b>	
Low-speed compression damping		
Comfort	20 clicks	
Standard	15 clicks	
Sport	10 clicks	
Full payload	7 clicks	
High-speed compression damping		
Comfort	2 turns	
Standard	1.5 turns	
Sport	1.5 turns	
Full payload	1 turn	
Rebound damping		
Comfort	20 clicks	
Standard	15 clicks	
Sport	12 clicks	
Full payload	9 clicks	
Spring preload - <b>Preload Adjuster</b>		
Comfort	4 turns	
Standard	4 turns	
Sport	4 turns	
Full payload	10 turns	
Fitted length	380 mm (14.96 in)	
Spring length	210 mm (8.27 in)	
Spring rate		
Weight of rider: 75 ... 85 kg (165 ... 187 lb.)	95 N/mm (542 lb/in)	
Gas pressure	16 bar (232 psi)	
Damper oil	Shock absorber fluid (SAE 2.5) (50180751S1) (p. 465)	

## 27.10 Chassis tightening torques

Remaining screws, chassis	<b>EJOTPT®</b> K45x12	1 Nm (0.7 lbf ft)
Remaining screws, chassis	<b>EJOTPT®</b> K50x12	1 Nm (0.7 lbf ft)
Remaining screws, chassis	<b>EJOTPT®</b> K50x14	1 Nm (0.7 lbf ft)
Remaining screws, chassis	<b>EJOTPT®</b> K50x16	2 Nm (1.5 lbf ft)
Remaining screws, chassis	<b>EJOTPT®</b> K50x18	2 Nm (1.5 lbf ft)
Remaining nuts, chassis	M4	3 Nm (2.2 lbf ft)
Remaining screws, chassis	M4	3 Nm (2.2 lbf ft)
Screw, fixed grip, left	M4	2 Nm (1.5 lbf ft)
Remaining nuts, chassis	M5	5 Nm (3.7 lbf ft)
Remaining screws, chassis	M5	5 Nm (3.7 lbf ft)
Screw for throttle grip	M5	3.5 Nm (2.58 lbf ft)
Screw, air filter box	M5	3 Nm (2.2 lbf ft)

Screw, brake fluid reservoir for rear brake	M5	5 Nm (3.7 lbf ft)	<b>Loctite®243™</b>
Screw, cable on starter motor	M5	3 Nm (2.2 lbf ft)	
Screw, combination instrument	M5	4 Nm (3 lbf ft)	
Screw, combination switch, left	M5	2 Nm (1.5 lbf ft)	
Screw, combination switch, right	M5	5 Nm (3.7 lbf ft)	
Screw, engine sprocket cover	M5	5 Nm (3.7 lbf ft)	<b>Loctite®243™</b>
Screw, foot brake lever stub	M5	5 Nm (3.7 lbf ft)	<b>Loctite®243™</b>
Screw, fork protector	M5x12	5 Nm (3.7 lbf ft)	
Screw, fork protector	M5x17	5 Nm (3.7 lbf ft)	
Screw, heat guard	M5	5 Nm (3.7 lbf ft)	<b>Loctite®243™</b>
Screw, license plate holder	M5	5 Nm (3.7 lbf ft)	<b>Loctite®243™</b>
Screw, side stand switch	M5	2 Nm (1.5 lbf ft)	<b>Loctite®243™</b>
Screw, trim	M5	3 Nm (2.2 lbf ft)	
Nut, hand brake lever	M6	Attach torque to nut. 10 Nm (7.4 lbf ft)	
Nut, push rod, foot brake lever	M6	6 Nm (4.4 lbf ft)	
Nut, shift rod	M6	6 Nm (4.4 lbf ft)	
Nut, shift rod	M6LH	6 Nm (4.4 lbf ft)	
Remaining nuts, chassis	M6	10 Nm (7.4 lbf ft)	
Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)	
Screw, angle sensor	M6	5 Nm (3.7 lbf ft)	
Screw, ball joint of push rod on foot brake cylinder	M6	10 Nm (7.4 lbf ft)	<b>Loctite®243™</b>
Screw, battery support bracket	M6	4.5 Nm (3.32 lbf ft)	
Screw, battery terminal	M6	4.5 Nm (3.32 lbf ft)	
Screw, bottom radiator bracket	M6	5 Nm (3.7 lbf ft)	
Screw, brake assembly	M6	5 Nm (3.7 lbf ft)	
Screw, clutch assembly	M6	5 Nm (3.7 lbf ft)	
Screw, cross member in rear	M6x13	10 Nm (7.4 lbf ft)	<b>Loctite®243™</b>
Screw, engine guard	M6x8	8 Nm (5.9 lbf ft)	
Screw, engine guard	M6x10	10 Nm (7.4 lbf ft)	<b>Loctite®243™</b>
Screw, foot brake cylinder	M6	10 Nm (7.4 lbf ft)	<b>Loctite®243™</b>
Screw, footrest bracket, rear	M6	6 Nm (4.4 lbf ft)	<b>Loctite®243™</b>
Screw, front brake disc	M6	14 Nm (10.3 lbf ft)	<b>Loctite®243™</b>
Screw, front wheel speed sensor	M6	6 Nm (4.4 lbf ft)	
Screw, fuel tank cover	M6x12	8 Nm (5.9 lbf ft)	
Screw, fuel tank cover	M6x18	5 Nm (3.7 lbf ft)	<b>Loctite®243™</b>

Screw, fuel tank cover	M6	5 Nm (3.7 lbf ft) <b>Loctite®243™</b>
Screw, fuel tank spoiler attachment	M6	3 Nm (2.2 lbf ft)
Screw, ground wire on frame	M6	6 Nm (4.4 lbf ft)
Screw, ground wire to starter motor	M6	10 Nm (7.4 lbf ft)
Screw, headlight mask	M6	10 Nm (7.4 lbf ft) <b>Loctite®243™</b>
Screw, ignition lock (tamper-proof screw)	M6	22 Nm (16.2 lbf ft) <b>Loctite®243™</b>
Screw, magnetic holder on side stand	M6	2 Nm (1.5 lbf ft) <b>Loctite®243™</b>
Screw, manifold clamp	M6	8 Nm (5.9 lbf ft) Copper paste
Screw, rear brake disc	M6	14 Nm (10.3 lbf ft) <b>Loctite®243™</b>
Screw, rear wheel speed sensor	M6	6 Nm (4.4 lbf ft)
Screw, seat fixing	M6	5 Nm (3.7 lbf ft)
Screw, seat lock	M6	10 Nm (7.4 lbf ft) <b>Loctite® 222™</b>
Screw, shift rod	M6	10 Nm (7.4 lbf ft) <b>Loctite®243™</b>
Screw, shift shaft deflector on shift shaft	M6	10 Nm (7.4 lbf ft) <b>Loctite®243™</b>
Foot brake lever, fitting	M8	25 Nm (18.4 lbf ft) <b>Loctite®2701™</b>
Nut, manifold on cylinder head	M8	Tighten the nuts evenly. Do not bend the metal. 20 Nm (14.8 lbf ft) Copper paste
Pin, rear brake caliper	M8	22 Nm (16.2 lbf ft)
Remaining nuts, chassis	M8	25 Nm (18.4 lbf ft)
Remaining screws, chassis	M8	25 Nm (18.4 lbf ft)
Screw, bottom triple clamp	M8	12 Nm (8.9 lbf ft)
Screw, engine fixing arm linkage bracket	M8	25 Nm (18.4 lbf ft) <b>Loctite®243™</b>
Screw, engine guard frame	M8	25 Nm (18.4 lbf ft) <b>Loctite®243™</b>
Screw, fork stub	M8	15 Nm (11.1 lbf ft)
Screw, grab handle	M8	25 Nm (18.4 lbf ft) <b>Loctite®243™</b>
Screw, handlebar clamp	M8	20 Nm (14.8 lbf ft)
Screw, main silencer fastening	M8	15 Nm (11.1 lbf ft)
Screw, presilencer on frame	M8	25 Nm (18.4 lbf ft) <b>Loctite®243™</b>
Screw, rear footrest bracket	M8	25 Nm (18.4 lbf ft) <b>Loctite®243™</b>
Screw, seat bracket	M8	25 Nm (18.4 lbf ft) <b>Loctite®243™</b>

Screw, shift lever	M8	25 Nm (18.4 lbf ft) <b>Loctite®2701™</b>
Screw, spring holder plate on side stand bracket	M8	15 Nm (11.1 lbf ft) <b>Loctite®2701™</b>
Screw, steering damper on holder	M8	8 Nm (5.9 lbf ft) <b>Loctite®243™</b>
Screw, steering damper on triple clamp	M8	8 Nm (5.9 lbf ft) <b>Loctite®243™</b>
Screw, steering stem	M8	20 Nm (14.8 lbf ft) <b>Loctite®243™</b>
Screw, top triple clamp	M8	15 Nm (11.1 lbf ft)
Securing bolt for brake linings	M8	10 Nm (7.4 lbf ft)
Remaining nuts, chassis	M10	45 Nm (33.2 lbf ft)
Remaining screws, chassis	M10	45 Nm (33.2 lbf ft)
Screw, engine bracket	M10	45 Nm (33.2 lbf ft) <b>Loctite®243™</b>
Screw, front footrest bracket	M10x30	45 Nm (33.2 lbf ft) <b>Loctite®243™</b>
Screw, front footrest bracket	M10x40	45 Nm (33.2 lbf ft) <b>Loctite®243™</b>
Screw, front footrest bracket	M10x65	45 Nm (33.2 lbf ft) <b>Loctite®243™</b>
Screw, handlebar support	M10	45 Nm (33.2 lbf ft) <b>Loctite®243™</b>
Screw, side stand	M10	42 Nm (31 lbf ft) <b>Loctite®243™</b>
Screw, subframe	M10	50 Nm (36.9 lbf ft) <b>Loctite®243™</b>
Banjo bolt, brake line	M10x1	25 Nm (18.4 lbf ft)
Screw, front brake caliper	M10x1.25	45 Nm (33.2 lbf ft) <b>Loctite®243™</b>
Screw, bottom shock absorber	M12	80 Nm (59 lbf ft) <b>Loctite®2701™</b>
Screw, swingarm pivot	M12	100 Nm (73.8 lbf ft)
Screw, top shock absorber	M12	80 Nm (59 lbf ft) <b>Loctite®2701™</b>
Lambda sensor	M18x1.5	50 Nm (36.9 lbf ft)
Adjusting screw, swingarm	M20LHx1.5	10 Nm (7.4 lbf ft)
Nut, rear wheel spindle	M25x1.5	90 Nm (66.4 lbf ft) Thread and contact area of wheel spindle greased
Screw, front wheel spindle	M25x1.5	45 Nm (33.2 lbf ft) Thread greased
Screw, steering head	M25x1.5	18 Nm (13.3 lbf ft)

## 28.1 Cleaning the motorcycle

### Note

**Material damage** Components become damaged or destroyed if a pressure cleaner is used incorrectly. The high pressure forces water into the electrical components, connectors, throttle cables, and bearings, etc. Pressure which is too high causes malfunctions and destroys components.

- Do not direct the water jet directly on to electrical components, connectors, throttle cables or bearings.
- Maintain a minimum distance between the nozzle of the pressure cleaner and the component.  
Minimum clearance 60 cm (23.6 in)



### Note

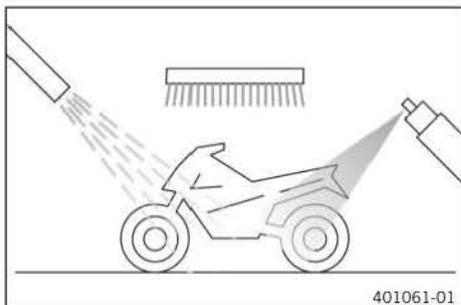
**Environmental hazard** Hazardous substances cause environmental damage.

- Dispose of oils, grease, filters, fuel, cleaning agents, brake fluid, etc., correctly and in compliance with the applicable regulations.



### Info

To maintain the value and appearance of the motorcycle over a long period, clean it regularly. Avoid direct sunshine when cleaning the motorcycle.



- Close off the exhaust system to keep water from entering.
- Remove loose dirt first with a soft jet of water.
- Spray heavily soiled parts with a normal commercial motorcycle cleaner and then brush off with a soft brush.

Motorcycle cleaner (📖 p. 466)



### Info

Use warm water containing normal motorcycle cleaner and a soft sponge. Never apply motorcycle cleaner to a dry vehicle; always rinse the vehicle with water first. If the vehicle was operated in road salt, clean it with cold water. Warm water would enhance the corrosive effects of salt.

- After rinsing the motorcycle with a gentle spray of water, allow it to dry thoroughly.
- Remove the closure of the exhaust system.



### Warning

**Danger of accidents** Moisture and dirt impair the brake system.

- Brake carefully several times to dry out and remove dirt from the brake linings and the brake discs.

- After cleaning, ride the vehicle a short distance until the engine warms up.



### Info

The heat produced causes water at inaccessible locations in the engine and on the brake system to evaporate.

- After the motorcycle has cooled down, lubricate all moving parts and pivot points.
- Clean the chain. (📖 p. 175)
- Treat bare metal (except for brake discs and the exhaust system) with a corrosion inhibitor.

Preserving materials for paints, metal and rubber (📖 p. 467)

- Treat the painted parts with a mild paint polish.

Perfect finish and high gloss polish for paints (📖 p. 467)



**Info**

Do not polish parts that were matte when delivered as this would strongly impair the material quality.

- Treat the plastic parts and powder-coated parts with a mild cleaning and care product.

Special cleaner for glossy and matte paint finishes, metal and plastic surfaces (📖 p. 467)

- Oil the ignition and steering lock, tank lock, and seat lock.

Universal oil spray (📖 p. 467)

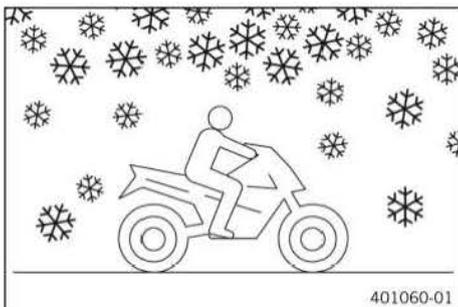


**28.2 Checks and maintenance steps for winter operation**



**Info**

If you use the motorcycle in winter, salt can be expected on the roads. You should therefore take precautions against aggressive road salt. After riding on salted roads, thoroughly clean the vehicle with cold water and dry it well. Warm water enhances the corrosive effects of salt.



- Clean motorcycle. (📖 p. 410)
- Clean brake system.



**Info**

After **EVERY** trip on salted roads, thoroughly clean the brake calipers and brake linings, after they have cooled down and without removing them, with cold water and dry them carefully.

After riding on salted roads, thoroughly clean the motorcycle with cold water and dry it well.

- Treat engine, link fork, and all other bare or zinc-plated parts (except the brake discs) with a wax-based corrosion inhibitor.



**Info**

Corrosion inhibitor must not come in contact with the brake discs as this would greatly reduce the braking force.

- Clean the chain. (📖 p. 175)

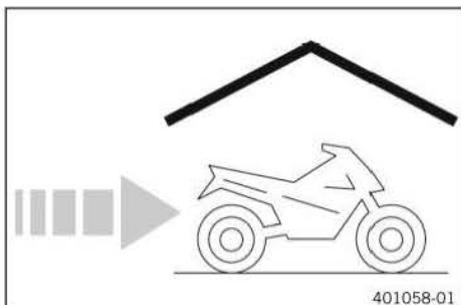


## 29.1 Storage

### **i** Info

If you plan to garage the motorcycle for a longer period, perform the following steps or have them performed.

Before storing the motorcycle, check all parts for function and wear. If service, repairs, or replacements are necessary, you should do this during the storage period (less workshop overload). In this way, you can avoid long workshop waiting times at the start of the new season.



- When refueling for the last time before taking the motorcycle out of service, add fuel additive.

Fuel additive (📖 p. 466)
--------------------------

- Refuel. (📖 p. 129)
- Clean motorcycle. (📖 p. 410)
- Change the engine oil and oil filter, clean the oil screens. (📖 p. 381)
- Check the coolant fill level and antifreeze. (📖 p. 364)
- Check tire pressure. (📖 p. 142)
- Remove the 12-V battery. (📖 p. 182)

#### Guideline

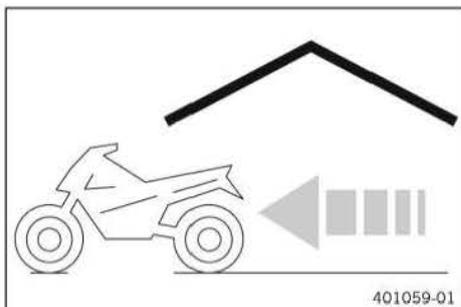
Storage temperature of the 12-V battery without direct sunlight	0 ... 35 °C (32 ... 95 °F)
-----------------------------------------------------------------	----------------------------

- Charge the 12-V battery.
- Store the vehicle in a dry location that is not subject to large fluctuations in temperature.
- Cover the motorcycle with a tarp or cover that is permeable to air.

### **i** Info

Do not use non-porous materials since they prevent humidity from escaping, thus causing corrosion. Avoid running the engine for a short time only. Since the engine cannot warm up properly, the water vapor produced during combustion condenses and causes valves and the exhaust system to rust.

## 29.2 Preparing for use after storage



- Take the motorcycle off the front lifting gear. (📖 p. 14)
- Remove the rear of the motorcycle from the lifting gear. (📖 p. 15)
- Install the 12-V battery. (📖 p. 183)
- Set the time and date.
- Perform checks and maintenance measures when preparing for use.
- Take a test ride.

**30.1 Additional information**

Any further work that results from the compulsory work or from the recommended work must be ordered separately and invoiced separately.  
 Different service intervals may apply in your country, depending on the local operating conditions.  
 Individual service intervals and scopes may change in the course of technical developments. The most up-to-date service schedule can always be found on KTM Dealer.net. Your authorized KTM dealer will be happy to advise you.

**30.2 Required work**

	every 24 months				
	every 12 months				
	every 30,000 km (18,600 mi)				
	every 15,000 km (9,300 mi)				
	after 1,000 km (620 mi)				
Read out the trouble code memory using the KTM diagnostics tool.	○	●	●	●	●
Program the shift shaft sensor. (📖 p. 363)	○	●	●	●	●
Check that the electrical system is functioning properly.	○	●	●	●	●
Change the engine oil and oil filter, clean the oil screens. (📖 p. 381)	○	●	●	●	●
Check the front brake linings. (📖 p. 191)	○	●	●	●	●
Check the rear brake linings. (📖 p. 197)	○	●	●	●	●
Check brake discs. (📖 p. 146)	○	●	●	●	●
Check the brake lines for damage and leakage.	○	●	●	●	●
Check the front brake fluid level. (📖 p. 193)	○	●	●	●	●
Check the rear brake fluid level. (📖 p. 202)	○	●	●	●	●
Change the front brake fluid. (📖 p. 195)					●
Change the rear brake fluid. (📖 p. 204)					●
Check the free travel of the clutch lever. (📖 p. 57)	○	●	●	●	●
Check the free travel of the foot brake lever. (📖 p. 200)	○	●	●	●	●
Check the shock absorber and fork for leaks. Perform service as needed and depending on how the vehicle is used.	○	●	●	●	●
Clean the dust boots of the fork legs. (📖 p. 20)		●	●		
Check the steering head bearing play. (📖 p. 46)	○	●	●	●	●
Check the tire condition. (📖 p. 142)	○	●	●	●	●
Check tire pressure. (📖 p. 142)	○	●	●	●	●
Retighten the spokes.	○				
Check the spoke tension. (📖 p. 145)		●	●	●	●
Check the rim run-out. (📖 p. 143)	○	●	●	●	●
Check the chain, rear sprocket, engine sprocket, and chain guide.		●	●	●	●
Check the chain tension. (📖 p. 171)	○	●	●	●	●
Change the spark plugs. (📖 p. 392)			●		
Check the valve clearance. (📖 p. 371)			●		
Check the antifreeze and coolant level.	○	●	●	●	●
Check the cables for damage and for routing without kinks.		●	●	●	●
Change the air filter, clean the air filter box. (📖 p. 111)		●	●		
Check the fuel pressure. (📖 p. 119)		●	●	●	●
Check the headlight setting. (📖 p. 210)	○	●	●		

	every 24 months	every 12 months	every 30,000 km (18,600 mi)	every 15,000 km (9,300 mi)	after 1,000 km (620 mi)
Check that the radiator fan is functioning properly.	○	●	●	●	●
Final check: Check the vehicle is roadworthy and take a test ride.	○	●	●	●	●
Read out the error memory after the test ride using the KTM diagnostics tool.	○	●	●	●	●
Adjust service display with KTM diagnostics tool. (🔧 p. 396)	○	●	●	●	●
Make the service entry in <b>KTM Dealer.net</b> and in the Service & Manufacturer Warranty booklet.	○	●	●	●	●

○ One-time interval

● Periodic interval

## 30.3 Recommended work

	every 48 months	every 12 months	every 30,000 km (18,600 mi)	every 15,000 km (9,300 mi)	after 1,000 km (620 mi)
Check the frame. (🔧 p. 62)			●		
Check the link fork. (🔧 p. 90)			●		
Check/clean the oil nozzle for clutch lubrication. (🔧 p. 384)	○	●	●		
Check the fork bearing for play. (🔧 p. 90)		●	●		
Check the wheel bearing for play. (🔧 p. 144)		●	●		
Change the coolant. (🔧 p. 368)					●
Empty the drainage hoses.	○	●	●	●	●
Check all hoses (e.g. fuel, cooling, bleeder, drainage hoses, etc.) and sleeves for cracking, tightness, and correct routing.		●	●	●	●
Grease all moving parts (e.g. side stand, hand lever, chain, etc.) and check for smooth operation.	○	●	●	●	●
Check the screws and nuts for tightness.	○	●	●	●	●

○ One-time interval

● Periodic interval





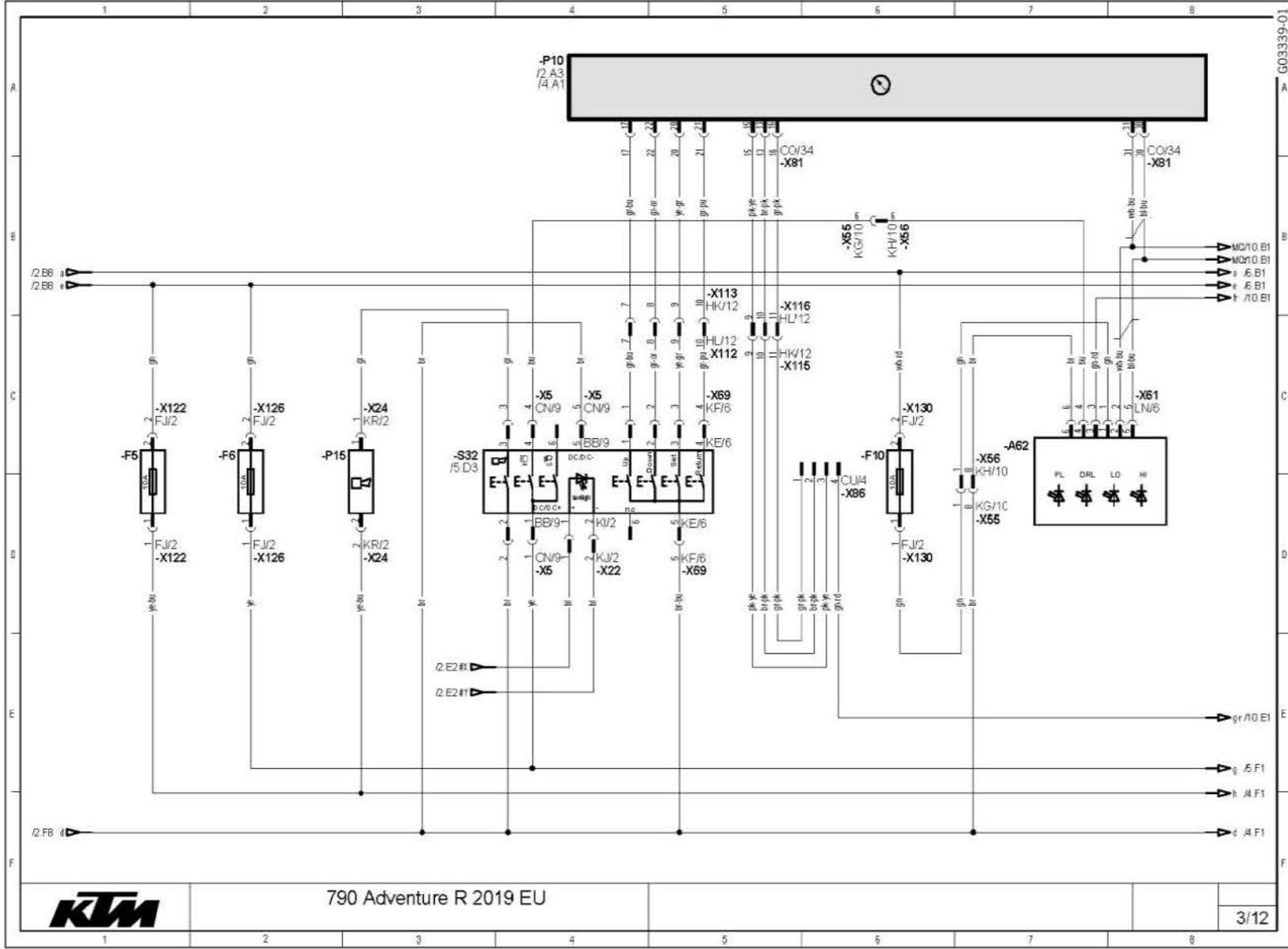
**Components:**

A11	Engine electronics control unit
F7	Fuse
G10	12-V battery
G20	Alternator
K10	Starter relay with main fuse
K11	Start auxiliary relay
M10	Electric starter system
T20	Voltage regulator
X270	Connector for accessory ground (terminal 31) <b>ACC 1</b> (not assigned)
X271	Connector for accessory plus (terminal 30) <b>ACC 1</b> (not assigned)
X291	Connector for accessory ground (terminal 31) <b>ACC 1</b>
X292	Connector for accessory plus (terminal 30) <b>ACC 1</b>



**Components:**

A11	Engine electronics control unit
F1	Fuse
F3	Fuse
K12	Light relay
K30	Power relay
K40	Fuel pump relay
M13	Fuel pump
P10	Combination instrument
S11	Ignition and steering lock
S23	Emergency OFF switch, tip switch



**Components:**

A62	Headlight control unit
F5	Fuse
F6	Fuse
F10	Fuse
P10	Combination instrument
P15	Horn
S32	Combination switch



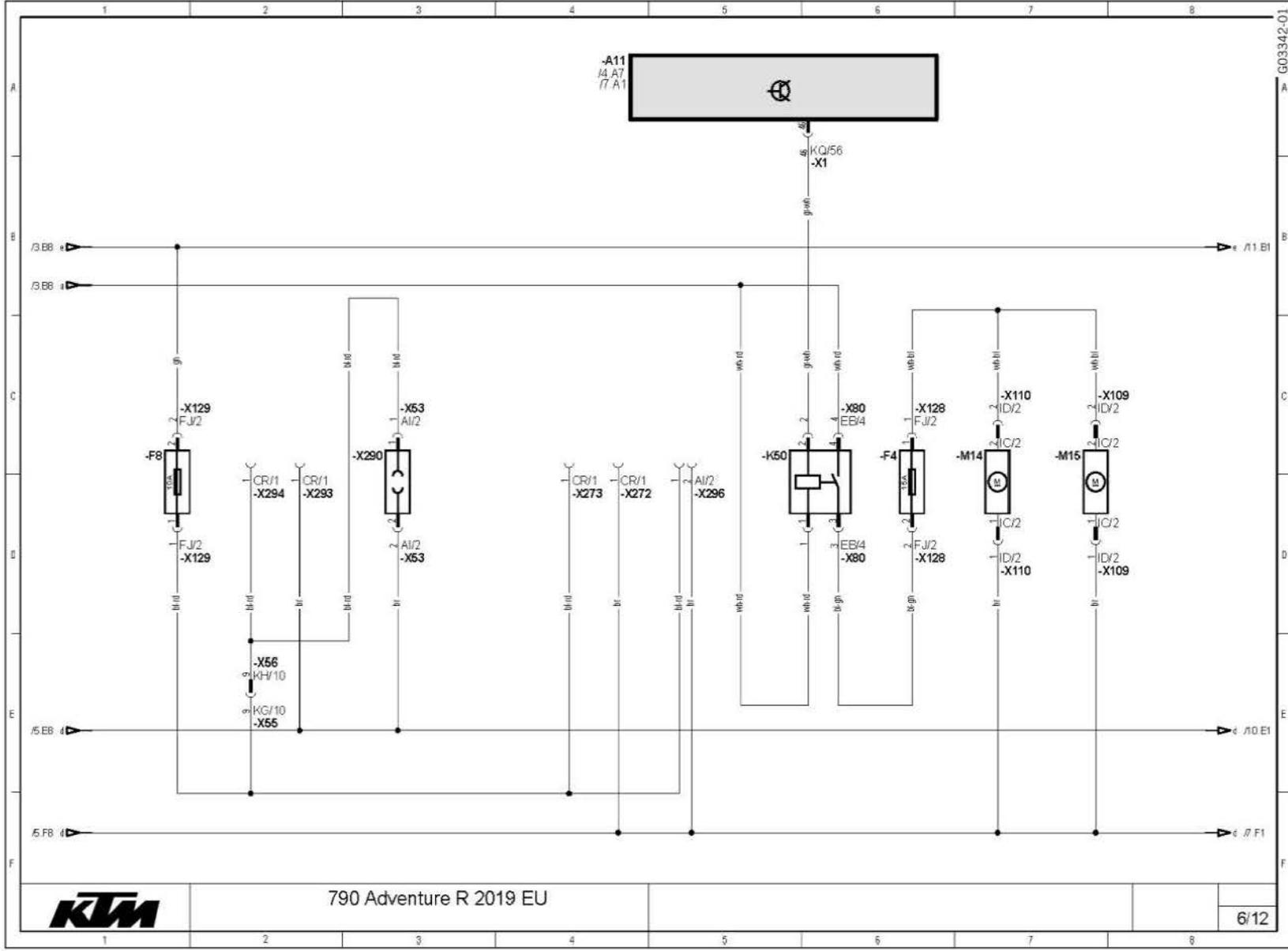
**Components:**

A11	Engine electronics control unit
B25	Ambient air temperature sensor
B32	Fuel level sensor
B76	Front brake light switch
B77	Rear brake light switch
P10	Combination instrument
P41	Turn signal, front left
P42	Turn signal, front right



**Components:**

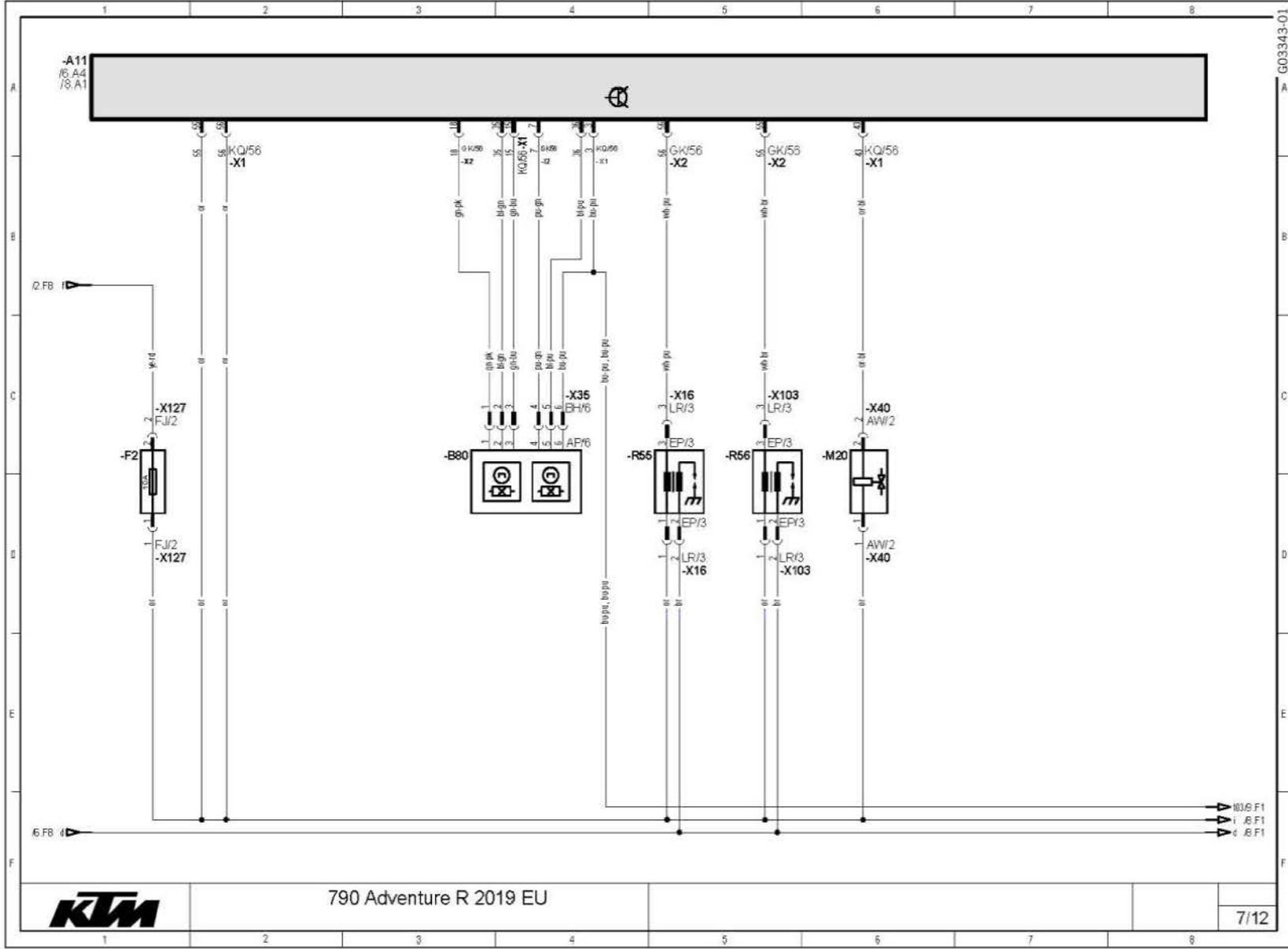
E80	Seat heater (optional)
K20	Turn signal relay
P10	Combination instrument
P45	Turn signal, rear left
P46	Turn signal, rear right
P37	Tail light
S32	Combination switch
S39	Seat heater switch (optional)



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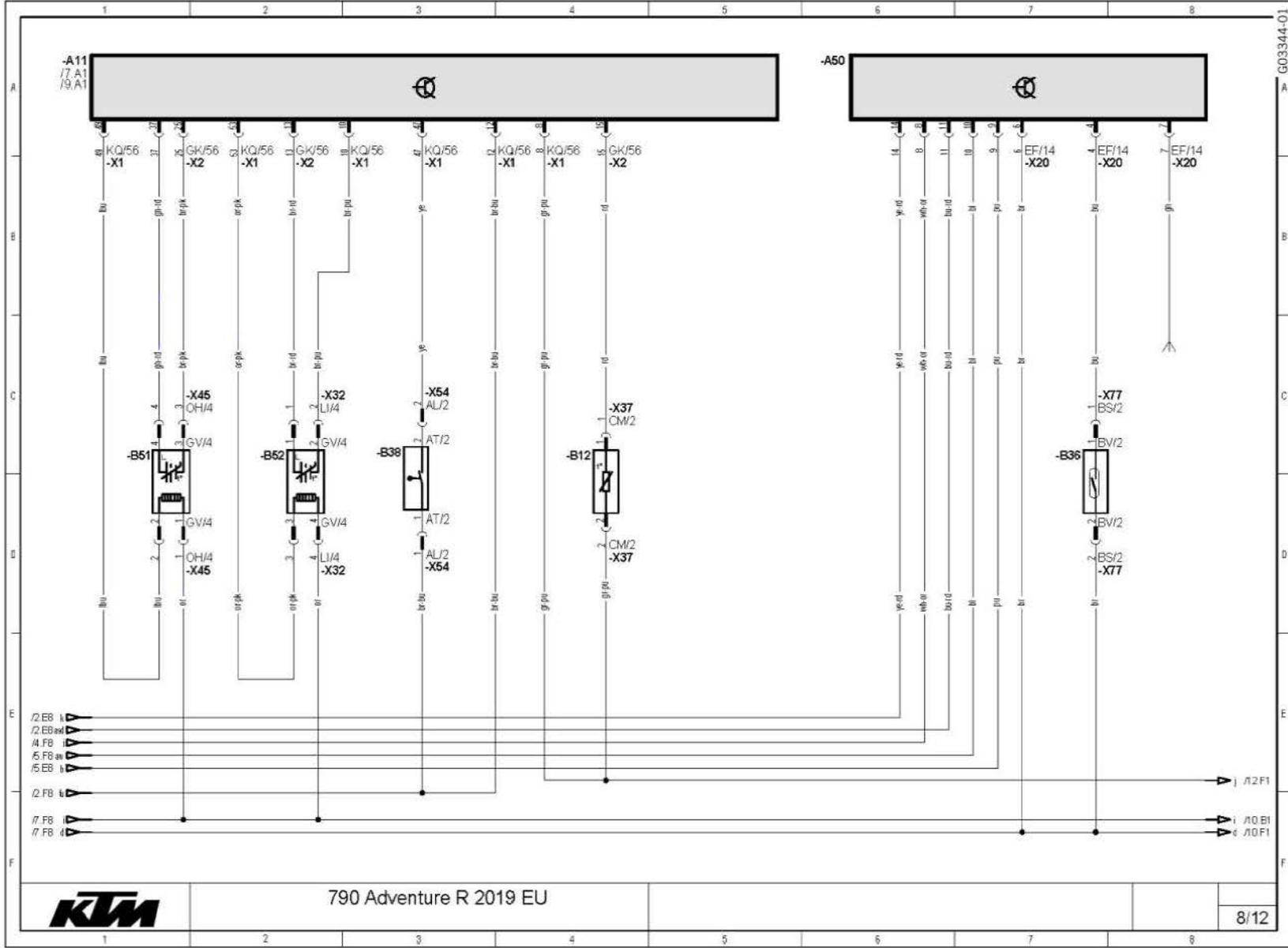
**Components:**

A11	Engine electronics control unit
F4	Fuse
F8	Fuse
K50	Radiator fan relay
M14	Radiator fan 1
M15	Radiator fan 2
X272	Connector for accessory ground (terminal 31) <b>ACC 2</b> (not assigned)
X273	Connector for accessory plus (terminal 15) <b>ACC 2</b> (not assigned)
X290	Socket
X293	Connector for accessory ground (terminal 31) <b>ACC 2</b> (not assigned)
X294	Connector for accessory plus (terminal 15) <b>ACC 2</b> (not assigned)
X296	USB charging plug



**Components:**

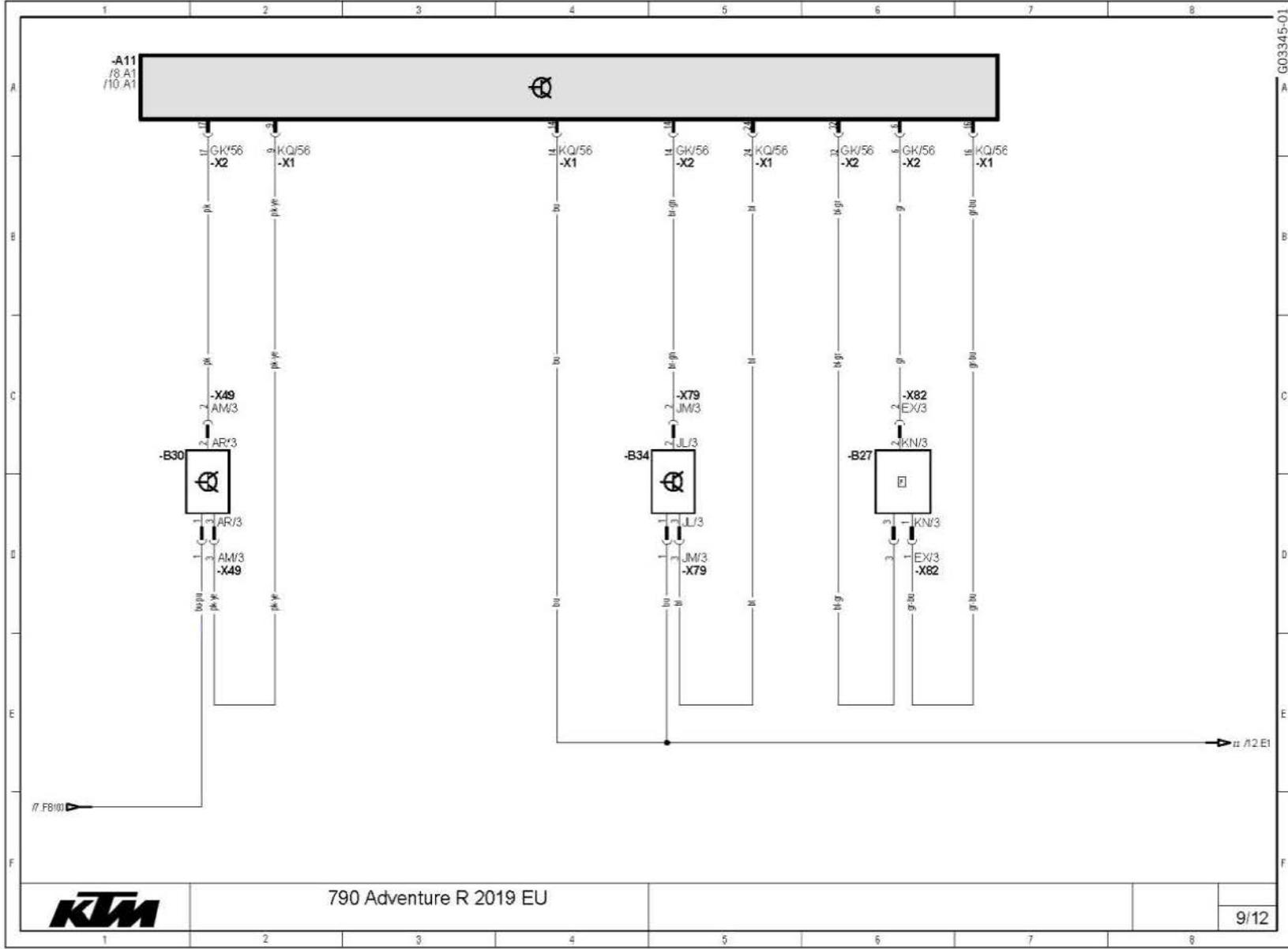
A11	Engine electronics control unit
B80	Throttle grip
F2	Fuse
M20	Evaporate emission control valve
R55	Ignition coil, cylinder 1
R56	Ignition coil, cylinder 2



G03344-01

**Components:**

A11	Engine electronics control unit
A50	Alarm system
B12	Intake air temperature sensor
B36	Alarm system switch
B38	Clutch switch
B51	Cylinder 1 lambda sensor
B52	Cylinder 2 lambda sensor



G03345-01

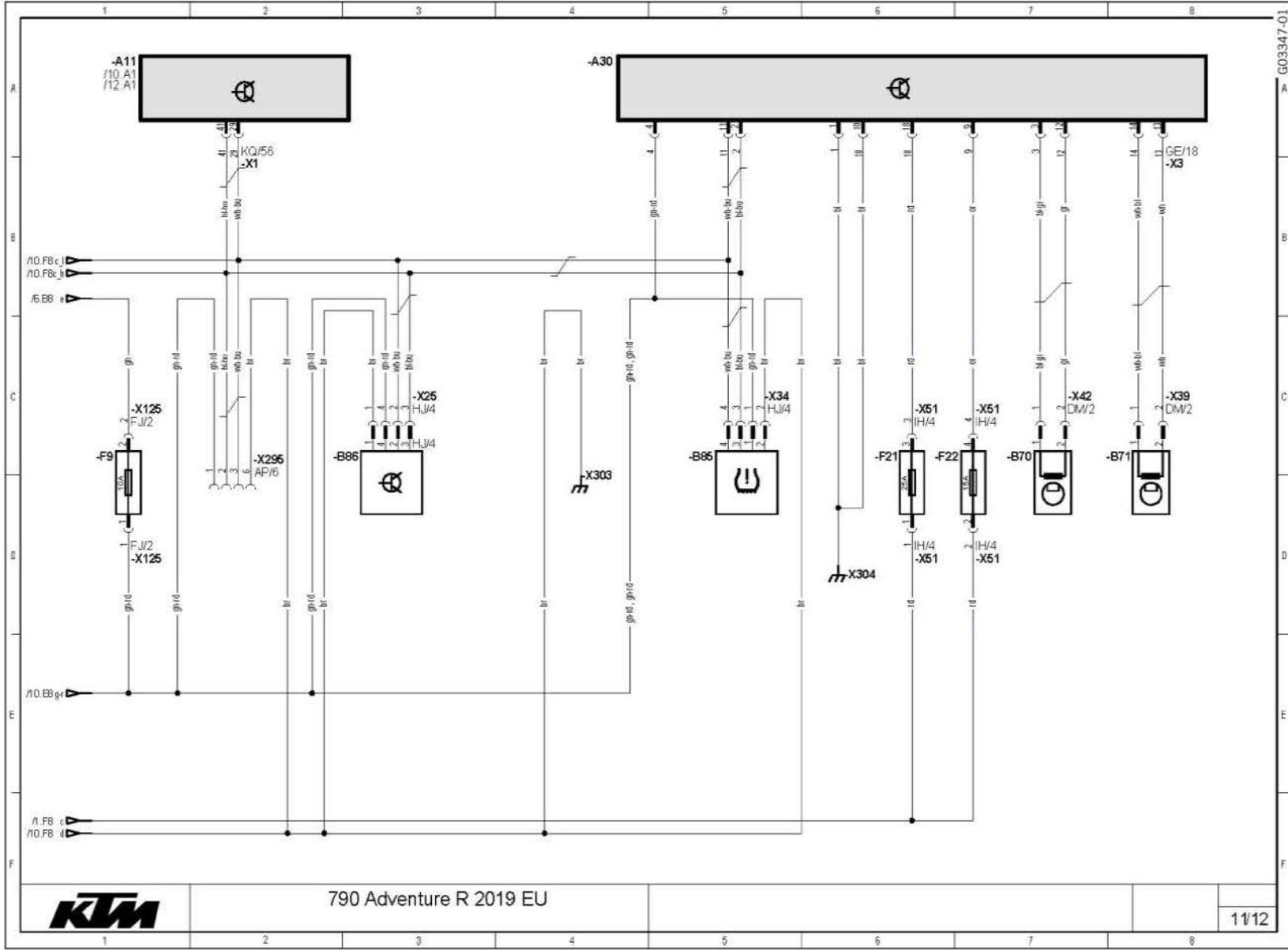
**Components:**

A11	Engine electronics control unit
B27	Shift shaft sensor
B30	Side stand sensor
B34	Gear position sensor



**Components:**

- A11 Engine electronics control unit
- A51 EDS control unit
- B37 Crankshaft speed sensor
- T30 Antenna for immobilizer control unit



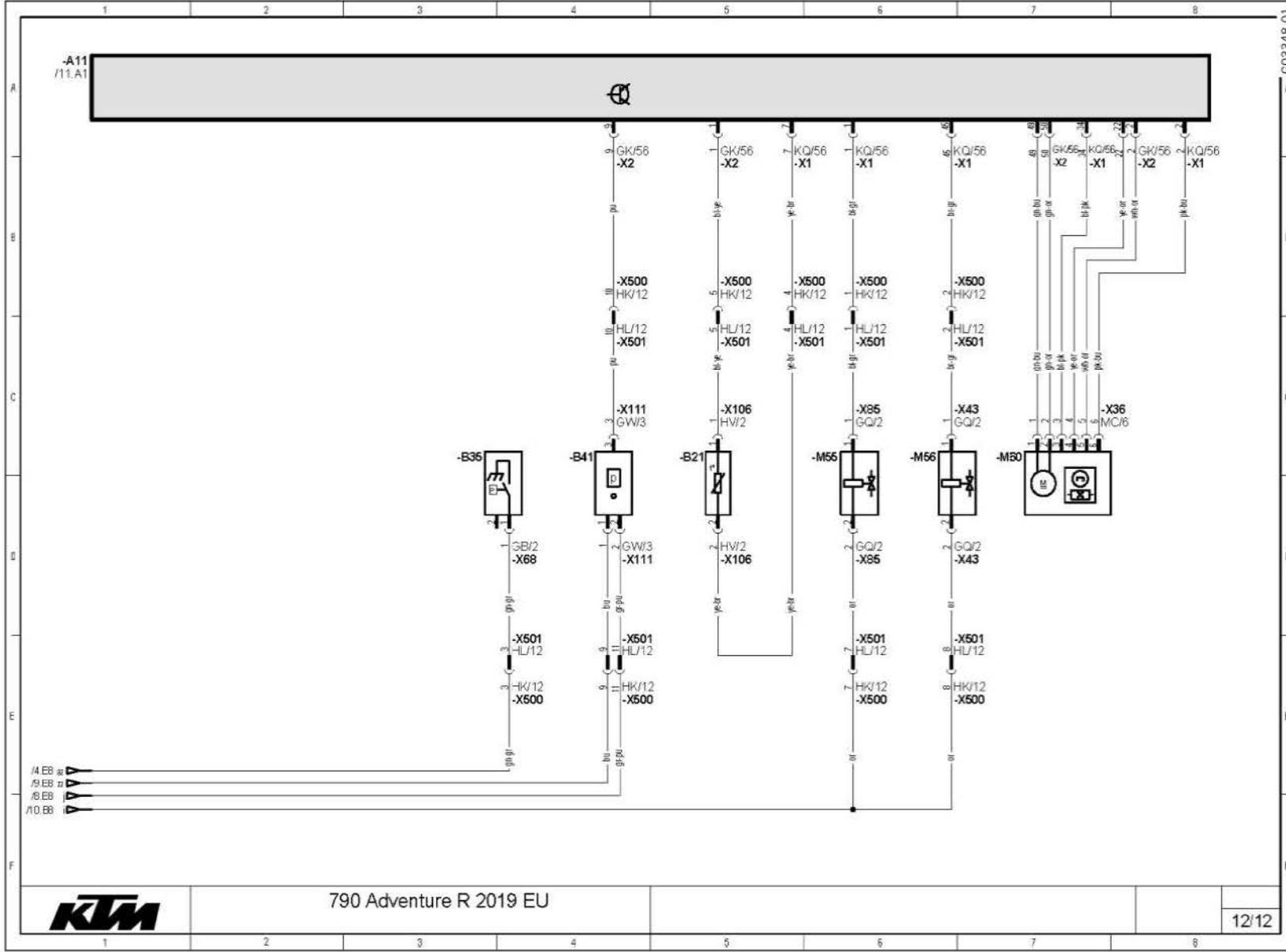
G03347-01

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**Components:**

A11	Engine electronics control unit
A30	ABS control unit
B70	Front wheel speed sensor
B71	Rear wheel speed sensor
B85	Tire pressure sensor (optional)
B86	Angle sensor
F9	Fuse
F21	ABS return pump fuse
F22	ABS hydraulic unit fuse
X295	Diagnostics connector

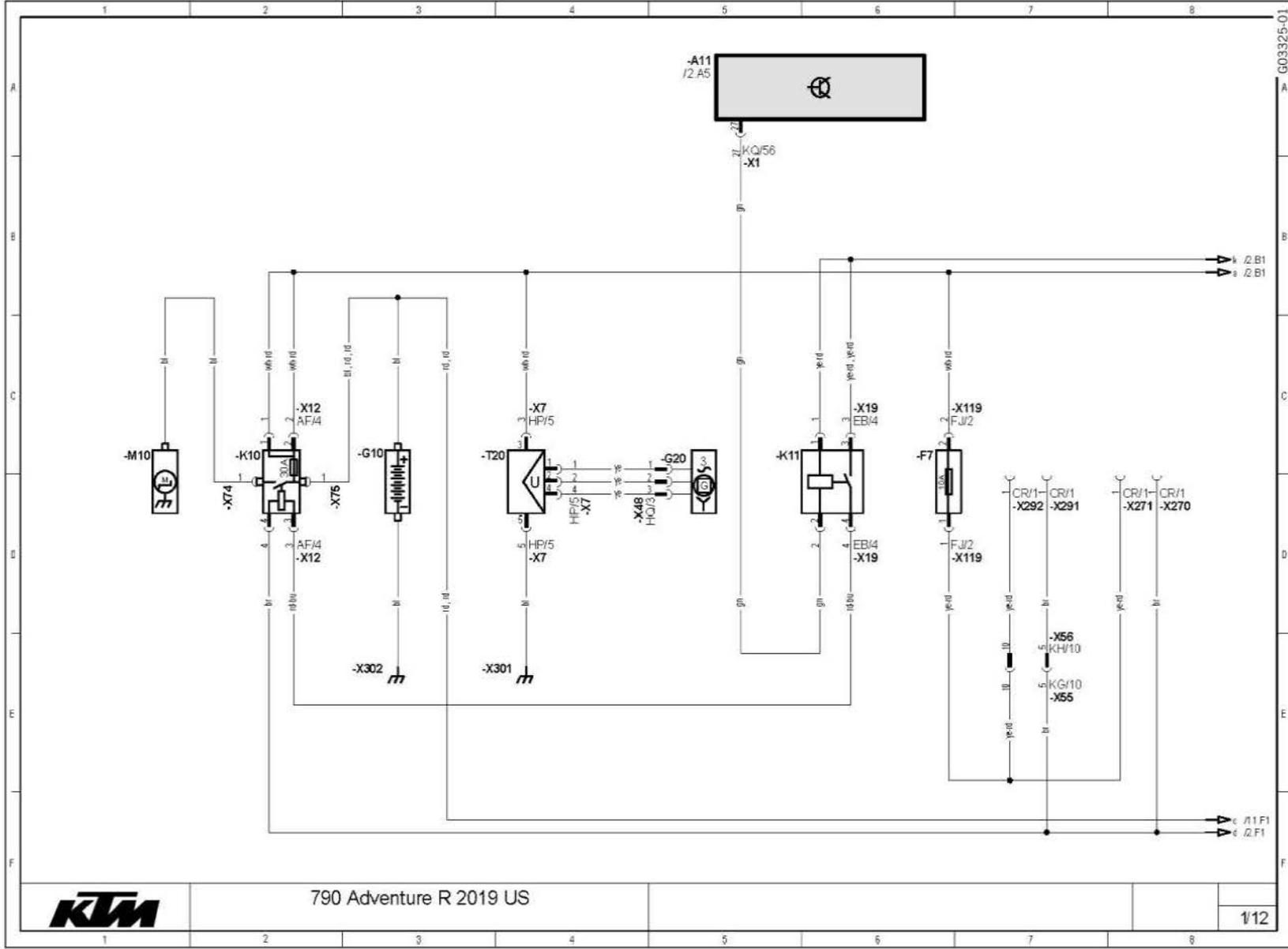


**Components:**

A11	Engine electronics control unit
B21	Coolant temperature sensor
B35	Oil pressure sensor
B41	Induction manifold pressure sensor cylinder 1
M55	Electronic fuel injection, cylinder 1
M56	Electronic fuel injection, cylinder 2
M60	Throttle valve position sensor

**Cable colors:**

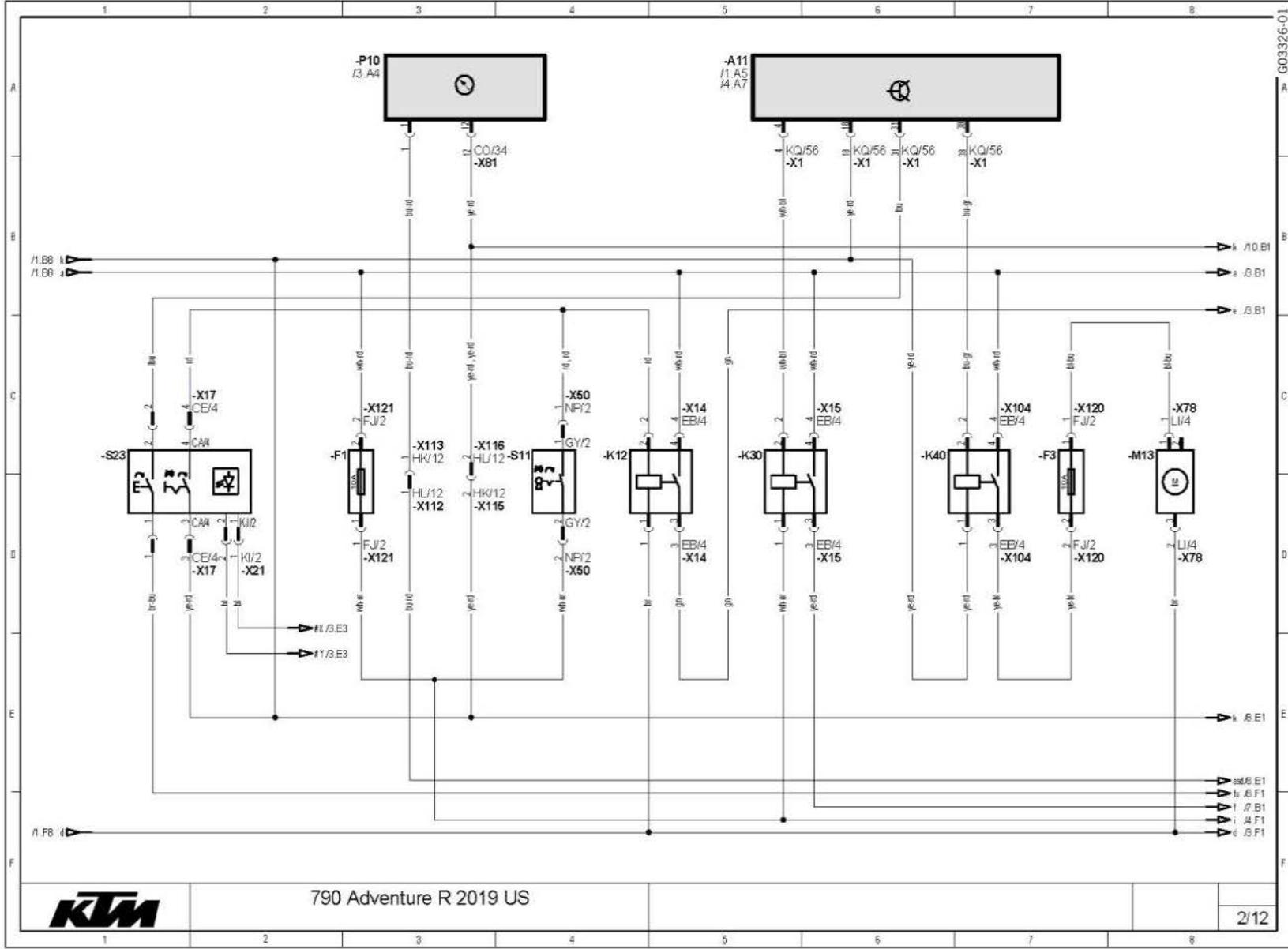
bl	Black
br	Brown
bu	Blue
gn	Green
gr	Gray
lbu	Light blue
or	Orange
pk	Pink
pu	Violet
rd	Red
wh	White
ye	Yellow



G03325-01

**Components:**

A11	Engine electronics control unit
F7	Fuse
G10	12-V battery
G20	Alternator
K10	Starter relay with main fuse
K11	Start auxiliary relay
M10	Electric starter system
T20	Voltage regulator
X270	Connector for accessory ground (terminal 31) <b>ACC 1</b> (not assigned)
X271	Connector for accessory plus (terminal 30) <b>ACC 1</b> (not assigned)
X291	Connector for accessory ground (terminal 31) <b>ACC 1</b>
X292	Connector for accessory plus (terminal 30) <b>ACC 1</b>



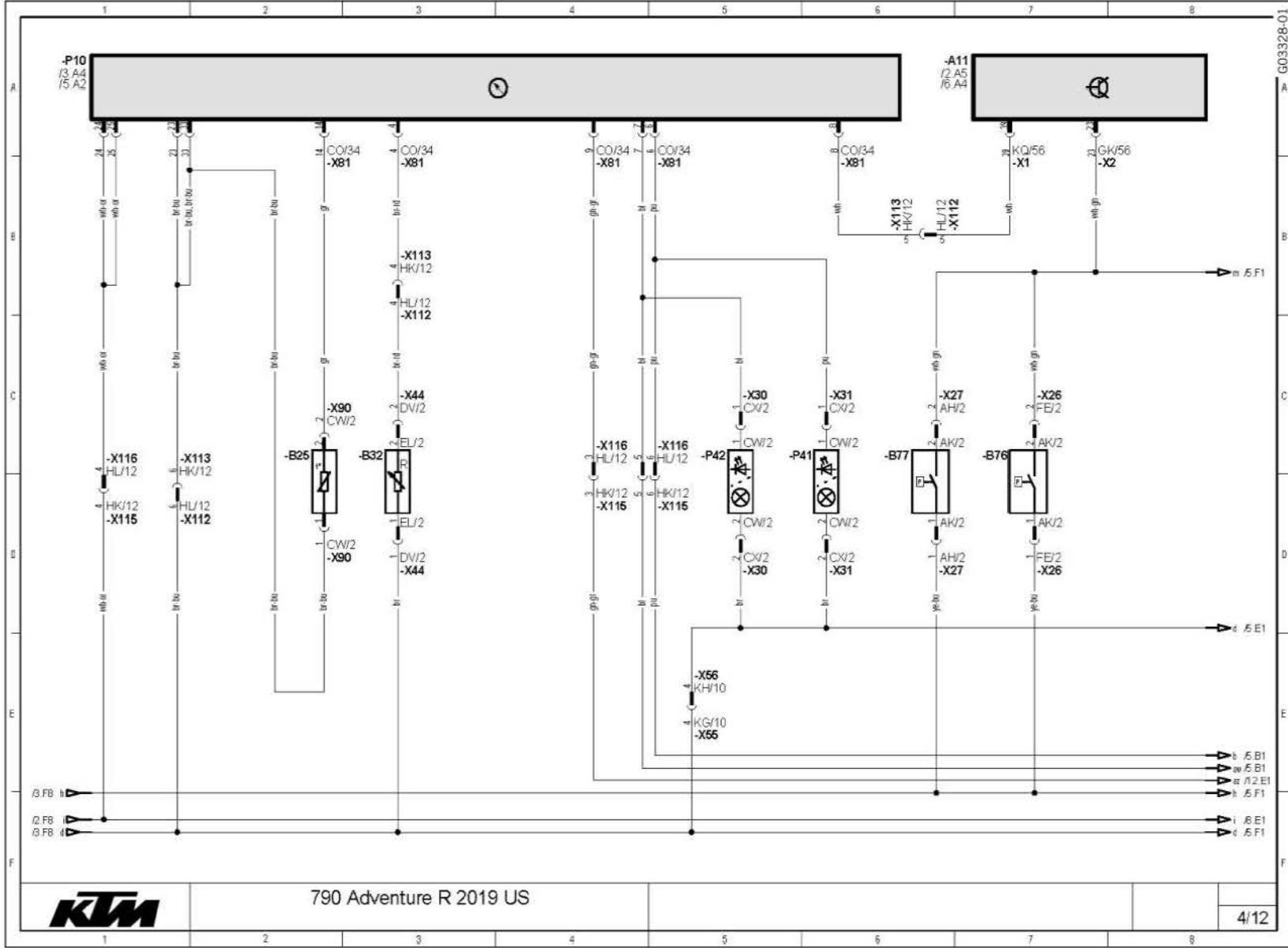
**Components:**

A11	Engine electronics control unit
F1	Fuse
F3	Fuse
K12	Light relay
K30	Power relay
K40	Fuel pump relay
M13	Fuel pump
P10	Combination instrument
S11	Ignition and steering lock
S23	Emergency OFF switch, tip switch



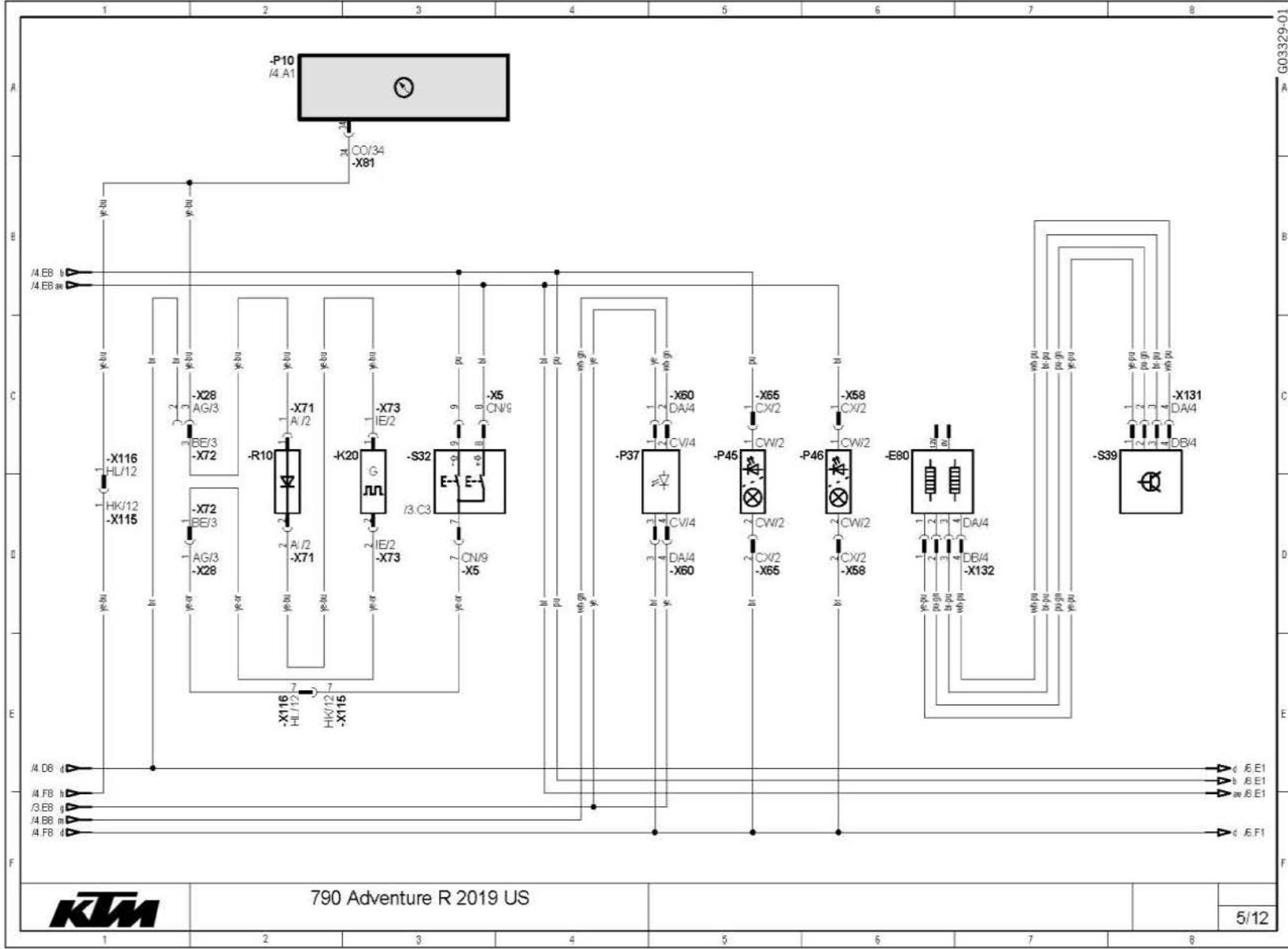
**Components:**

A62	Headlight control unit
F5	Fuse
F6	Fuse
F10	Fuse
P10	Combination instrument
P15	Horn
S32	Combination switch



**Components:**

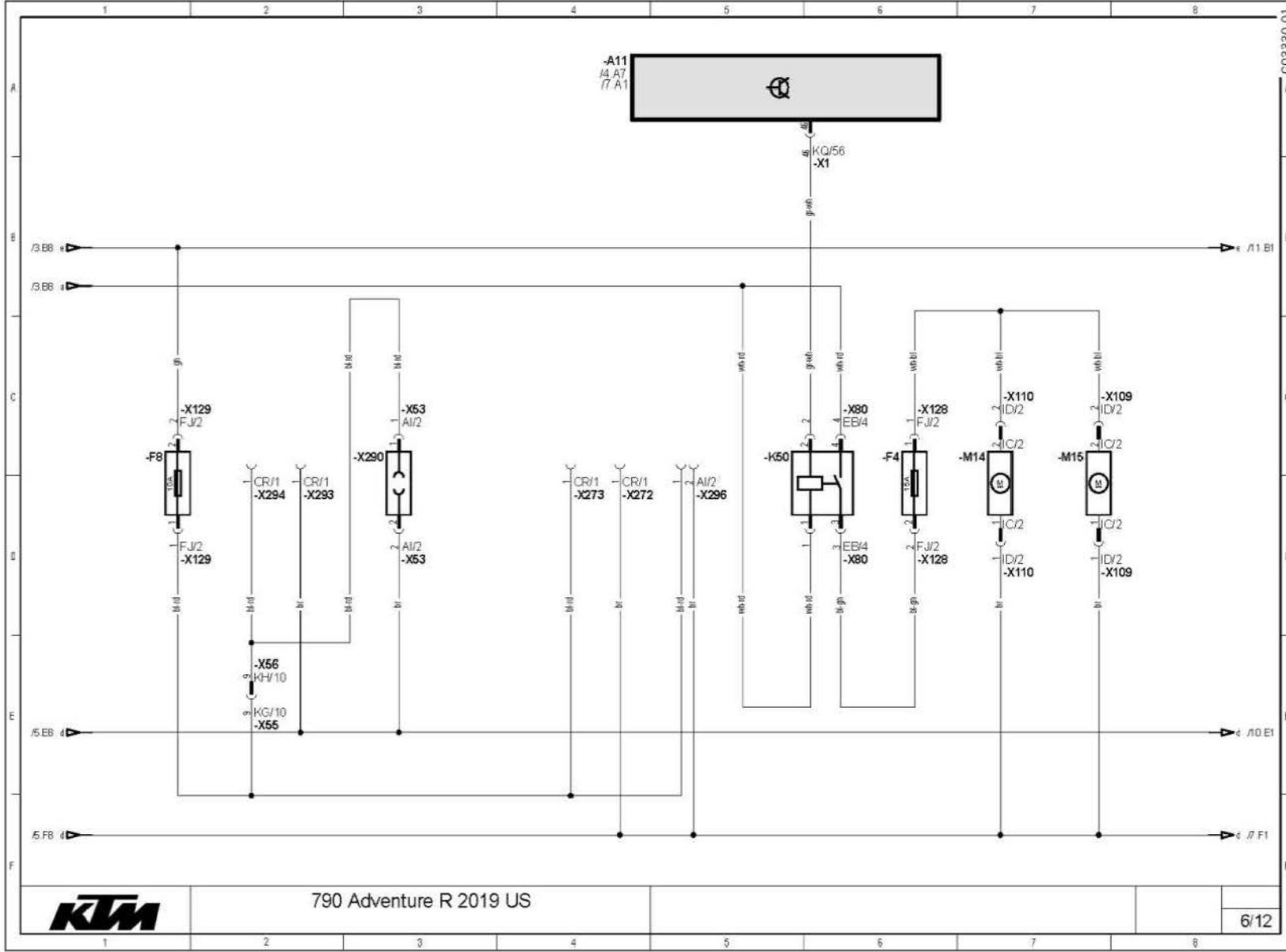
A11	Engine electronics control unit
B25	Ambient air temperature sensor
B32	Fuel level sensor
B76	Front brake light switch
B77	Rear brake light switch
P10	Combination instrument
P41	Turn signal, front left
P42	Turn signal, front right



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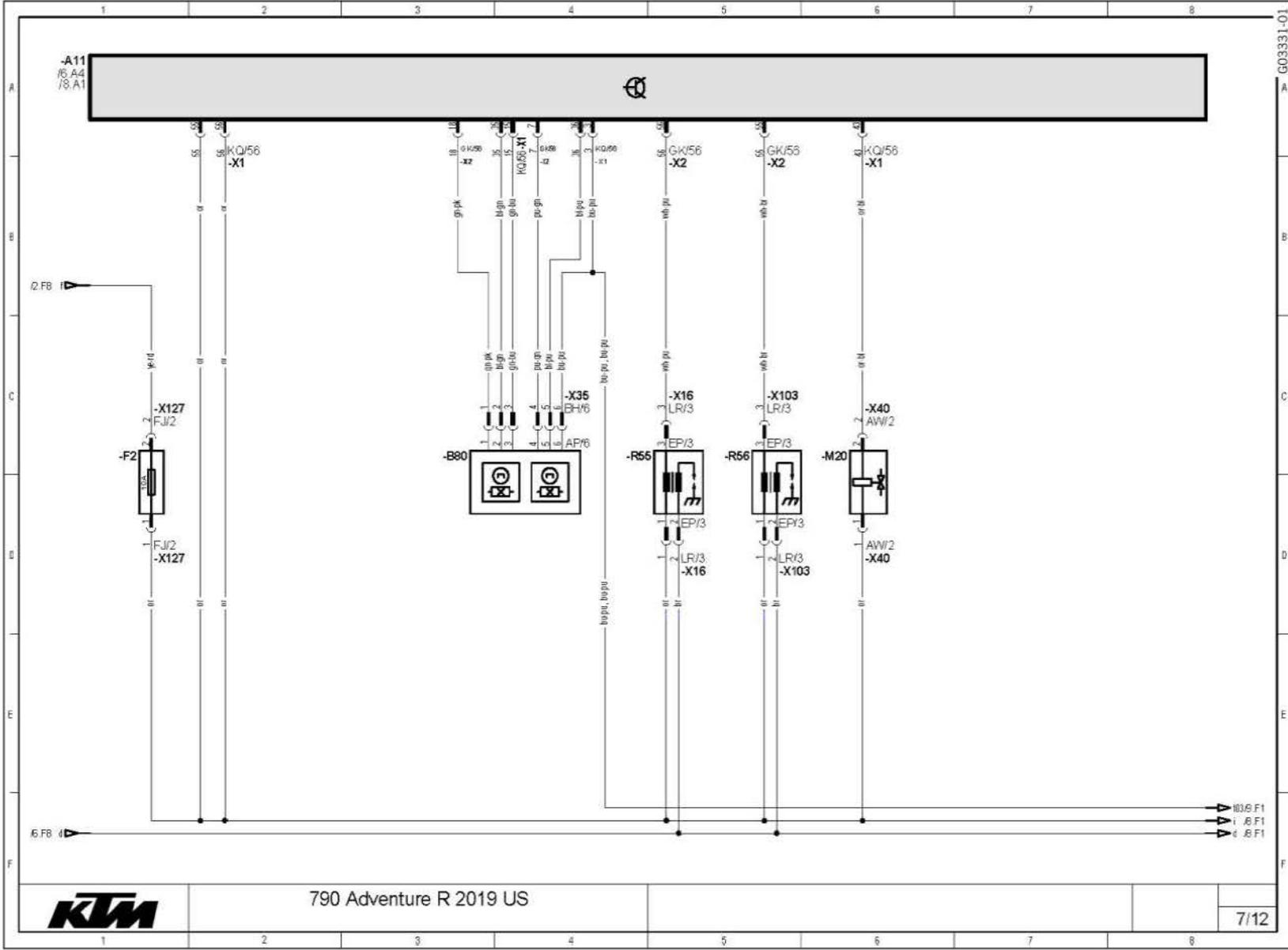
**Components:**

E80	Seat heater (optional)
K20	Turn signal relay
P10	Combination instrument
P45	Turn signal, rear left
P46	Turn signal, rear right
P37	Tail light
S32	Combination switch
R10	Diode
S39	Seat heater switch (optional)



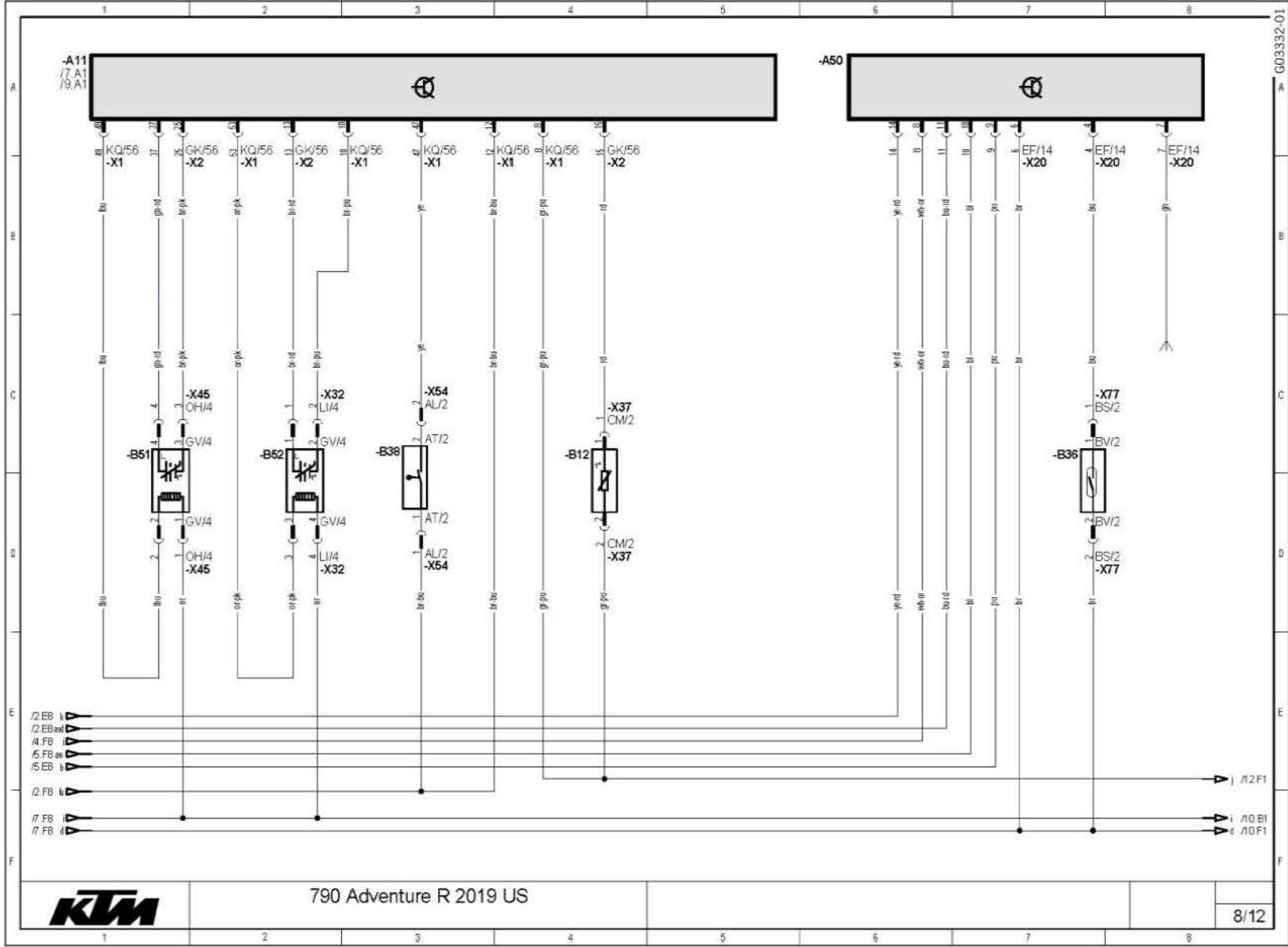
**Components:**

A11	Engine electronics control unit
F4	Fuse
F8	Fuse
K50	Radiator fan relay
M14	Radiator fan 1
M15	Radiator fan 2
X272	Connector for accessory ground (terminal 31) <b>ACC 2</b> (not assigned)
X273	Connector for accessory plus (terminal 15) <b>ACC 2</b> (not assigned)
X290	Socket
X293	Connector for accessory ground (terminal 31) <b>ACC 2</b> (not assigned)
X294	Connector for accessory plus (terminal 15) <b>ACC 2</b> (not assigned)
X296	USB charging plug



**Components:**

A11	Engine electronics control unit
B80	Throttle grip
F2	Fuse
M20	Evaporate emission control valve
R55	Ignition coil, cylinder 1
R56	Ignition coil, cylinder 2



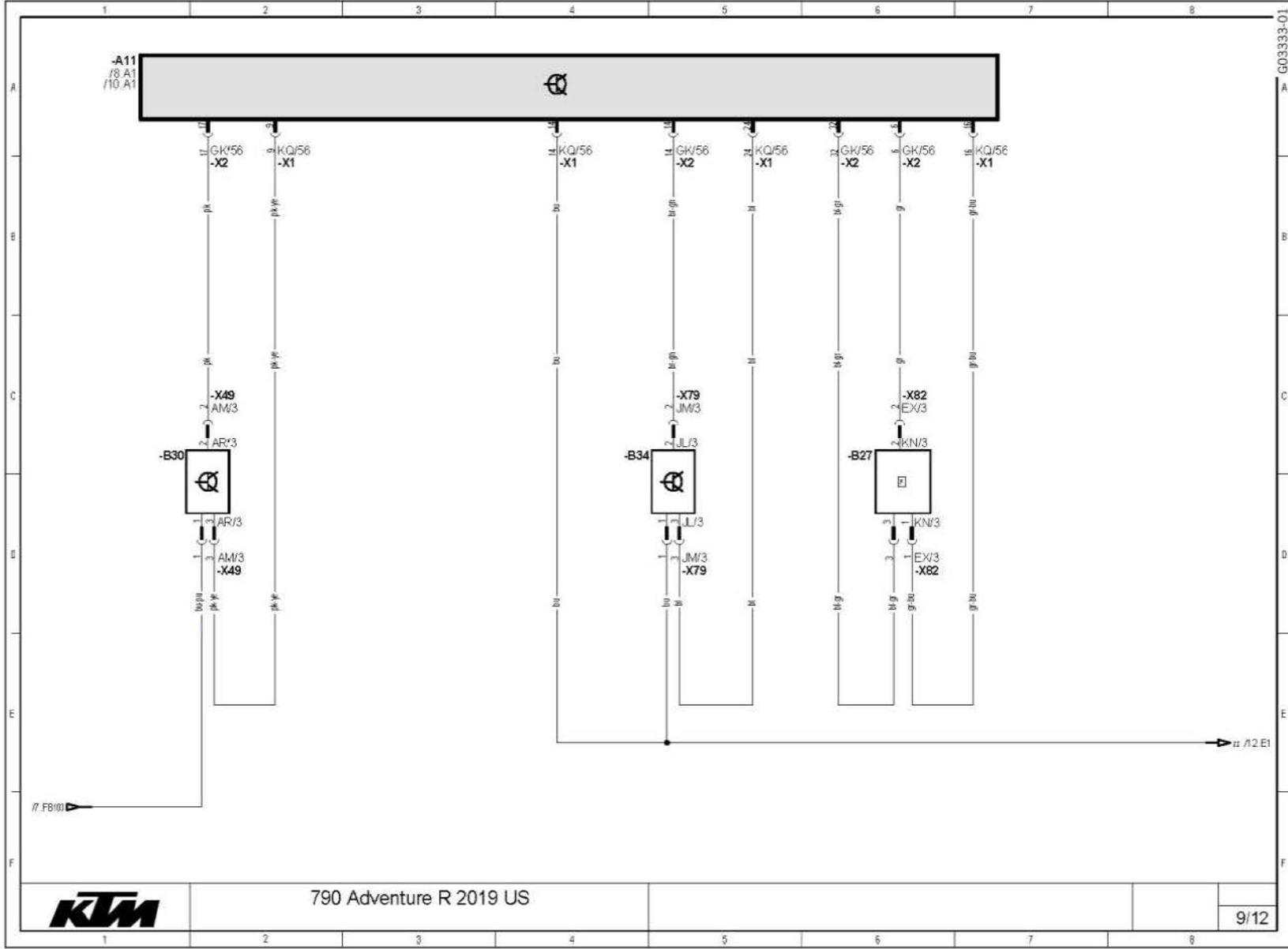
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G03332-01

**Components:**

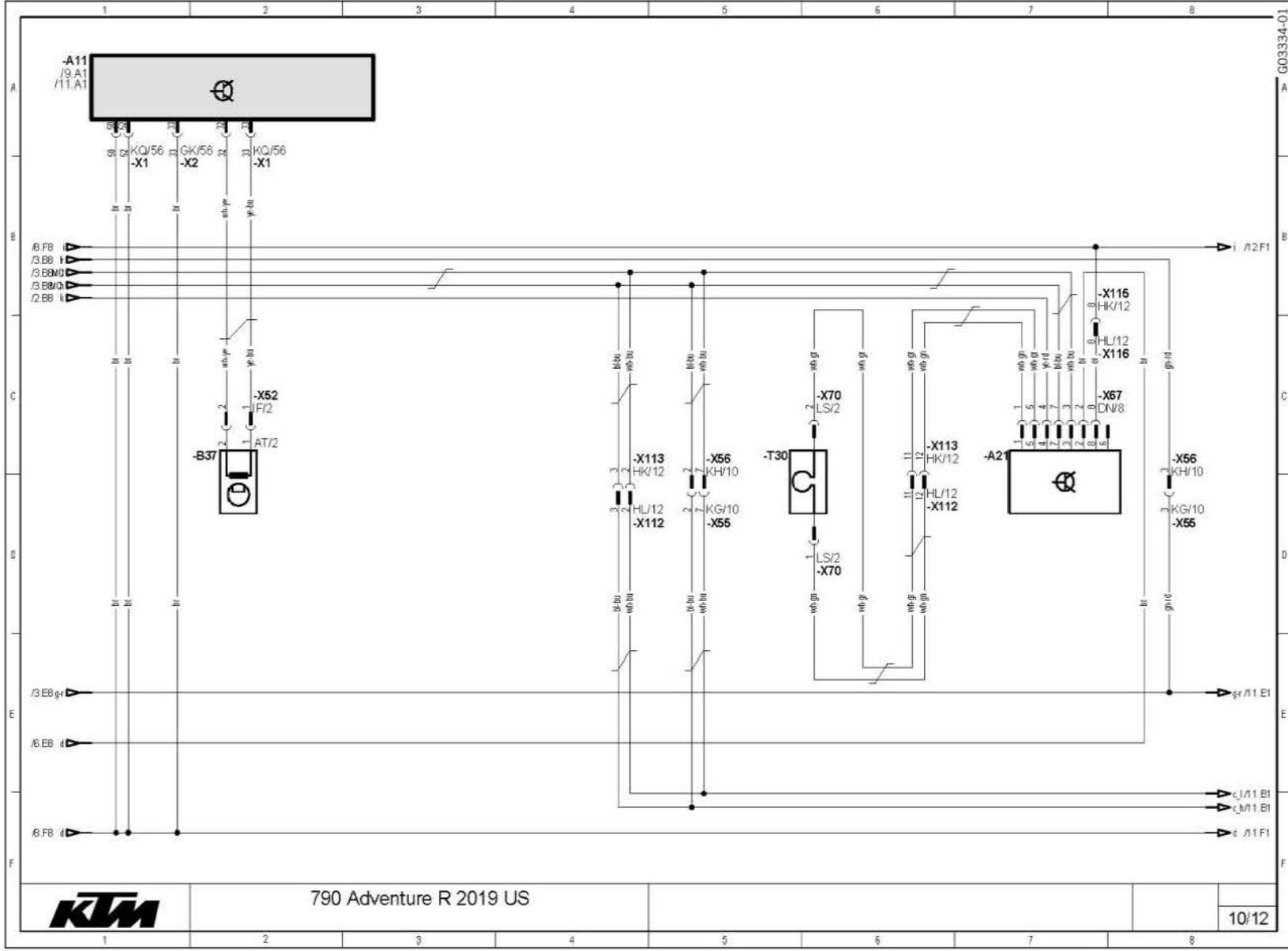
A11	Engine electronics control unit
A50	Alarm system
B12	Intake air temperature sensor
B36	Alarm system switch
B38	Clutch switch
B51	Cylinder 1 lambda sensor
B52	Cylinder 2 lambda sensor



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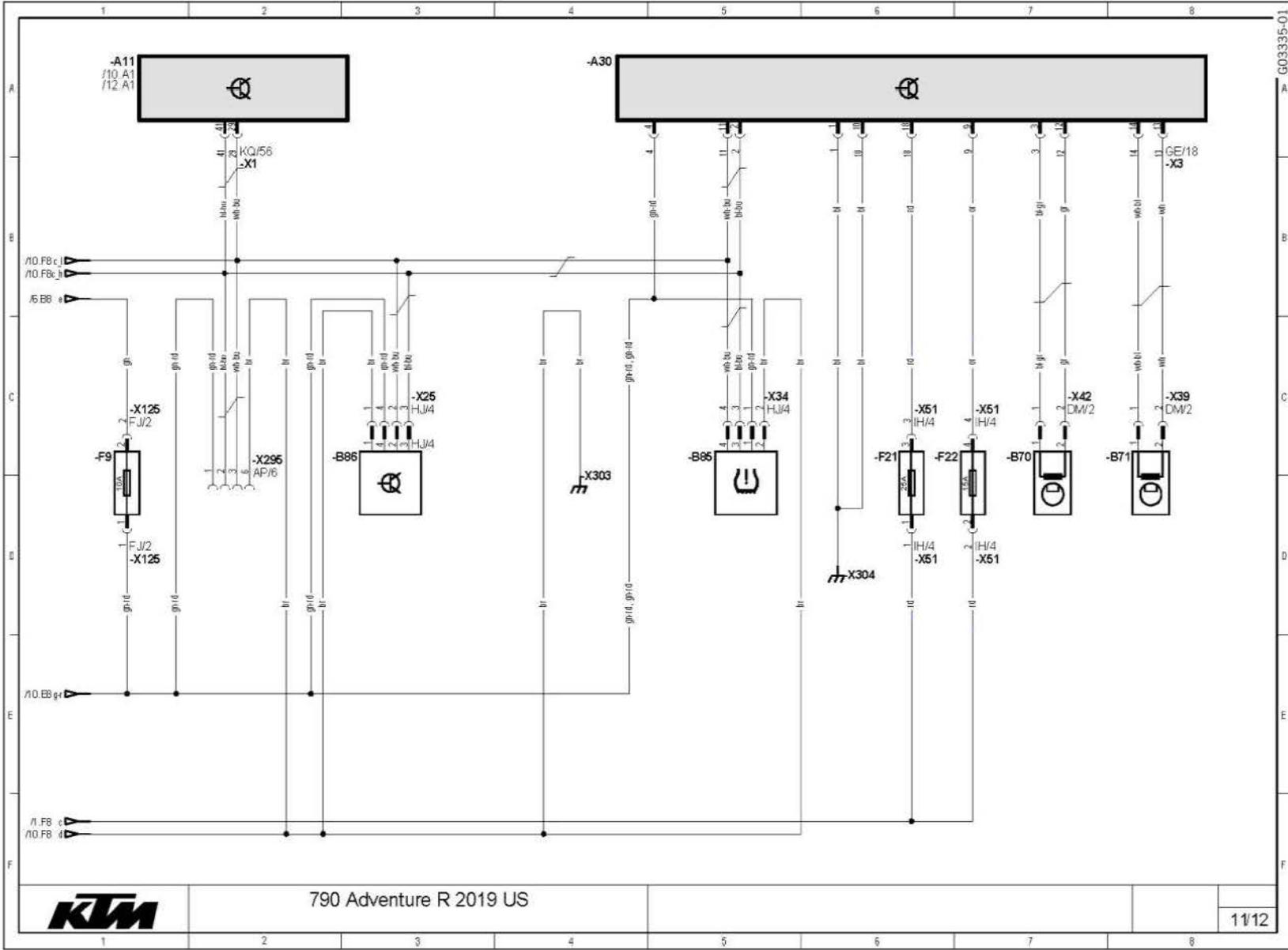
**Components:**

A11	Engine electronics control unit
B27	Shift shaft sensor
B30	Side stand sensor
B34	Gear position sensor



**Components:**

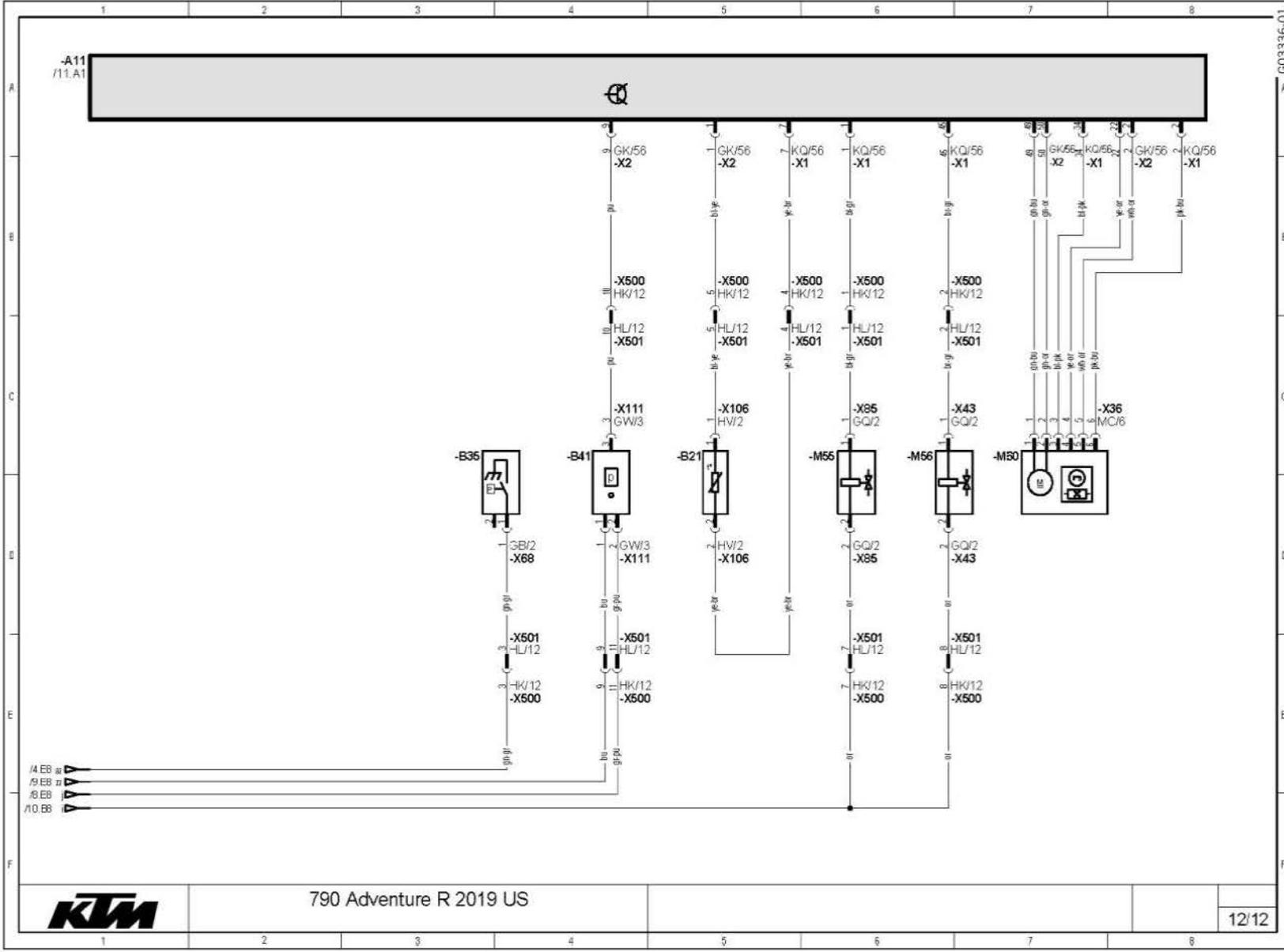
A11	Engine electronics control unit
A51	EDS control unit
B37	Crankshaft speed sensor
T30	Antenna for immobilizer control unit



G03335-01

**Components:**

A11	Engine electronics control unit
A30	ABS control unit
B70	Front wheel speed sensor
B71	Rear wheel speed sensor
B85	Tire pressure sensor (optional)
B86	Angle sensor
F9	Fuse
F21	ABS return pump fuse
F22	ABS hydraulic unit fuse
X295	Diagnostics connector



**Components:**

A11	Engine electronics control unit
B21	Coolant temperature sensor
B35	Oil pressure sensor
B41	Induction manifold pressure sensor cylinder 1
M55	Electronic fuel injection, cylinder 1
M56	Electronic fuel injection, cylinder 2
M60	Throttle valve position sensor

**Cable colors:**

bl	Black
br	Brown
bu	Blue
gn	Green
gr	Gray
lbu	Light blue
or	Orange
pk	Pink
pu	Violet
rd	Red
wh	White
ye	Yellow

## Brake fluid DOT 4 / DOT 5.1

### Standard/classification

- DOT

### Guideline

- Use only brake fluid that complies with the specified standard (see specifications on the container) and that exhibits the corresponding properties.

### Recommended supplier

#### Castrol

- REACT PERFORMANCE DOT 4

#### MOTOREX®

- Brake Fluid DOT 5.1

## Coolant

### Guideline

- Only use high-grade, silicate-free coolant with corrosion inhibitor additive for aluminum motors. Low grade and unsuitable antifreeze causes corrosion, deposits and frothing.
- Do not use pure water as only coolant is able to meet the requirements needed in terms of corrosion protection and lubrication properties.
- Only use coolant that complies with the requirements stated (see specifications on the container) and that has the relevant properties.

Antifreeze protection to at least	-25 °C (-13 °F)
-----------------------------------	-----------------

The mixture ratio must be adjusted to the necessary antifreeze protection. Use distilled water if the coolant needs to be diluted.

The use of premixed coolant is recommended.

Observe the coolant manufacturer specifications for antifreeze protection, dilution and miscibility (compatibility) with other coolants.

### Recommended supplier

#### MOTOREX®

- COOLANT M3.0

## Engine oil (SAE 10W/50)

### Standard/classification

- JASO T903 MA2 (📖 p. 486)
- SAE (📖 p. 486) (SAE 10W/50)

### Guideline

- Use only engine oils that comply with the specified standards (see specifications on the container) and that possess the corresponding properties.

Fully synthetic engine oil
----------------------------

### Recommended supplier

#### MOTOREX®

- Power Synt 4T

**Fork oil (SAE 4) (48601166S1)****Standard/classification**

- SAE (📖 p. 486) (SAE 4)

**Guideline**

- Use only oils that comply with the specified standards (see specifications on the container) and that exhibit the corresponding properties.

**Shock absorber fluid (SAE 2.5) (50180751S1)****Standard/classification**

- SAE (📖 p. 486) (SAE 2.5)

**Guideline**

- Use only oils that comply with the specified standards (see specifications on the container) and that exhibit the corresponding properties.

**Super unleaded (ROZ 95/RON 95/PON 91)****Standard/classification**

- DIN EN 228 (ROZ 95/RON 95/PON 91)

**Guideline**

- Only use unleaded super fuel that matches or is equivalent to the specified fuel grade.
- Fuel with an ethanol content of up to 10 % (E10 fuel) is safe to use.

**Info**

Do **not** use fuel containing methanol (e. g. M15, M85, M100) or more than 10 % ethanol (e. g. E15, E25, E85, E100).

---

### Chain cleaner

Recommended supplier  
MOTOREX®  
– Chain Clean

### Fuel additive

Recommended supplier  
MOTOREX®  
– Fuel Stabilizer

### High viscosity grease

Recommended supplier  
SKF®  
– LGHB 2

### Long-life grease

Recommended supplier  
MOTOREX®  
– Bike Grease 2000

### Lubricant (T158)

Recommended supplier  
Lubcon®  
– Turmogrease® PP 300

### Lubricant (T14034)

Recommended supplier  
WP Performance Systems  
– WP Racing Grease IPR 2

### Lubricant (T159)

Recommended supplier  
Bel-Ray®  
– MC-11®

### Lubricant (T625)

Recommended supplier  
Molykote®  
– 33 Medium

### Motorcycle cleaner

Recommended supplier  
MOTOREX®  
– Moto Clean

**Perfect finish and high gloss polish for paints**

Recommended supplier

**MOTOREX®**

- Moto Shine

**Preserving materials for paints, metal and rubber**

Recommended supplier

**MOTOREX®**

- Moto Protect

**Special cleaner for glossy and matte paint finishes, metal and plastic surfaces**

Recommended supplier

**MOTOREX®**

- Quick Cleaner

**Street chain spray**

Guideline

Recommended supplier

**MOTOREX®**

- Chainlube Road Strong

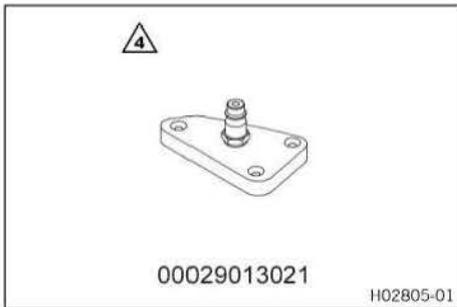
**Universal oil spray**

Recommended supplier

**MOTOREX®**

- Joker 440 Synthetic

## Bleeder cover



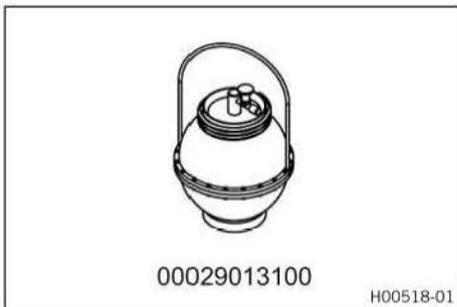
Art. no.: 00029013021

## Bleeder cover



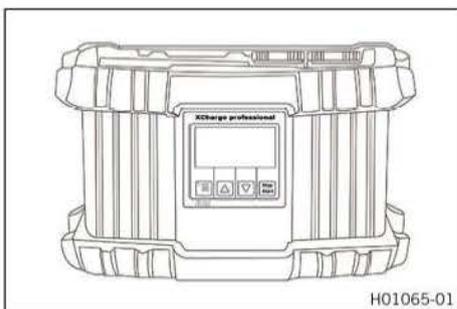
Art. no.: 00029013022

## Bleeding device



Art. no.: 00029013100

## EU battery charger XCharge-professional

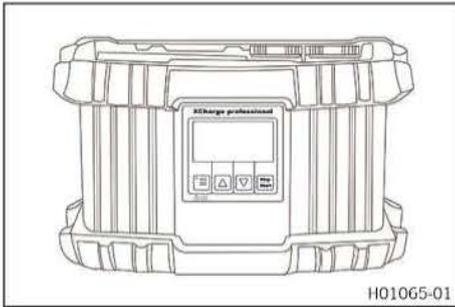


Art. no.: 00029095050

### Feature

EU safety plug	
Nominal voltage	230 V
Mains fuse	16 A
Power cable length approx.	5 m (16 ft)
Charger cable length approx.	5 m (16 ft)

**US battery charger XCharge-professional**

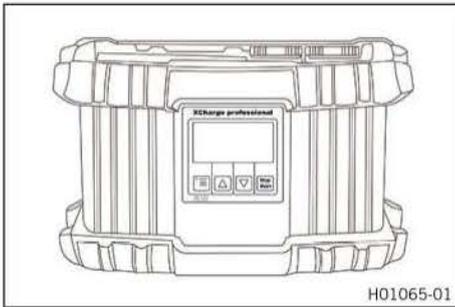


Art. no.: 00029095051

**Feature**

US plug	
Nominal voltage	120 V
Mains fuse	32 A
Power cable length approx.	5 m (16 ft)
Charger cable length approx.	5 m (16 ft)

**UK battery charger XCharge-professional**

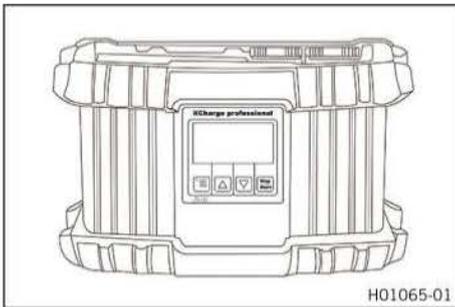


Art. no.: 00029095052

**Feature**

UK safety plug	
Nominal voltage	230 V
Mains fuse	16 A
Power cable length approx.	5 m (16 ft)
Charger cable length approx.	5 m (16 ft)

**CH battery charger XCharge-professional**

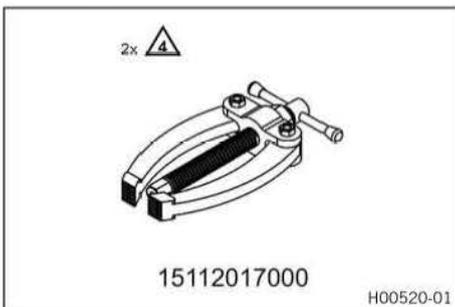


Art. no.: 00029095053

**Feature**

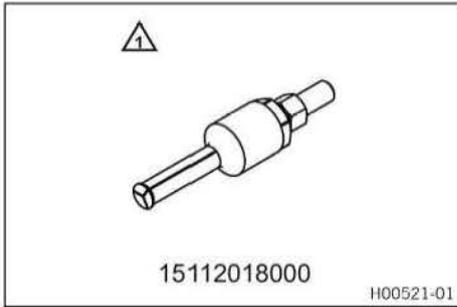
CH plug	
Nominal voltage	230 V
Mains fuse	16 A
Power cable length approx.	5 m (16 ft)
Charger cable length approx.	5 m (16 ft)

**Bearing puller**



Art. no.: 15112017000

## Internal bearing puller

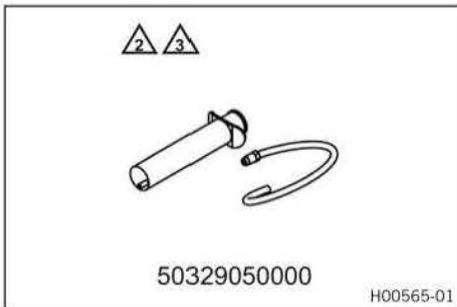


Art. no.: 15112018000

### Feature

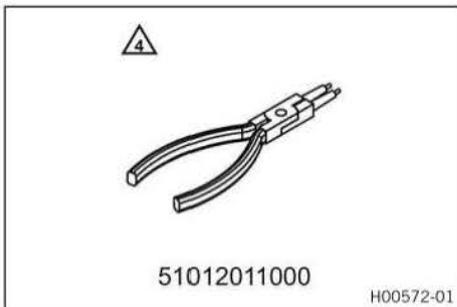
12 ... 16 mm (0.47 ... 0.63 in)

## Syringe



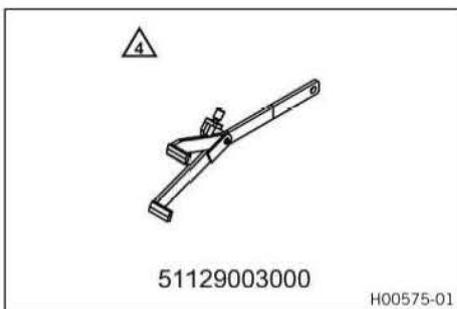
Art. no.: 50329050000

## Lock ring plier



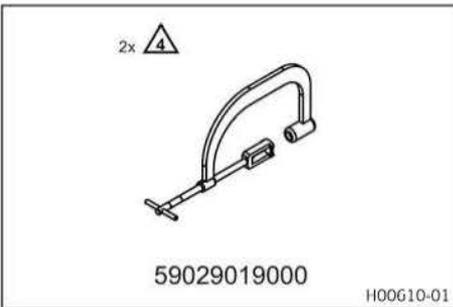
Art. no.: 51012011000

## Holding wrench



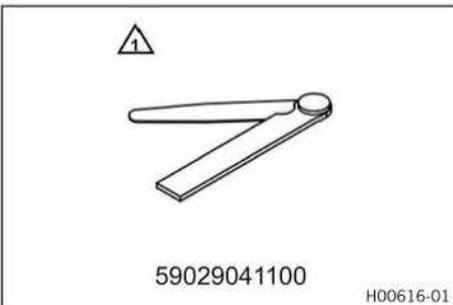
Art. no.: 51129003000

**Valve spring mounter**



Art. no.: 59029019000

**Feeler gauge**

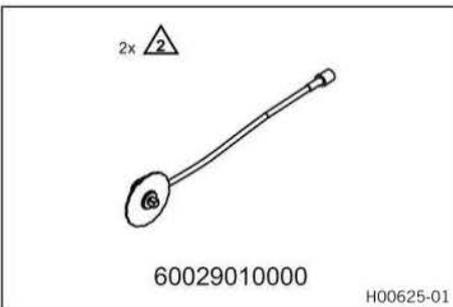


Art. no.: 59029041100

**Feature**

5 piece	0.10 ... 0.25 mm (0.0039 ... 0.0098 in)
---------	-----------------------------------------

**Angle disc**

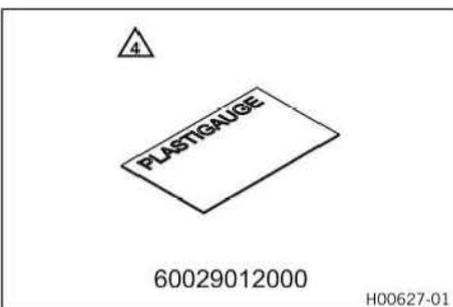


Art. no.: 60029010000

**Feature**

Driver system / tip	1/2 in
---------------------	--------

**Plastigauge clearance gauge**

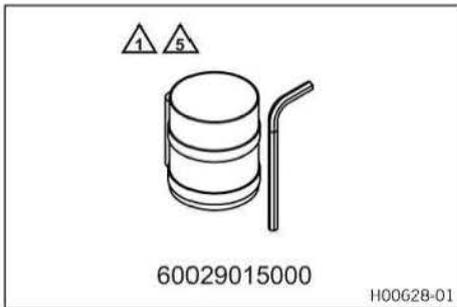


Art. no.: 60029012000

**Feature**

0.025 ... 0.175 mm (0.00098 ... 0.00689 in)
---------------------------------------------

## Piston ring compressor

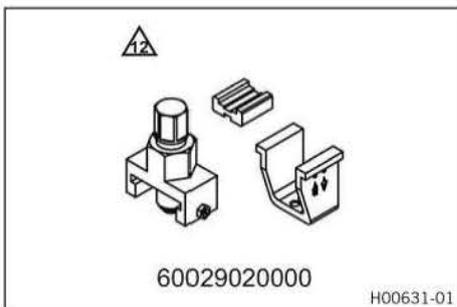


Art. no.: 60029015000

### Feature

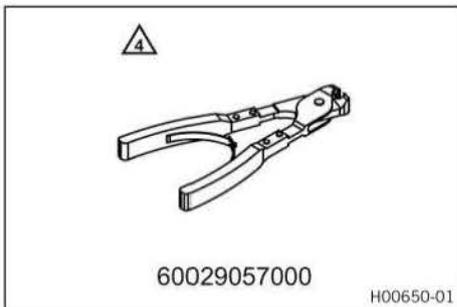
Height	80 mm (3.15 in)
Diameter	57 ... 125 mm (2.24 ... 4.92 in)

## Chain rivet tool



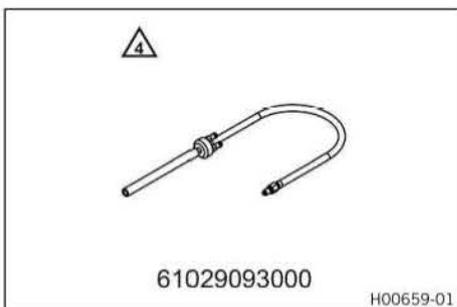
Art. no.: 60029020000

## Hose clamp plier

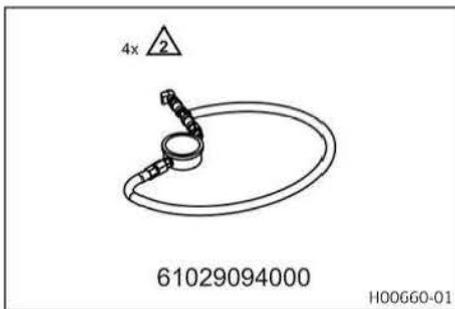


Art. no.: 60029057000

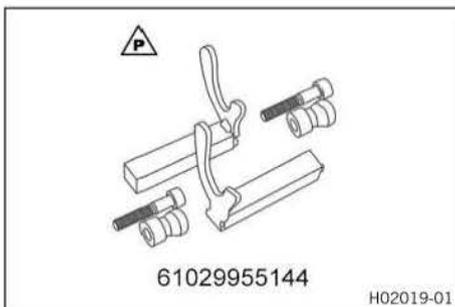
## Testing hose



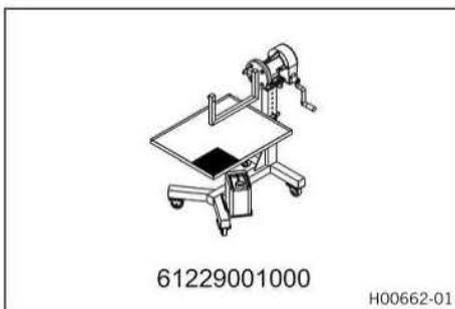
Art. no.: 61029093000

**Pressure testing tool**

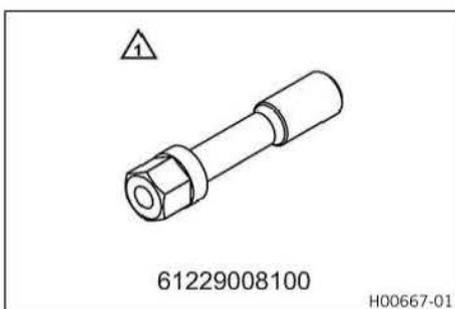
Art. no.: 61029094000

**Retaining adapter**

Art. no.: 61029955144

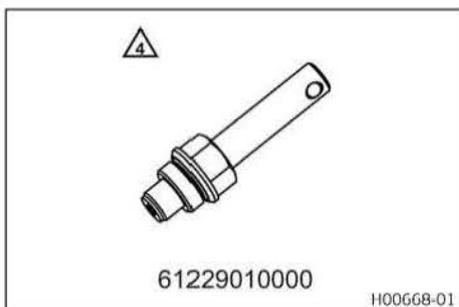
**Engine assembly stand**

Art. no.: 61229001000

**Pressing tool**

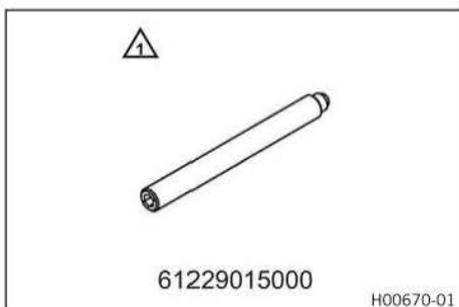
Art. no.: 61229008100

## Puller



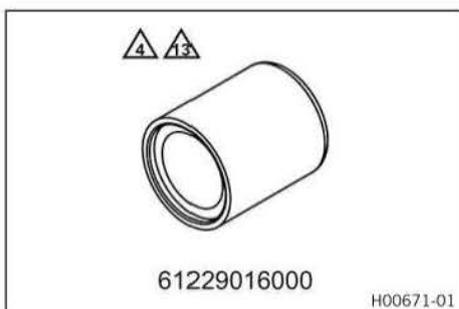
Art. no.: 6122901000

## Locking screw



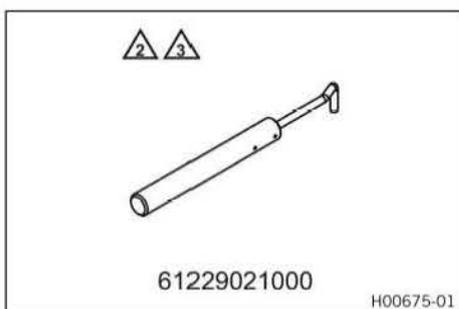
Art. no.: 61229015000

## Pressing tool



Art. no.: 61229016000

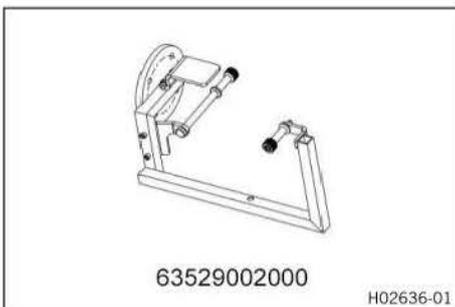
## Release device for timing chain tensioner



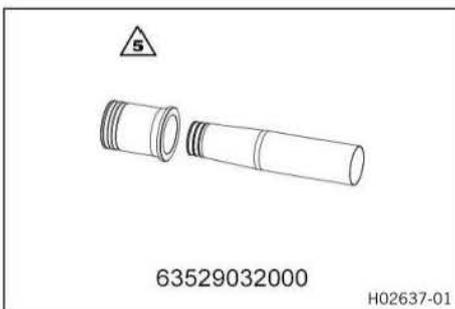
Art. no.: 61229021000

**Work stand**

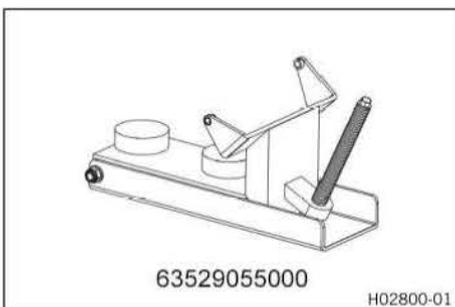
Art. no.: 62529055200

**Engine bracket for engine work stand**

Art. no.: 63529002000

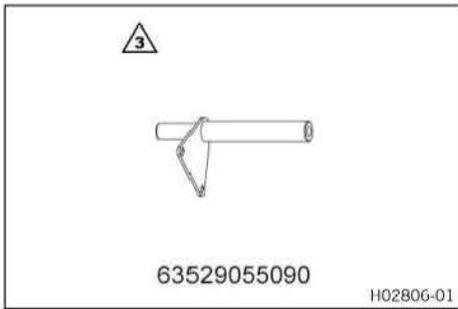
**Mounting tool for lock ring**

Art. no.: 63529032000

**Floor jack attachment**

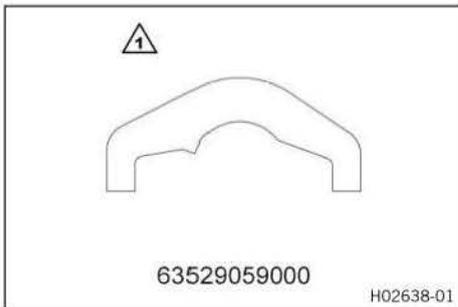
Art. no.: 63529055000

## Socket pin



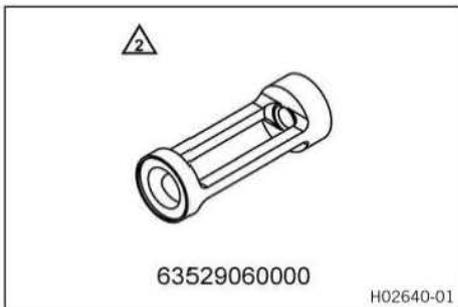
Art. no.: 63529055090

## Setting gauge



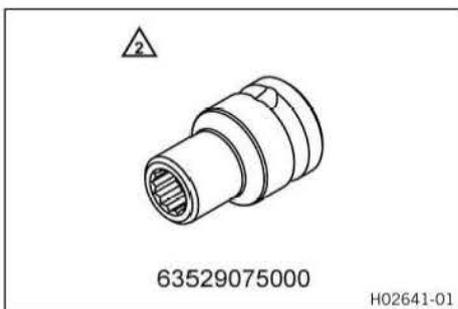
Art. no.: 63529059000

## Insert for valve spring lever



Art. no.: 63529060000

## Multi-tooth wrench socket

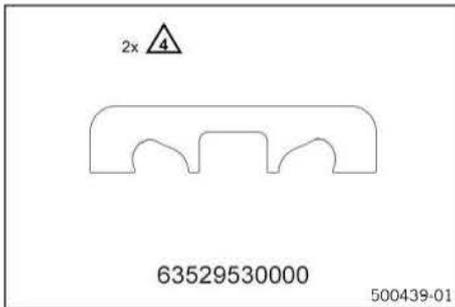


Art. no.: 63529075000

### Feature

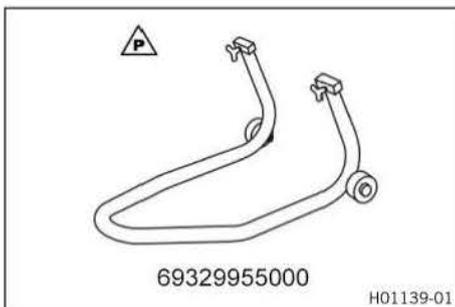
Drive	1/2 in
Diameter	9 mm (0.35 in)

**Setting gauge**



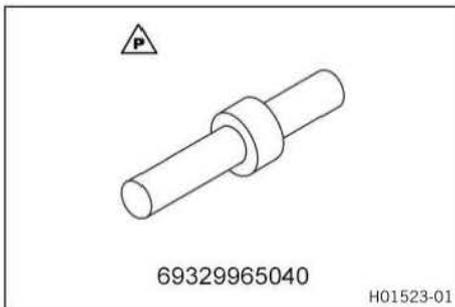
Art. no.: 63529530000

**Rear wheel work stand**



Art. no.: 69329955000

**Mounting pin**

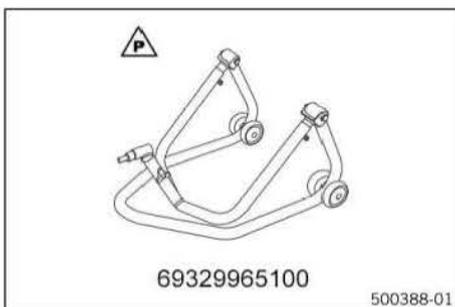


Art. no.: 69329965040

**Feature**

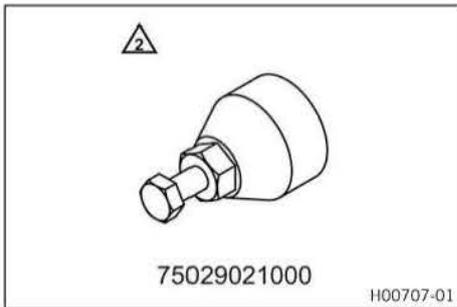
Diameter	23.5 mm (0.925 in)
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**Front wheel work stand, large**



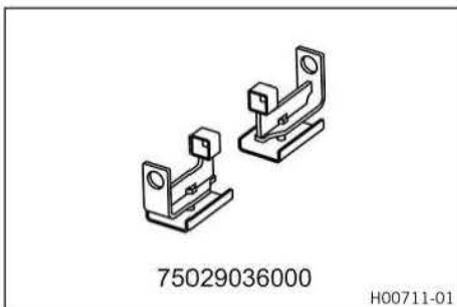
Art. no.: 69329965100

## Puller



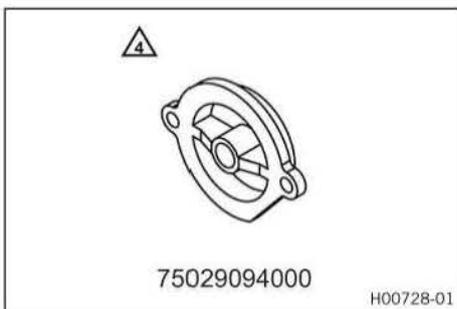
Art. no.: 75029021000

## Work stand attachments



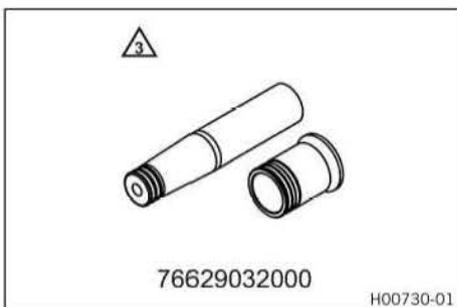
Art. no.: 75029036000

## Oil pressure adapter



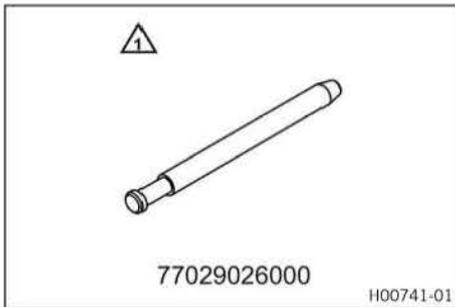
Art. no.: 75029094000

## Mounting tool for lock ring



Art. no.: 76629032000

**Limit plug gauge**

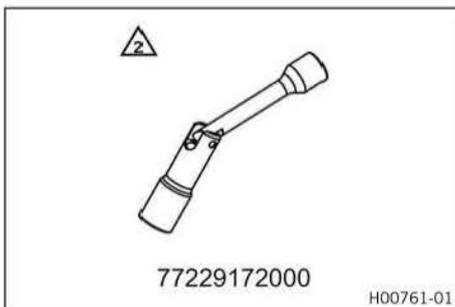


Art. no.: 77029026000

**Feature**

Diameter	5.05 mm (0.1988 in)
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**Spark plug wrench with link**

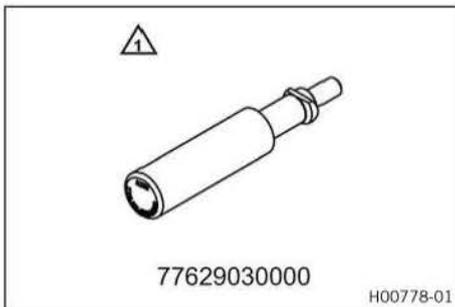


Art. no.: 77229172000

**Feature**

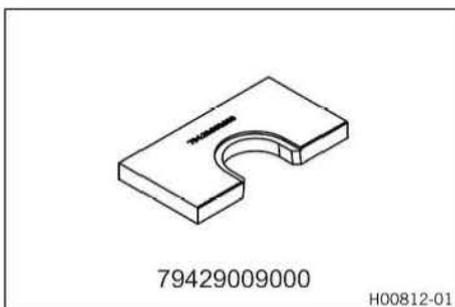
Drive	3/8 in
Hexagonal part	14 mm (0.55 in)
Length	130 mm (5.12 in)

**Insertion for piston ring lock**



Art. no.: 77629030000

**Separator plate**



Art. no.: 79429009000

## XC\_1 NG DE

Art. no.: 00029196000DE



## XC\_1 NG EN

Art. no.: 00029196000EN



## XC\_1 NG ES

Art. no.: 00029196000ES



## XC\_1 NG FR

Art. no.: 00029196000FR



**XC\_1 NG IT**

Art. no.: 00029196000IT

**XC\_1 NG JP**

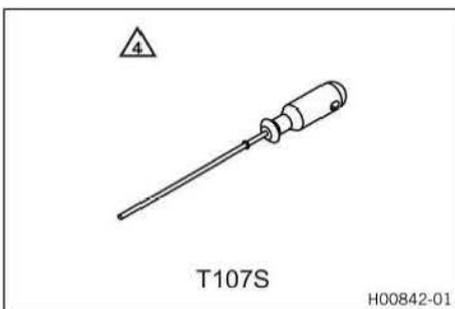
Art. no.: 00029196000JP

**XC\_1 NG US**

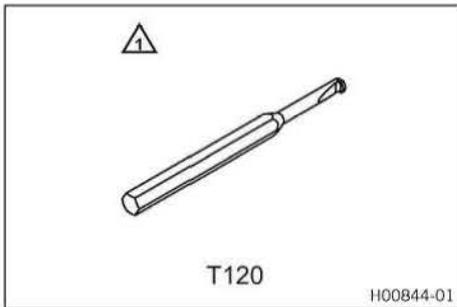
Art. no.: 00029196000US

**Depth micrometer**

Art. no.: T107S



## Drift

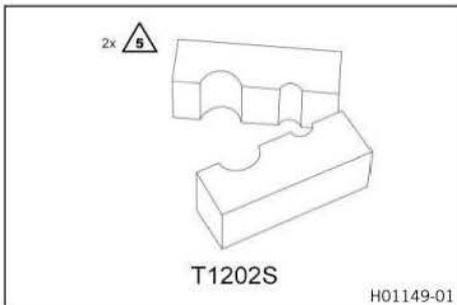


Art. no.: T120

### Feature

Diameter	8 mm (0.31 in)
----------	----------------

## Clamping stand

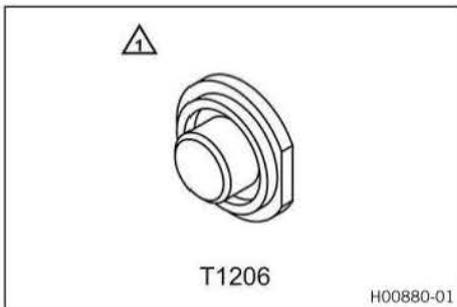


Art. no.: T1202S

### Feature

Diameter	10 mm (0.39 in)
Diameter	18 mm (0.71 in)

## Pressing tool

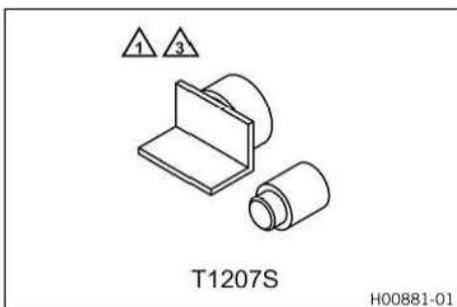


Art. no.: T1206

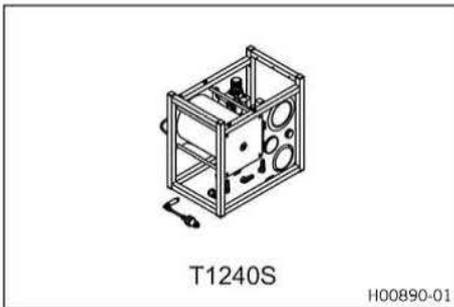
### Feature

Diameter	15 ... 30 mm (0.59 ... 1.18 in)
----------	---------------------------------

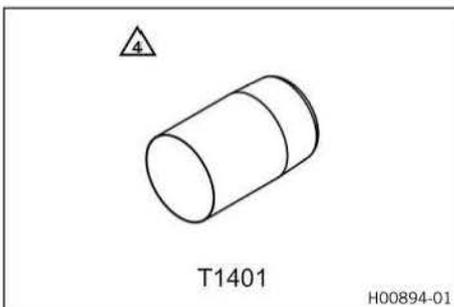
## Pressing tool



Art. no.: T1207S

**Vacuum pump**

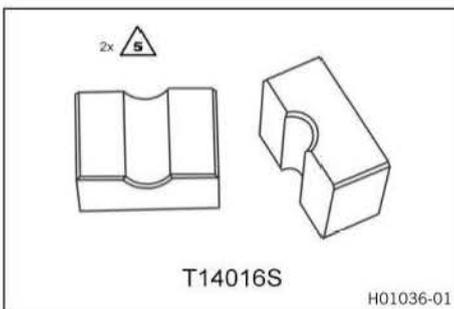
Art. no.: T1240S

**Protecting sleeve**

Art. no.: T1401

**Feature**

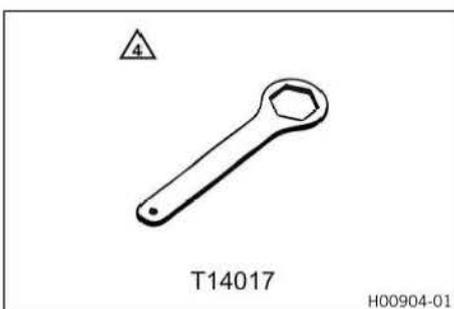
Diameter	48 mm (1.89 in)
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**Clamping stand**

Art. no.: T14016S

**Feature**

Diameter	12 mm (0.47 in)
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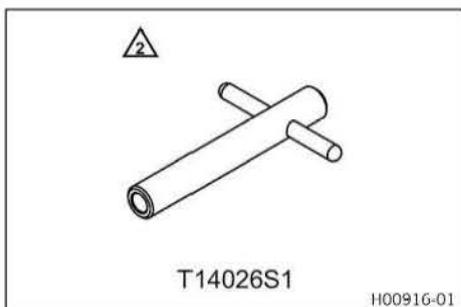
**Ring wrench**

Art. no.: T14017

**Feature**

Hexagonal part	50 mm (1.97 in)
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## Support tool

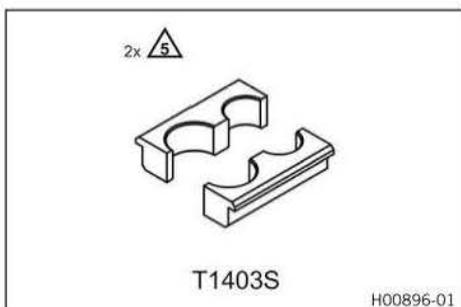


Art. no.: T14026S1

### Feature

M12	
Diameter	17 mm (0.67 in)

## Clamping stand

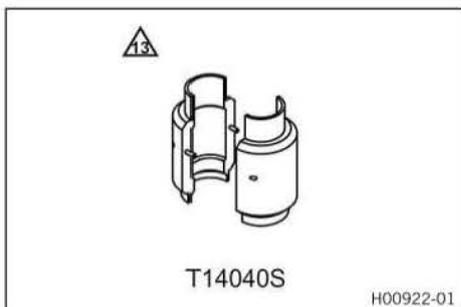


Art. no.: T1403S

### Feature

Diameter	48 mm (1.89 in)
Diameter	60 mm (2.36 in)

## Mounting tool

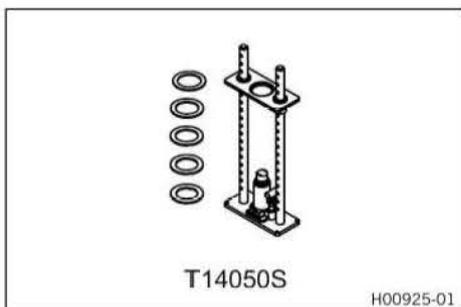


Art. no.: T14040S

### Feature

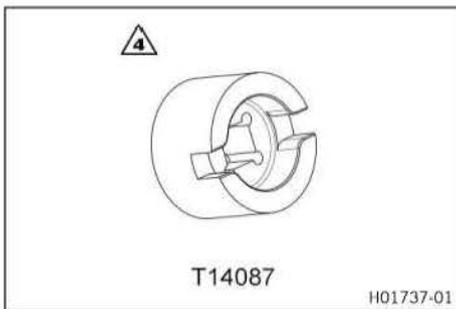
Diameter	48 mm (1.89 in)
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## Spring compressor



Art. no.: T14050S

**Special socket**

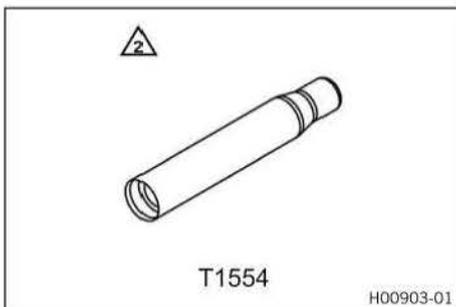


Art. no.: T14087

**Feature**

Drive	1/2 in
External diameter	44 mm (1.73 in)
Internal diameter	29.5 mm (1.161 in)

**Mounting sleeve**

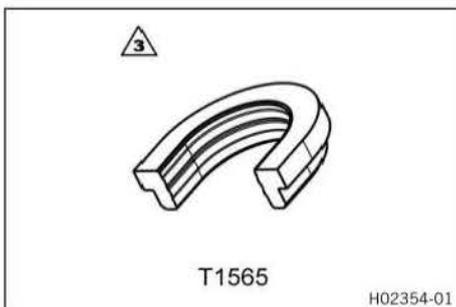


Art. no.: T1554

**Feature**

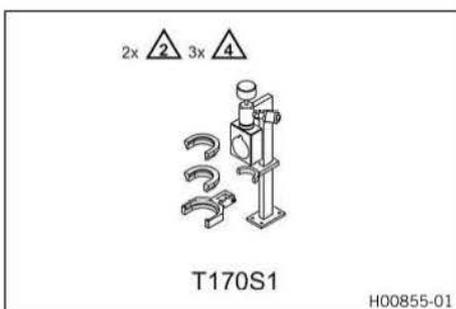
Diameter	18 mm (0.71 in)
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**Filling adapter**



Art. no.: T1565

**Filling tool**



Art. no.: T170S1

### **JASO T903 MA2**

Different technical development directions required a separate specification for motorcycles – the **JASO T903 MA2** standard.

Earlier, engine oils from the automobile industry were used for motorcycles because there was no separate motorcycle specification.

Whereas long service intervals are demanded for automobile engines, the focus for motorcycle engines is on high performance at high engine speeds.

In most motorcycle engines, the transmission and clutch are lubricated with the same oil.

The **JASO T903 MA2** standard meets these special requirements.

### **SAE**

The SAE viscosity classes were defined by the Society of Automotive Engineers and are used for classifying oils according to their viscosity. The viscosity describes only one property of oil and says nothing about quality.

ABS	Anti-lock braking system	Safety system that prevents locking of the wheels when driving straight ahead without the influence of lateral forces
-	KTM MY RIDE	System for wireless communication with appropriate cellphones and headsets for telephony and audio
OBD	On-board diagnosis	Vehicle system, which monitors the specified parameters of the vehicle electronics
PA	Preload adjuster	Device on the suspension components that enables the adjustment of the spring preload
TPMS	Tire pressure monitoring system	A safety system that monitors the tire pressure with the assistance of sensors in the tires and displays it to the rider

## 37 LIST OF ABBREVIATIONS

Art. no.	Article number
ca.	circa
cf.	compare
e.g.	for example
etc.	et cetera
i.a.	inter alia
no.	number
poss.	possibly

### 38.1 Red symbols

Red symbols indicate an error condition that requires immediate intervention.

	The oil pressure warning lamp lights up red – The oil pressure is too low. Stop immediately, taking care not to endanger yourself or other road users in the process, and switch off the engine.
-----------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

### 38.2 Yellow and orange symbols

Yellow and orange symbols indicate an error condition that requires prompt intervention. Active driving aids are also represented by yellow or orange symbols.

	Malfunction indicator lamp lights up yellow – The OBD has detected an error in the vehicle electronics. Come safely to a halt, and contact an authorized KTM workshop.
	ABS warning lamp lights up/flashes yellow – Status or error messages relating to ABS. The ABS warning lamp flashes if the ABS mode <b>Offroad</b> is enabled.
	TC indicator lamp lights up/flashes yellow – <b>MTC</b> is not enabled or is currently intervening. The TC indicator lamp also lights up if an error is detected. Contact an authorized KTM workshop. The TC indicator lamp flashes if <b>MTC</b> makes an active intervention.
	The cruise control system indicator lamp (optional) lights up yellow – The cruise control system function is switched on, but cruise control is not activated.
	The general warning lamp lights up yellow – A note/warning note on operating safety has been detected. This is also shown in the display.

### 38.3 Green and blue symbols

Green and blue symbols reflect information.

	The turn signal indicator lamp flashes green simultaneously with the turn signal – The turn signal is switched on.
	The idle indicator lamp lights up green – The transmission is in neutral.
	The cruise control system indicator lamp (optional) lights up green – The cruise control system function is switched on and cruise control is activated.
	The high beam indicator lamp lights up blue – The high beam is switched on.

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