

**250 EXC TPI**  
**250 EXC Six Days TPI**  
**250 XC-W TPI**  
**300 EXC TPI**  
**300 EXC Six Days TPI**  
**300 XC-W TPI**  
**300 XC-W Six Days TPI**

Art. no. 3206345en



**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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This document is valid for the following models:

250 EXC TPI EU (F7303S7)

250 EXC Six Days TPI EU (F7303S2)

250 XC-W TPI US (F7375S4)

300 EXC TPI EU (F7403S7)

300 EXC Six Days TPI EU (F7403S2)

300 XC-W TPI US (F7475S3)

300 XC-W Six Days TPI US (F7475S2)



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## 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.

---

|                                |   |
|--------------------------------|---|
| <b>Proprietary name</b>        | Indicates a proprietary name.   |
| <b>Name®</b>                   | Indicates a protected name.   |
| <b>Brand™</b>                  | Indicates a brand available on the open market.   |
| <b><u>Underlined terms</u></b> | 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 that will help you repair and maintain 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 thread locker (e.g. **Loctite**<sup>®</sup>) is required. Apply according to 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.

### 3.1 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 **KTM Dealer.net**, otherwise any warranty coverage will become void. Damage or secondary damage caused by tampering with and/or conversions on the vehicle are not covered by the warranty.

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

### 3.2 Operating and 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 operating and auxiliary substances in accordance with the Owner's Manual and specification.

### 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>

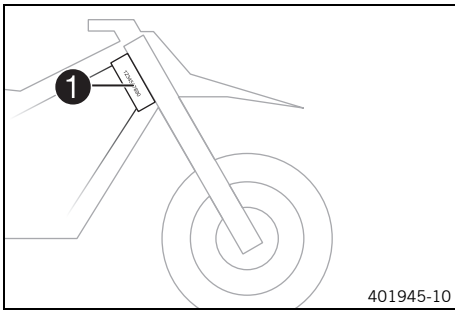
### 3.4 Figures

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.

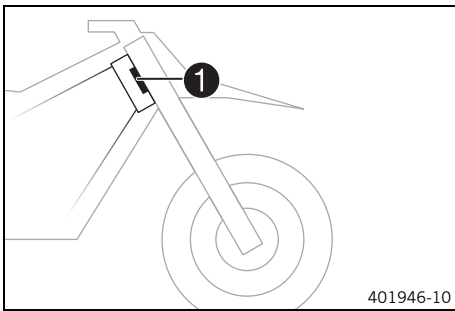
# 4 SERIAL NUMBERS

## 4.1 Chassis number



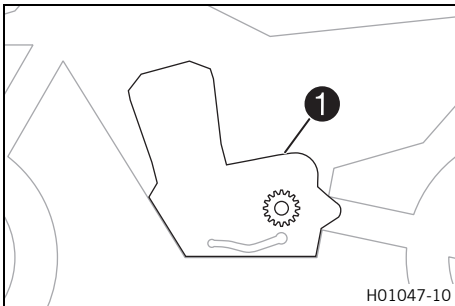
The chassis number **1** is stamped on the right side of the steering head.

## 4.2 Type label



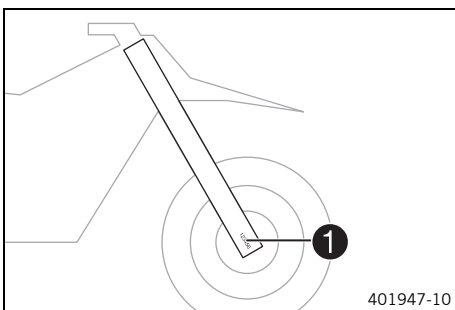
Type label **1** is fixed to the front of the steering head.

## 4.3 Engine number



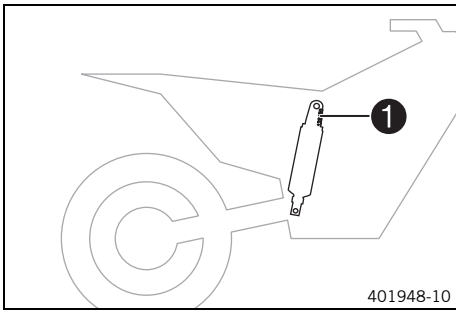
The engine number **1** is located on the left side of the engine over the engine sprocket.

## 4.4 Fork part number



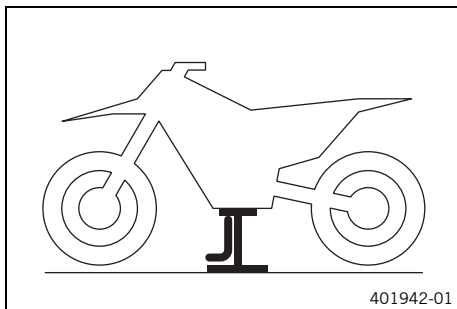
The fork part number **1** is stamped on the inside of the axle clamp.



**4.5 Shock absorber article number**

Shock absorber article number **1** is stamped on the top of the shock absorber above the adjusting ring towards the engine side.

## 5.1 Raising the motorcycle with a lift stand



### Note

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

- Park the vehicle on a firm and level surface.
- Raise the motorcycle at the frame underneath the engine.

Lift stand (78129955100) (🗨️ p. 370)

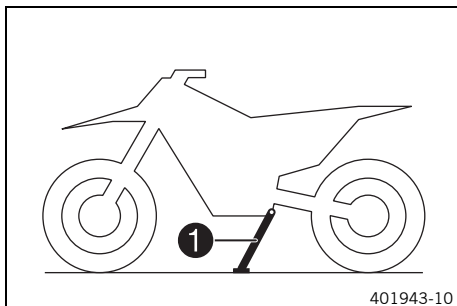
- ✓ Neither wheel is in contact with the ground.
- Secure the motorcycle against falling over.

## 5.2 Removing the motorcycle from the lift stand

### Note

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

- Park the vehicle on a firm and level surface.



- Remove the motorcycle from the lift stand.
- Remove the lift stand.
- To park the motorcycle, press side stand ① to the ground with your foot and lean the motorcycle on it.

### Info

When you are riding, the side stand must be folded up and secured with the rubber band.

## 5.3 Starting the vehicle



### Danger

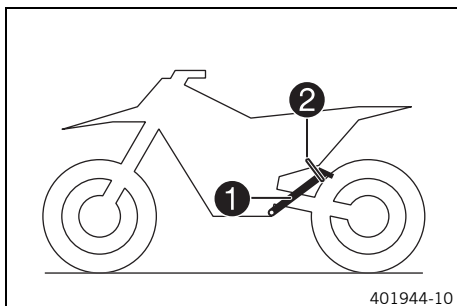
**Danger of poisoning** Exhaust gases are toxic and inhaling them may result in unconsciousness and death.

- Always make sure there is sufficient ventilation when running the engine.
- Use an effective exhaust extraction system 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 side stand ① and secure the side stand with rubber band ②.
- Shift gear to neutral.

### Condition

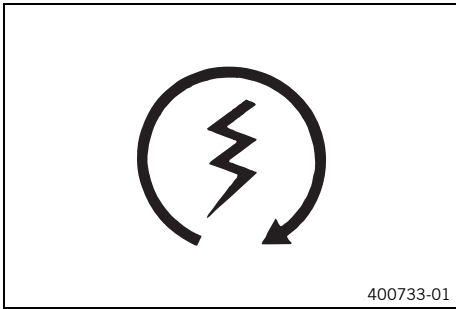
Ambient temperature: < 10 °C (< 50 °F)

- Pull the cold start button fully out and turn it by a ¼ turn.

---

**i Info**  
If the engine is warm, the cold start button must be deactivated.

---



- Press the electric starter button or push the kick starter robustly through its full range.

---

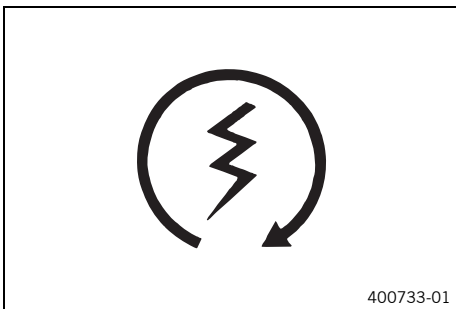
**i Info**  
Do not open the throttle.  
Press the electric starter button for a maximum of 5 seconds. Wait for 30 seconds before a further attempt at starting.  
At temperatures below 15 °C (60 °F), several attempts at starting may be necessary to warm-up the lithium-ion battery and thereby increase the starting power.  
During the starting process, the malfunction indicator lamp lights up.

---

## 5.4 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 an effective exhaust extraction system when starting or running the engine in an enclosed space.



- Shift gear to neutral.
- Press the electric starter button or push the kick starter robustly through its full range.

---

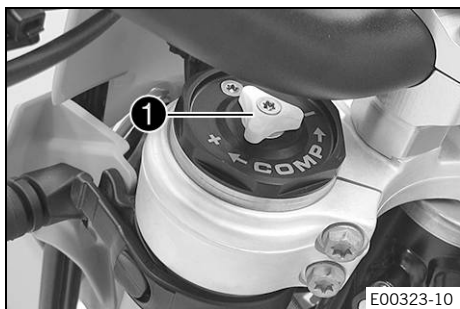
**i Info**  
Press the electric starter button for a maximum of 5 seconds. Wait for 30 seconds before a further attempt at starting.  
At temperatures below 15 °C (60 °F), several attempts at starting may be necessary to warm-up the lithium-ion battery and thereby increase the starting power.  
During the starting process, the malfunction indicator lamp lights up.  
Do not open the throttle.

---

## 6.1 Adjusting the compression damping of the fork

**i Info**

The hydraulic compression damping determines the fork suspension behavior.



**(All standard EXC/XC-W models)**

- Turn white adjusting screw **1** clockwise as far as it will go.

**i Info**

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

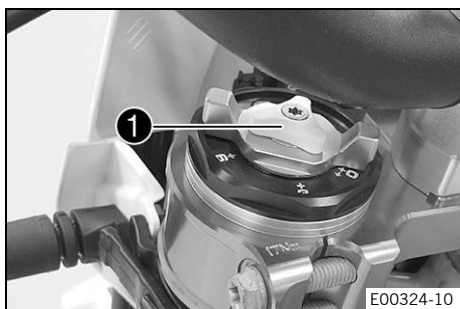
- Turn counterclockwise by the number of clicks corresponding to the fork type.

Guideline

| Compression damping |           |
|---------------------|-----------|
| Comfort             | 18 clicks |
| Standard            | 15 clicks |
| Sport               | 12 clicks |

**i Info**

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



**(All Six Days models)**

- Turn white adjusting screw **1** clockwise as far as it will go.

**i Info**

Adjusting screw **1** is located at the upper end of the left fork leg. The compression damping is located in left fork leg **COM** (white adjusting screw). The rebound damping is located in right fork leg **REB** (red adjusting screw).

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

Guideline

| Compression damping |           |
|---------------------|-----------|
| Comfort             | 18 clicks |
| Standard            | 15 clicks |
| Sport               | 12 clicks |

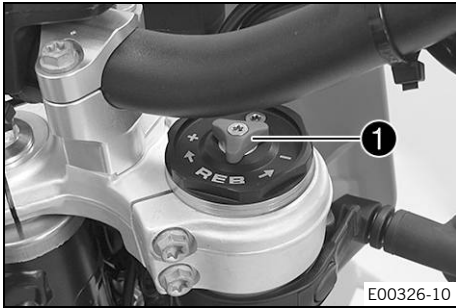
**i Info**

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

**6.2 Adjusting the rebound damping of the fork**

**i Info**

The hydraulic rebound damping determines the fork suspension behavior.



E00326-10

**(All standard EXC/XC-W models)**

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

**i Info**

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

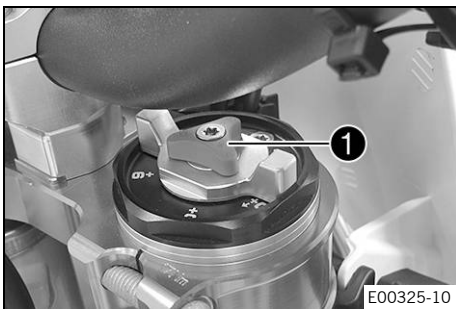
- Turn counterclockwise by the number of clicks corresponding to the fork type.

Guideline

| Rebound damping |           |
|-----------------|-----------|
| Comfort         | 18 clicks |
| Standard        | 15 clicks |
| Sport           | 12 clicks |

**i Info**

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



E00325-10

**(All Six Days models)**

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

**i Info**

Adjusting screw **1** is located at the upper end of the right fork leg. The rebound damping is located in right fork leg **REB** (red adjusting screw). The compression damping is located in left fork leg **COM** (white adjusting screw).

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

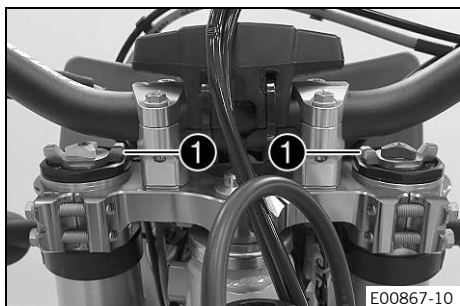
Guideline

| Rebound damping |           |
|-----------------|-----------|
| Comfort         | 18 clicks |
| Standard        | 15 clicks |
| Sport           | 12 clicks |

**i Info**

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

## 6.3 Adjusting the spring preload of the fork (All Six Days models)



### Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 12)

### Main work

- Turn the adjusting wings ❶ counterclockwise all the way.
  - ✓ The marking **+0** aligns with the adjusting wing on both fork legs.



### 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 - Preload Adjuster |           |
|-----------------------------------|-----------|
| Comfort                           | <b>+0</b> |
| Standard                          | <b>+0</b> |
| Sport                             | <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.

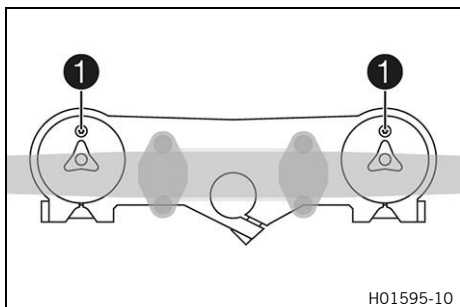
Adjusting the spring preload has no influence on the absorption setting of the rebound.

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

### Finishing work

- Remove the motorcycle from the lift stand. (📖 p. 12)

## 6.4 Bleeding the fork legs



### Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 12)

### Main work

- Release bleeder screws ❶.
  - ✓ Any excess pressure escapes from the interior of the fork.
- Tighten the bleeder screws.

### Finishing work

- Remove the motorcycle from the lift stand. (📖 p. 12)

## 6.5 Cleaning the dust boots of the fork legs



### Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 12)
- Remove the fork protector. (📖 p. 19)

### 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. 361)

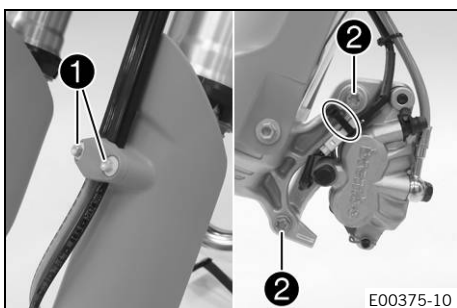
- Press the dust boots back into their installation position.
- Remove excess oil.

### Finishing work

- Install the fork protector. (📖 p. 19)
- Remove the motorcycle from the lift stand. (📖 p. 12)



## 6.6 Removing the fork legs



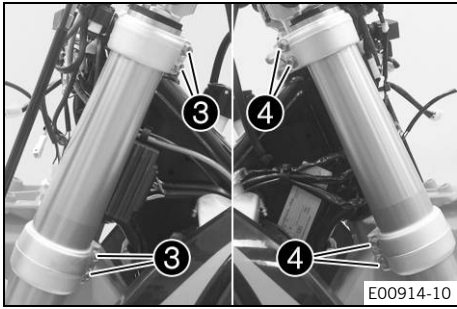
### Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 12)
- Remove the front wheel. (📖 p. 141)
- Remove the headlight mask with the headlight. (📖 p. 135)

### Main work

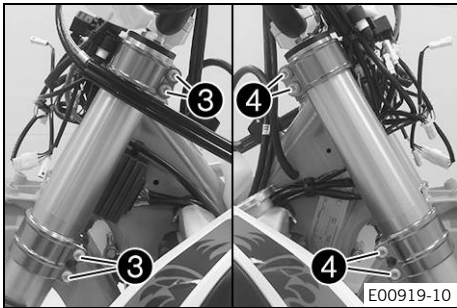
- Remove screws ① and take off the clamp.
- Remove the cable tie.
- Remove screws ② and take off the brake caliper.
- Allow the brake caliper and brake line to hang loosely to the side.

# 6 FORK, TRIPLE CLAMP



**(All standard EXC/XC-W models)**

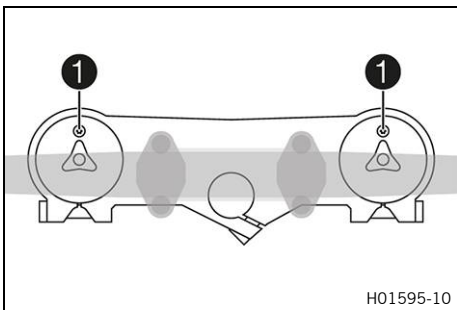
- Loosen screws ③. Remove the left fork leg.
- Loosen screws ④. Remove the right fork leg.



**(All Six Days models)**

- Loosen screws ③. Remove the left fork leg.
- Loosen screws ④. Remove the right fork leg.

## 6.7 Installing the fork legs



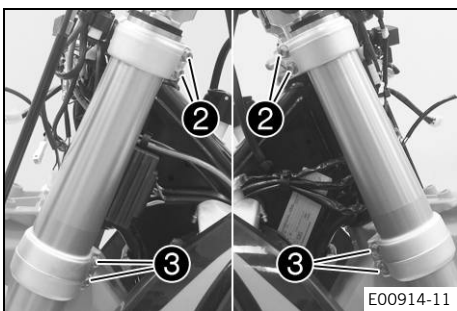
**Main work**

- Position the fork legs.
- ✓ Bleeder screws ① are positioned toward the front.



**Info**

The rebound damping is located in right fork leg **REB** (red adjusting screw). The compression damping is located in left fork leg **COM** (white adjusting screw). Grooves are milled into the side of the upper end of the fork legs. The second milled groove (from the top) must be flush with the top edge of the upper triple clamp.



**(All standard EXC/XC-W models)**

- Tighten screws ②.

Guideline

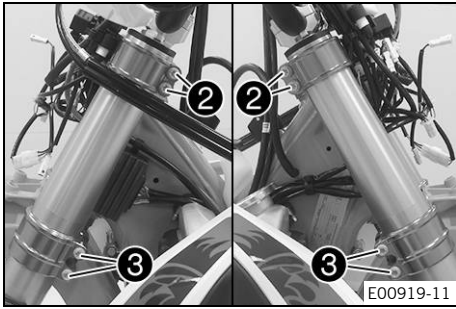
|                         |    |                        |
|-------------------------|----|------------------------|
| Screw, top triple clamp | M8 | 20 Nm<br>(14.8 lbf ft) |
|-------------------------|----|------------------------|

- Tighten screws ③.

Guideline

|                            |    |                        |
|----------------------------|----|------------------------|
| Screw, bottom triple clamp | M8 | 15 Nm<br>(11.1 lbf ft) |
|----------------------------|----|------------------------|





**(All Six Days models)**

- Tighten screws **2**.

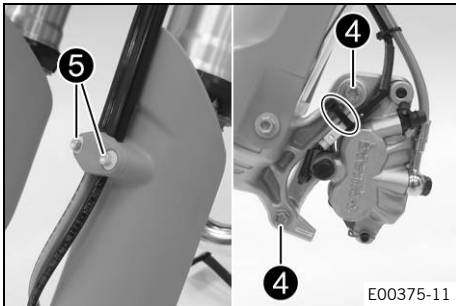
Guideline

|                         |    |                        |
|-------------------------|----|------------------------|
| Screw, top triple clamp | M8 | 17 Nm<br>(12.5 lbf ft) |
|-------------------------|----|------------------------|

- Tighten screws **3**.

Guideline

|                            |    |                        |
|----------------------------|----|------------------------|
| Screw, bottom triple clamp | M8 | 15 Nm<br>(11.1 lbf ft) |
|----------------------------|----|------------------------|



- Position the brake caliper, and mount and tighten screws **4**.

Guideline

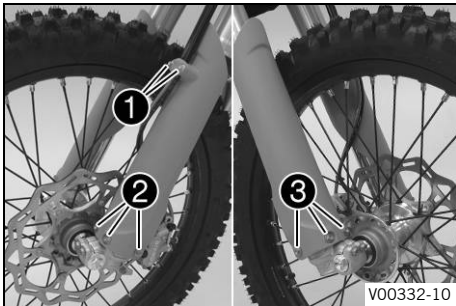
|                            |    |  |
|----------------------------|----|--|
| Screw, front brake caliper | M8 | 25 Nm (18.4 lbf ft)<br><b>Loctite®243™</b> |
|----------------------------|----|--|

- Mount the cable tie(s).
- Position the brake line, wiring harness, and clamp. Mount and tighten screws **5**.

**Finishing work**

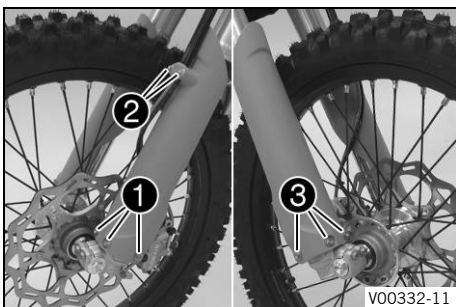
- Install the front wheel. (📖 p. 142)
- Install the headlight mask with the headlight. (📖 p. 135)
- Check the headlight setting. (📖 p. 183)

## 6.8 Removing the fork protector



- Remove screws **1** and take off the clamp.
- Remove screws **2** and take off the left fork protector.
- Remove screws **3** and take off the right fork protector.

## 6.9 Installing the fork protector



- Position the fork protector on the left fork leg. Mount and tighten screws **1**.

Guideline

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

- Position the brake line, wiring harness, and clamp. Mount and tighten screws **2**.
- Position the fork protector on the right fork leg. Mount and tighten screws **3**.

## Guideline

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

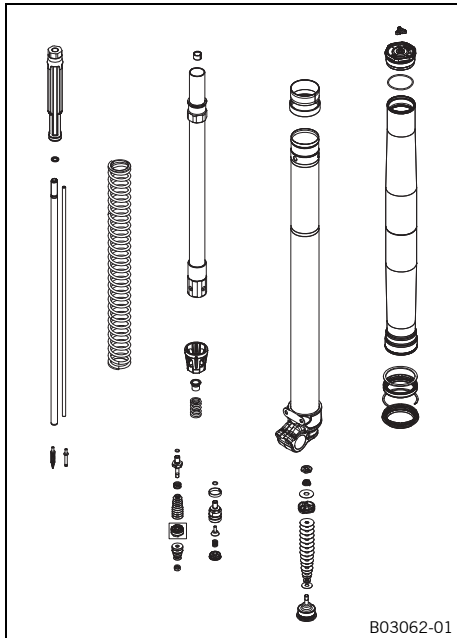
### 6.10 All standard EXC/XC-W models

#### 6.10.1 Servicing the fork

##### Condition

The fork legs have been removed.

- Disassemble the fork legs. (📖 p. 20)
- Disassemble the cartridge. (📖 p. 23)
- Check the fork legs. (📖 p. 27)
- Assemble the cartridge. (📖 p. 29)
- Assemble the fork legs. (📖 p. 33)



#### 6.10.2 Disassembling the fork legs

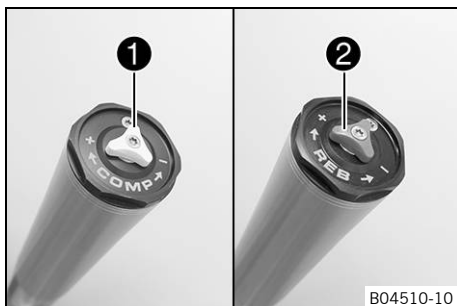
##### Info

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.

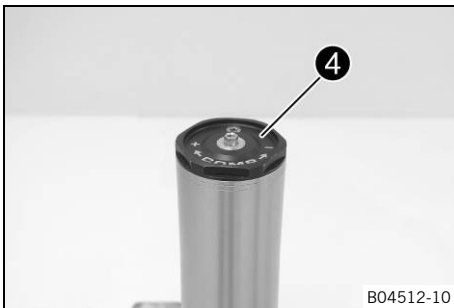




- Clamp the fork leg in the area of the lower triple clamp.

Clamping stand (T1403S) (📖 p. 374)

- Remove screw ③. Remove adjuster.



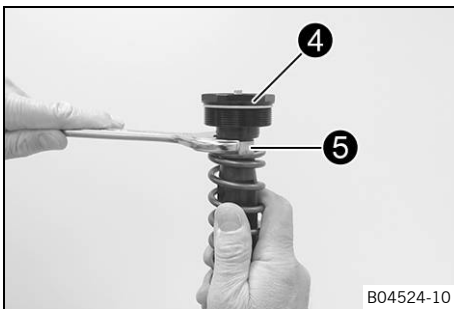
- Loosen the screw cover ④.

Ring wrench (T14017) (📖 p. 374)



### Info

The screw cover cannot be removed yet.

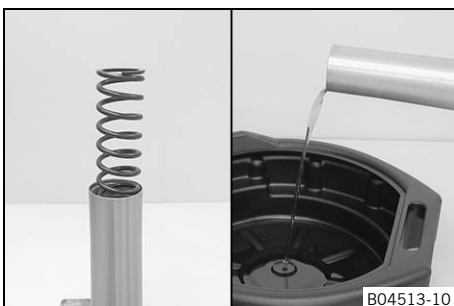


- Extract the fork leg and push the outer tube downward.
- Pull the spring downward and push the open end wrench onto hexagonal part ⑤.
- Hold the hexagonal part and loosen screw cap ④, but do not take it off yet.

Ring wrench (T14017) (📖 p. 374)



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



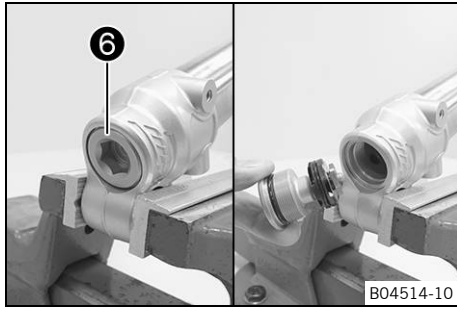
- Remove the spring.
- Drain the fork oil.



### Info

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

## 6 FORK, TRIPLE CLAMP



- Clamp the fork leg with the axle clamp.

Guideline

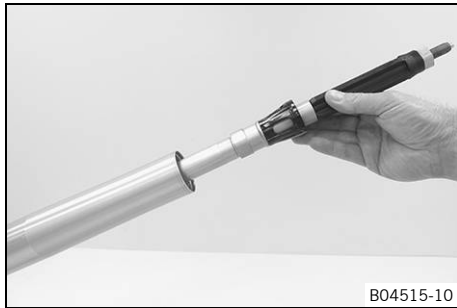
Use soft jaws.

- Unscrew and remove compression holder (6).

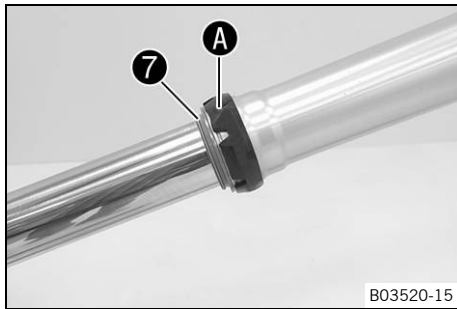


### Info

Place a container underneath as oil will run out in most cases.



- Remove the cartridge.

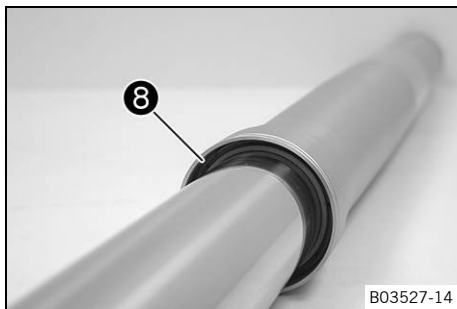


- Remove dust boot (7).
- Remove fork protector ring (A).



### Info

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

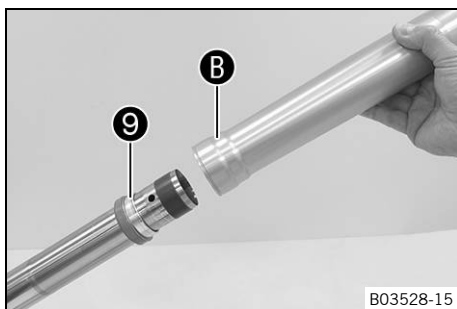


- Remove lock ring (8).



### Info

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



- Warm up the outer tube in area (B) of the lower sliding bushing.

Guideline

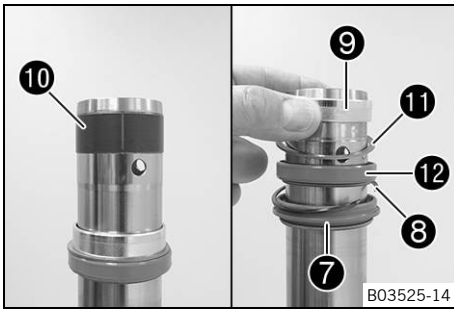
50 °C (122 °F)

- Pull the outer tube from the inner tube with a jerk.



### Info

Lower sliding bushing (9) must be pulled from its bearing seat.



- Remove upper sliding bushing 10.

**i 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.
- Unclamp the fork leg.



## 6.10.3 Disassembling the cartridge

### Preparatory work

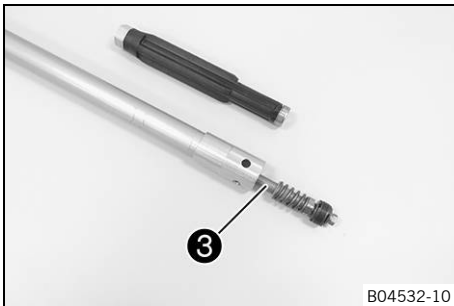
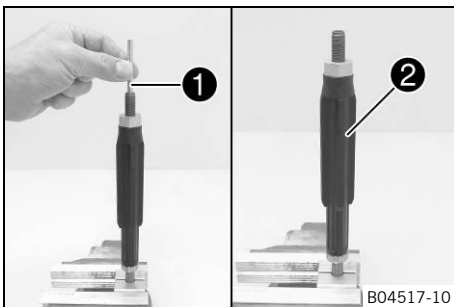
- Disassemble the fork legs. (📖 p. 20)

### Right cartridge

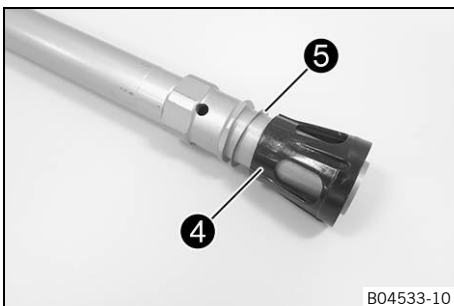
- Clamp the piston rod with the special tool.

Clamping stand (T14016S) (📖 p. 374)

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



- Take piston rod 3 out of the cartridge.



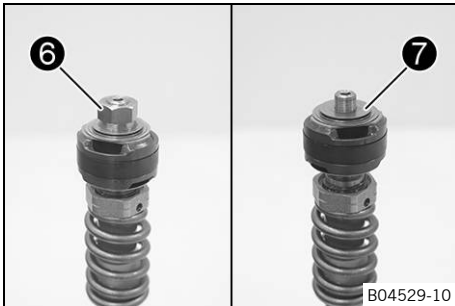
- Take spring seat 4 and washer 5 off of the cartridge.

## 6 FORK, TRIPLE CLAMP

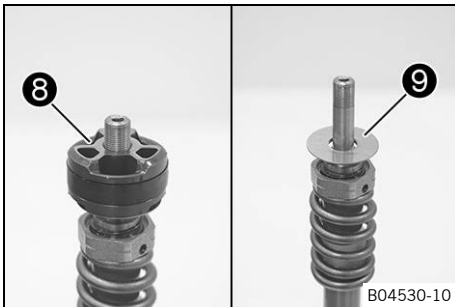


- Degrease the piston rod.
- Clamp the piston rod with the special tool.

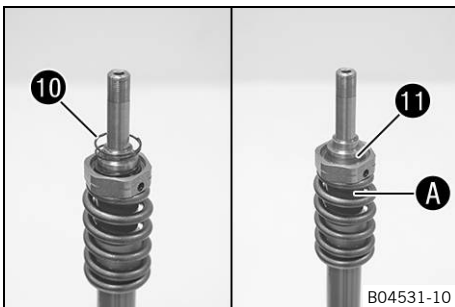
Clamping stand (T14016S) (📖 p. 374)



- Remove nut 6.
- Completely remove shim stack 7.



- Remove piston 8.
- Completely remove shim stack 9.

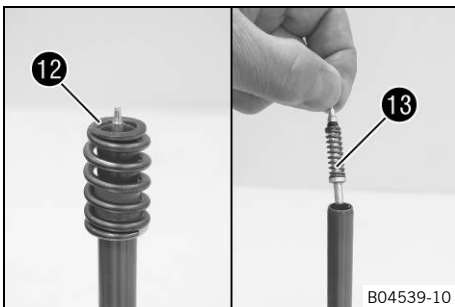


- Remove spring 10.
- Warm up the piston rod in area A.

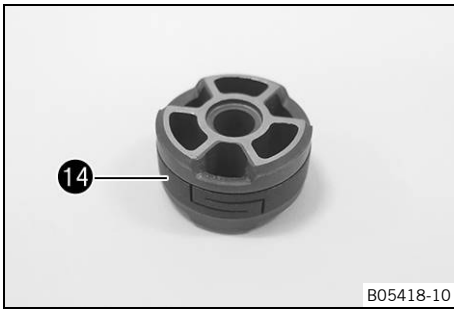
Guideline

50 °C (122 °F)

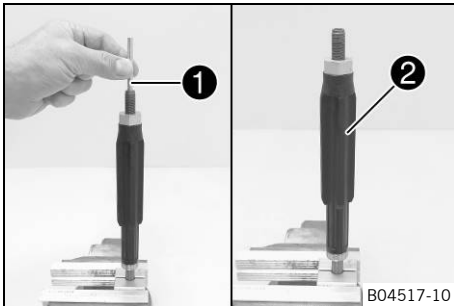
- Remove tap rebound 11.



- Remove spring 12.
- Remove valve 13 of the rebound damping with the spring.
- Unclamp the piston rod.

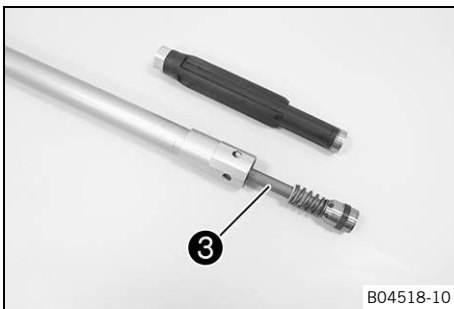


- Remove piston ring **14**.

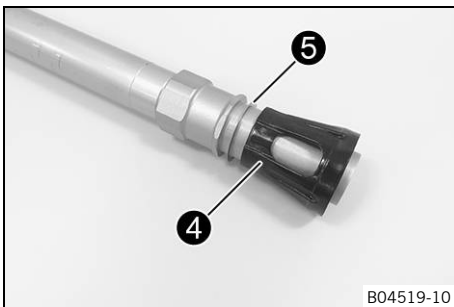


### Left cartridge

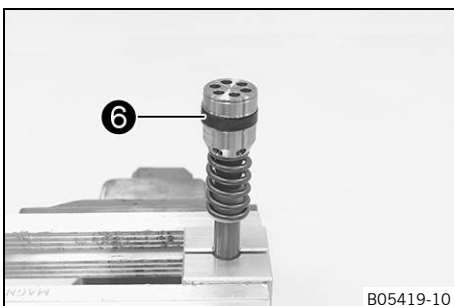
- Clamp the piston rod with the special tool.  
Clamping stand (T14016S) (📖 p. 374)
- Remove adjusting tube **1**.
- Remove fluid barrier **2** from the piston rod.



- Take piston rod **3** out of the cartridge.

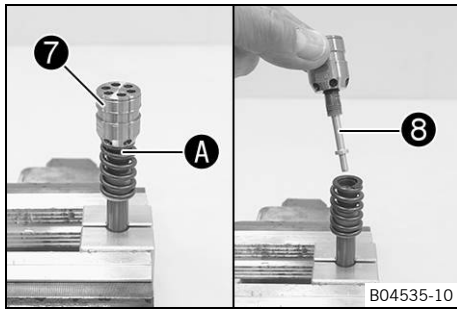


- Take spring seat **4** and washer **5** off of the cartridge.



- Degrease the piston rod.
- Clamp the piston rod with the special tool.  
Clamping stand (T14016S) (📖 p. 374)
- Remove piston ring **6**.

## 6 FORK, TRIPLE CLAMP

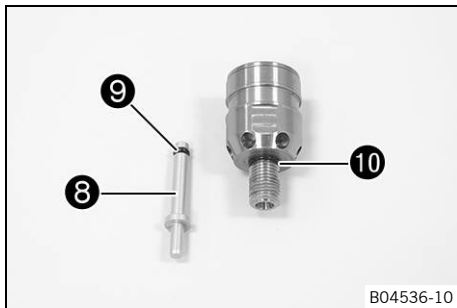


- Warm up the piston rod in area **A**.

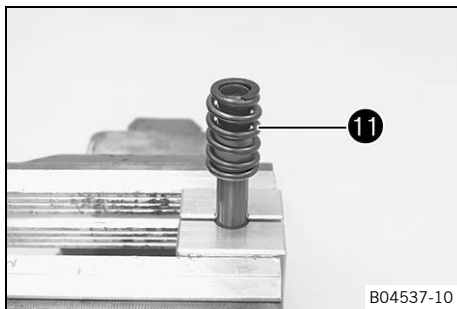
Guideline

50 °C (122 °F)

- Remove piston **7** with setting needle **8**.



- Pull setting needle **8** out of the piston.
- Remove O-rings **9** and **10**.



- Remove spring **11**.
- Unclamp the piston rod.

### 6.10.4 Disassembling the tap compression



#### Info

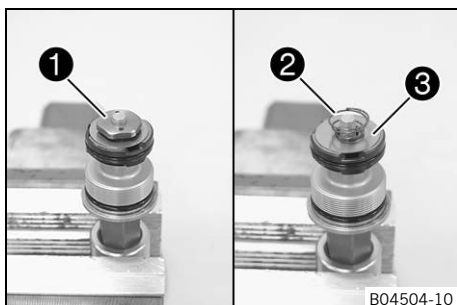
The procedures are the same on both fork legs.

#### Preparatory work

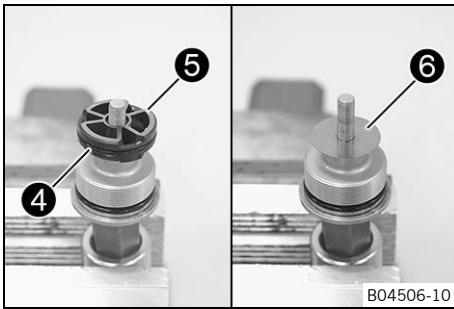
- Disassemble the fork legs. (🗨️ p. 20)

#### Main work

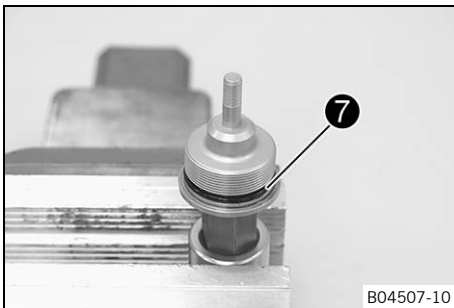
- Mount the tap compression on a suitable hexagon socket and clamp into a vise.
- Remove nut **1**.
- Remove spring **2**.
- Remove washer **3**.







- Remove O-ring ④.
- Remove piston ⑤.
- Remove shim stack ⑥.

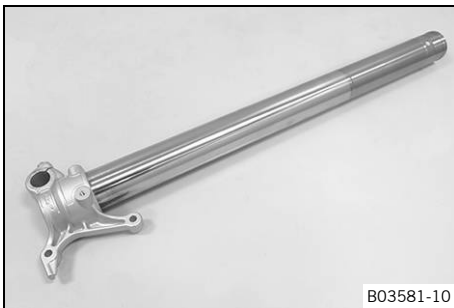


- Remove O-ring ⑦ from the tap compression.
- Extract the tap compression.

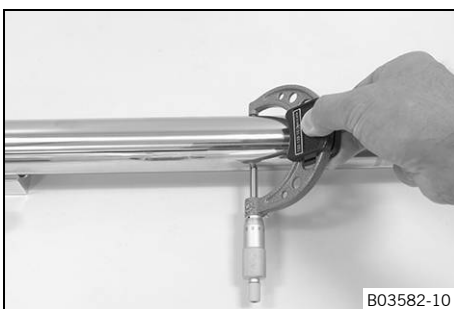
## 6.10.5 Checking the fork legs

### Condition

The fork legs have been disassembled.



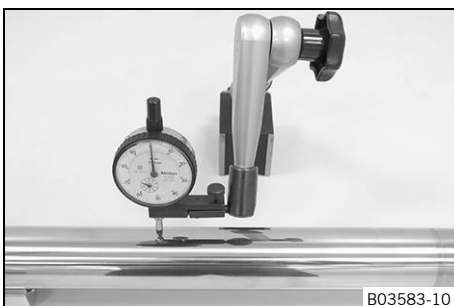
- Check the inner tube and the axle clamp for damage.
  - » If damage is found:
    - Change the inner tube.



- Measure the outside diameter of the inner tube in several places.

|                                    |  |
|------------------------------------|--|
| Outside diameter of the inner tube | 47.975 ... 48.005 mm<br>(1.88878 ... 1.88996 in) |
|------------------------------------|--|

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



- Measure the run-out of the inner tube.

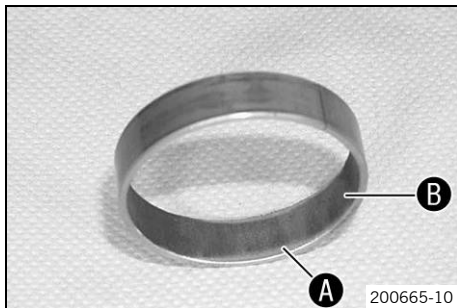
|                   |                         |
|-------------------|-------------------------|
| Inner tub run-out | ≤ 0.20 mm (≤ 0.0079 in) |
|-------------------|-------------------------|

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

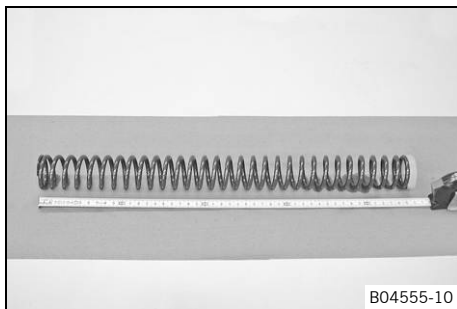
## 6 FORK, TRIPLE CLAMP



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



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



- Check the spring length.

Guideline

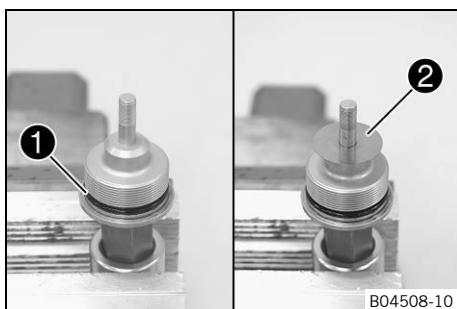
|                                      |                   |
|--------------------------------------|-------------------|
| Spring length with preload spacer(s) | 474 mm (18.66 in) |
|--------------------------------------|-------------------|

- » 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.

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

### 6.10.6 Assembling the tap compression

**i Info**  
The procedures are the same on both fork legs.

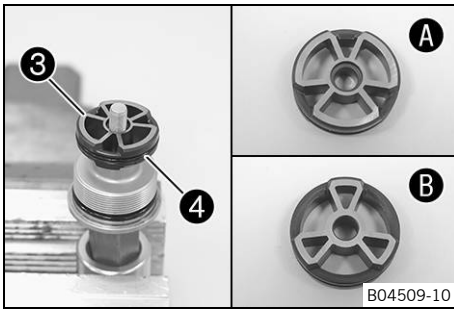


- Mount the tap compression on a suitable hexagon socket and clamp into a vise.
- Mount O-ring **1**.
- Grease O-ring.

Lubricant (T158) (📖 p. 360)

- Mount shim stack **2**.

**i Info**  
Mount the smaller shims below.



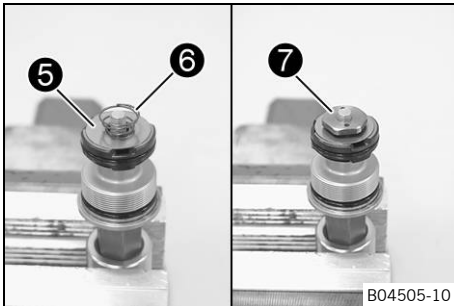
- Mount piston ③.

Guideline

|        |                      |
|--------|----------------------|
| View A | of piston from above |
| View B | of piston from below |

- Mount O-ring ④.
- Grease the piston O-ring.

Fork oil (SAE 4) (48601166S1) (📖 p. 359)



- Mount washer ⑤.
- Mount spring ⑥ with the tighter coil facing downward.
- Mount and tighten nut ⑦.

Guideline

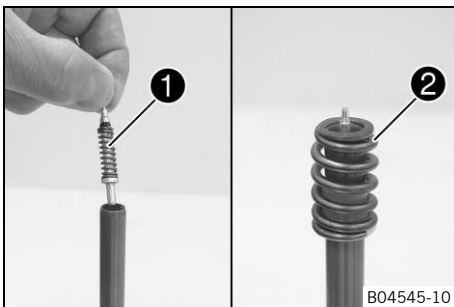
|                      |        |                   |
|----------------------|--------|-------------------|
| Nut, tap compression | M6x0.5 | 5 Nm (3.7 lbf ft) |
|----------------------|--------|-------------------|

**i** Info

Washer ⑤ must be free to move against the spring force.

- Extract the tap compression.

## 6.10.7 Assembling the cartridge



### Right cartridge

- Clamp in the piston rod.

Clamping stand (T14016S) (📖 p. 374)

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

Lubricant (T158) (📖 p. 360)

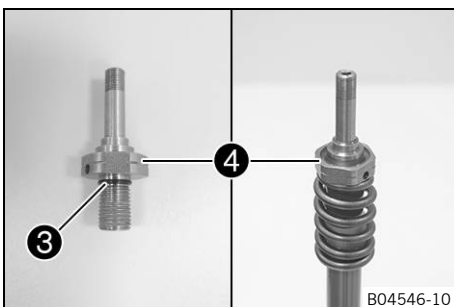
- Mount spring ②.
- Mount and grease O-ring ③ in tap rebound ④.

Lubricant (T158) (📖 p. 360)

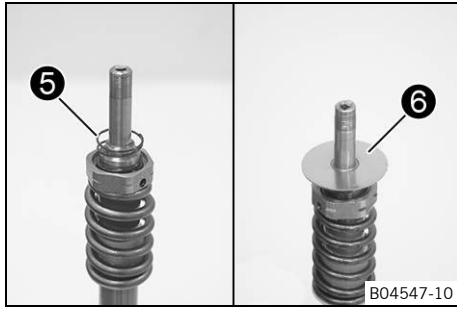
- Mount and tighten the tap rebound.

Guideline

|             |      |   |
|-------------|------|---|
| Tap rebound | M9x1 | 18 Nm (13.3 lbf ft)<br><b>Loctite®2701™</b> |
|-------------|------|---|



## 6 FORK, TRIPLE CLAMP

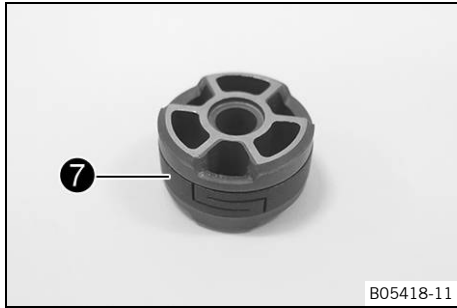


- Position spring 5.
- Mount shim stack 6.

**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.

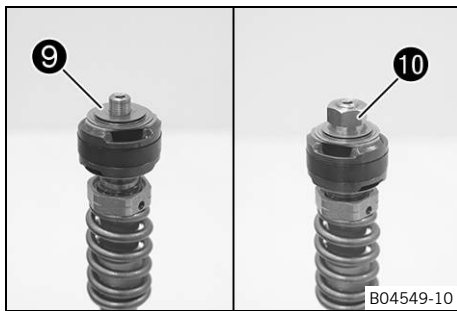
|  |
|--|
| Fork oil (SAE 4) (48601166S1) (📖 p. 359) |
|--|



- Mount piston 8 with the piston ring.

Guideline

|        |                      |
|--------|----------------------|
| View A | of piston from above |
| View B | of piston from below |



- Mount shim stack 9.

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

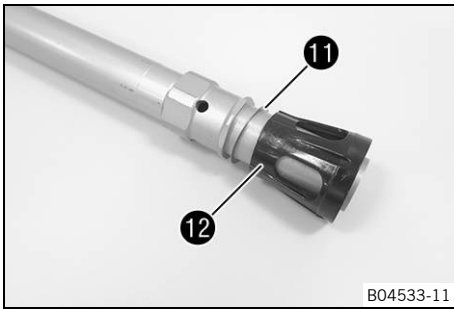
- Mount and tighten nut 10 with the collar facing downward.

Guideline

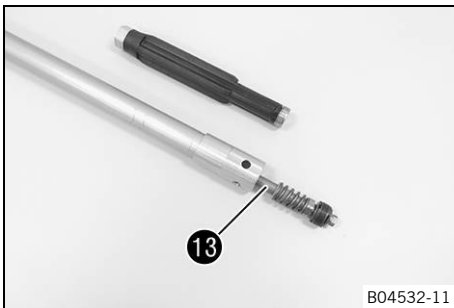
|                 |        |                   |
|-----------------|--------|-------------------|
| Tap rebound nut | M6x0.5 | 5 Nm (3.7 lbf ft) |
|-----------------|--------|-------------------|

- ✓ The lower shim stack is free to move against the spring force.

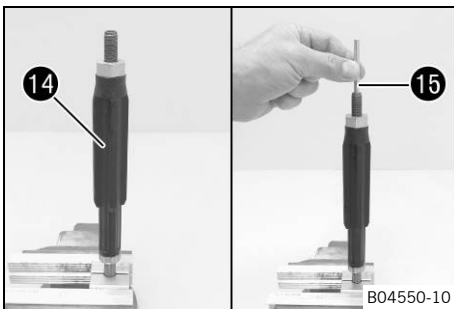
- Lock the nut by center punching it.



- Mount washer **11** and spring seat **12**.



- Slide piston rod **13** into the cartridge.



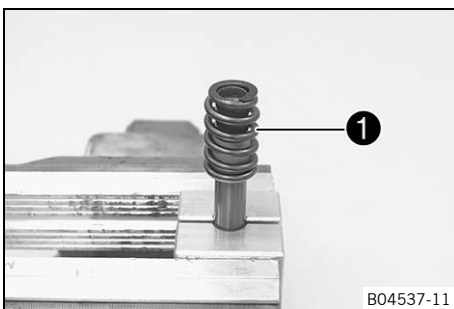
- Mount fluid barrier **14** all the way on.



### Info

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

- Mount adjusting tube **15** 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.

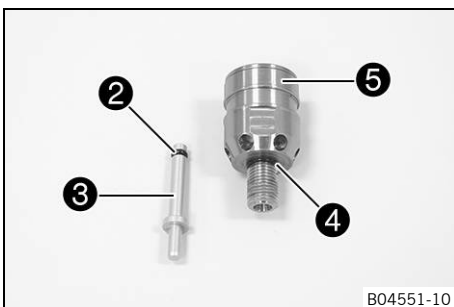


### Left cartridge

- Clamp in the piston rod.

Clamping stand (T14016S) (🗨️ p. 374)

- Mount spring **1**.



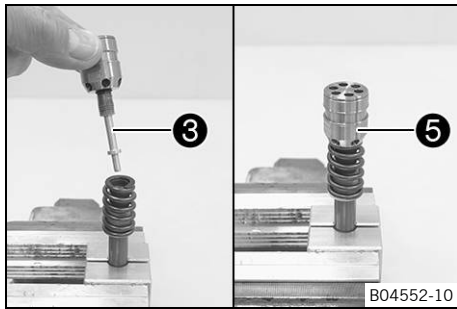
- Mount and lubricate O-ring **2** for setting needle **3**.

Lubricant (T158) (🗨️ p. 360)

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

Lubricant (T158) (🗨️ p. 360)

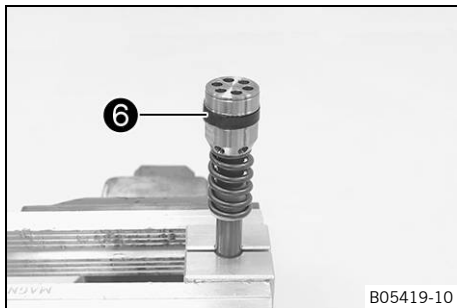
## 6 FORK, TRIPLE CLAMP



- Insert setting needle **3** in the piston.
- Mount and tighten piston **5**.

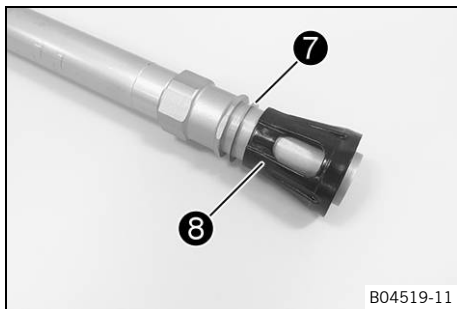
Guideline

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

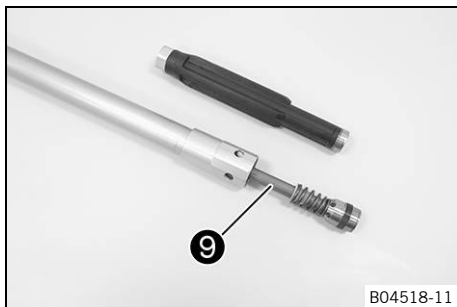


- Mount and lubricate piston ring **6**.

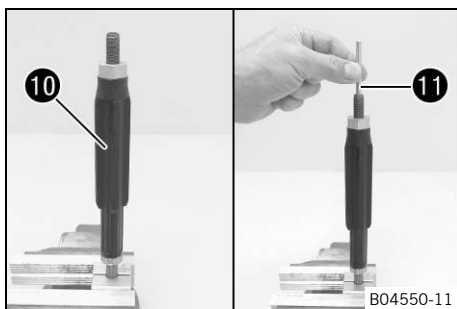
|  |
|--|
| Fork oil (SAE 4) (48601166S1) (📖 p. 359) |
|--|



- Mount washer **7** and spring seat **8**.



- Slide piston rod **9** into the cartridge.



- Mount fluid barrier **10** all the way on.



### Info

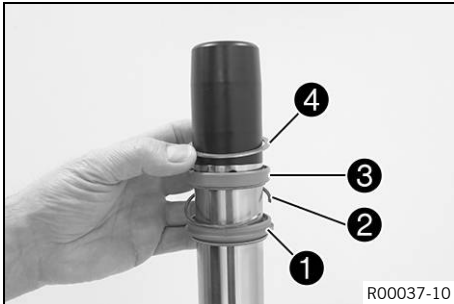
The fluid barrier must be tightened all the way. Do not use a tool.

- Mount adjusting tube **11** 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.

## 6.10.8 Assembling the fork legs

**i Info**

The operations are the same on both fork legs.



**Preparatory work**

- Check the fork legs. (📖 p. 27)
- Assemble the cartridge. (📖 p. 29)
- Assemble the tap compression. (📖 p. 28)

**Main work**

- Clamp the inner tube using the axle clamp.

**Guideline**

Use soft jaws.

- Mount the special tool.

Protecting sleeve (T1401) (📖 p. 373)

- Grease and push on dust boot ①.

Lubricant (T14034) (📖 p. 360)

**i Info**

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

- Push on lock ring ②.
- Grease and push on seal ring ③.

Lubricant (T14034) (📖 p. 360)

**i Info**

Sealing lip downward, open side upward.

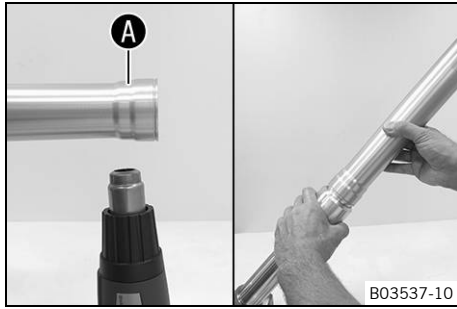
- Push on support ring ④.
- Remove the special tool.
- Push on lower sliding bushing ⑤.
- Mount upper sliding bushing ⑥.

**i Info**

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



## 6 FORK, TRIPLE CLAMP



- Warm up the outer tube in area **A** of the lower sliding bushing.

Guideline

50 °C (122 °F)

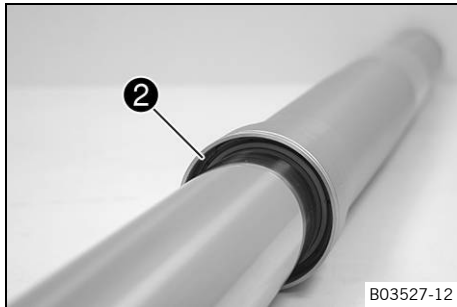
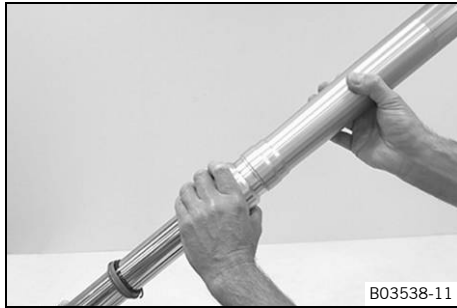
- Push the outer tube on.
- Hold the lower sliding bushing with the longer side of the special tool.

Mounting tool (T14040S) (圖 p. 375)

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

Mounting tool (T14040S) (圖 p. 375)

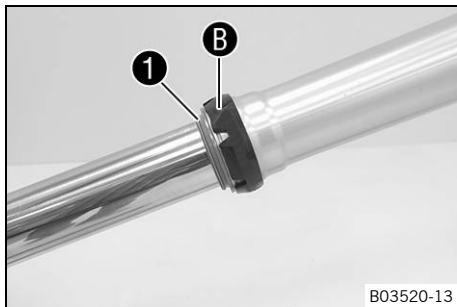
- Press the outer tube all the way in.



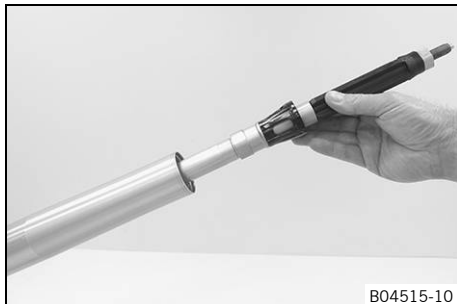
- Mount lock ring **2**.

**i** Info

The lock ring must engage audibly.

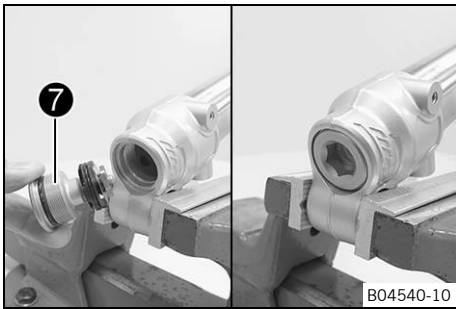


- Mount dust boot **1**.
- Mount fork protector ring **B**.



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

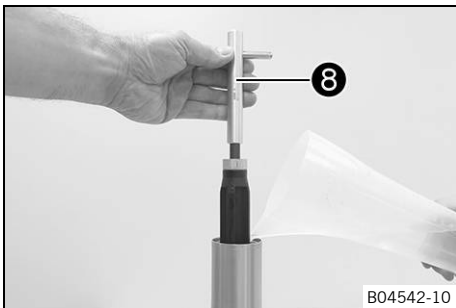




- Mount and tighten tap compression **7**.

Guideline

|                                  |       |                     |
|----------------------------------|-------|---------------------|
| Compression damp-<br>ing fitting | M29x1 | 35 Nm (25.8 lbf ft) |
|----------------------------------|-------|---------------------|



- Mount special tool **8** on the piston rod.

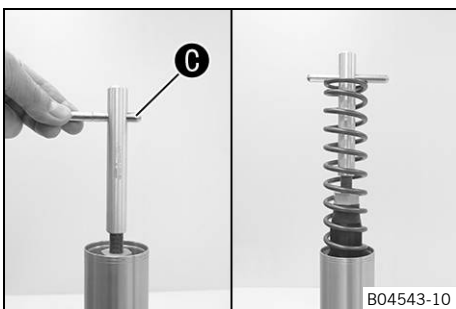
|                                    |
|------------------------------------|
| Support tool (T14026S1) (📖 p. 374) |
|------------------------------------|

**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.
- Fill with fork oil.

|                       |  |  |
|-----------------------|--|--|
| Fork oil per fork leg | 642 ± 10 ml<br>(21.71<br>± 0.34 fl. oz.) | Fork oil (SAE 4)<br>(48601166S1)<br>(📖 p. 359) |
|-----------------------|--|--|

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

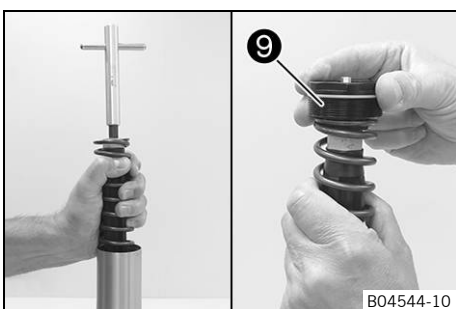


- Remove pin **C** of the special tool.

|                                    |
|------------------------------------|
| Support tool (T14026S1) (📖 p. 374) |
|------------------------------------|

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

|  |                       |
|--|-----------------------|
| Spring rate  |                       |
| Weight of rider: 65 ...<br>75 kg (143 ... 165 lb.) | 4.0 N/mm (22.8 lb/in) |
| Weight of rider: 75 ...<br>85 kg (165 ... 187 lb.) | 4.2 N/mm (24 lb/in)   |
| Weight of rider: 85 ...<br>95 kg (187 ... 209 lb.) | 4.4 N/mm (25.1 lb/in) |



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

|                                    |
|------------------------------------|
| Support tool (T14026S1) (📖 p. 374) |
|------------------------------------|

- Mount screw cap **9**.

**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.



B04524-11

- Pull the spring downward.
- Mount the open end wrench on the hexagonal part.
- Hold the open end wrench. Tighten the screw cover.

Guideline

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

|                                 |
|---------------------------------|
| Ring wrench (T14017) (📖 p. 374) |
|---------------------------------|



B04541-10

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

|                                    |
|------------------------------------|
| Clamping stand (T1403S) (📖 p. 374) |
|------------------------------------|

- Grease the O-ring of the screw cover.

|                             |
|-----------------------------|
| Lubricant (T158) (📖 p. 360) |
|-----------------------------|

- Mount and tighten screw cap **9**.

Guideline

|                         |         |                     |
|-------------------------|---------|---------------------|
| Screw cap on outer tube | M51x1.5 | 40 Nm (29.5 lbf ft) |
|-------------------------|---------|---------------------|

|                                 |
|---------------------------------|
| Ring wrench (T14017) (📖 p. 374) |
|---------------------------------|

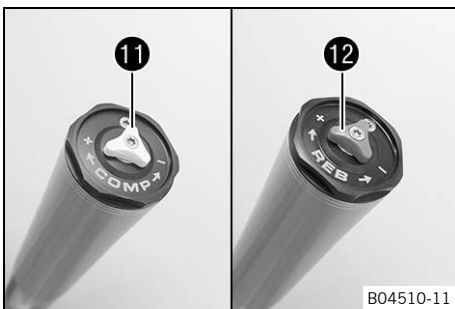


B04511-11

- Mount the adjuster.
- Mount and tighten screw **10**.

Guideline

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



B04510-11

**Alternative 1**

- Turn compression adjuster **11** and rebound adjuster **12** 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               | 12 clicks |
| Compression damping |           |
| Comfort             | 18 clicks |
| Standard            | 15 clicks |
| Sport               | 12 clicks |

## Alternative 2



### Warning

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

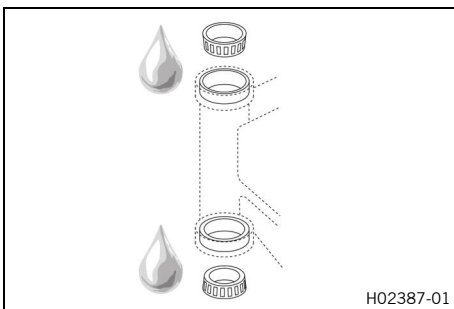
Extreme modifications to the suspension setting may cause a serious deterioration in the handling characteristic and overload components.

- 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.



## 6.10.9 Lubricating the steering head bearing



- Remove the lower triple clamp. (🔧 p. 37)
- Install the lower triple clamp. (🔧 p. 38)

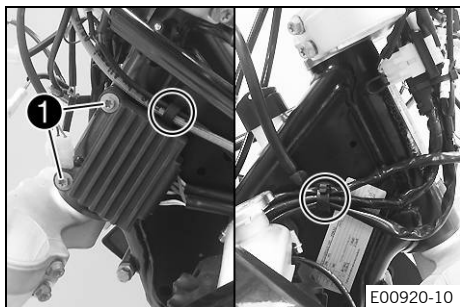


## 6.10.10 Removing the lower triple clamp

### Preparatory work

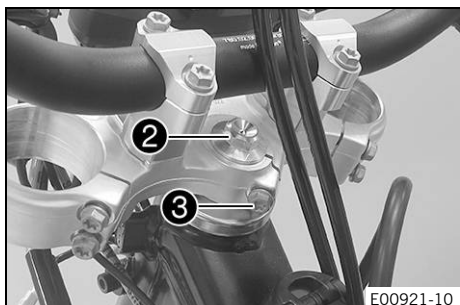
- Raise the motorcycle with a lift stand. (🔧 p. 12)
- Remove the front wheel. (🔧 p. 141)
- Remove the headlight mask with the headlight. (🔧 p. 135)
- Remove the fork legs. (🔧 p. 17)
- Remove front fender. (🔧 p. 134)
- Remove the handlebar cushion.

## 6 FORK, TRIPLE CLAMP



### Main work

- Remove screws **1** and hang the voltage regulator to the side.
- Open the cable holder in front of the left and right radiator and detach the wiring harness.

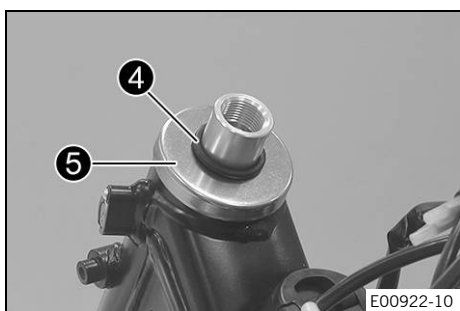


- Remove screw **2**.
- Loosen screw **3**. Take off the upper triple clamp with the handlebar and hang them to the side.



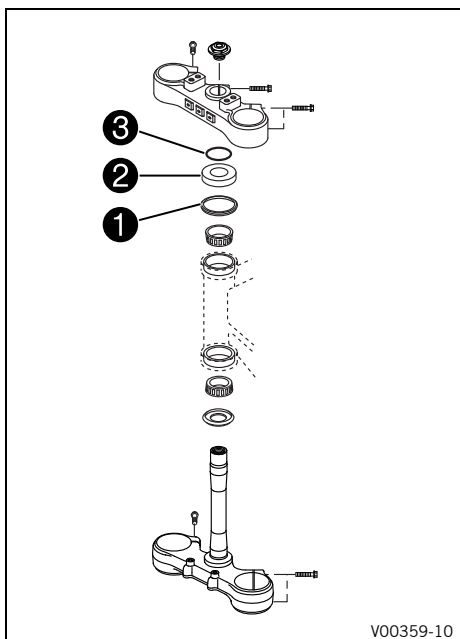
### Info

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



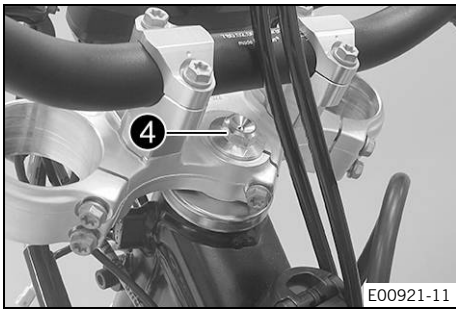
- Remove O-ring **4**. Remove protective ring **5**.
- Take off the lower triple clamp with the steering stem.
- Remove the upper steering head bearing.

### 6.10.11 Installing the lower triple clamp

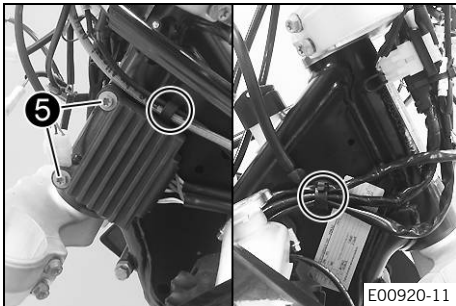


### Main work

- Clean the bearing and sealing elements, check for damage, and grease.
- High viscosity grease (📖 p. 360)
- Insert the lower triple clamp with the steering stem. Mount the upper steering head bearing.
  - Check whether upper steering head seal **1** is correctly positioned.
  - Mount protective ring **2** and O-ring **3**.



- Position the upper triple clamp with the handlebar.
- Position the clutch line and wiring harness.
- Mount screw 4 but do not tighten yet.

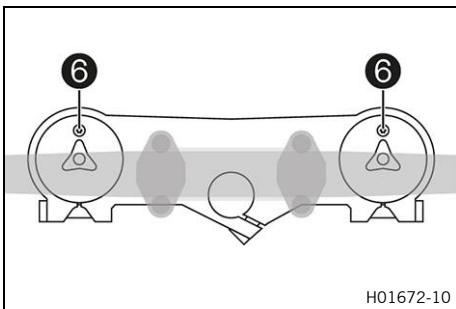


- Position the voltage regulator, and mount and tighten screws 5.

Guideline

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

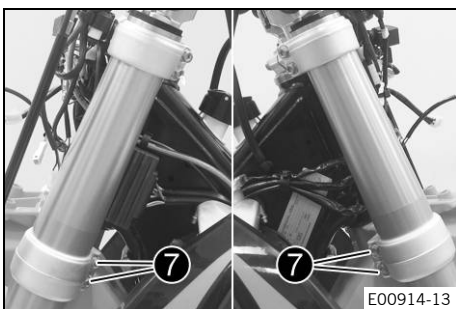
- Secure wiring harnesses with cable holders.



- Position the fork legs.
- ✓ Bleeder screws 6 are positioned toward the front.

**i** Info

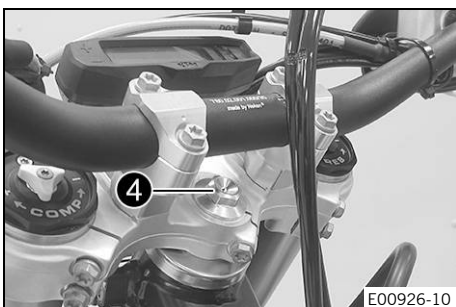
The rebound damping is located in right fork leg **REB** (red adjusting screw). The compression damping is located in left fork leg **COMP** (white adjusting screw). Grooves are milled into the side of the upper end of the fork legs. The second milled groove (from the top) must be flush with the top edge of the upper triple clamp.



- Tighten screws 7.

Guideline

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

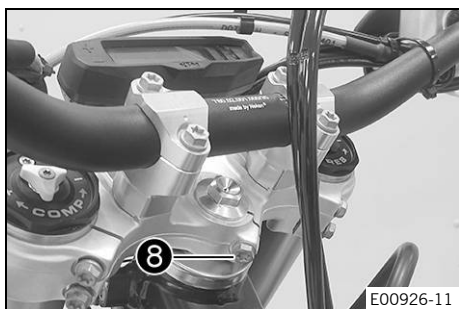


- Tighten screw 4.

Guideline

|                          |         |                    |
|--------------------------|---------|--------------------|
| Screw, top steering head | M20x1.5 | 12 Nm (8.9 lbf ft) |
|--------------------------|---------|--------------------|

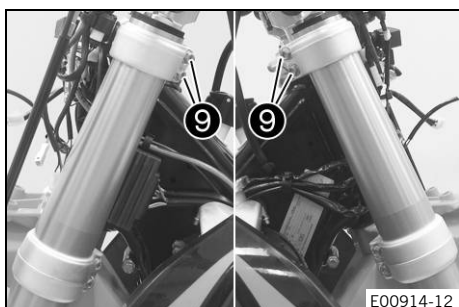
## 6 FORK, TRIPLE CLAMP



- Tighten screw **8**.

Guideline

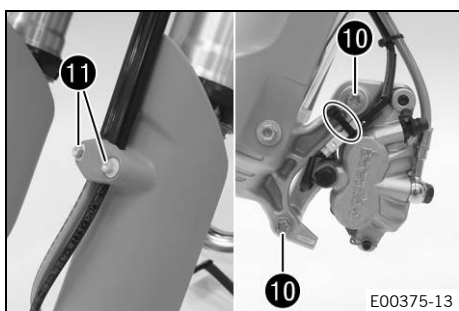
|                          |    |                     |
|--------------------------|----|---------------------|
| Screw, top steering stem | M8 | 20 Nm (14.8 lbf ft) |
|--------------------------|----|---------------------|



- Tighten screws **9**.

Guideline

|                         |    |                     |
|-------------------------|----|---------------------|
| Screw, top triple clamp | M8 | 20 Nm (14.8 lbf ft) |
|-------------------------|----|---------------------|



- Position the brake caliper, and mount and tighten screws **10**.

Guideline

|                            |    |  |
|----------------------------|----|--|
| Screw, front brake caliper | M8 | 25 Nm (18.4 lbf ft)<br><b>Loctite®243™</b> |
|----------------------------|----|--|

- Mount the cable tie(s).
- Position the brake line, wiring harness, and clamp. Mount and tighten screws **11**.

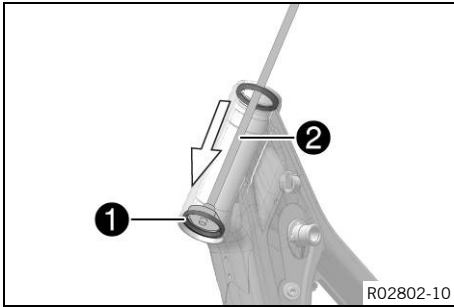
### Finishing work

- Mount the handlebar cushion.
- Install front fender. (📖 p. 134)
- Install the front wheel. (📖 p. 142)
- Install the headlight mask with the headlight. (📖 p. 135)
- Check that the wiring harness, throttle cables, and brake and clutch lines can move freely and are routed correctly.
- Check the play of the steering head bearing. (📖 p. 42)
- Remove the motorcycle from the lift stand. (📖 p. 12)
- Check the headlight setting. (📖 p. 183)

### 6.10.12 Changing the steering head bearing

#### Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 12)
- Remove the front wheel. (📖 p. 141)
- Remove the headlight mask with the headlight. (📖 p. 135)
- Remove the fork legs. (📖 p. 17)
- Remove front fender. (📖 p. 134)
- Remove the handlebar cushion.
- Remove the lower triple clamp. (📖 p. 37)

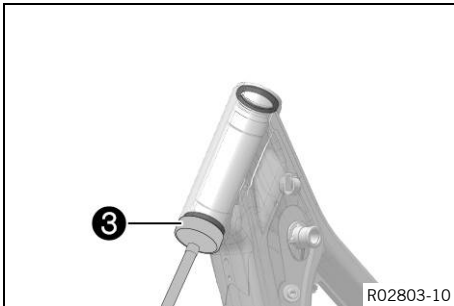


### Main work

- Remove lower bearing ring **1** with special tool **2**.

|                                       |
|---------------------------------------|
| Tool bracket (58429089000) (📖 p. 368) |
|---------------------------------------|

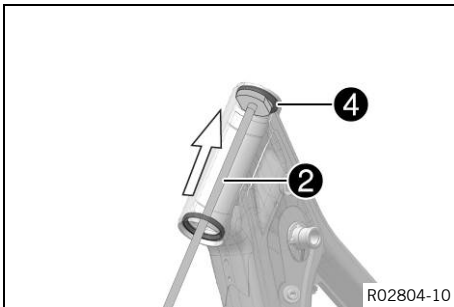
|  |
|--|
| Pressing tool (58429092000) (📖 p. 368) |
|--|



- Press the new bearing ring up to the stop with special tool **3**.

|                                       |
|---------------------------------------|
| Tool bracket (58429089000) (📖 p. 368) |
|---------------------------------------|

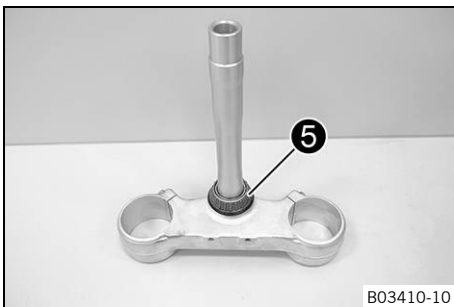
|  |
|--|
| Pressing tool (58429091000) (📖 p. 368) |
|--|



- Remove upper bearing ring **4** with special tool **2**.

|                                       |
|---------------------------------------|
| Tool bracket (58429089000) (📖 p. 368) |
|---------------------------------------|

|  |
|--|
| Pressing tool (58429092000) (📖 p. 368) |
|--|



- Remove lower steering head bearing **5**.
- Remove the seal ring.
- Grease and mount the new seal ring.
- Press on the new bearing with a suitable tube as far as it will go.



### Info

Only press the bearing in via the inner ring.

### Finishing work

- Install the lower triple clamp. (📖 p. 38)
- Mount the handlebar cushion.
- Install front fender. (📖 p. 134)
- Install the front wheel. (📖 p. 142)
- Install the headlight mask with the headlight. (📖 p. 135)
- Check that the wiring harness, throttle cables, and brake and clutch lines can move freely and are routed correctly.
- Check the play of the steering head bearing. (📖 p. 42)
- Remove the motorcycle from the lift stand. (📖 p. 12)
- Check the headlight setting. (📖 p. 183)



## 6.10.13 Checking the play of the steering head bearing



### Warning

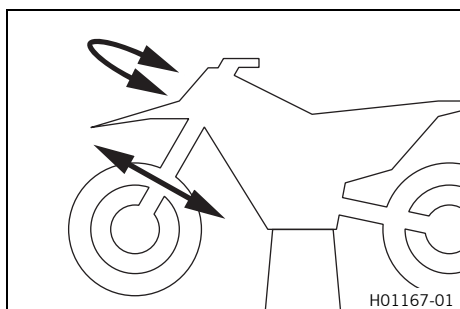
**Danger of accidents** Incorrect steering head bearing play impairs the handling characteristic and damages components.

- 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

- Raise the motorcycle with a lift stand. (🔧 p. 12)

### Main work

- Move the handlebar to the straight-ahead position. Move the fork legs to and fro 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. 42)

- Move the handlebar to and fro 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. 42)
  - Check the steering head bearing and change if necessary.

### Finishing work

- Remove the motorcycle from the lift stand. (🔧 p. 12)

## 6.10.14 Adjusting the steering head bearing play

### Preparatory work

- Raise the motorcycle with a lift stand. (🔧 p. 12)

### Main work

- Loosen screws ① and ②.
- Loosen and retighten screw ③.

#### Guideline

|                          |         |                    |
|--------------------------|---------|--------------------|
| Screw, top steering head | M20x1.5 | 12 Nm (8.9 lbf ft) |
|--------------------------|---------|--------------------|

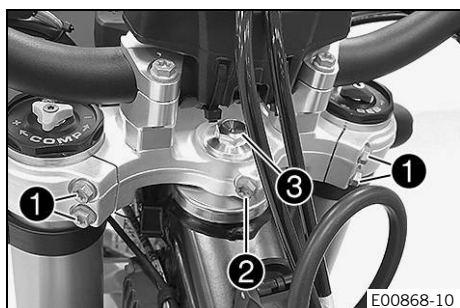
- Using a plastic hammer, tap lightly on the upper triple clamp to avoid stresses.

- Tighten screws ①.

#### Guideline

|                         |    |                     |
|-------------------------|----|---------------------|
| Screw, top triple clamp | M8 | 20 Nm (14.8 lbf ft) |
|-------------------------|----|---------------------|

- Tighten screw ②.





Guideline

|                          |    |                     |
|--------------------------|----|---------------------|
| Screw, top steering stem | M8 | 20 Nm (14.8 lbf ft) |
|--------------------------|----|---------------------|

**Finishing work**

- Check the play of the steering head bearing. (📖 p. 42)
- Remove the motorcycle from the lift stand. (📖 p. 12)

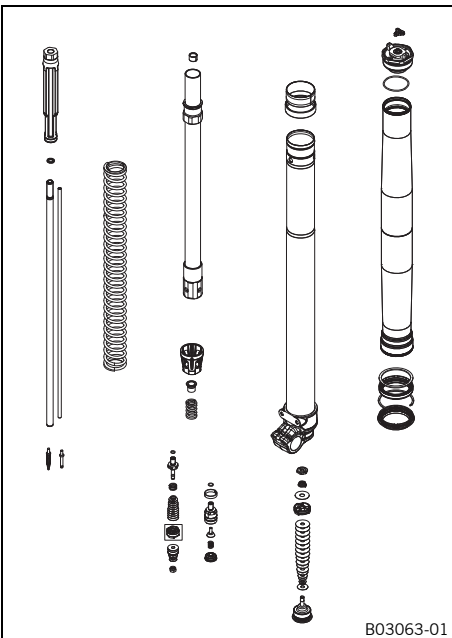


## 6.11 All Six Days models

### 6.11.1 Servicing the fork

**Condition**

The fork legs have been removed.



- Disassemble the fork legs. (📖 p. 43)
- Disassemble the cartridge. (📖 p. 46)
- Check the fork legs. (📖 p. 50)
- Assemble the cartridge. (📖 p. 52)
- Assemble the fork legs. (📖 p. 56)



### 6.11.2 Disassembling the fork legs

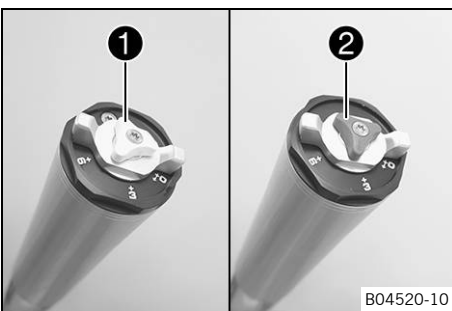


**Info**

The operations are the same on both fork legs.

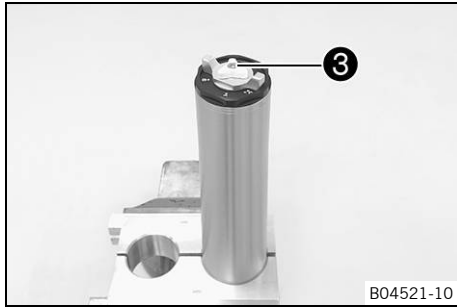
**Condition**

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.

## 6 FORK, TRIPLE CLAMP



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

Clamping stand (T1403S) (📖 p. 374)

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

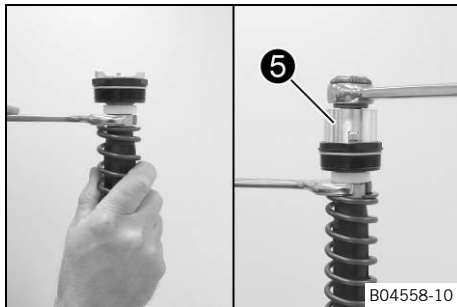


- Loosen the screw cover **4**.

Ring wrench (T14017) (📖 p. 374)

### **i** Info

The screw cover cannot be removed yet.

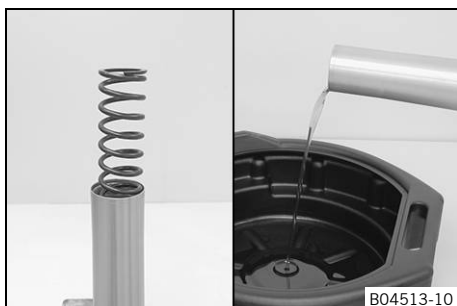


- Extract the fork leg and push the outer tube downward.
- Pull the spring downward and push the open end wrench onto the hexagonal part.
- Hold the hexagonal part and loosen Preload Adjuster with special tool **5**, but do not take it off yet.

Special socket (T14087) (📖 p. 375)



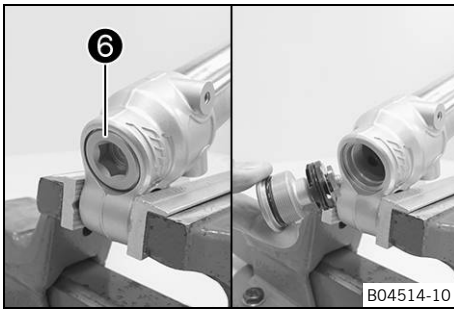
- Pull the spring downward. Remove the open end wrench.
- Remove the screw cap.



- Remove the spring.
- Drain the fork oil.

### **i** 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

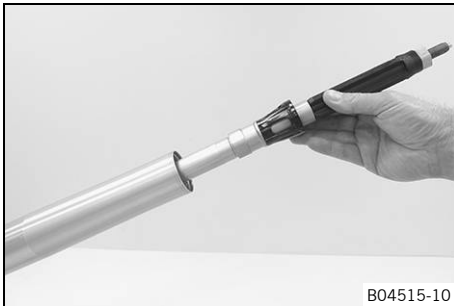
Use soft jaws.

- Unscrew and remove compression holder 6.

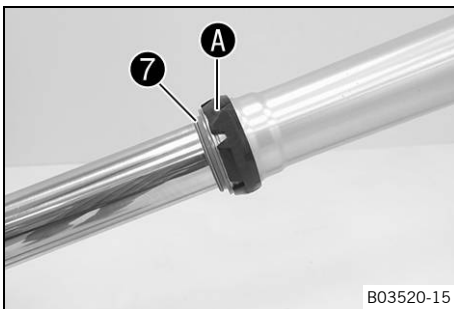


**Info**

Place a container underneath as oil will run out in most cases.



- Remove the cartridge.

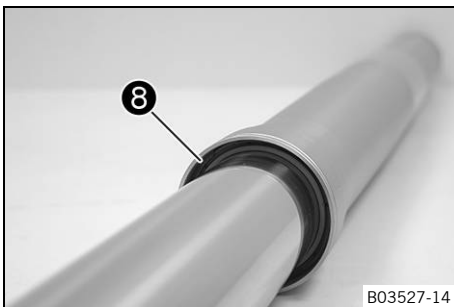


- Remove dust boot 7.
- Remove fork protector ring A.



**Info**

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

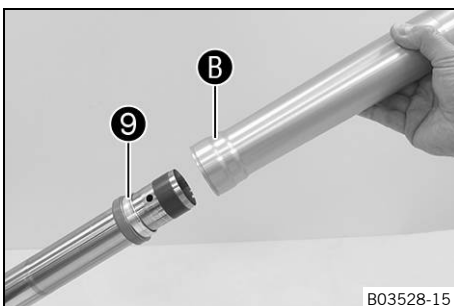


- Remove lock ring 8.



**Info**

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



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

Guideline

50 °C (122 °F)

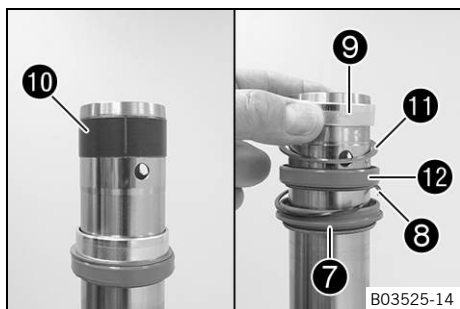
- Pull the outer tube from the inner tube with a jerk.



**Info**

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

## 6 FORK, TRIPLE CLAMP



- 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.
- Unclamp the fork leg.

### 6.11.3 Disassembling the cartridge

#### Preparatory work

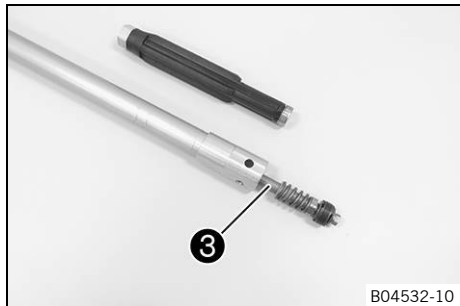
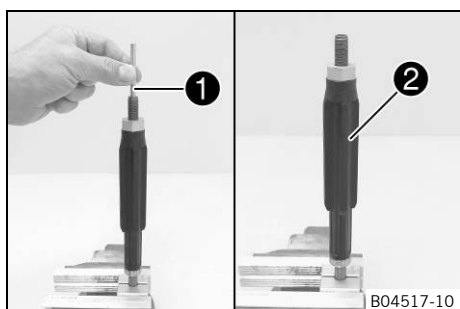
- Disassemble the fork legs. (📖 p. 43)

#### Right cartridge

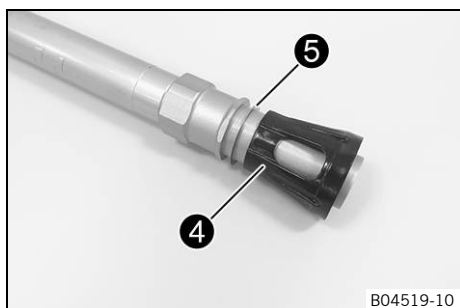
- Clamp the piston rod with the special tool.

Clamping stand (T14016S) (📖 p. 374)

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



- Take piston rod 3 out of the cartridge.

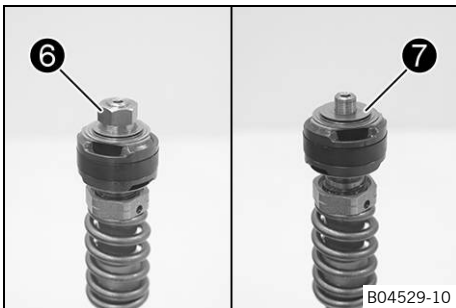


- Take spring seat 4 and washer 5 off of the cartridge.

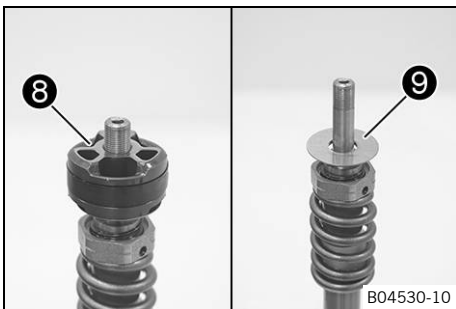


- Degrease the piston rod.
- Clamp the piston rod with the special tool.

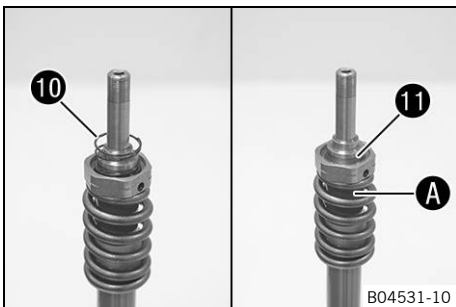
Clamping stand (T14016S) (📖 p. 374)



- Remove nut 6.
- Completely remove shim stack 7.



- Remove piston 8.
- Completely remove shim stack 9.

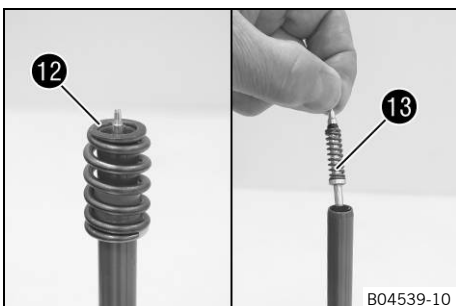


- Remove spring 10.
- Warm up the piston rod in area A.

Guideline

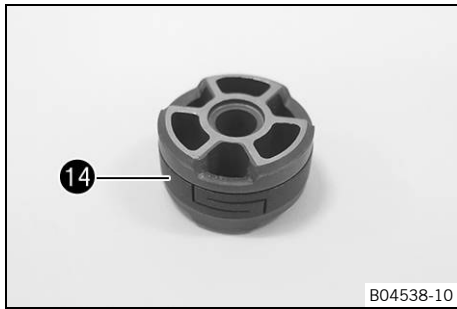
50 °C (122 °F)

- Remove tap rebound 11.

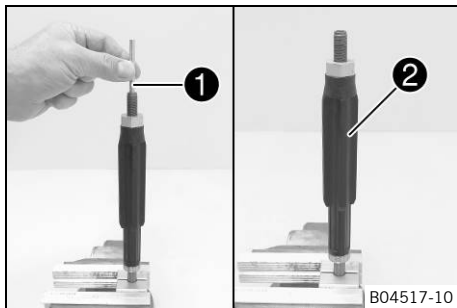


- Remove spring 12.
- Remove valve 13 of the rebound damping with the spring.
- Unclamp the piston rod.

## 6 FORK, TRIPLE CLAMP

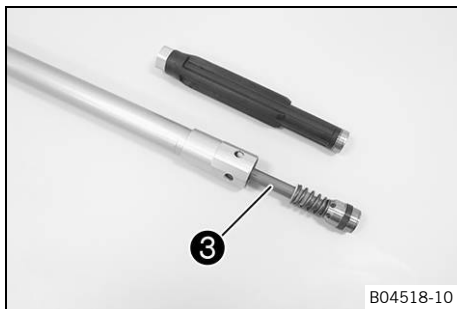


- Remove piston ring 14.

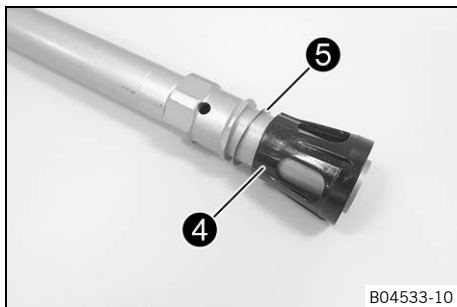


### Left cartridge

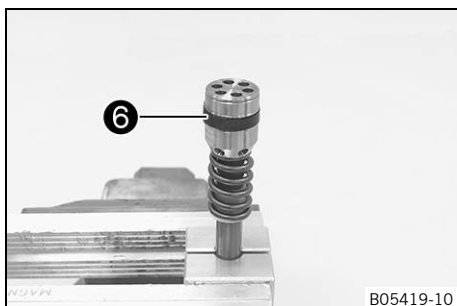
- Clamp the piston rod with the special tool.  
Clamping stand (T14016S) (📖 p. 374)
- Remove adjusting tube 1.
- Remove fluid barrier 2 from the piston rod.



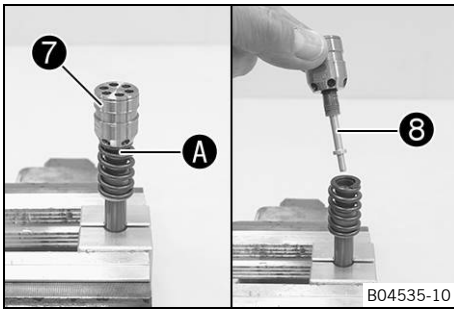
- Take piston rod 3 out of the cartridge.



- Take spring seat 4 and washer 5 off of the cartridge.



- Degrease the piston rod.
- Clamp the piston rod with the special tool.  
Clamping stand (T14016S) (📖 p. 374)
- Remove piston ring 6.

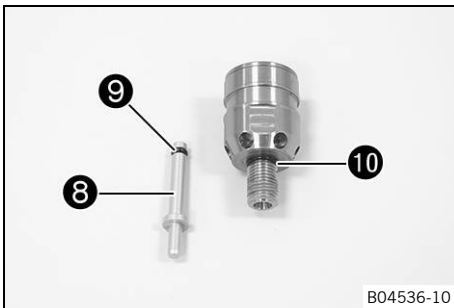


- Warm up the piston rod in area **A**.

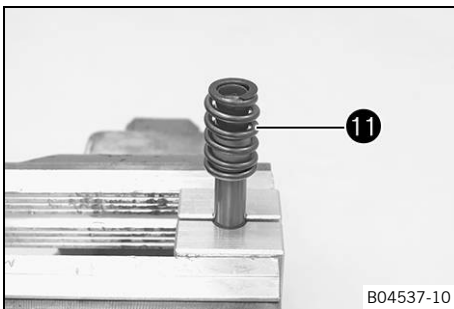
Guideline

50 °C (122 °F)

- Remove piston **7** with setting needle **8**.



- Pull setting needle **8** out of the piston.
- Remove O-rings **9** and **10**.



- Remove spring **11**.
- Unclamp the piston rod.

## 6.11.4 Disassembling the tap compression

### **i** Info

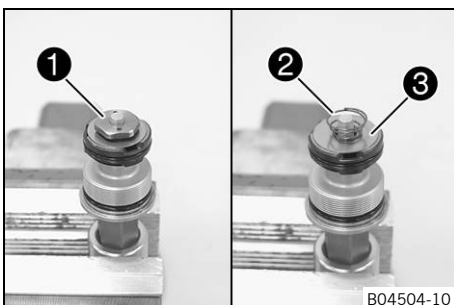
The procedures are the same on both fork legs.

### Preparatory work

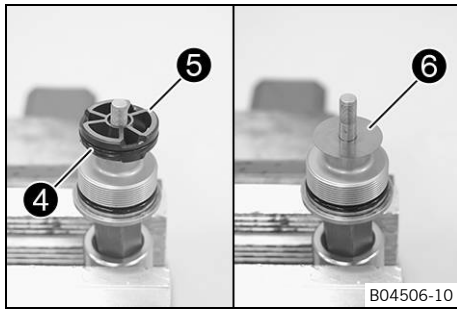
- Disassemble the fork legs. (📖 p. 43)

### Main work

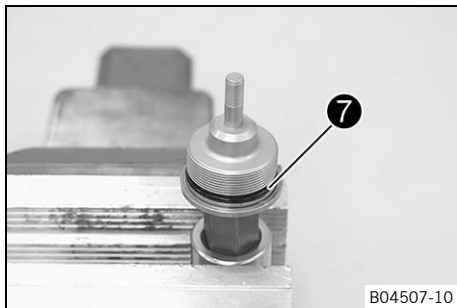
- Mount the tap compression on a suitable hexagon socket and clamp into a vise.
- Remove nut **1**.
- Remove spring **2**.
- Remove washer **3**.



## 6 FORK, TRIPLE CLAMP



- Remove O-ring ④.
- Remove piston ⑤.
- Remove shim stack ⑥.



- Remove O-ring ⑦ from the tap compression.
- Extract the tap compression.

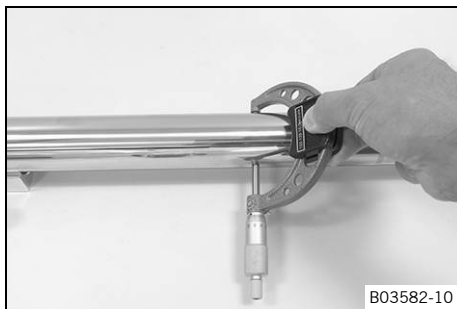
### 6.11.5 Checking the fork legs

#### Condition

The fork legs have been disassembled.



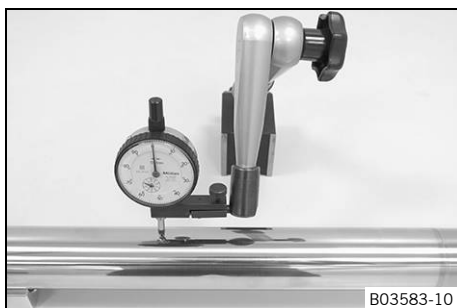
- Check the inner tube and the axle clamp for damage.
  - » If damage is found:
    - Change the inner tube.



- Measure the outside diameter of the inner tube in several places.

|                                    |  |
|------------------------------------|--|
| Outside diameter of the inner tube | 47.975 ... 48.005 mm<br>(1.88878 ... 1.88996 in) |
|------------------------------------|--|

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



- Measure the run-out of the inner tube.

|                   |                         |
|-------------------|-------------------------|
| Inner tub run-out | ≤ 0.20 mm (≤ 0.0079 in) |
|-------------------|-------------------------|

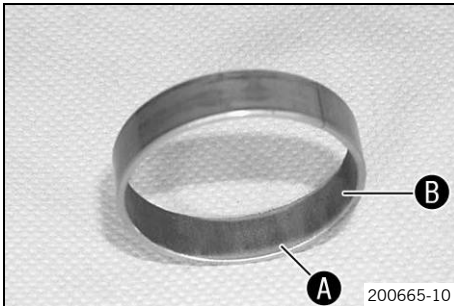
- » If the measured value is greater than the specified value:
  - Change the inner tube.





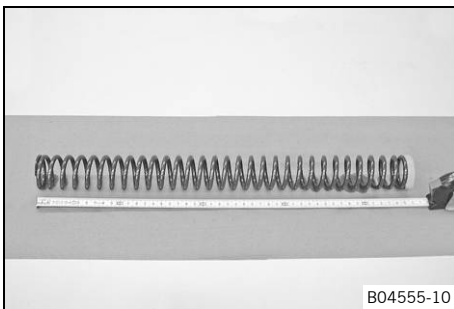
B03584-10

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



200665-10

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



B04555-10

- Check the spring length.

Guideline

|                                      |                   |
|--------------------------------------|-------------------|
| Spring length with preload spacer(s) | 474 mm (18.66 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**

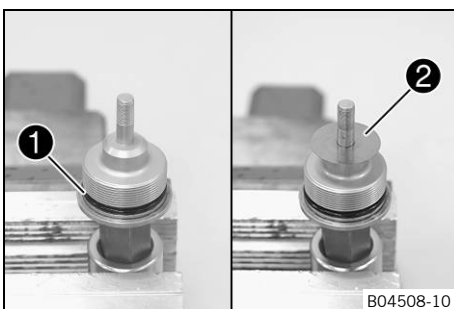
There may only be one preload spacer installed, or none at all.

## 6.11.6 Assembling the tap compression



**Info**

The procedures are the same on both fork legs.



B04508-10

- Mount the tap compression on a suitable hexagon socket and clamp into a vise.
- Mount O-ring **1**.
- Grease O-ring.

|                              |
|------------------------------|
| Lubricant (T158) (🗨️ p. 360) |
|------------------------------|

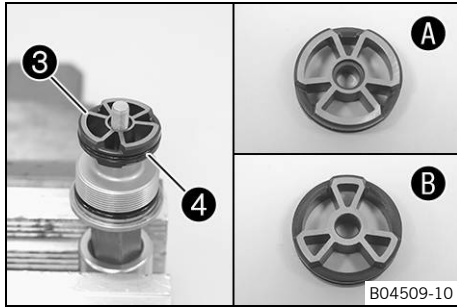
- Mount shim stack **2**.



**Info**

Mount the smaller shims below.

# 6 FORK, TRIPLE CLAMP



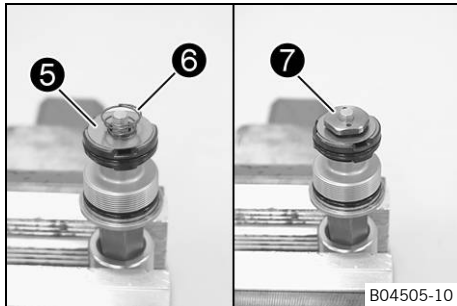
- Mount piston **3**.

Guideline

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

- Mount O-ring **4**.
- Grease the piston O-ring.

Fork oil (SAE 4) (48601166S1) (📖 p. 359)



- Mount washer **5**.
- Mount spring **6** with the tighter coil facing downward.
- Mount and tighten nut **7**.

Guideline

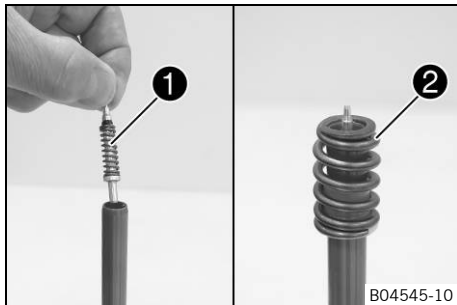
|                      |        |                   |
|----------------------|--------|-------------------|
| Nut, tap compression | M6x0.5 | 5 Nm (3.7 lbf ft) |
|----------------------|--------|-------------------|

**i Info**

Washer **5** must be free to move against the spring force.

- Extract the tap compression.

## 6.11.7 Assembling the cartridge



**Right cartridge**

- Clamp in the piston rod.

Clamping stand (T14016S) (📖 p. 374)

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

Lubricant (T158) (📖 p. 360)

- Mount spring **2**.

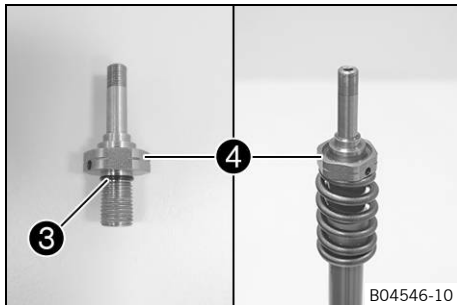
- Mount and grease O-ring **3** in tap rebound **4**.

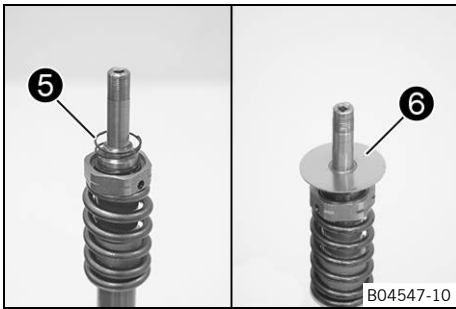
Lubricant (T158) (📖 p. 360)

- Mount and tighten the tap rebound.

Guideline

|             |      |   |
|-------------|------|---|
| Tap rebound | M9x1 | 18 Nm (13.3 lbf ft)<br><b>Loctite®2701™</b> |
|-------------|------|---|





- Position spring ⑤.
- Mount shim stack ⑥.



**Info**

Mount the smaller shims at the bottom.

- Press the shim stack downward against the spring force.

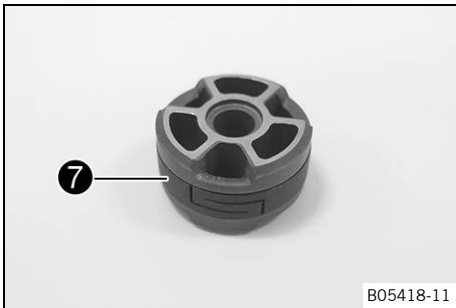


**Info**

The shim stack must be pressed downward over the collar.

- Mount and lubricate piston ring ⑦.

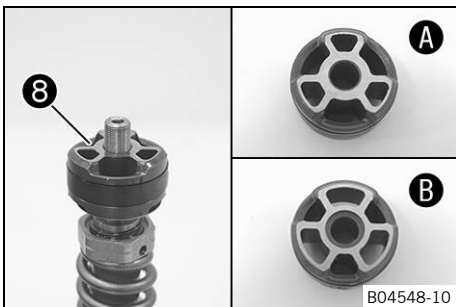
|  |
|--|
| Fork oil (SAE 4) (48601166S1) (📖 p. 359) |
|--|



- Mount piston ⑧ with the piston ring.

Guideline

|        |                      |
|--------|----------------------|
| View ① | of piston from above |
| View ② | of piston from below |



- Mount shim stack ⑨.



**Info**

Align the triangular plate exactly with the piston opening.

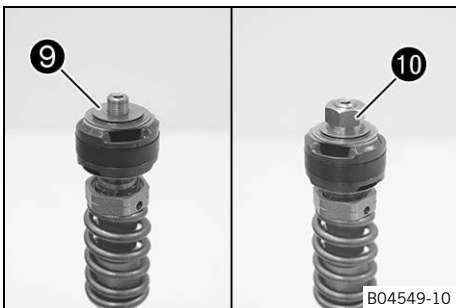
- Mount and tighten nut ⑩ with the collar facing downward.

Guideline

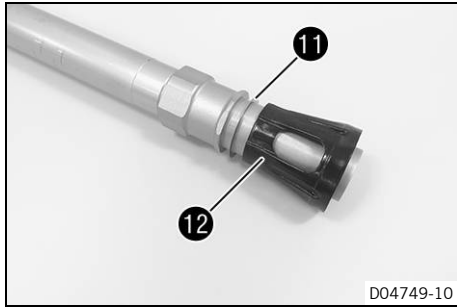
|                 |        |                   |
|-----------------|--------|-------------------|
| Tap rebound nut | M6x0.5 | 5 Nm (3.7 lbf ft) |
|-----------------|--------|-------------------|

- ✓ The lower shim stack is free to move against the spring force.

- Lock the nut by center punching it.



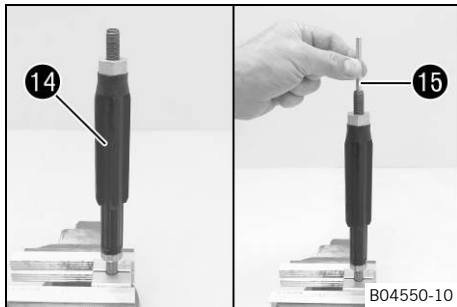
## 6 FORK, TRIPLE CLAMP



- Mount washer **11** and spring seat **12**.



- Slide piston rod **13** into the cartridge.



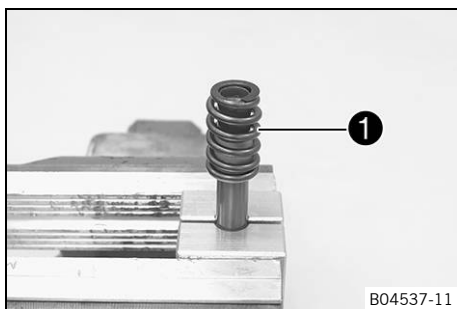
- Mount fluid barrier **14** all the way on.



### Info

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

- Mount adjusting tube **15** 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.

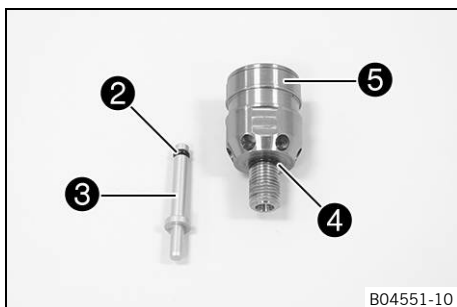


### Left cartridge

- Clamp in the piston rod.

Clamping stand (T14016S) (📖 p. 374)

- Mount spring **1**.

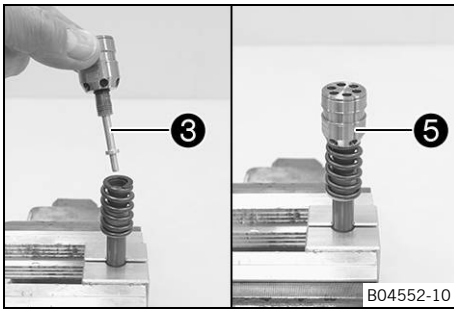


- Mount and lubricate O-ring **2** for setting needle **3**.

Lubricant (T158) (📖 p. 360)

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

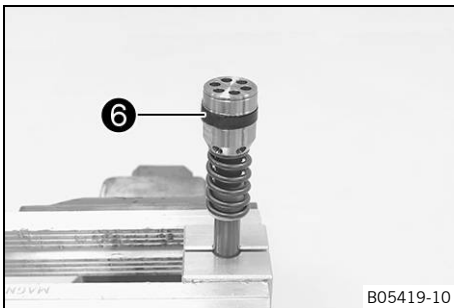
Lubricant (T158) (📖 p. 360)



- Insert setting needle **3** in the piston.
- Mount and tighten piston **5**.

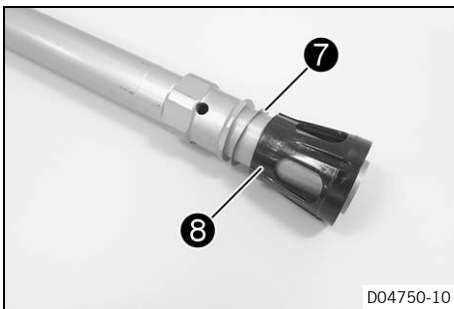
Guideline

|                    |      |   |
|--------------------|------|---|
| Compression piston | M9x1 | 18 Nm (13.3 lbf ft)<br><b>Loctite®2701™</b> |
|--------------------|------|---|

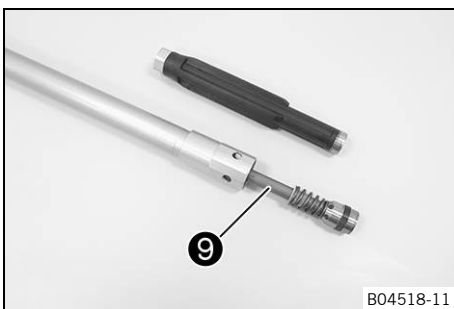


- Mount and lubricate piston ring **6**.

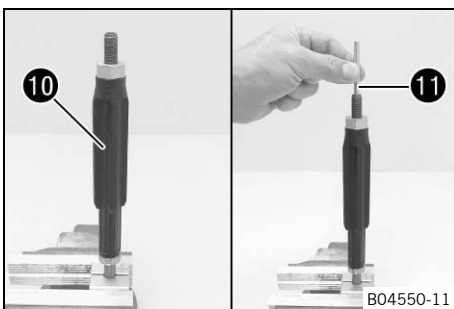
|  |
|--|
| Fork oil (SAE 4) (48601166S1) (📖 p. 359) |
|--|



- Mount washer **7** and spring seat **8**.



- Slide piston rod **9** into the cartridge.



- Mount fluid barrier **10** all the way on.



### Info

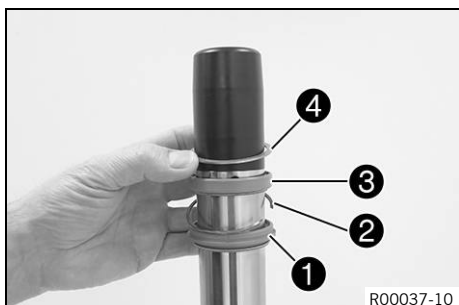
The fluid barrier must be tightened all the way. Do not use a tool.

- Mount adjusting tube **11** 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.

## 6.11.8 Assembling the fork legs

**i Info**

The operations are the same on both fork legs.



**Preparatory work**

- Check the fork legs. (📖 p. 50)
- Assemble the tap compression. (📖 p. 51)
- Assemble the cartridge. (📖 p. 52)

**Main work**

- Clamp the inner tube using the axle clamp.

**Guideline**

Use soft jaws.

- Mount the special tool.

Protecting sleeve (T1401) (📖 p. 373)

- Grease and push on dust boot **1**.

Lubricant (T14034) (📖 p. 360)

**i Info**

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

- Push on lock ring **2**.

- Grease and push on seal ring **3**.

Lubricant (T14034) (📖 p. 360)

**i Info**

Sealing lip downward, open side upward.

- Push on support ring **4**.

- Remove the special tool.

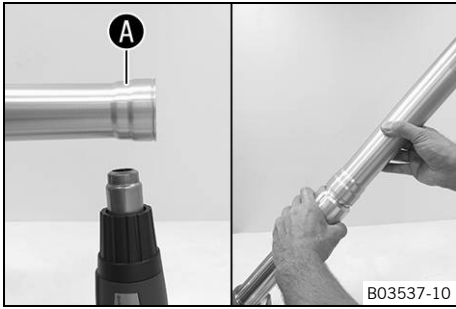
- Push on lower sliding bushing **5**.

- Mount upper sliding bushing **6**.

**i Info**

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





- Warm up the outer tube in area **A** of the lower sliding bushing.

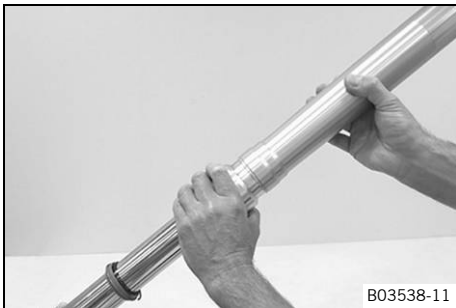
Guideline

50 °C (122 °F)

- Push the outer tube on.
- Hold the lower sliding bushing with the longer side of the special tool.

Mounting tool (T14040S) (📖 p. 375)

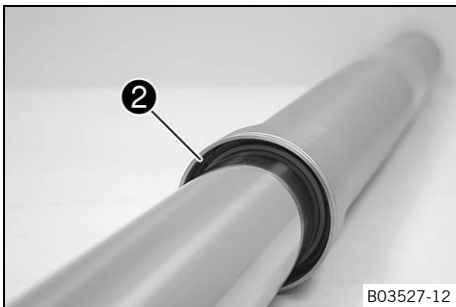
- Press the outer tube all the way in.



- Position the support ring.
- Hold the seal ring with the shorter side of the special tool.

Mounting tool (T14040S) (📖 p. 375)

- Press the outer tube all the way in.

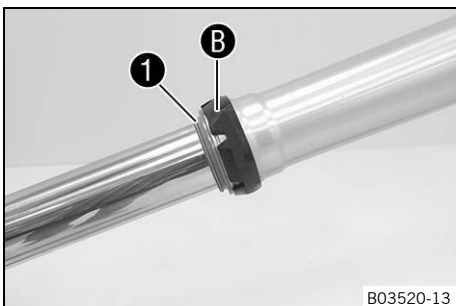


- Mount lock ring **2**.



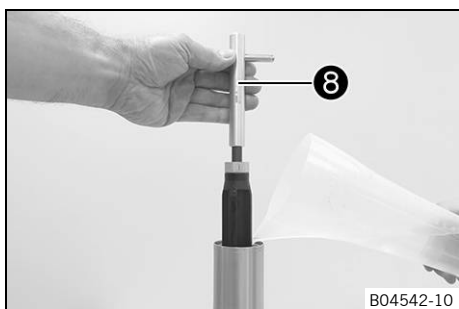
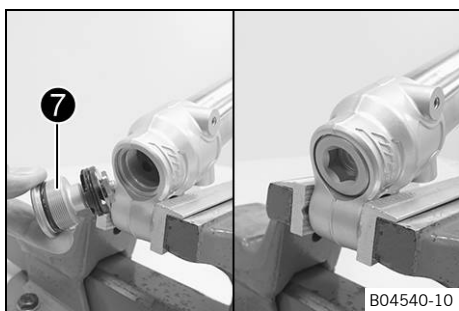
### Info

The lock ring must engage audibly.



- Mount dust boot **1**.
- Mount fork protector ring **B**.

## 6 FORK, TRIPLE CLAMP



- Slide the cartridge all the way into the inner tube.
- ✓ The hexagonal part of the cartridge engages in the inner 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 and tighten tap compression **7**.

Guideline

|                             |       |                     |
|-----------------------------|-------|---------------------|
| Compression damping fitting | M29x1 | 35 Nm (25.8 lbf ft) |
|-----------------------------|-------|---------------------|

- Mount special tool **8** on the piston rod.

|                                    |
|------------------------------------|
| Support tool (T14026S1) (📖 p. 374) |
|------------------------------------|

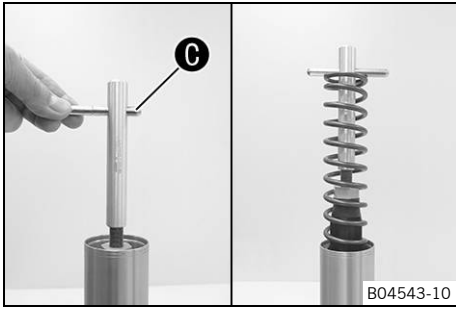
**i Info**  
The special tool must be used to prevent the adjusting tube from being lifted and thus to prevent oil from reaching the piston rod.

- Clamp the fork vertically.
- Fill with fork oil.

|                       |  |  |
|-----------------------|--|--|
| Fork oil per fork leg | 635 ± 10 ml<br>(21.47<br>± 0.34 fl. oz.) | Fork oil (SAE 4)<br>(48601166S1)<br>(📖 p. 359) |
|-----------------------|--|--|

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



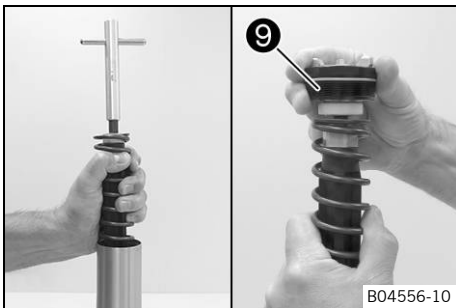


- Remove pin 6 of the special tool.

Support tool (T14026S1) (📖 p. 374)

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

| Spring rate  |                       |
|--|-----------------------|
| Weight of rider: 65 ...<br>75 kg (143 ... 165 lb.) | 4.0 N/mm (22.8 lb/in) |
| Weight of rider: 75 ...<br>85 kg (165 ... 187 lb.) | 4.2 N/mm (24 lb/in)   |
| Weight of rider: 85 ...<br>95 kg (187 ... 209 lb.) | 4.4 N/mm (25.1 lb/in) |

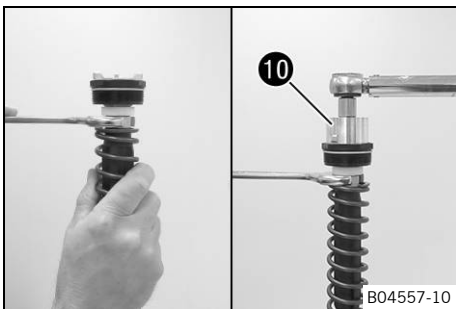


- Pull the spring downward.
- Remove the special tool.

Support tool (T14026S1) (📖 p. 374)

- Mount screw cap 9.

**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 Preload Adjuster with special tool 10.

Guideline

|  |       |                     |
|--|-------|---------------------|
| <b>Preload Adjuster</b> on<br>the piston rod | M12x1 | 25 Nm (18.4 lbf ft) |
|--|-------|---------------------|

Special socket (T14087) (📖 p. 375)



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

Clamping stand (T1403S) (📖 p. 374)

- Grease the O-ring of the screw cover.

Lubricant (T158) (📖 p. 360)

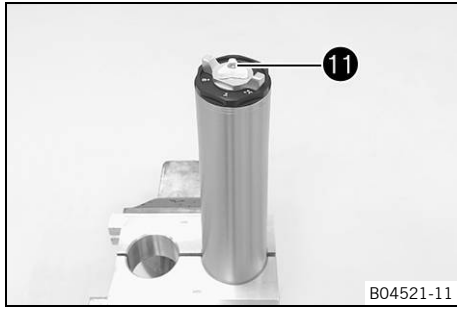
- Mount and tighten screw cap 9.

Guideline

|                            |         |                     |
|----------------------------|---------|---------------------|
| Screw cap on outer<br>tube | M51x1.5 | 40 Nm (29.5 lbf ft) |
|----------------------------|---------|---------------------|

Ring wrench (T14017) (📖 p. 374)

# 6 FORK, TRIPLE CLAMP

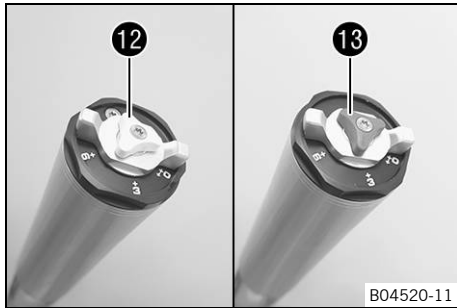


B04521-11

- Mount the adjuster.
- Mount and tighten screw 11.

Guideline

|                 |        |                         |
|-----------------|--------|-------------------------|
| Screw, adjuster | M4x0.5 | 2.5 Nm<br>(1.84 lbf ft) |
|-----------------|--------|-------------------------|



B04520-11

### Alternative 1

- Turn compression adjuster 12 and rebound adjuster 13 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               | 12 clicks |
| Compression damping |           |
| Comfort             | 18 clicks |
| Standard            | 15 clicks |
| Sport               | 12 clicks |

- Set the spring preload according to the fork type.

Guideline

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

### Alternative 2



#### Warning

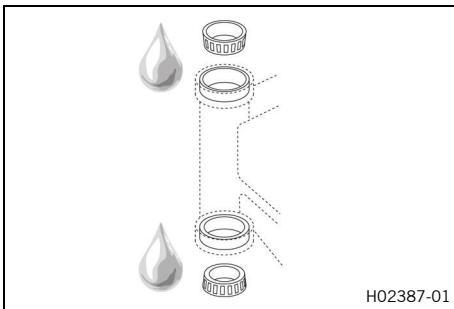
**Danger of accident** Modifications to the suspension setting may seriously alter the handling characteristic.

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.

## 6.11.9 Lubricating the steering head bearing



- Remove the lower triple clamp. (📖 p. 61)
- Install the lower triple clamp. (📖 p. 62)

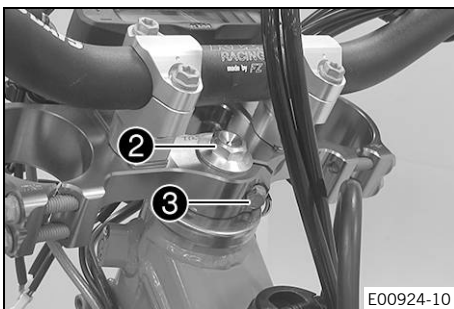
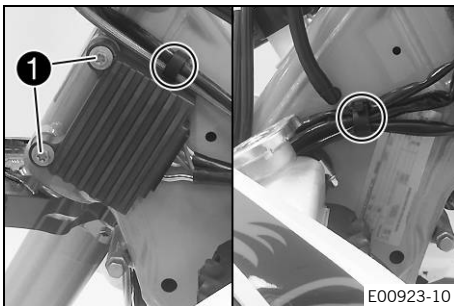
## 6.11.10 Removing the lower triple clamp

### Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 12)
- Remove the front wheel. (📖 p. 141)
- Remove the headlight mask with the headlight. (📖 p. 135)
- Remove the fork legs. (📖 p. 17)
- Remove front fender. (📖 p. 134)
- Remove the handlebar cushion.

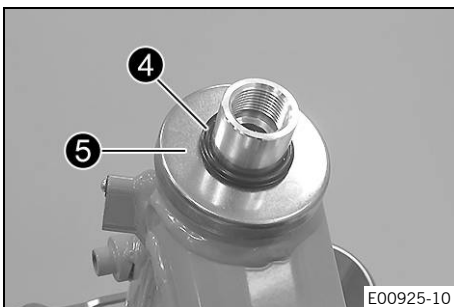
### Main work

- Remove screws ❶ and hang the voltage regulator to the side.
- Open the cable holder in front of the left and right radiator and detach the wiring harness.



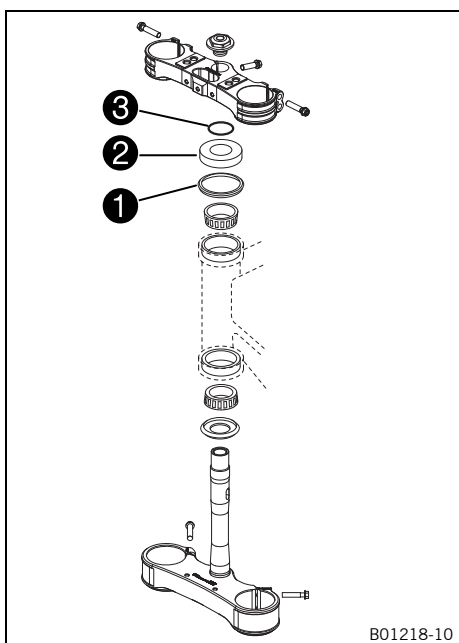
- Remove screw ❷.
- Remove screw ❸. Take off the upper triple clamp with the handlebar and set it aside.

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



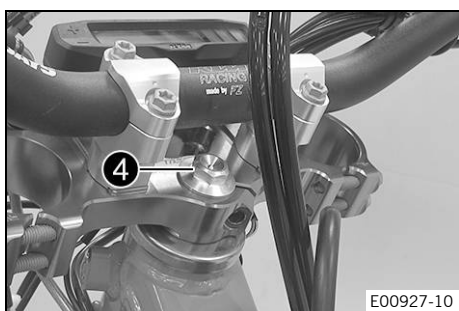
- Remove O-ring ❹. Remove protective ring ❺.
- Take off the lower triple clamp with the steering stem.
- Remove the upper steering head bearing.

## 6.11.11 Installing the lower triple clamp

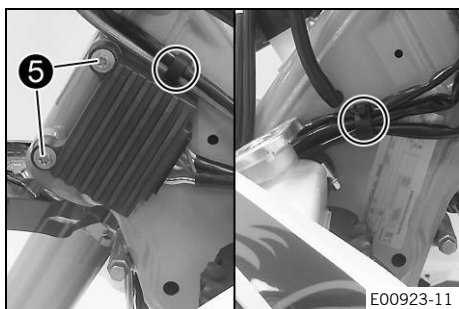


### Main work

- Clean the bearing and sealing elements, check for damage, and grease.
- High viscosity grease (📖 p. 360)
- Insert the lower triple clamp with the steering stem. Mount the upper steering head bearing.
  - Check whether upper steering head seal **1** is correctly positioned.
  - Mount protective ring **2** and O-ring **3**.



- Position the upper triple clamp with the handlebar.
- Mount screw **4** but do not tighten yet.
- Position the clutch line and wiring harness.

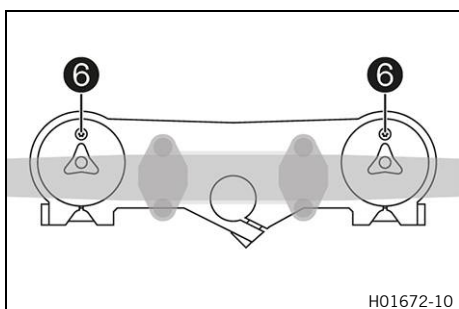


- Position the voltage regulator, and mount and tighten screws **5**.

### Guideline

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

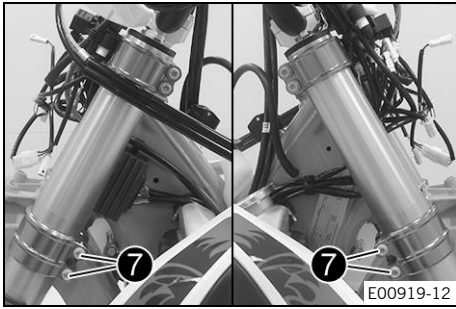
- Secure wiring harnesses with cable holders.



- Position the fork legs.
- ✓ Bleeder screws **6** are positioned toward the front.

### Info

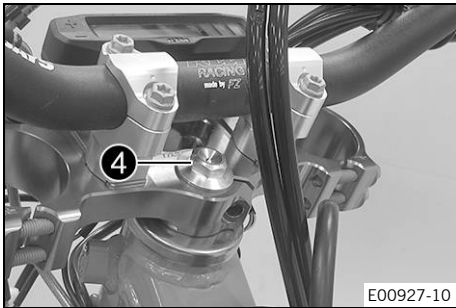
The rebound damping is located in right fork leg **REB** (red adjusting screw). The compression damping is located in left fork leg **COMP** (white adjusting screw). Grooves are milled into the side of the upper end of the fork legs. The second milled groove (from the top) must be flush with the top edge of the upper triple clamp.



- Tighten screws 7.

Guideline

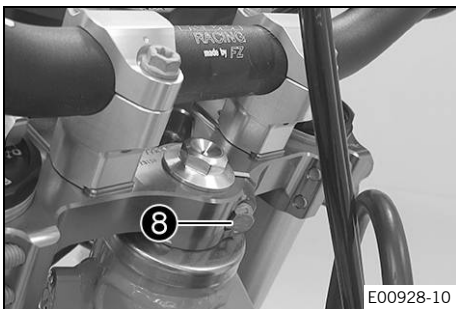
|                            |    |                     |
|----------------------------|----|---------------------|
| Screw, bottom triple clamp | M8 | 15 Nm (11.1 lbf ft) |
|----------------------------|----|---------------------|



- Tighten screw 4.

Guideline

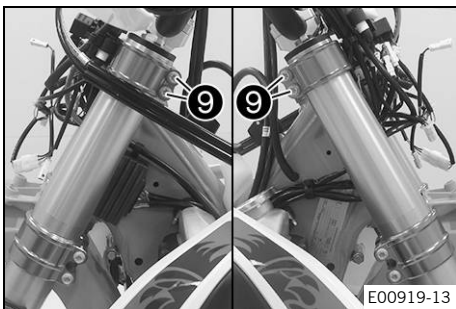
|                          |         |                    |
|--------------------------|---------|--------------------|
| Screw, top steering head | M20x1.5 | 12 Nm (8.9 lbf ft) |
|--------------------------|---------|--------------------|



- Mount and tighten screw 8.

Guideline

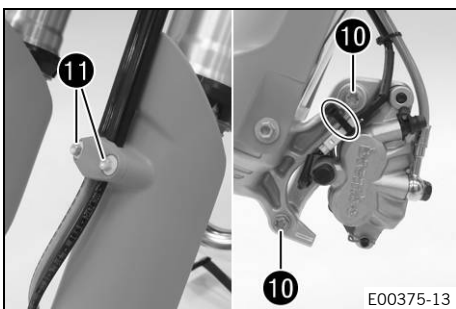
|                          |    |  |
|--------------------------|----|--|
| Screw, top steering stem | M8 | 17 Nm (12.5 lbf ft)<br><b>Loctite®243™</b> |
|--------------------------|----|--|



- Tighten screws 9.

Guideline

|                         |    |                     |
|-------------------------|----|---------------------|
| Screw, top triple clamp | M8 | 17 Nm (12.5 lbf ft) |
|-------------------------|----|---------------------|



- Position the brake caliper, and mount and tighten screws 10.

Guideline

|                            |    |  |
|----------------------------|----|--|
| Screw, front brake caliper | M8 | 25 Nm (18.4 lbf ft)<br><b>Loctite®243™</b> |
|----------------------------|----|--|

- Mount the cable tie(s).
- Position the brake line, wiring harness, and clamp. Mount and tighten screws 11.

### Finishing work

- Mount the handlebar cushion.
- Install front fender. (📖 p. 134)
- Install the front wheel. (📖 p. 142)
- Install the headlight mask with the headlight. (📖 p. 135)

- Check that the wiring harness, throttle cables, and brake and clutch lines can move freely and are routed correctly.
- Check the play of the steering head bearing. (📖 p. 65)
- Remove the motorcycle from the lift stand. (📖 p. 12)
- Check the headlight setting. (📖 p. 183)

## 6.11.12 Changing the steering head bearing

### Preparatory work

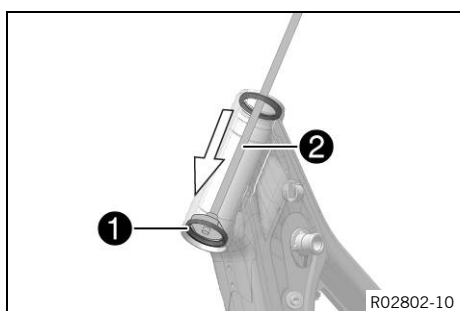
- Raise the motorcycle with a lift stand. (📖 p. 12)
- Remove the front wheel. (📖 p. 141)
- Remove the headlight mask with the headlight. (📖 p. 135)
- Remove the fork legs. (📖 p. 17)
- Remove front fender. (📖 p. 134)
- Remove the handlebar cushion.
- Remove the lower triple clamp. (📖 p. 61)

### Main work

- Remove lower bearing ring ❶ with special tool ❷.

|                                       |
|---------------------------------------|
| Tool bracket (58429089000) (📖 p. 368) |
|---------------------------------------|

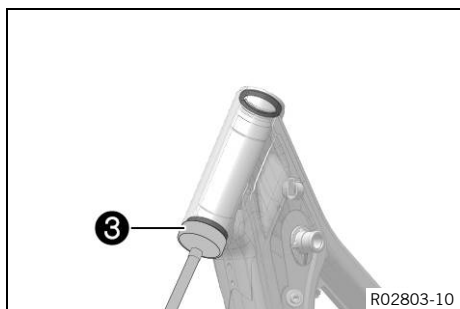
|  |
|--|
| Pressing tool (58429092000) (📖 p. 368) |
|--|



- Press the new bearing ring up to the stop with special tool ❸.

|                                       |
|---------------------------------------|
| Tool bracket (58429089000) (📖 p. 368) |
|---------------------------------------|

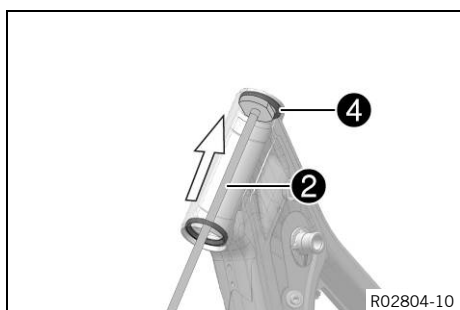
|  |
|--|
| Pressing tool (58429091000) (📖 p. 368) |
|--|

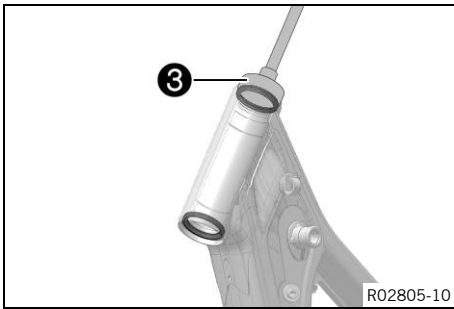


- Remove upper bearing ring ❹ with special tool ❷.

|                                       |
|---------------------------------------|
| Tool bracket (58429089000) (📖 p. 368) |
|---------------------------------------|

|  |
|--|
| Pressing tool (58429092000) (📖 p. 368) |
|--|

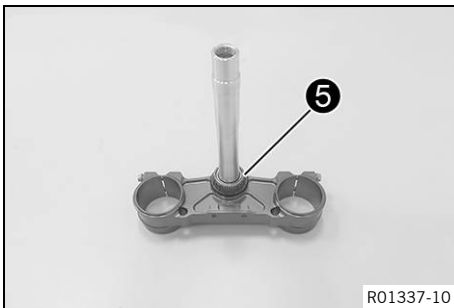




- Press the new bearing ring up to the stop with special tool **3**.

Tool bracket (58429089000) (📖 p. 368)

Pressing tool (58429091000) (📖 p. 368)



- Remove lower steering head bearing **5**.
- Remove the seal ring.
- Grease and mount the new seal ring.
- Press on the new bearing with a suitable tube as far as it will go.

### **i** Info

Only press the bearing in via the inner ring.

### Finishing work

- Install the lower triple clamp. (📖 p. 62)
- Mount the handlebar cushion.
- Install front fender. (📖 p. 134)
- Install the front wheel. (📖 p. 142)
- Install the headlight mask with the headlight. (📖 p. 135)
- Check that the wiring harness, throttle cables, and brake and clutch lines can move freely and are routed correctly.
- Check the play of the steering head bearing. (📖 p. 65)
- Remove the motorcycle from the lift stand. (📖 p. 12)
- Check the headlight setting. (📖 p. 183)



## 6.11.13 Checking the play of the steering head bearing



### Warning

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

- Correct incorrect steering head bearing play immediately.



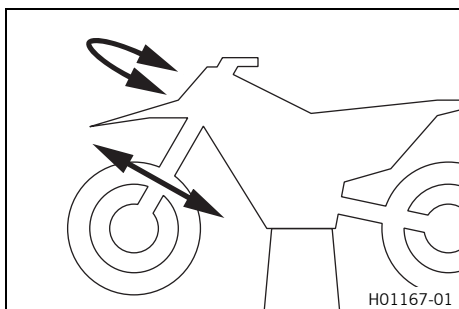
### Info

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

- Raise the motorcycle with a lift stand. (📖 p. 12)





### Main work

- Move the handlebar to the straight-ahead position. Move the fork legs to and fro 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. (🔧 p. 66)

- Move the handlebar to and fro 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. 66)
  - Check the steering head bearing and change if necessary.

### Finishing work

- Remove the motorcycle from the lift stand. (🔧 p. 12)

## 6.11.14 Adjusting the steering head bearing play

### Preparatory work

- Raise the motorcycle with a lift stand. (🔧 p. 12)

### Main work

- Loosen screws ❶. Remove screw ❷.
- Loosen and retighten screw ❸.

#### Guideline

|                          |         |                    |
|--------------------------|---------|--------------------|
| Screw, top steering head | M20x1.5 | 12 Nm (8.9 lbf ft) |
|--------------------------|---------|--------------------|

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

- Tighten screws ❶.

#### Guideline

|                         |    |                     |
|-------------------------|----|---------------------|
| Screw, top triple clamp | M8 | 17 Nm (12.5 lbf ft) |
|-------------------------|----|---------------------|

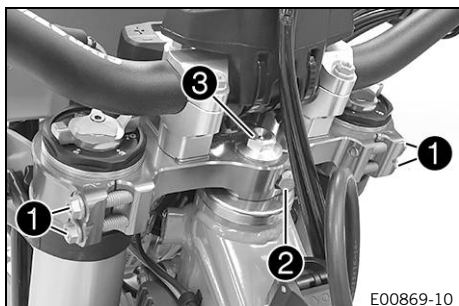
- Mount and tighten screw ❷.

#### Guideline

|                          |    |  |
|--------------------------|----|--|
| Screw, top steering stem | M8 | 17 Nm (12.5 lbf ft)<br><b>Loctite®243™</b> |
|--------------------------|----|--|

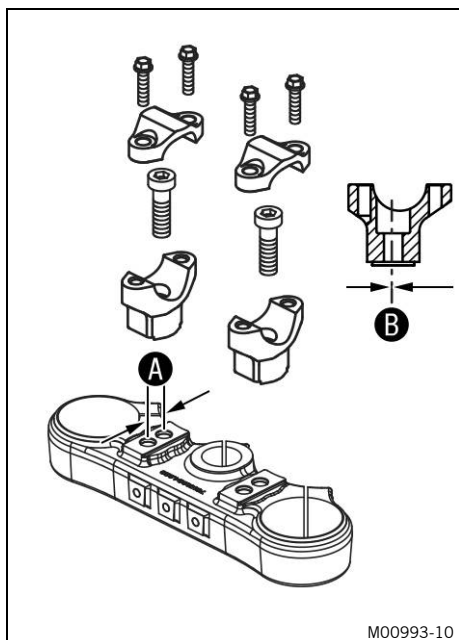
### Finishing work

- Check the play of the steering head bearing. (🔧 p. 65)
- Remove the motorcycle from the lift stand. (🔧 p. 12)





## 7.1 Handlebar position



### (All standard EXC/XC-W models)

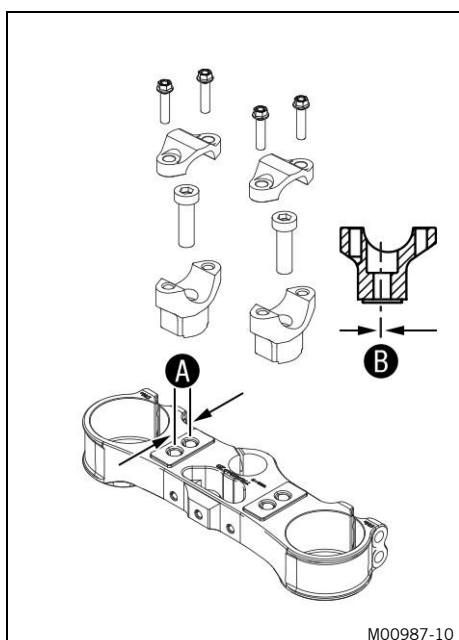
On the upper triple clamp, there are 2 holes at a distance of **A** to each other.

|                 |                 |
|-----------------|-----------------|
| Hole distance A | 15 mm (0.59 in) |
|-----------------|-----------------|

The holes on the handlebar support are placed at a distance of **B** from the center.

|                 |                   |
|-----------------|-------------------|
| Hole distance B | 3.5 mm (0.138 in) |
|-----------------|-------------------|

The handlebar can be mounted in four different positions. This allows the handlebar to be mounted in the most comfortable position for the rider.



### (All Six Days models)

On the upper triple clamp, there are 2 holes at a distance of **A** to each other.

|                 |                 |
|-----------------|-----------------|
| Hole distance A | 15 mm (0.59 in) |
|-----------------|-----------------|

The holes on the handlebar support are placed at a distance of **B** from the center.

|                 |                   |
|-----------------|-------------------|
| Hole distance B | 3.5 mm (0.138 in) |
|-----------------|-------------------|

The handlebar can be mounted in four different positions. This allows the handlebar to be mounted in the most comfortable position for the rider.

## 7.2 Adjusting the handlebar position



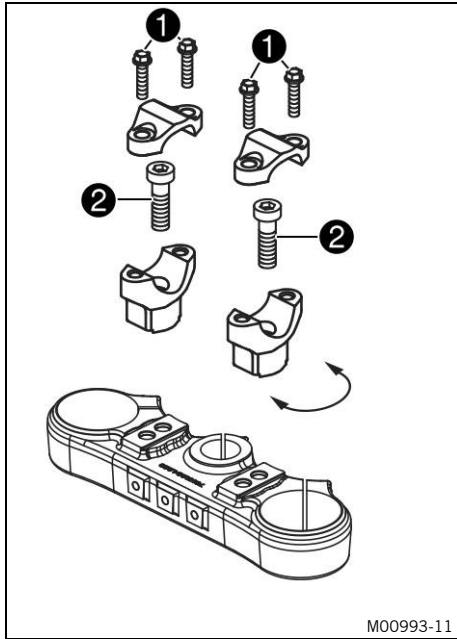
### Warning

**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.

## 7 HANDLEBAR, CONTROLS



### (All standard EXC/XC-W models)

- Remove screws **1**. Take off the handlebar clamps. Remove the handlebar and lay it to one side.

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

- Remove screws **2**. Take off the handlebar supports.
- Place the handlebar supports in the required position. Mount and tighten screws **2**.

#### Guideline

|                          |     |  |
|--------------------------|-----|--|
| Screw, handlebar support | M10 | 40 Nm (29.5 lbf ft)<br><b>Loctite®243™</b> |
|--------------------------|-----|--|

**i Info**  
Position the left and right handlebar supports evenly.

- Position the handlebar.

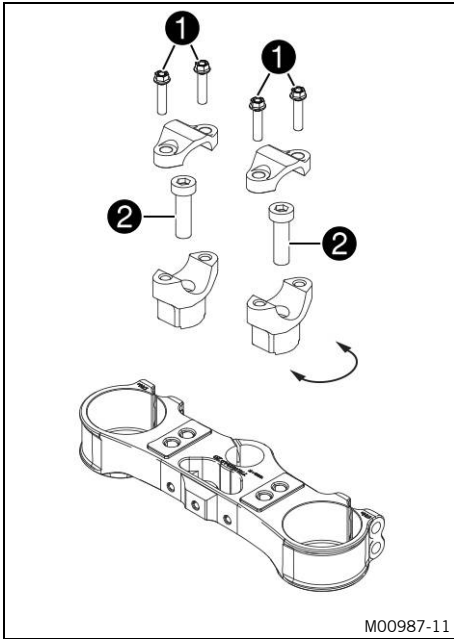
**i Info**  
Make sure the cables and wiring are positioned correctly.

- Position the handlebar clamps. Mount screws **1** and tighten evenly.

#### Guideline

|                        |    |                        |
|------------------------|----|------------------------|
| Screw, handlebar clamp | M8 | 20 Nm<br>(14.8 lbf ft) |
|------------------------|----|------------------------|

**i Info**  
Make sure the gap widths are even.



### (All Six Days models)

- Remove screws **1**. Take off the handlebar clamps. Remove the handlebar and lay it to one side.



#### Info

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

- Remove screws **2**. Take off the handlebar supports.
- Place the handlebar supports in the required position. Mount and tighten screws **2**.

#### Guideline

|                          |     |  |
|--------------------------|-----|--|
| Screw, handlebar support | M10 | 40 Nm (29.5 lbf ft)<br><b>Loctite®243™</b> |
|--------------------------|-----|--|



#### Info

Position the left and right handlebar supports evenly.

- Position the handlebar.



#### Info

Make sure the cables and wiring are positioned correctly.

- Position the handlebar clamps. Mount screws **1** and tighten evenly.

#### Guideline

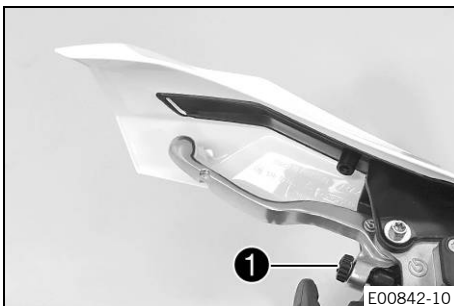
|                        |    |                        |
|------------------------|----|------------------------|
| Screw, handlebar clamp | M8 | 20 Nm<br>(14.8 lbf ft) |
|------------------------|----|------------------------|



#### Info

Make sure the gap widths are even.

## 7.3 Adjusting the basic position of the clutch lever



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



#### Info

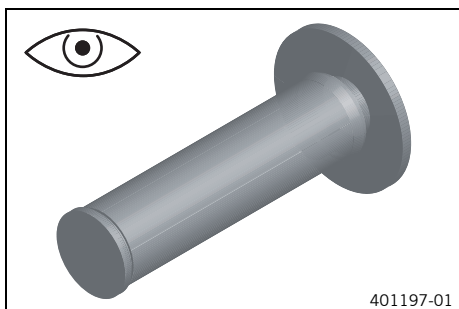
Turn the adjusting screw counterclockwise to decrease the distance between the clutch lever and the handlebar.

Turn the adjusting screw clockwise to increase the distance between the clutch lever and the handlebar. The range of adjustment is limited.

Turn the adjusting screw by hand only, and do not apply any force.

Do not make any adjustments while riding.

## 7.4 Checking the rubber grip



- Check the rubber grips on the handlebar for damage, wear, and looseness.



### Info

The rubber grips are vulcanized onto a sleeve on the left and onto the handle tube of the throttle grip on the right. The left sleeve is clamped onto the handlebar. The rubber grip can only be replaced with the sleeve or the throttle tube.

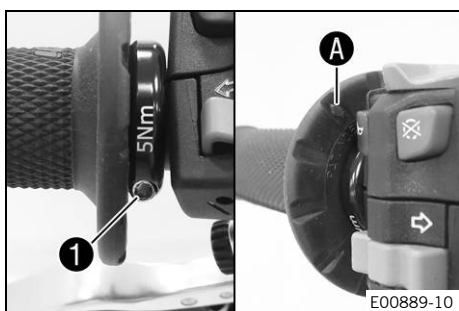
- » If a rubber grip is damaged or worn:
  - Change the rubber grip.

- Check that screw ❶ is firmly seated.

### Guideline

|                   |    |  |
|-------------------|----|--|
| Screw, fixed grip | M4 | 5 Nm (3.7 lbf ft)<br><b>Loctite®243™</b> |
|-------------------|----|--|

The diamond ❷ must be positioned visibly as shown in the figure.



## 7.5 Checking throttle cable routing

### Preparatory work

- Remove the seat. (📖 p. 121)
- Remove the fuel tank. (📖 p. 122)

### Main work

- Check throttle cable routing.

Both throttle cables must be routed, side by side, on the back of the handlebars, above the fuel tank bracket on the right of the frame to the throttle valve body. Both throttle cables must be secured behind the fuel tank contact area rubber band.

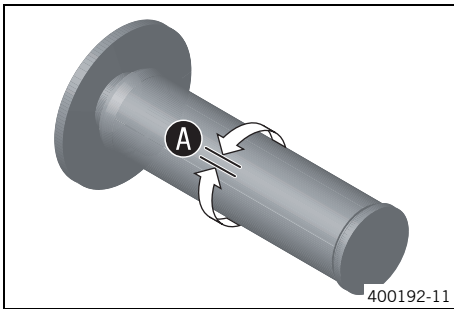
- » If the throttle cable routing is not as specified:
  - Correct throttle cable routing.



### Finishing work

- Install the fuel tank. (📖 p. 123)
- Mount the seat. (📖 p. 121)

## 7.6 Checking the play in the throttle cable



- Check the throttle grip for smooth operation.
- Turn the handlebar as far as possible to the right. Turn the throttle grip back and forth slightly and determine the play in throttle cable **A**.

|                        |                              |
|------------------------|------------------------------|
| Play in throttle cable | 3 ... 5 mm (0.12 ... 0.2 in) |
|------------------------|------------------------------|

- » If the throttle cable play does not meet the specified value:
  - Adjust the play in the throttle cable. (📖 p. 71)



### 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 an effective exhaust extraction system when starting or running the engine in an enclosed space.

- Start the engine and let it run idle. Move the handlebar to and fro over the entire steering range.

|                                 |
|---------------------------------|
| The idle speed must not change. |
|---------------------------------|

- » If the idle speed changes:
  - Adjust the play in the throttle cable. (📖 p. 71)



## 7.7 Adjusting the play in the throttle cable



### Info

If the correct routing of the throttle cables has already been secured, the fuel tank does not need to be removed.

### Preparatory work

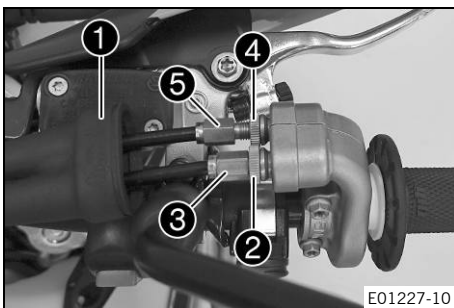
- Remove the seat. (📖 p. 121)
- Remove the fuel tank. (📖 p. 122)
- Check throttle cable routing. (📖 p. 70)

### Main work

- Move the handlebar to the straight-ahead position.
- Push back sleeve **1**.
- Loosen nut **2**.
- Turn adjusting screw **3** in as far as possible.
- Loosen nut **4**.
- Turn adjusting screw **5** in as far as possible.
- Turn adjusting screw **3** so that there is play in the throttle cable at the throttle grip.

### Guideline

|                        |                              |
|------------------------|------------------------------|
| Play in throttle cable | 3 ... 5 mm (0.12 ... 0.2 in) |
|------------------------|------------------------------|



- Unscrew the adjusting screw **5** until the smooth operation or play in throttle cable is worsened.
- Turn the adjusting screw **5** approx. two turns further.
- Tighten nut **4**.
- Tighten nut **2**.
- Slide on sleeve **1**.
- Check the throttle grip for smooth operation.

### Finishing work

- Check the play in the throttle cable. (📖 p. 71)

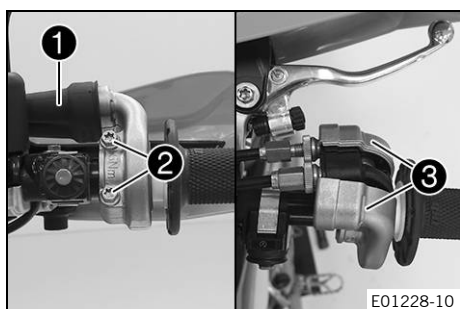
## 7.8 Setting the characteristic map of the throttle response



### Info

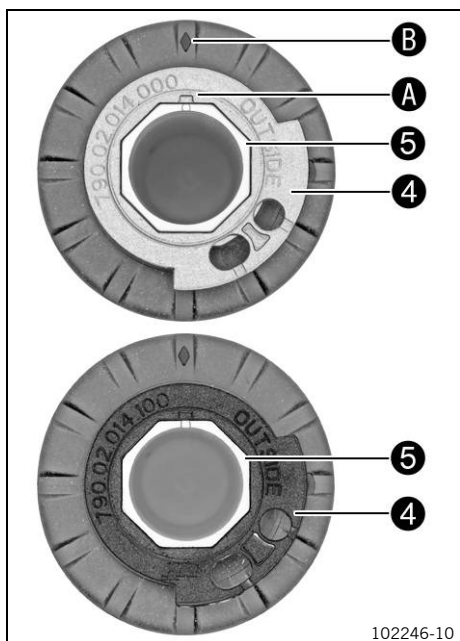
On the throttle grip, the characteristic map of the throttle response is changed by changing the guide plate.

A guide plate with a different characteristic map is supplied.



### Main work

- Push back sleeve **1**.
- Remove screws **2** and half-shells **3**.
- Detach the throttle cables and take off the grip tube.



- Remove guide plate **4** from handle tube **5**.
- Position the required guide plate on the grip tube.

### Guideline

The label **OUTSIDE** must be visible. Marking **A** must be positioned at marking **B**.

Grey guide plate (79002014000)

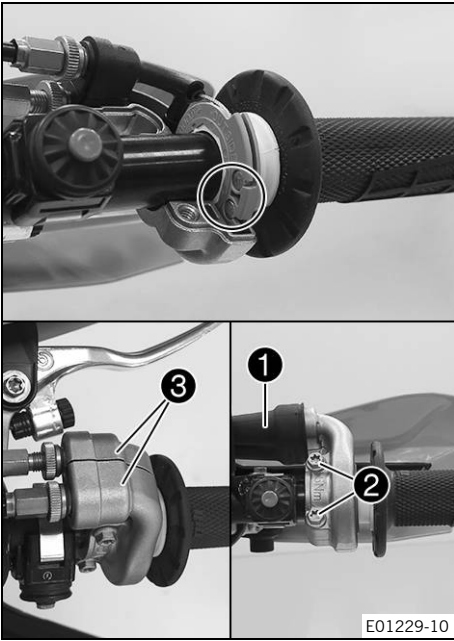
### Alternative 1

Black guide plate (79002014100)



### Info

The gray guide plate opens the throttle valve more slowly.  
The black guide plate opens the throttle valve more quickly.  
The gray guide plate is mounted upon delivery.



- Clean the outside of the handlebar and the inside of the grip tube. Mount the grip tube on the handlebar.
- Attach the throttle cables to the guide plate and route correctly.
- Position half-shells **3**, mount and tighten screws **2**.

Guideline

|                      |    |                   |
|----------------------|----|-------------------|
| Screw, throttle grip | M6 | 5 Nm (3.7 lbf ft) |
|----------------------|----|-------------------|

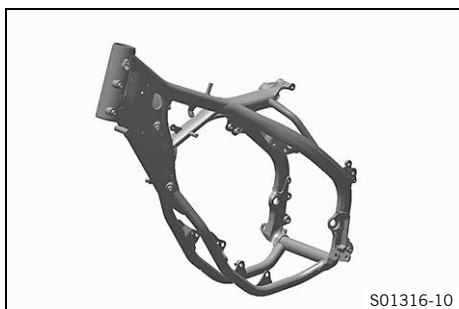
- Slide on sleeve **1** and check the throttle grip for ease of movement.

**Finishing work**

- Check the play in the throttle cable. (📖 p. 71)



## 8.1 Checking the frame



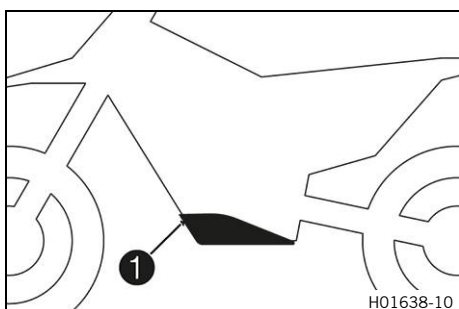
- Check the frame for cracks and deformation.
  - » If the frame exhibits cracks or deformation due to a mechanical impact:
    - Change the frame.



### Info

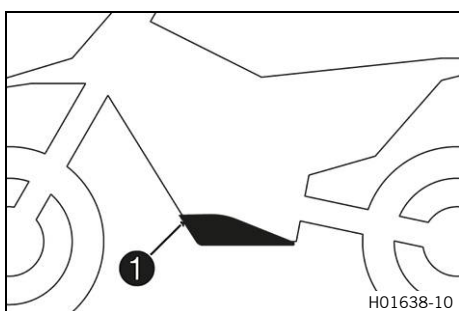
Always replace a frame that has been damaged due to a mechanical impact. Repair of the frame is not authorized by KTM.

## 8.2 Removing the engine guard (All Six Days models)



- Remove screws ❶ and engine guard.

## 8.3 Installing the engine guard (All Six Days models)



- Attach the engine guard on the frame at the rear and swing up at the front.
- Mount and tighten screws ❶.

### Guideline

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

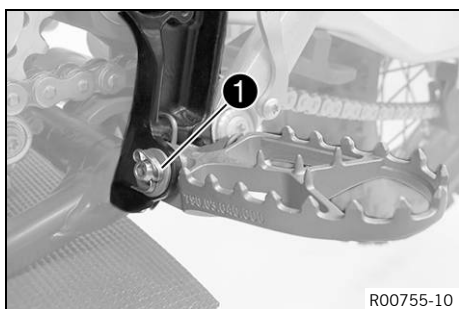
## 8.4 Changing the footrests

### Condition

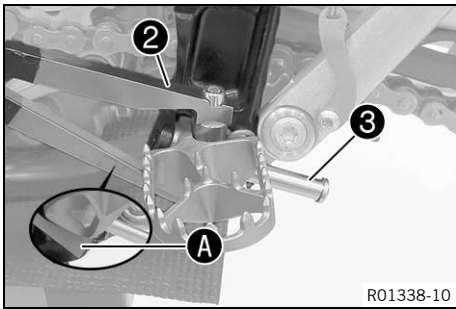
The frame protectors have been removed on the left and right.

### Left footrest

- Raise the motorcycle with a lift stand. (📖 p. 12)
- Remove split pin ❶ and take off the washer.



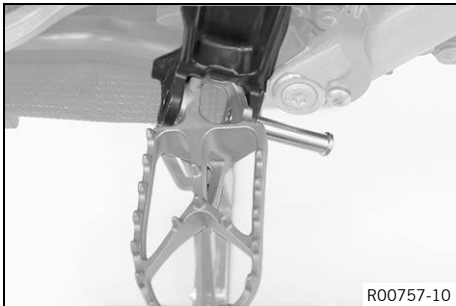




- Press the spring with special tool ②.

Footrest spring plier (79029083000) (📖 p. 371)

- ✓ The special tool is applied to area A on the footrest.
- Remove pin ③.

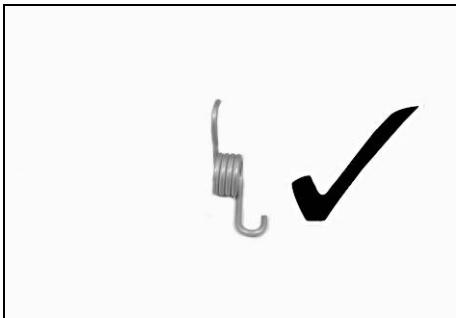


- Position the new footrest and pin.



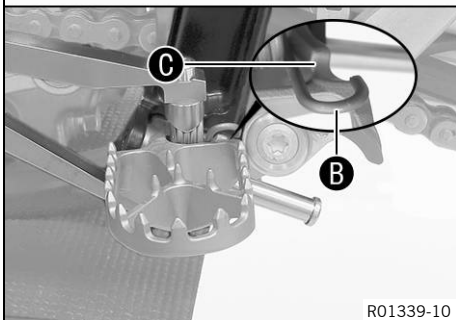
**Info**

Only insert the pin to the extent that the spring can still be mounted.



- Position spring as shown.

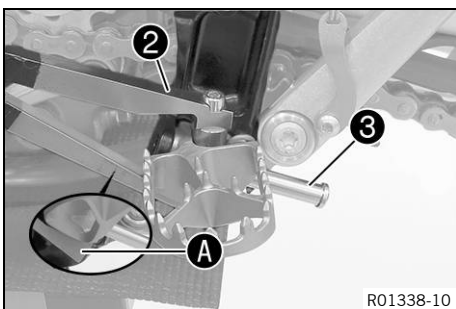
- ✓ Spring B engages in area C.

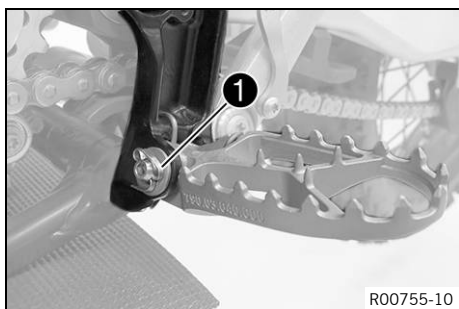


- Press the spring with special tool ②.

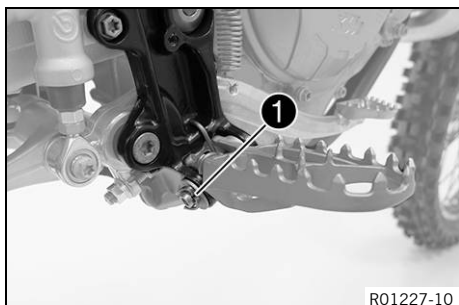
Footrest spring plier (79029083000) (📖 p. 371)

- ✓ The special tool is applied to area A on the footrest.
- Mount pin ③.



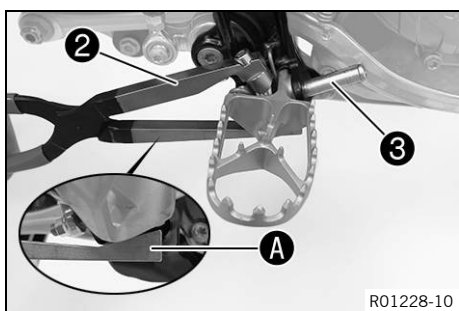


- Mount the washer and split pin ①.
- Remove the motorcycle from the lift stand. (📖 p. 12)



### Right footrest

- Remove split pin ① and take off the washer.



- Press the spring with special tool ②.

Footrest spring plier (79029083000) (📖 p. 371)

✓ The special tool is applied to area A on the footrest.

- Remove pin ③.

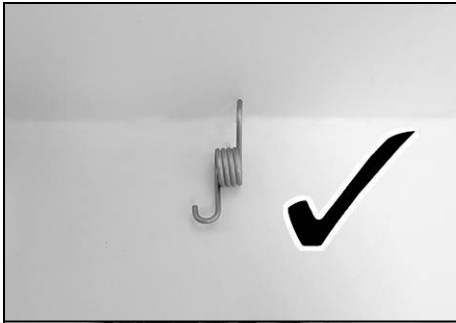


- Position the new footrest and pin.

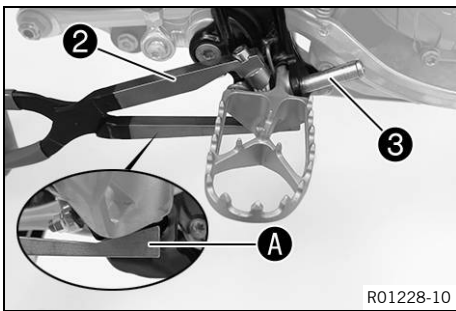
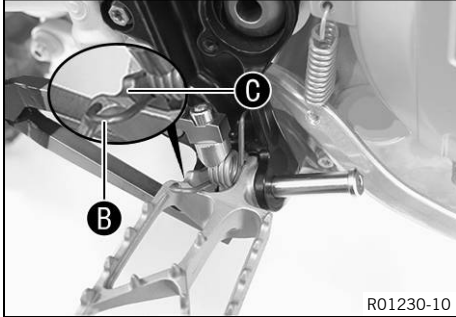


### Info

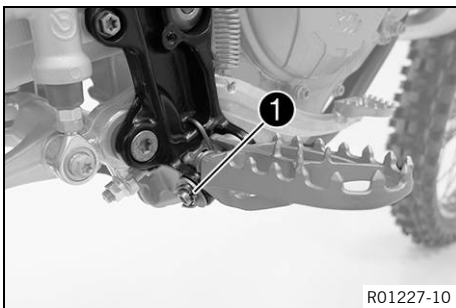
Only insert the pin to the extent that the spring can still be mounted.



- Position spring as shown.
- ✓ Spring **B** engages in area **C**.



- Press the spring with special tool **2**.
- Footrest spring plier (79029083000) (📖 p. 371)
- ✓ The special tool is applied to area **A** on the footrest.
  - Mount pin **3**.



- Mount the washer and split pin **1**.

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



### Caution

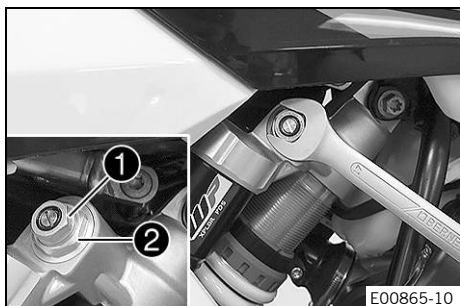
**Risk of injury** Parts of the shock absorber will move around if the shock absorber is detached incorrectly. The shock absorber is filled with highly compressed nitrogen.

- Please follow the description provided.



### Info

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



- Using an open end wrench, turn adjusting screw **1** clockwise all the way.



### Info

Do not loosen fitting **2**!

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

Guideline

| Compression damping, high-speed |           |
|---------------------------------|-----------|
| Comfort                         | 2.5 turns |
| Standard                        | 2 turns   |
| Sport                           | 1 turn    |



### Info

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

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



### Caution

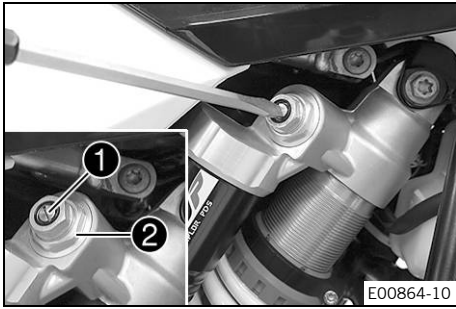
**Risk of injury** Parts of the shock absorber will move around if the shock absorber is detached incorrectly. The shock absorber is filled with highly compressed nitrogen.

- 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 ❶ clockwise with a screwdriver as far as the last perceptible click.

**i Info**  
Do not loosen fitting ❷!

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

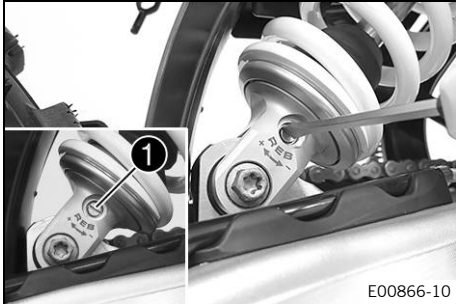
Guideline

| Compression damping, low-speed |           |
|--------------------------------|-----------|
| Comfort                        | 18 clicks |
| Standard                       | 15 clicks |
| Sport                          | 12 clicks |

**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.



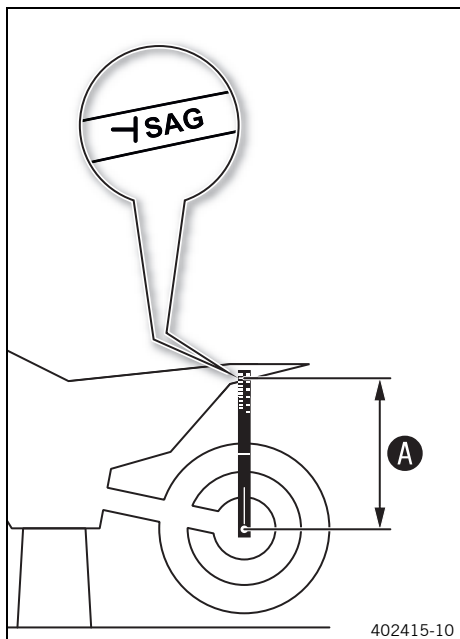
- Turn adjusting screw ❶ clockwise up to the last perceptible click.
- Turn counterclockwise by the number of clicks corresponding to the shock absorber type.

Guideline

| Rebound damping |           |
|-----------------|-----------|
| Comfort         | 18 clicks |
| Standard        | 15 clicks |
| Sport           | 12 clicks |

**i Info**  
Turn clockwise to increase damping; turn counterclockwise to reduce damping.

## 9.4 Measuring the rear wheel dimension unloaded



### Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 12)

### Main work

- Position the sag gauge in the rear axle and measure the distance to marking **SAG** on the rear fender.

|                         |
|-------------------------|
| Sag gauge (00029090100) |
|-------------------------|

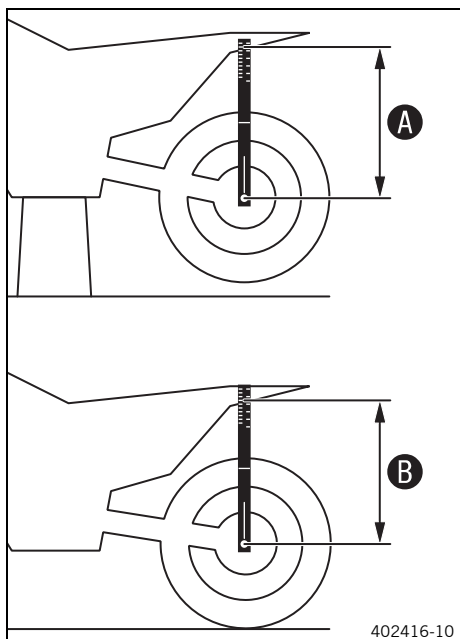
|                                 |
|---------------------------------|
| Pin for sag gauge (00029990010) |
|---------------------------------|

- Note down the value as dimension **A**.

### Finishing work

- Remove the motorcycle from the lift stand. (📖 p. 12)

## 9.5 Checking the static sag of the shock absorber



- Measure dimension **A** of rear wheel unloaded. (📖 p. 80)
- Hold the motorcycle upright with the aid of an assistant.
- Again measure the distance between the rear axle and marking **SAG** on the rear fender using the sag gauge.
- Note down the value as dimension **B**.

### Info

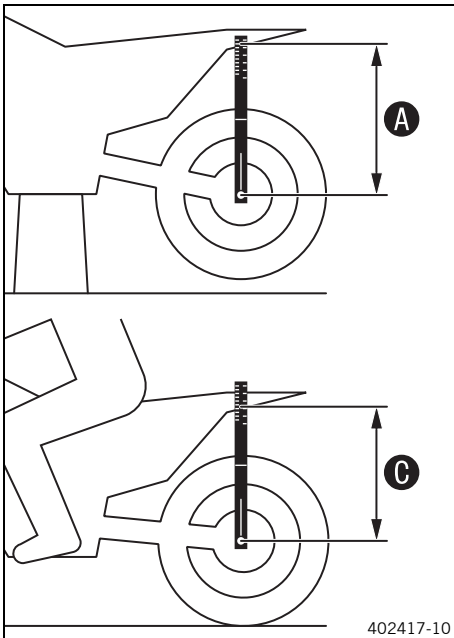
The static sag is the difference between measurements **A** and **B**.

- Check the static sag.

|            |                 |
|------------|-----------------|
| Static sag | 35 mm (1.38 in) |
|------------|-----------------|

- » If the static sag is less or more than the specified value:
  - Adjust the spring preload of the shock absorber. (📖 p. 81)

## 9.6 Checking the riding sag of the shock absorber



- Measure dimension **A** of rear wheel unloaded. (📖 p. 80)
- With another person holding the motorcycle, the rider, wearing full protective clothing, sits on the seat in a normal sitting position (feet on footrests) and bounces up and down a few times.
  - ✓ The rear wheel suspension levels out.
- Another person again measures the distance between the rear axle and marking **SAG** on the rear fender using the sag gauge.
- Note down the value as dimension **C**.



### Info

The riding sag is the difference between measurements **A** and **C**.

- Check the riding sag.

|            |                  |
|------------|------------------|
| Riding sag | 110 mm (4.33 in) |
|------------|------------------|

- » If the riding sag differs from the specified measurement:
  - Adjust the riding sag. (📖 p. 82)

## 9.7 Adjusting the spring preload 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.

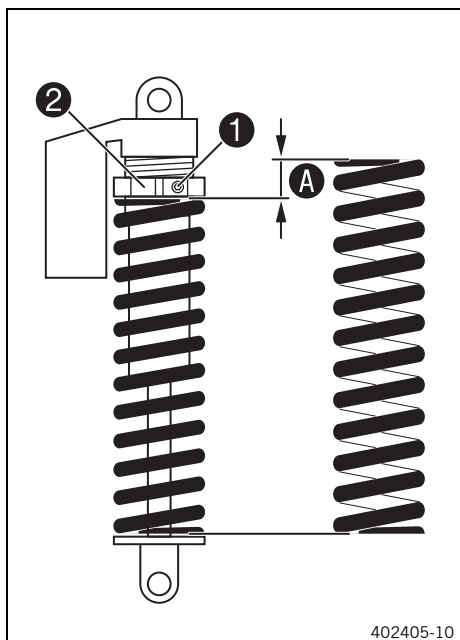


### Info

Before changing the spring preload, make a note of the present setting, e.g., by measuring the spring length.

### Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 12)
- Remove the shock absorber. (📖 p. 83)
- After removing the shock absorber, clean it thoroughly.



### Main work

- Loosen screw ①.
- Turn adjusting ring ② until the spring is no longer under tension.

Holding wrench (90129051000) (📖 p. 371)

- Measure the overall spring length while the spring is not under tension.
- Tighten the spring by turning adjusting ring ② to measurement A.

### Guideline

|                |                |
|----------------|----------------|
| Spring preload | 8 mm (0.31 in) |
|----------------|----------------|

### Info

Depending on the static sag and/or the riding sag, it may be necessary to increase or decrease the spring preload.

- Tighten screw ①.

### Guideline

|                                      |    |                   |
|--------------------------------------|----|-------------------|
| Screw, shock absorber adjusting ring | M5 | 5 Nm (3.7 lbf ft) |
|--------------------------------------|----|-------------------|

### Finishing work

- Install the shock absorber. (📖 p. 83)
- Remove the motorcycle from the lift stand. (📖 p. 12)

## 9.8 Adjusting the riding sag

### Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 12)
- Remove the shock absorber. (📖 p. 83)
- After removing the shock absorber, clean it thoroughly.

### Main work

- Choose and mount a suitable spring.

### Guideline

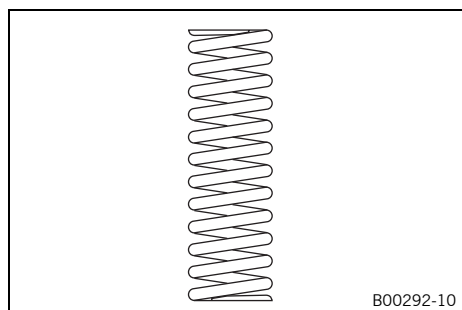
| Spring rate                                     |                                    |
|---|------------------------------------|
| Weight of rider: 65 ... 75 kg (143 ... 165 lb.) | 57 ... 63 N/mm (325 ... 360 lb/in) |
| Weight of rider: 75 ... 85 kg (165 ... 187 lb.) | 60 ... 66 N/mm (343 ... 377 lb/in) |
| Weight of rider: 85 ... 95 kg (187 ... 209 lb.) | 63 ... 69 N/mm (360 ... 394 lb/in) |

### Info

The spring rate is shown on the outside of the spring.

### Finishing work

- Install the shock absorber. (📖 p. 83)
- Remove the motorcycle from the lift stand. (📖 p. 12)
- Check the static sag of the shock absorber. (📖 p. 80)





- Check the riding sag of the shock absorber. (📖 p. 81)
- Adjust the rebound damping of the shock absorber. (📖 p. 79)

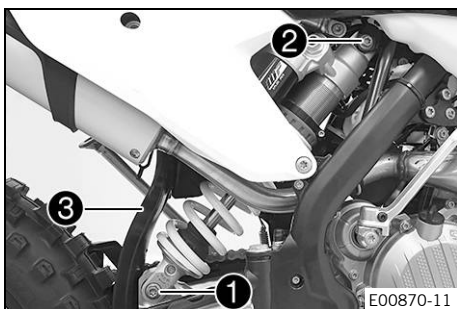
## 9.9 Removing the shock absorber

### Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 12)

### Main work

- Remove screw ❶ and lower the rear wheel with the swingarm as far as possible without blocking the rear wheel. Secure the rear wheel in this position.
- Remove screw ❷, push splash protector ❸ to the side, and remove the shock absorber.



## 9.10 Installing the shock absorber

### Main work

- Push splash protector ❶ to the side and position the shock absorber. Mount and tighten screw ❷.

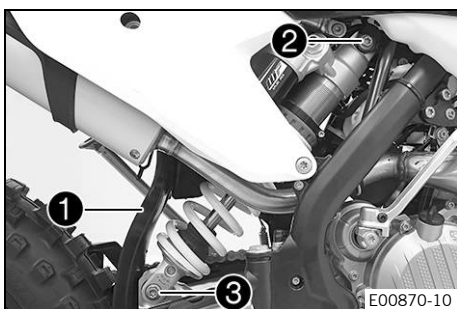
#### Guideline

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

- Mount and tighten screw ❸.

#### Guideline

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



### Info

The heim joint for the shock absorber at the swingarm is Teflon-coated. It must not be greased with grease or with other lubricants. Lubricants dissolve the Teflon coating, thereby drastically reducing the service life.

### Finishing work

- Remove the motorcycle from the lift stand. (📖 p. 12)

## 9.11 Servicing the shock absorber



### Caution

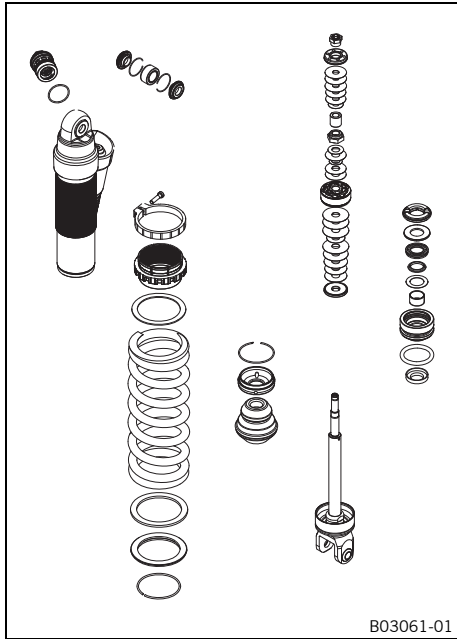
**Risk of injury** Parts of the shock absorber will move around if the shock absorber is detached incorrectly. The shock absorber is filled with highly compressed nitrogen.

- Please follow the description provided.

### Condition

The shock absorber has been removed.

## 9 SHOCK ABSORBER, SWINGARM

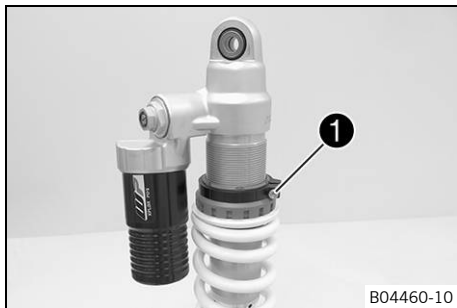


- Remove the spring. (📖 p. 84)
- Disassemble the damper. (📖 p. 85)
- Disassemble the piston rod. (📖 p. 87)
- Disassemble the seal ring retainer. (📖 p. 86)
- Check the damper. (📖 p. 89)
- Remove the heim joint. (📖 p. 90)
- Install the heim joint. (📖 p. 91)
- Assemble the seal ring retainer. (📖 p. 91)
- Assemble the piston rod. (📖 p. 92)
- Assemble the damper. (📖 p. 94)
- Install the spring. (📖 p. 100)

### 9.12 Removing the spring

#### Condition

The shock absorber has been removed.



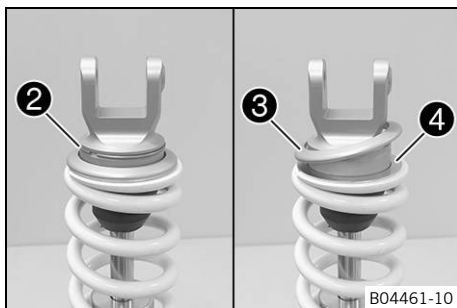
- Clamp the shock absorber into the vise.

#### Guideline

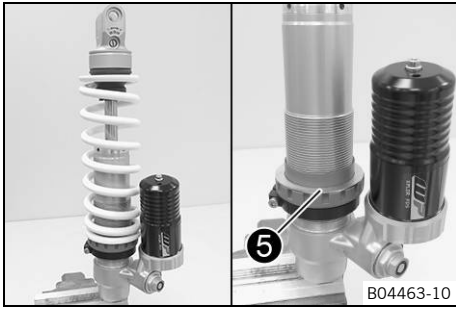
Use soft jaws.

- Measure and note the spring length while the spring is under tension.
- Loosen screw ①.
- Turn the adjusting ring until the spring is completely without tension.

Holding wrench (90129051000) (📖 p. 371)



- Remove lock ring ②.
- Remove spring retainer ③.
- Remove washer ④.



- Remove the spring.
- Remove washer **5**.

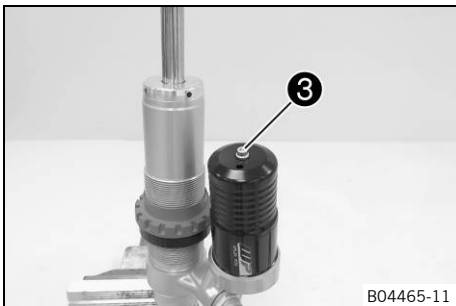
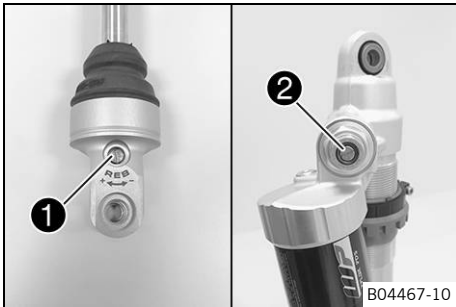
## 9.13 Disassembling the damper

### Preparatory work

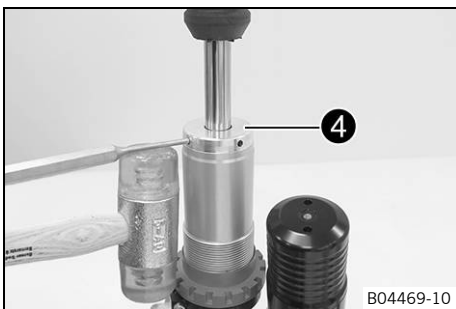
- Remove the spring. (📖 p. 84)

### Main work

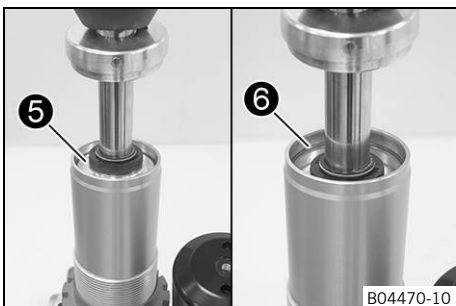
- Make a note of present state of rebound **1** and compression damping **2**.
- Open the adjusters of the rebound and compression damping completely.



- Slowly open screw **3**.  
✓ The nitrogen pressure dissipates.
- Remove the screw with the O-ring.



- Remove locking cap **4**.



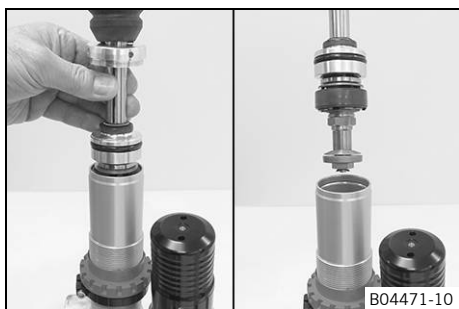
- Push in seal ring retainer **5**.
- Remove lock ring **6**.



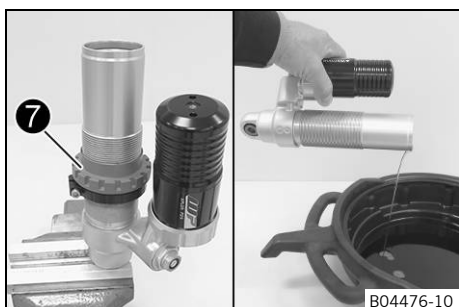
### Info

Check inner surface; do not scratch. Remove any burrs with sandpaper if needed.

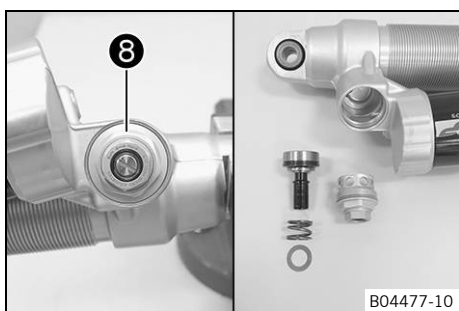
## 9 SHOCK ABSORBER, SWINGARM



- Remove the piston rod.



- Remove adjusting ring 7 with the clamping ring.
- Drain the oil.



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

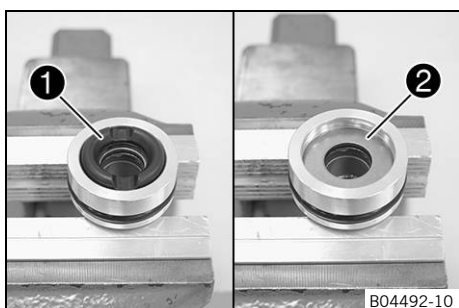
### 9.14 Disassembling the seal ring retainer

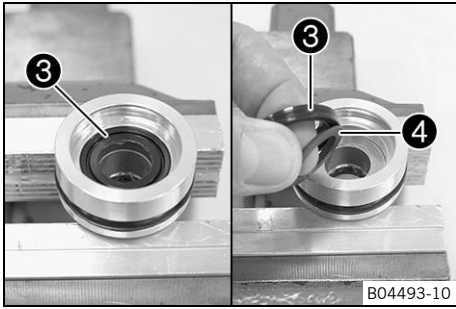
#### Preparatory work

- Remove the spring. (📖 p. 84)
- Disassemble the damper. (📖 p. 85)
- Disassemble the piston rod. (📖 p. 87)

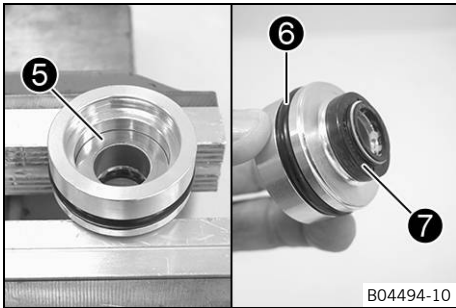
#### Main work

- Remove rebound rubber 1.
- Remove washer 2.





- Remove seal ring ③.
- Remove washer ④ from seal ring ③.



- Remove washer ⑤.
- Remove O-ring ⑥.
- Remove dust boot ⑦.

## 9.15 Disassembling the piston rod

### Preparatory work

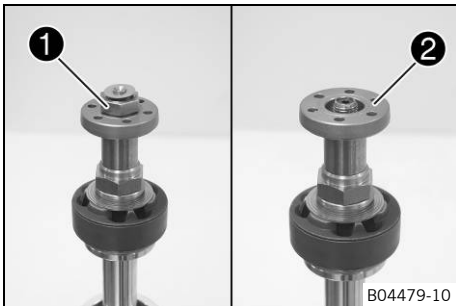
- Remove the spring. (📖 p. 84)
- Disassemble the damper. (📖 p. 85)

### Main work

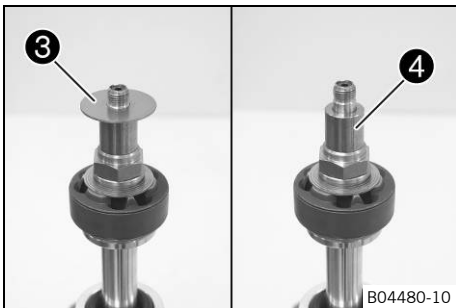
- Clamp the piston rod with the fork in the bench vise.

#### Guideline

Use soft jaws.



- Remove nut ①.
- Remove piston ②.



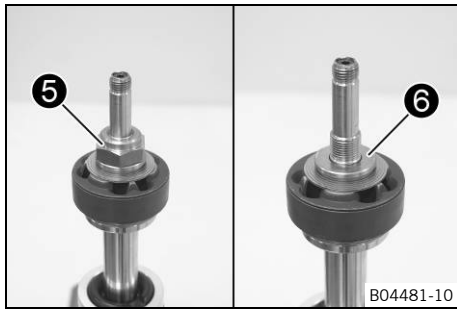
- Remove compression shim stack ③.

#### **i** Info

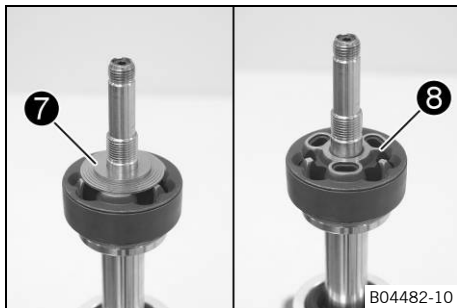
Guide the compression shim stack onto a screwdriver and put them to one side together.

- Remove bushing ④.

## 9 SHOCK ABSORBER, SWINGARM



- Remove nut 5.
- Remove washer 6.



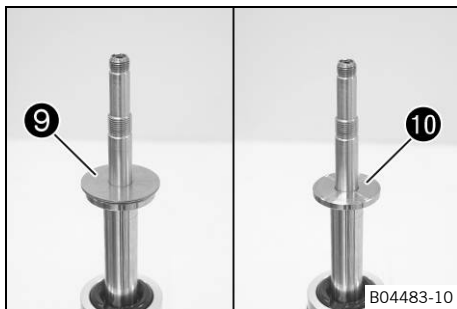
- Remove rebound shim stack 7.



### Info

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

- Remove piston 8.



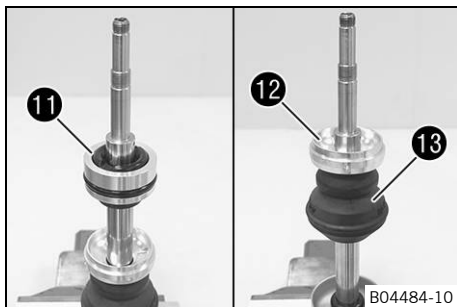
- Remove compression shim stack 9.



### Info

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

- Remove rebound washer 10.

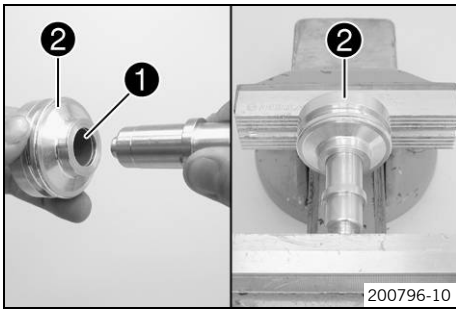


- Remove seal ring retainer 11.
- Remove locking cap 12 and rubber buffer 13.

### 9.16 Replacing the pilot bushing

#### Preparatory work

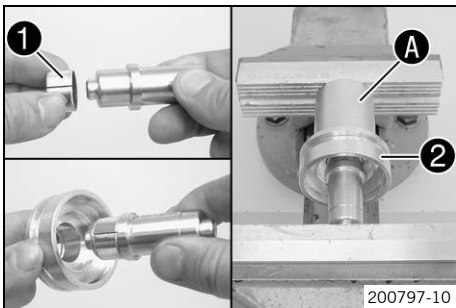
- Remove the spring. (📖 p. 84)
- Disassemble the damper. (📖 p. 85)
- Disassemble the piston rod. (📖 p. 87)
- Disassemble the seal ring retainer. (📖 p. 86)



### Main work

- Press pilot bushing 1 out of seal ring retainer 2 using the special tool.

Pressing tool (T1504) (📖 p. 375)



- Slide the new pilot bushing 1 onto the special tool.

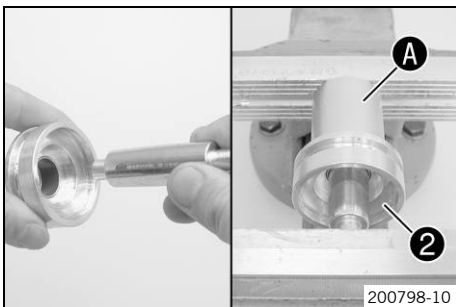
Pressing tool (T1504) (📖 p. 375)

- Position the pilot bushing in the seal ring retainer using the special tool.

Pressing tool (T1504) (📖 p. 375)

- Support seal ring retainer 2 with the sleeve A of the special tool. Press the pilot bushing all the way in.

Mounting tool (T150S) (📖 p. 375)



- Lubricate the special tool.

Shock absorber fluid (SAE 2.5) (50180751S1) (📖 p. 359)

Calibrating unit (T1205) (📖 p. 372)

- Support seal ring retainer 2 with the sleeve A of the special tool.

Mounting tool (T150S) (📖 p. 375)

- Press the special tool through the new pilot bushing.

Calibrating unit (T1205) (📖 p. 372)

✓ The pilot bushing is to be calibrated.

### Finishing work

- Assemble the seal ring retainer. (📖 p. 91)

## 9.17 Checking the damper



### Condition

The damper has been disassembled.

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

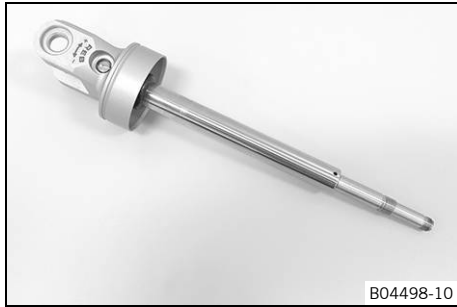
Damper cartridge

|          |                     |
|----------|---------------------|
| 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:
    - Replace the heim joint.



## 9 SHOCK ABSORBER, SWINGARM



- Measure the diameter of the piston rod.

|            |  |
|------------|--|
| Piston rod |  |
| Diameter   | $\geq 17.95 \text{ mm}$ ( $\geq 0.7067 \text{ in}$ ) |

- » If the measured value is smaller than the specified value:

- Replace the piston rod.

- Measure the run-out of the piston rod.

|            |   |
|------------|---|
| Piston rod |   |
| Run-out    | $\leq 0.03 \text{ mm}$ ( $\leq 0.0012 \text{ in}$ ) |

- » 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.

- Check the piston rings for damage and wear.

- » If damage or a bronze-colored surface is visible:

- Replace the piston rings.



### 9.18 Removing the heim joint

#### Condition

The shock absorber has been removed.

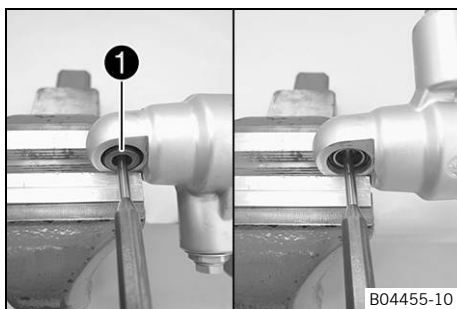
- Clamp the shock absorber into the vise.

Guideline

Use soft jaws.

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

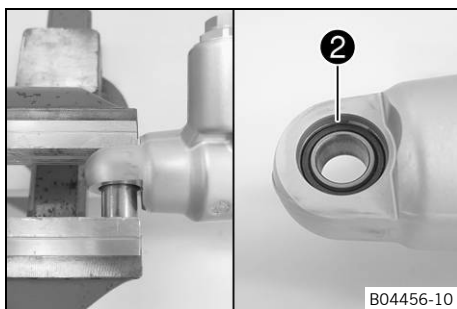
Drift (T120) (📖 p. 372)



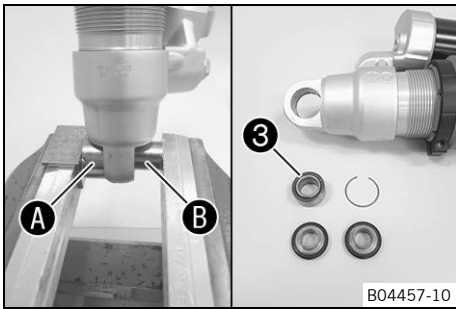
- Press the heim joint against a lock ring using the special tool.

Pressing tool (T1207S) (📖 p. 373)

- Remove second lock ring ②.



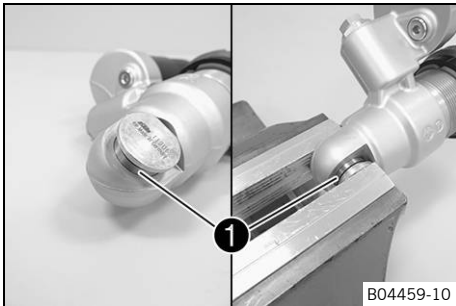




- Place special tool **A** underneath and press out heim joint **3** using special tool **B**.

Pressing tool (T1207S) (📖 p. 373)

## 9.19 Installing the heim joint



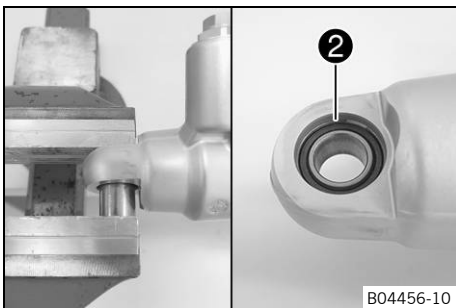
- Position new heim joint **1** and the special tool in the bench vise.

Guideline

Use soft jaws.

Pressing tool (T1206) (📖 p. 373)

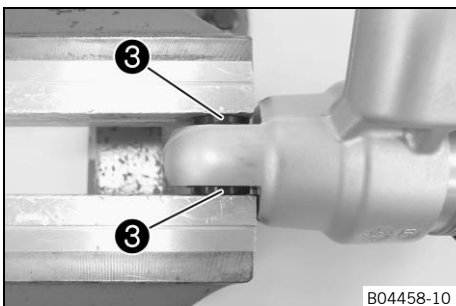
- Press the heim joint all the way in.



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

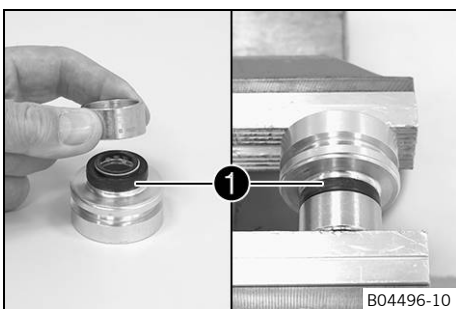
Pressing tool (T1207S) (📖 p. 373)

- Mount second lock ring **2**.



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

## 9.20 Assembling seal ring retainer



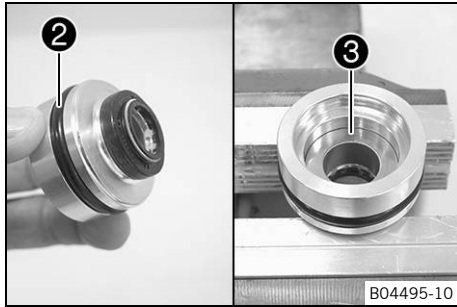
- Mount dust boot **1** with the special tool.

Mounting sleeve (T1204) (📖 p. 372)

- Grease the sealing lip of the dust boot.

Lubricant (T625) (📖 p. 360)

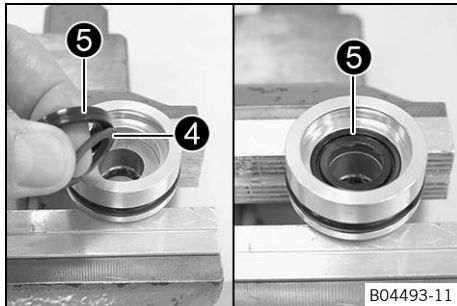
## 9 SHOCK ABSORBER, SWINGARM



- Grease the O-ring groove.

Lubricant (T158) (📖 p. 360)

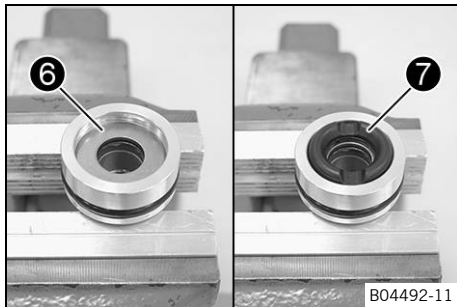
- Mount O-ring ②.
- Mount washer ③.



- Position washer ④ on seal ring ⑤.

- Grease the seal ring and mount with the washer facing downward.

Lubricant (T14034) (📖 p. 360)



- Mount washer ⑥.

- Mount rebound rubber ⑦.

### 9.21 Assembling the piston rod

#### Preparatory work

- Assemble the seal ring retainer. (📖 p. 91)

#### Main work

- Clamp the piston rod with the fork in the bench vise.

Guideline

Use soft jaws.

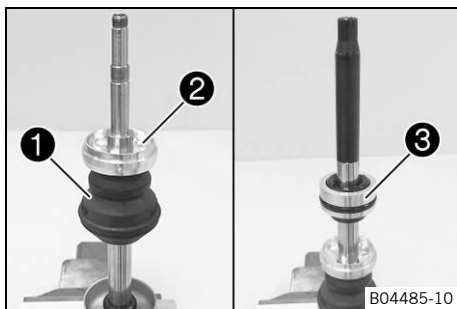
- Mount rubber buffer ① and locking cap ②.
- Position the special tool on the piston rod.

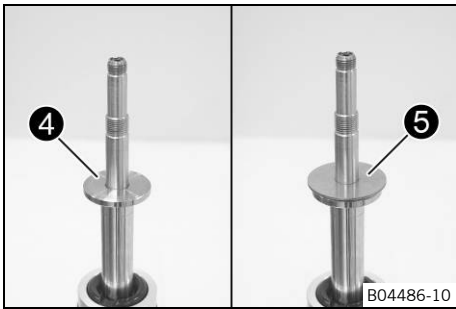
Mounting sleeve (T1554) (📖 p. 376)

- Grease the dust boot and slide the seal ring retainer ③ onto the piston rod.

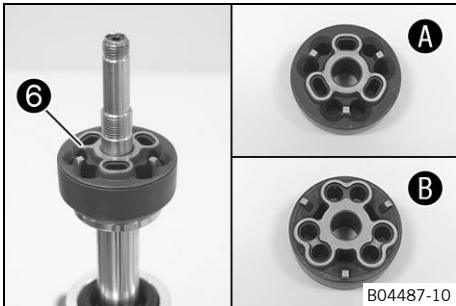
Lubricant (T625) (📖 p. 360)

- Remove the special tool.





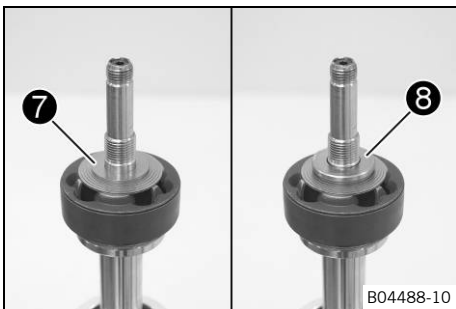
- Mount rebound washer ④.
- Mount compression shim stack ⑤ with the smaller washers facing downward.



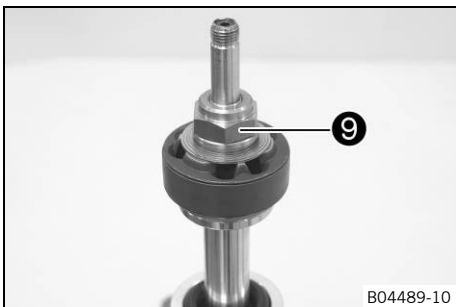
- Clean piston ⑥.
- Mount the piston.

Guideline

|        |                      |
|--------|----------------------|
| View A | of piston from above |
| View B | of piston from below |



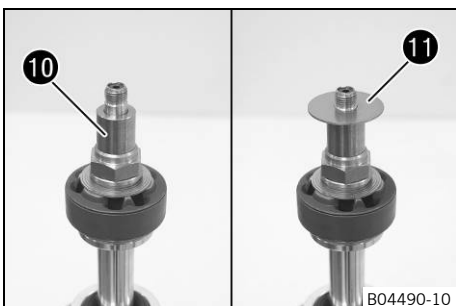
- Mount rebound shim stack ⑦ with the smaller washers facing upward.
- Mount washer ⑧.



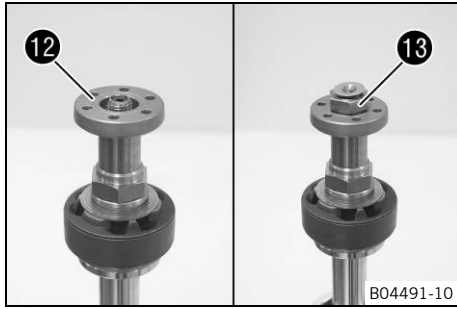
- Mount and tighten nut ⑨ with the collar facing upward.

Guideline

|                    |       |                     |
|--------------------|-------|---------------------|
| Nut, damper piston | M12x1 | 40 Nm (29.5 lbf ft) |
|--------------------|-------|---------------------|



- Mount bushing ⑩.
- Mount compression shim stack ⑪ with the smaller washers facing downward.



- Position piston **12** with the groove facing upward.
- Mount and tighten nut **13**.

Guideline

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

## 9.22 Assembling the damper

### Preparatory work

- Assemble the seal ring retainer. (📖 p. 91)
- Assemble the piston rod. (📖 p. 92)

### Main work

- Lubricate the O-rings of the compression adjuster.

|                             |
|-----------------------------|
| Lubricant (T158) (📖 p. 360) |
|-----------------------------|

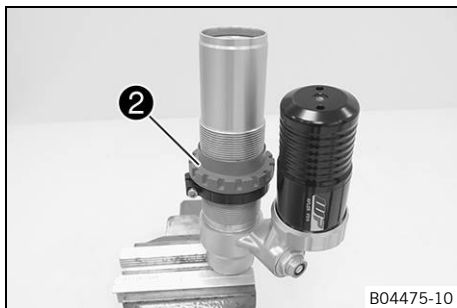
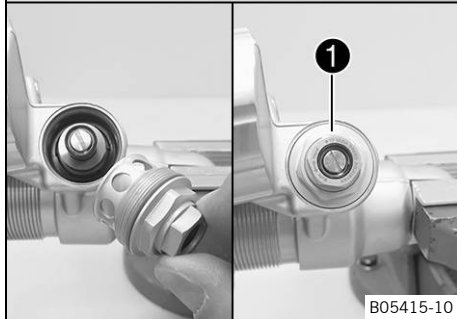
- Lubricate the thread.

|                             |
|-----------------------------|
| Lubricant (T159) (📖 p. 360) |
|-----------------------------|

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

Guideline

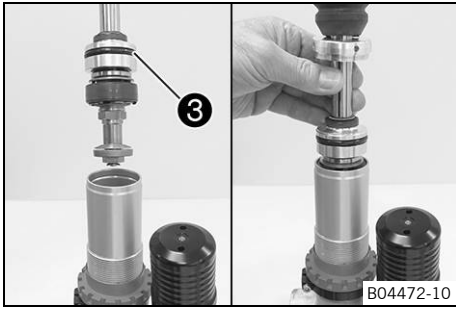
|                      |       |                     |
|----------------------|-------|---------------------|
| Compression adjuster | M31x1 | 35 Nm (25.8 lbf ft) |
|----------------------|-------|---------------------|



- Mount adjusting ring **2** with the clamping ring.

### **i** Info

The adjusting ring cannot be mounted after the piston rod has been mounted.



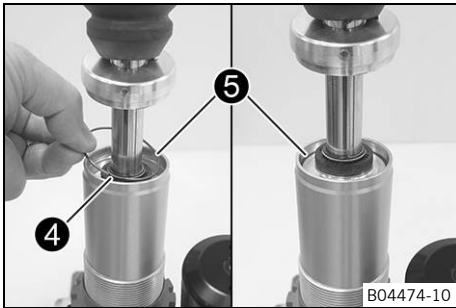
- Fill the damper cartridge about half full.

Shock absorber fluid (SAE 2.5) (50180751S1) (📖 p. 359)

- Lubricate O-ring ③ of the seal ring retainer.

Lubricant (T158) (📖 p. 360)

- Mount the piston rod carefully.



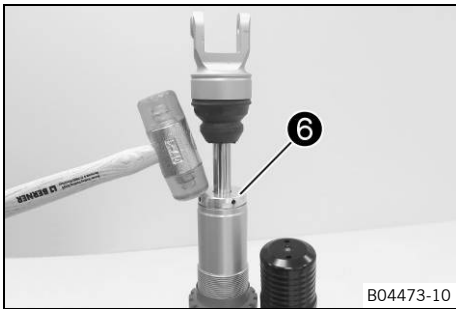
- Mount seal ring retainer ④ and slide it under the ring groove.
- Mount lock ring ⑤.



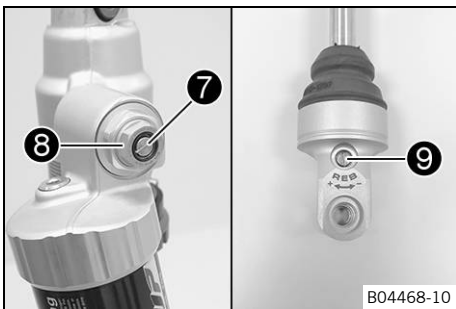
### Info

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 ⑥ of the damper cartridge.
- Bleed and fill the damper. (📖 p. 96)
- Fill the damper with nitrogen. (📖 p. 99)



### Alternative 1

- Turn adjusting screw ⑦ clockwise with a screwdriver up to the last perceptible click.
- Turn counterclockwise by the number of clicks corresponding to the shock absorber type.

#### Guideline

| Compression damping, low-speed |           |
|--------------------------------|-----------|
| Comfort                        | 18 clicks |
| Standard                       | 15 clicks |
| Sport                          | 12 clicks |

- Using an open end wrench, turn adjusting screw ⑧ clockwise all the way.
- Turn counterclockwise by the number of turns corresponding to the shock absorber type.

#### Guideline

| Compression damping, high-speed |           |
|---------------------------------|-----------|
| Comfort                         | 2.5 turns |
| Standard                        | 2 turns   |
| Sport                           | 1 turn    |

- Turn adjusting screw ⑨ clockwise up to the last perceptible click.

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

Guideline

| Rebound damping |           |
|-----------------|-----------|
| Comfort         | 18 clicks |
| Standard        | 15 clicks |
| Sport           | 12 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.

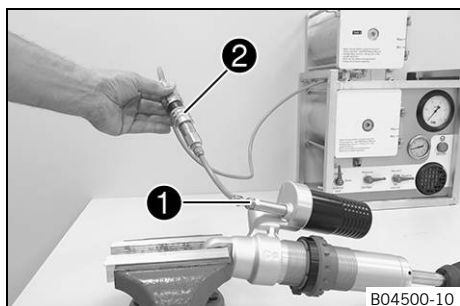
- Position adjusting screws ⑦, ⑧, and ⑨ in the location determined during disassembly.

## 9.23 Bleeding and filling the damper



### Info

Before working with the vacuum pump, carefully read the operating manual included with the vacuum pump.  
Open the adjusters of the rebound and compression damping completely.



- Clamp the damper as shown.

Guideline

Use soft jaws.



### 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 filling port screw with the O-ring.
- Mount adapter ① on the damper.

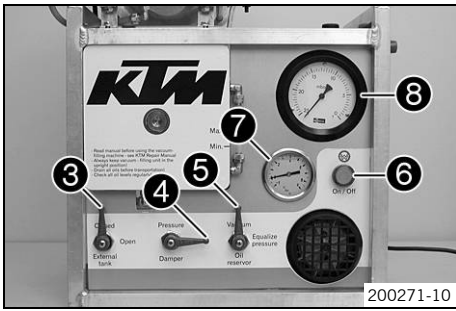


### Info

Hand-tighten only without using a tool.

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

Vacuum pump (T1240S) (📖 p. 373)



- 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

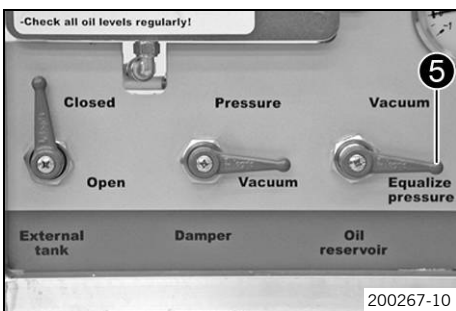
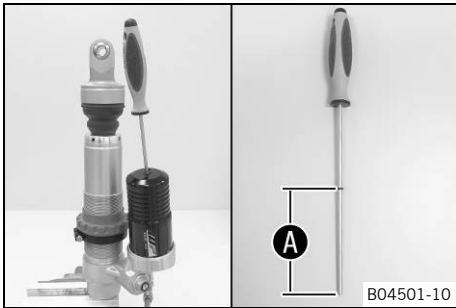
- ✓ Vacuum gauge ⑧ drops to the required value.

4 mbar

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

Depth micrometer (T107S) (📖 p. 372)

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



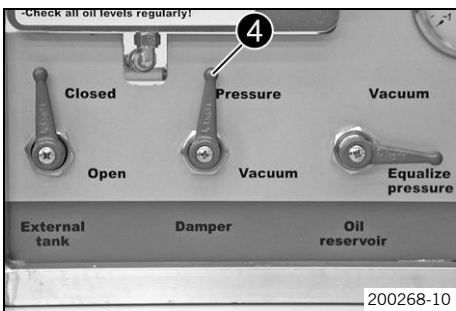
- When the vacuum gauge reaches the required value, turn control lever **Oil reservoir** ⑤ to **Equalize pressure**.

Guideline

4 mbar

- ✓ The pressure gauge increases to the required value.

0 bar



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

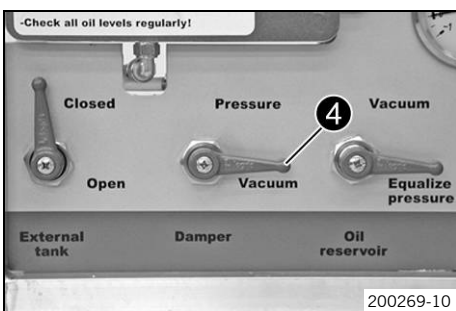
Guideline

0 bar

- ✓ Oil is pumped into the damper.

- ✓ The pressure gauge increases to the required value.

3 bar



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

Guideline

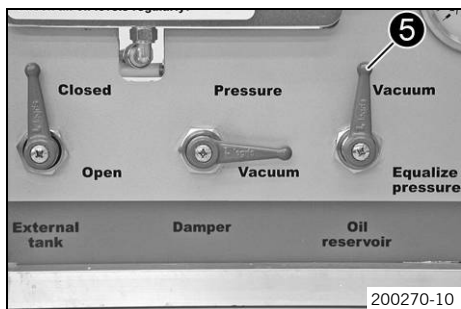
3 bar

- ✓ The pressure gauge drops to the required value.

0 bar



# 9 SHOCK ABSORBER, SWINGARM



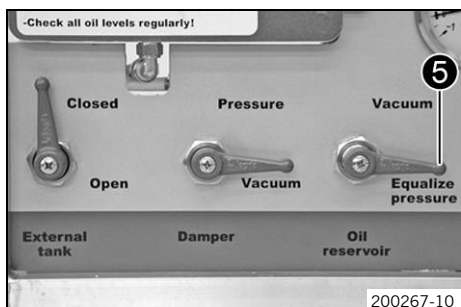
- When the pressure gauge reaches the specified value, turn control lever **Oil reservoir 5** to **Vacuum**.

Guideline

0 bar

- ✓ The vacuum gauge drops to the required value.

8 mbar



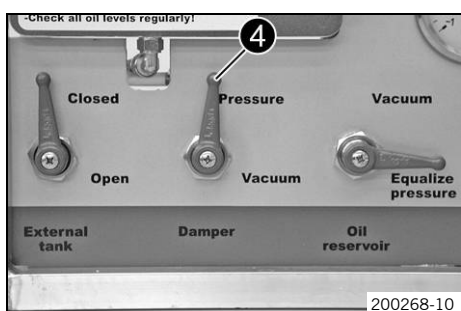
- When the vacuum gauge reaches the required value, turn control lever **Oil reservoir 5** to **Equalize Pressure**.

Guideline

8 mbar

- ✓ The pressure gauge drops to the required value.

0 bar



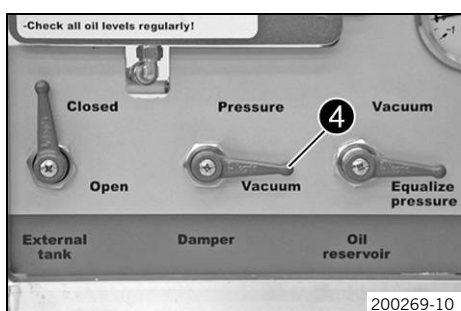
- When the pressure gauge reaches the specified value, turn control lever **Damper 4** to **Pressure**.

Guideline

0 bar

- ✓ Oil is pumped into the damper.
- ✓ The pressure gauge increases 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.

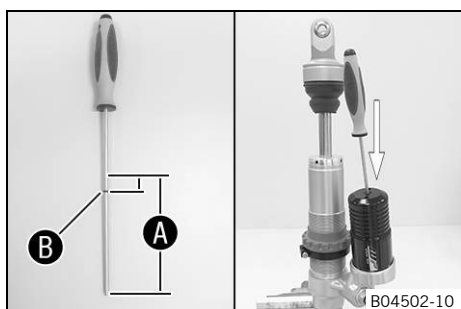
0 bar

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

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

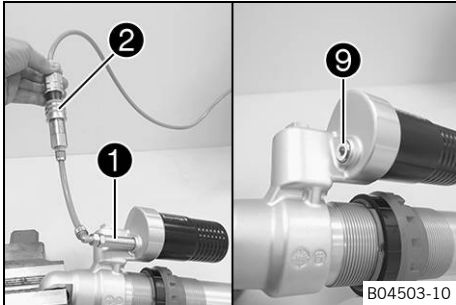
5 mm

Depth micrometer (T107S) (p. 372)

- 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 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.

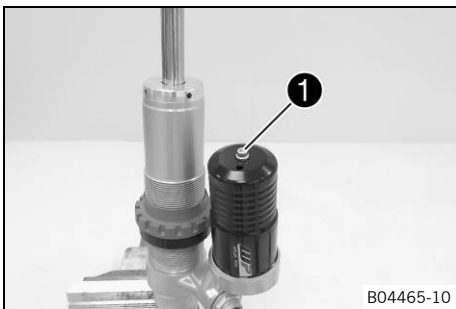
**i Info**  
Hold the damper so that the filling port is at the highest point.

- Remove the adapter.
- Mount screw ⑨ with the O-ring and tighten.

Guideline

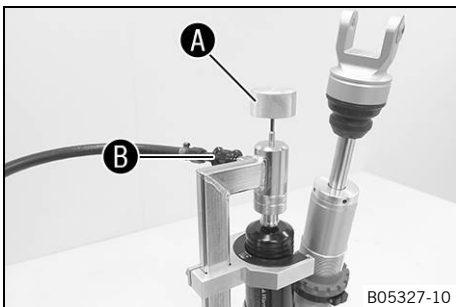
|                    |       |                     |
|--------------------|-------|---------------------|
| Filling port screw | M10x1 | 14 Nm (10.3 lbf ft) |
|--------------------|-------|---------------------|

## 9.24 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. 376)

Filling adapter (T1565) (📖 p. 376)

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

Filling gas - nitrogen

- Adjust the pressure regulator.

Guideline

|              |                  |
|--------------|------------------|
| Gas pressure | 10 bar (145 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 | 10 bar (145 psi) |
|--------------|------------------|

**i Info**

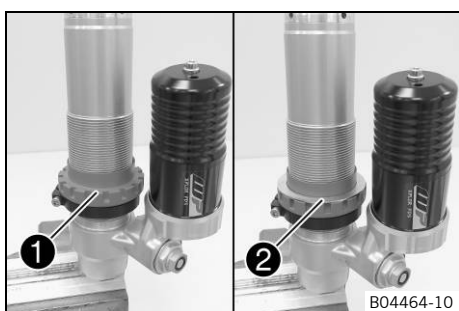
Watch the pressure regulator dial.  
Ensure that the damper is filled to the specified pressure.

- 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) |
|--------------------------------|----|-------------------|

## 9.25 Installing the spring

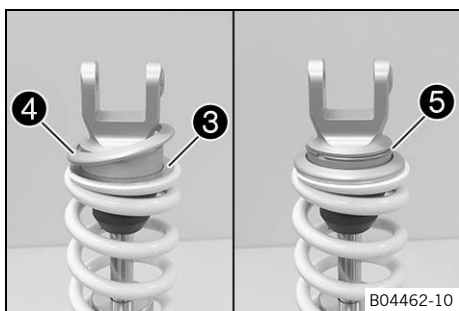


- Clamp the shock absorber into the vise.

Guideline

Use soft jaws.

- Ensure that adjusting ring **1** is mounted with the clamping ring.
- Mount washer **2**.



- Measure the total spring length while the spring is not under tension.
- Position the spring.

Guideline

| Spring rate                                     |                                    |
|---|------------------------------------|
| Weight of rider: 65 ... 75 kg (143 ... 165 lb.) | 57 ... 63 N/mm (325 ... 360 lb/in) |
| Weight of rider: 75 ... 85 kg (165 ... 187 lb.) | 60 ... 66 N/mm (343 ... 377 lb/in) |
| Weight of rider: 85 ... 95 kg (187 ... 209 lb.) | 63 ... 69 N/mm (360 ... 394 lb/in) |

- Mount washer **3**.
- Mount spring retainer **4**.
- Mount lock ring **5**.

**Alternative 1**

- Tension the spring by turning the adjusting ring to the prescribed value.

Guideline

|                |                |
|----------------|----------------|
| Spring preload | 8 mm (0.31 in) |
|----------------|----------------|

|   |
|---|
| Holding wrench (90129051000) (🔧 p. 371) |
|---|

## 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.

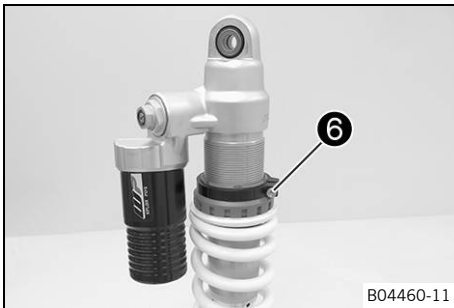
- Tension the spring to the length measured during disassembly by turning the adjusting ring.

Holding wrench (90129051000) (📖 p. 371)

- Tighten screw ⑥.

Guideline

|                                      |    |                   |
|--------------------------------------|----|-------------------|
| Screw, shock absorber adjusting ring | M5 | 5 Nm (3.7 lbf ft) |
|--------------------------------------|----|-------------------|



## 9.26 Checking the swingarm



- Check the swingarm for damage, cracking, and deformation.
  - » If the swingarm shows signs of damage, cracking, or deformation:
    - Change the swingarm.



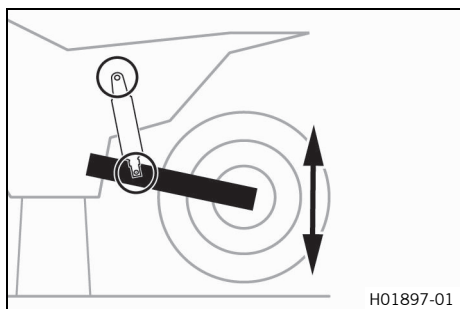
### Info

Always change a damaged swingarm. Repair of the swingarm is not authorized by KTM.

## 9.27 Checking the heim joint for play

### Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 12)
- Place a load on the front of the vehicle.
  - ✓ The rear wheel is not in contact with the ground.



### Main work

- Check the top and bottom heim joints.
- Move the swingarm up and down.
  - » If there is detectable play:
    - Change the heim joint. (📖 p. 102)

### Finishing work

- Remove load from the front of the vehicle.
- Remove the motorcycle from the lift stand. (📖 p. 12)

## 9.28 Changing the heim joint

### Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 12)
- Remove the shock absorber. (📖 p. 83)

### Main work

- 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. 372)

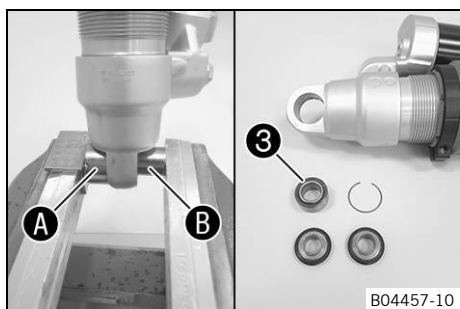
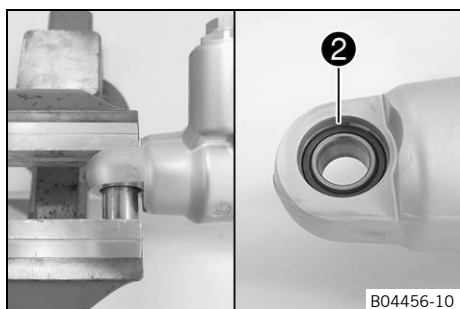
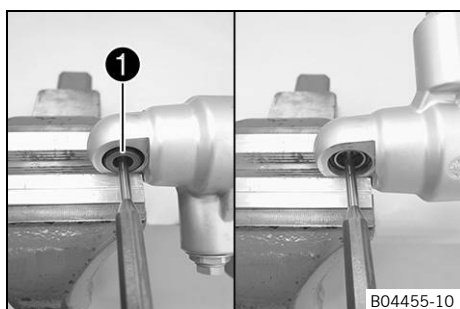
- Press the heim joint against a lock ring using the special tool.

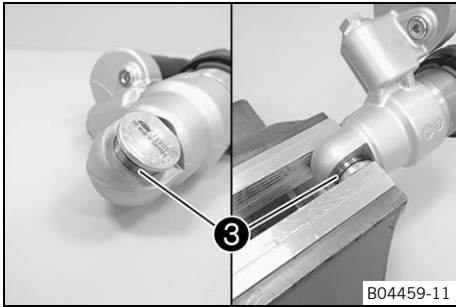
Pressing tool (T1207S) (📖 p. 373)

- Remove second lock ring ②.

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

Pressing tool (T1207S) (📖 p. 373)





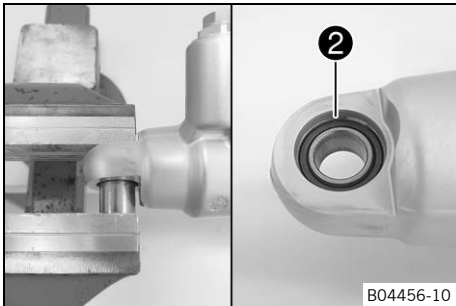
- Position the new heim joint **3** and the special tool.

Guideline

Use soft jaws.

Pressing tool (T1206) (📖 p. 373)

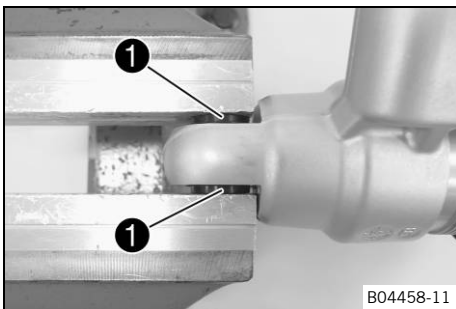
- Press the heim joint all the way in.



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

Pressing tool (T1207S) (📖 p. 373)

- Mount second lock ring **2**.



- Position both collar bushings **1** and press in.

### Finishing work

- Install the shock absorber. (📖 p. 83)
- Remove the motorcycle from the lift stand. (📖 p. 12)

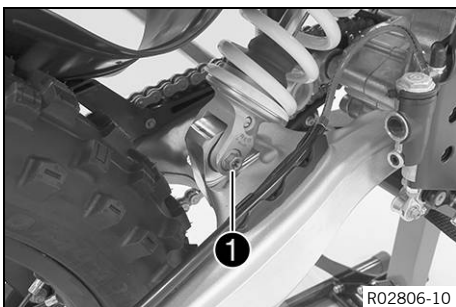
## 9.29 Changing the heim joint on the swingarm

### Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 12)

### Main work

- Remove screw **1** and lower the rear wheel with the swingarm as far as possible without blocking the rear wheel. Secure the rear wheel in this position.

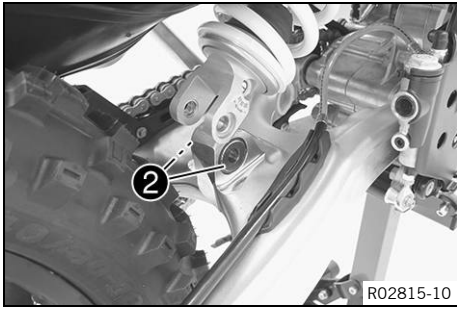


### Info

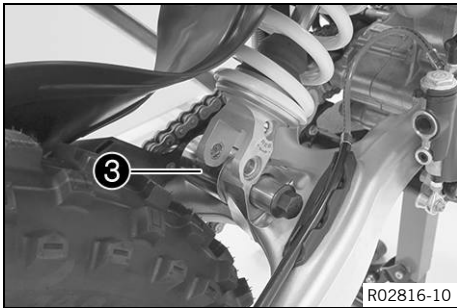
Raise the wheel slightly to make it easier to remove the screw.

- Swing the shock absorber to the rear.

# 9 SHOCK ABSORBER, SWINGARM



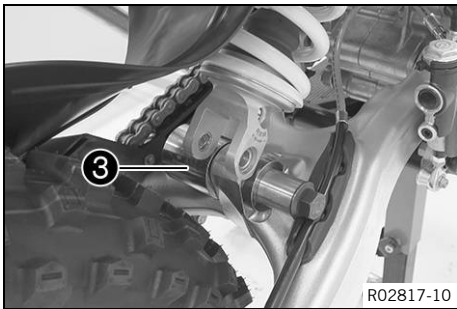
- Remove spacers **2** on both sides.



- Mount special tool **3**.

Pressing tool (79629000044) (📖 p. 371)

- Press out the heim joint by screwing in the screw.

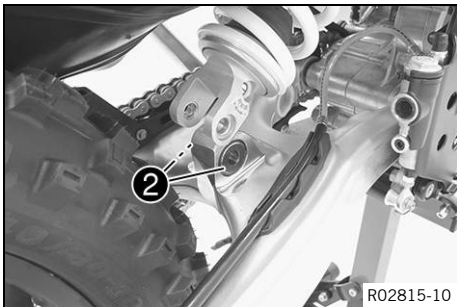


- Position the new heim joint.

- Mount special tool **3**.

Pressing tool (79629000044) (📖 p. 371)

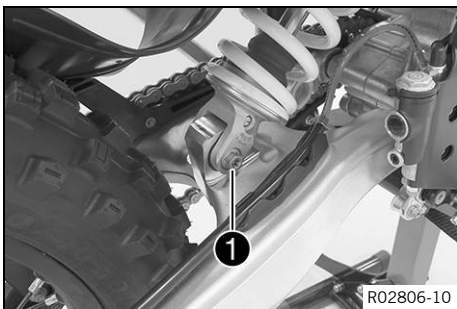
- Press in the heim joint by screwing in the screw.



- Mount spacers **2** on both sides.

**i Info**

The heim joint for the shock absorber at the swingarm is Teflon-coated. It must not be greased with grease or with other lubricants. Lubricants dissolve the Teflon coating, thereby drastically reducing the service life.



- Position the shock absorber.

- Mount and tighten screw **1**.

Guideline

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

**i Info**

Raise the wheel slightly to be able to mount the screw more easily.

**Finishing work**

- Remove the motorcycle from the lift stand. (📖 p. 12)

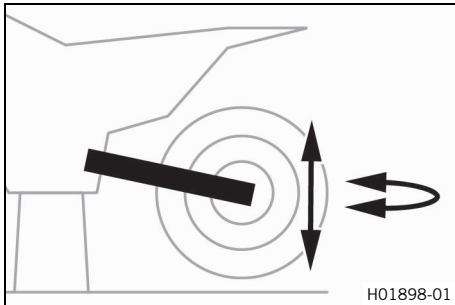
### 9.30 Checking the swingarm bearing for play

#### Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 12)
- Place a load on the front of the vehicle.
- ✓ The rear wheel is not in contact with the ground.

#### Main work

- Move the swingarm up and down.
  - » If there is detectable play:
    - Change the swingarm bearing. (📖 p. 108)
- Move the swingarm from one side to the other.
  - » If there is detectable play:
    - Change the swingarm bearing. (📖 p. 108)



#### Finishing work

- Remove the motorcycle from the lift stand. (📖 p. 12)

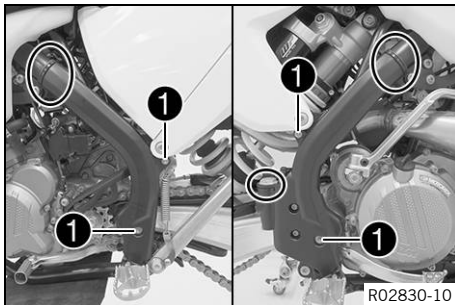
### 9.31 Removing the swingarm

#### Preparatory work

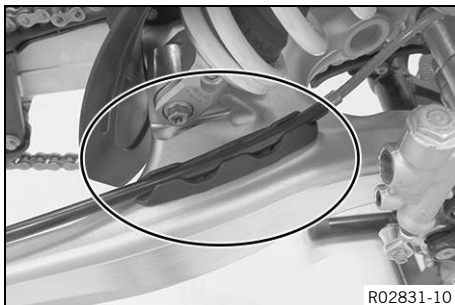
- Raise the motorcycle with a lift stand. (📖 p. 12)
- Remove the rear wheel. (📖 p. 144)

#### Main work

- Remove screws ① with the washers.
- Remove the cable ties.
- Take off the frame protector on both sides.

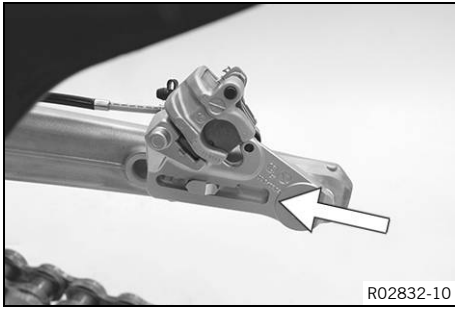


- Take the brake line out of the guide.





## 9 SHOCK ABSORBER, SWINGARM

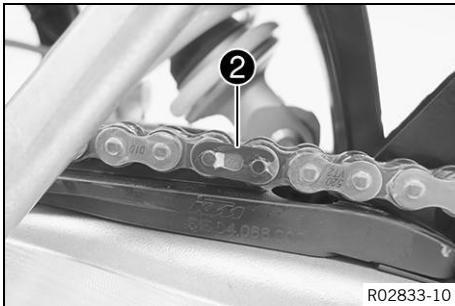


- Push the brake caliper forward, slip it out, and hang it to the side.



### Info

Cover the components to protect them against damage.



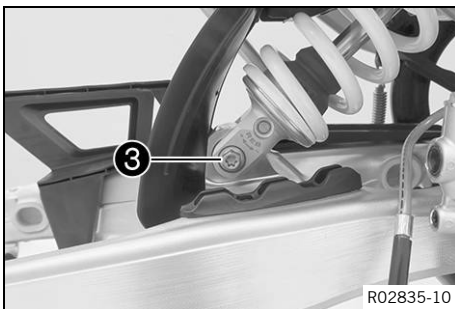
- Remove connecting link ② of the chain.



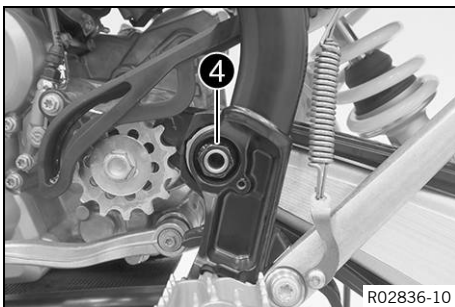
### Info

Cover the components to protect them against damage.

- Take off the chain.

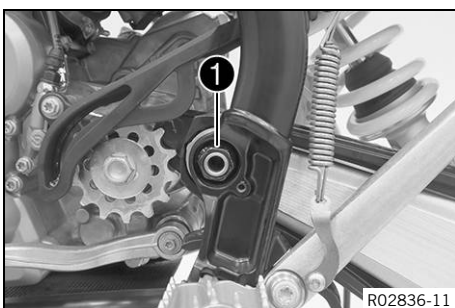


- Remove screw ③.
- Push the swingarm down and away from the shock absorber.



- Remove nut ④.
- Remove the swingarm pivot.
- Take off the swingarm.

### 9.32 Installing the swingarm



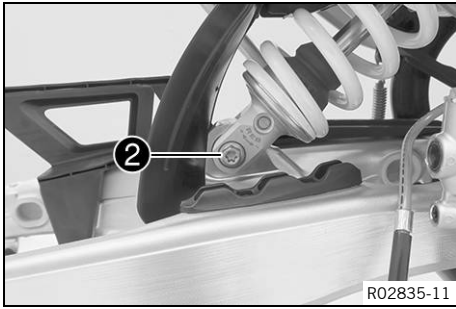
#### Main work

- Position the swingarm. Mount the swingarm pivot.
- Mount and tighten nut ①.

#### Guideline

|                     |         |                         |
|---------------------|---------|-------------------------|
| Nut, swingarm pivot | M16x1.5 | 100 Nm<br>(73.8 lbf ft) |
|---------------------|---------|-------------------------|

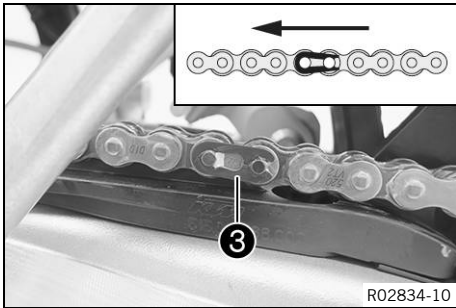




- Lift the swingarm and position the shock absorber.
- Mount and tighten screw ②.

Guideline

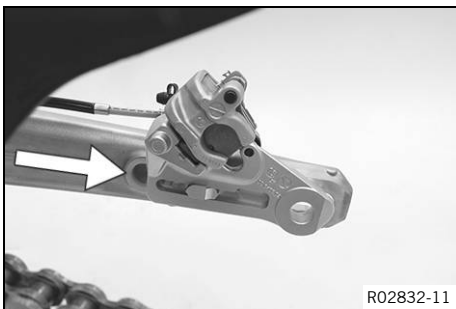
|                              |     |   |
|------------------------------|-----|---|
| Screw, bottom shock absorber | M12 | 80 Nm (59 lbf ft)<br><b>Loctite®2701™</b> |
|------------------------------|-----|---|



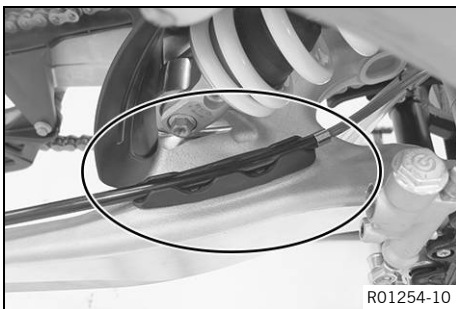
- Mount the chain.
- Connect the chain with connecting link ③.

Guideline

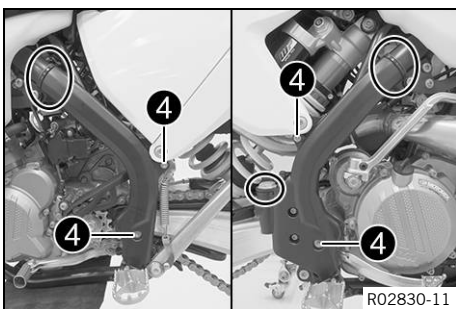
|   |
|---|
| The closed side of the chain joint lock must face in the direction of travel. |
|---|



- Position the brake caliper.



- Position the brake line in the guide.



- Position the frame protectors on the left and right.
- Mount and tighten screws ④ with the washers.

Guideline

|                        |    |                   |
|------------------------|----|-------------------|
| Screw, frame protector | M5 | 3 Nm (2.2 lbf ft) |
|------------------------|----|-------------------|

- Mount the cable ties.

**Finishing work**

- Install the rear wheel. (📖 p. 145)
- Check the chain tension. (📖 p. 150)
- Remove the motorcycle from the lift stand. (📖 p. 12)

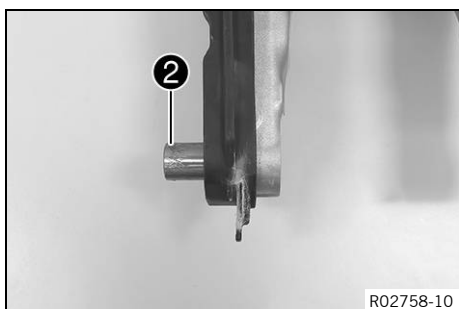
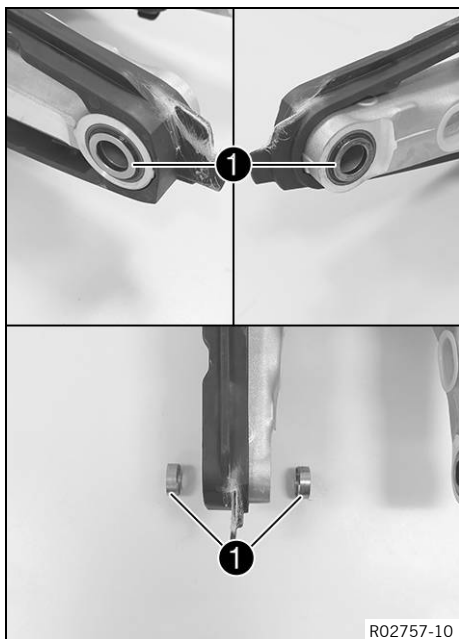
## 9.33 Changing the swingarm bearing

### Preparatory work

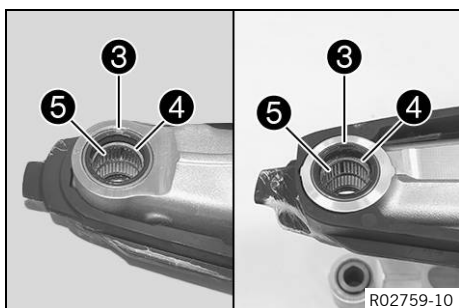
- Raise the motorcycle with a lift stand. (📖 p. 12)
- Remove the rear wheel. (📖 p. 144)
- Remove the swingarm. (📖 p. 105)

### Left swingarm bearing

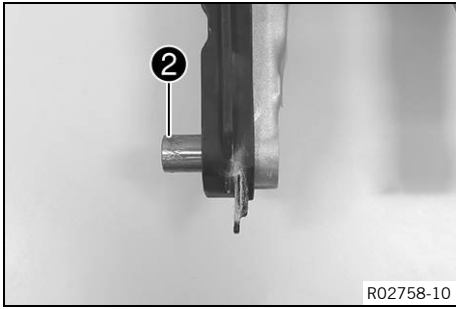
- Remove collar bushings ❶.



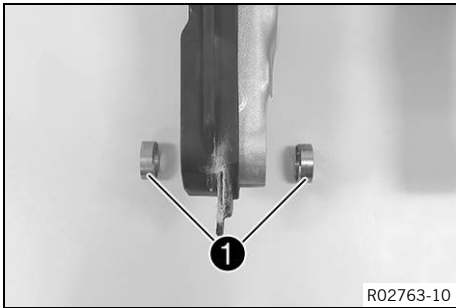
- Remove bushing ❷.



- Remove shaft seal rings ❸ using a suitable tool.
- Remove stop disks ❹.
- Press out bearing ❺ using a suitable tool.
- Using a suitable tool, press in new bearing ❺.
- Position the stop disks ❹.
- Press in shaft seal rings ❸.

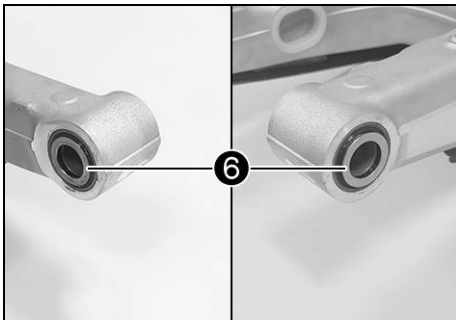


- Mount bushing ②.



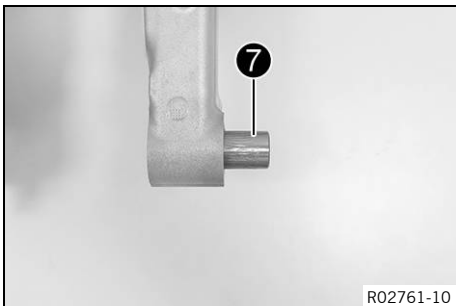
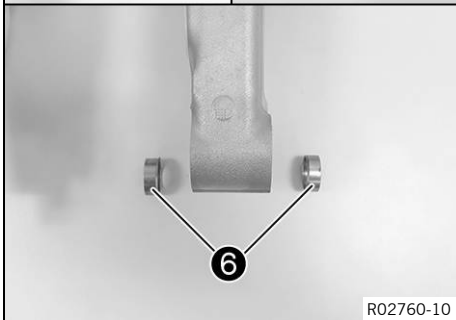
- Grease the shaft seal rings.  

Long-life grease (📖 p. 360)
- Position the collar bushings ① with the shoulder facing inward.



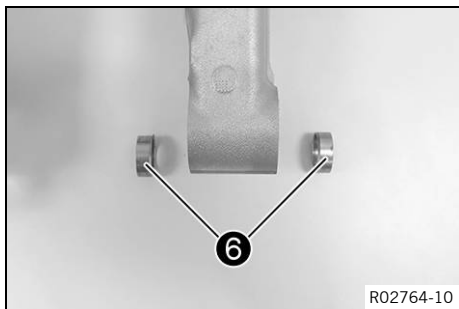
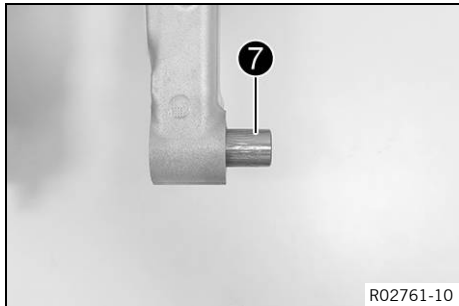
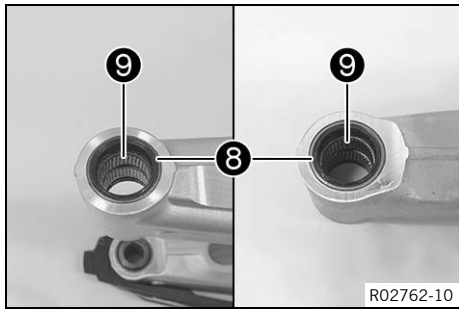
### Right swingarm bearing

- Remove collar bushings ⑥.



- Remove bushing ⑦.

## 9 SHOCK ABSORBER, SWINGARM



- 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.

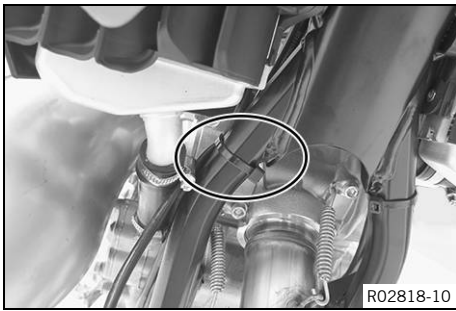
Long-life grease (📖 p. 360)

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

### Finishing work

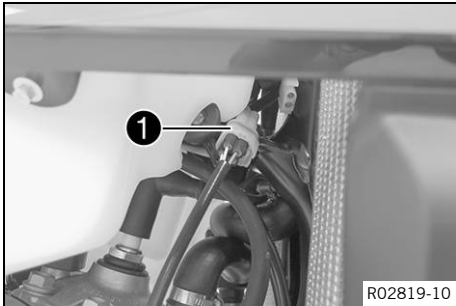
- Install the swingarm. (📖 p. 106)
- Install the rear wheel. (📖 p. 145)
- Check the chain tension. (📖 p. 150)
- Remove the motorcycle from the lift stand. (📖 p. 12)

## 10.1 Removing the manifold

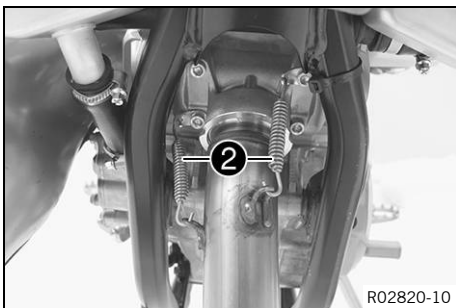


### (All EXC models)

- Remove the cable tie(s) and expose the cable.

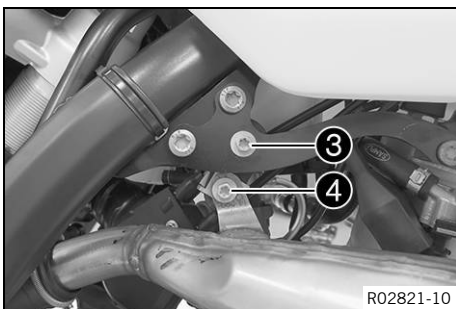


- Disconnect plug-in connector **1** of the lambda sensor.
- Expose the cable.

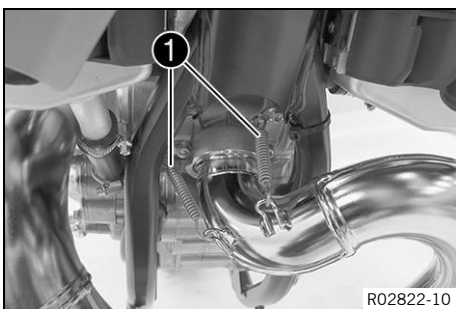


- Remove springs **2**.

Spring hook (5030501700004) (📖 p. 371)



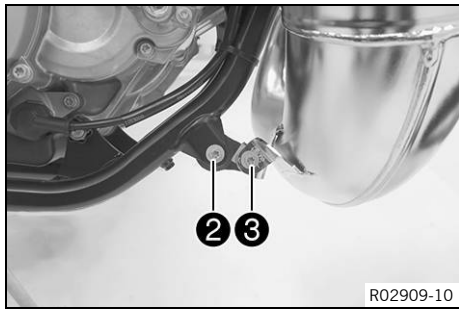
- Loosen screw **3**.
- Remove screw **4**.
- Take off the exhaust manifold toward the front.



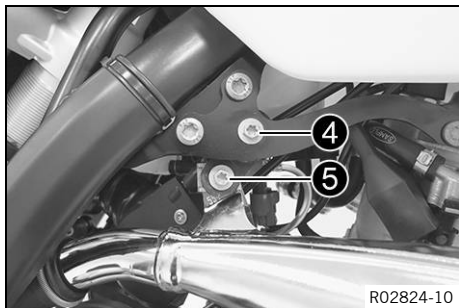
### (All XC-W models)

- Remove springs **1**.

Spring hook (5030501700004) (📖 p. 371)

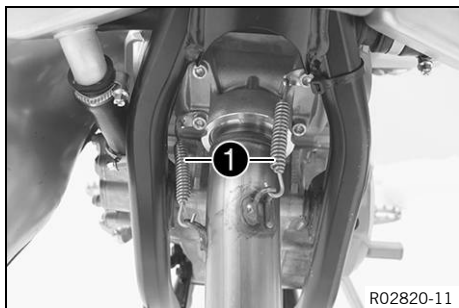


- Loosen screw ②.
- Remove screw ③.



- Loosen screw ④.
- Remove screw ⑤.
- Take off the exhaust manifold toward the front.

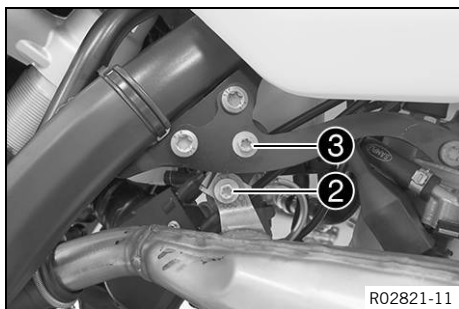
## 10.2 Installing the manifold



(All EXC models)

- Position the manifold and mount springs ①.

Spring hook (5030501700004) (📖 p. 371)



- Mount and tighten screw ②.

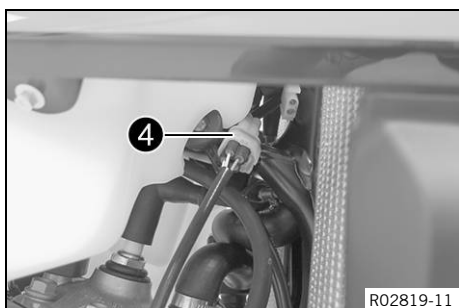
Guideline

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

- Tighten screw ③.

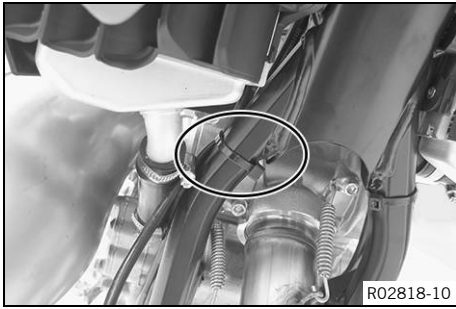
Guideline

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

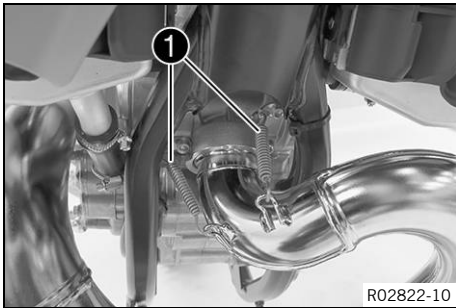


- Join plug-in connector ④ of the lambda sensor.





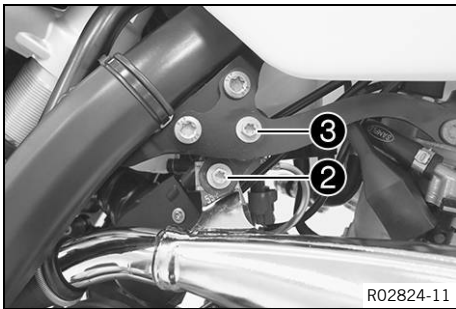
- Route the cable without tension and secure it with a cable tie.



**(All XC-W models)**

- Position the manifold and mount springs **1**.

|  |
|--|
| Spring hook (5030501700004) (📖 p. 371) |
|--|



- Mount and tighten screw **2**.

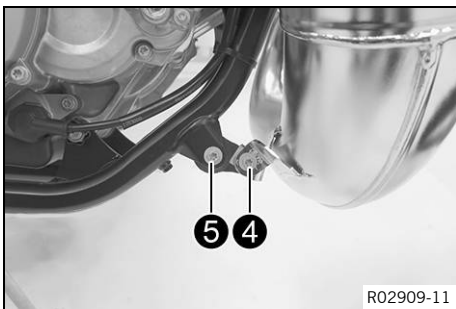
Guideline

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

- Tighten screw **3**.

Guideline

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



- Mount and tighten screw **4**.

Guideline

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

- Tighten screw **5**.

Guideline

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

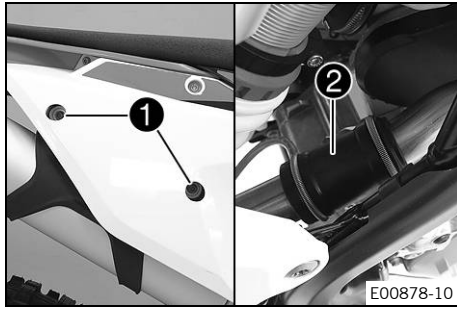
## 10.3 Removing the main silencer



**Warning**

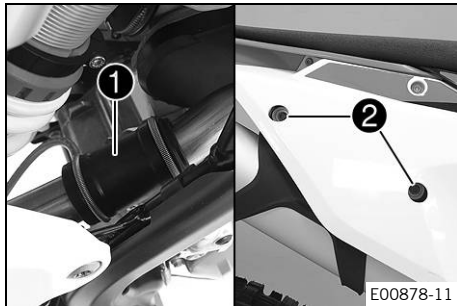
**Danger of burns** The exhaust system gets very hot when the vehicle is driven.

- Allow the exhaust system to cool down before performing any work on the vehicle.



- Remove screws ①.
- Pull off the main silencer at the rubber sleeve ② and the spring ring from the manifold.

## 10.4 Installing the main silencer



- Mount the main silencer with the rubber sleeve ① and spring ring.
- Mount and tighten screws ②.

Guideline

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

## 10.5 Changing the glass fiber yarn filling in the main silencer



### Warning

**Danger of burns** The exhaust system gets very hot when the vehicle is driven.

- Allow the exhaust system to cool down before performing any work on the vehicle.



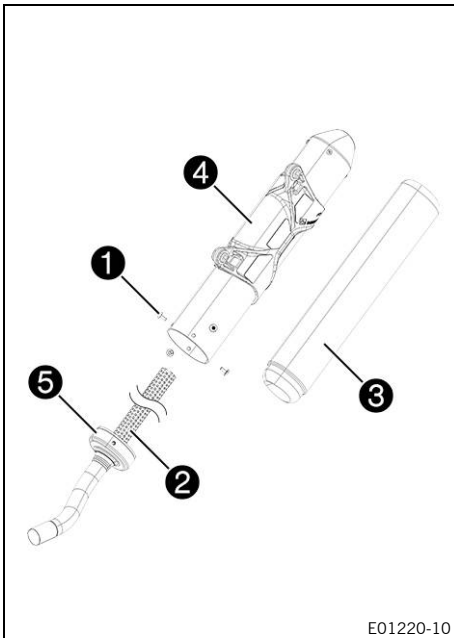
### Info

Over time, the fibers of the glass fiber yarn escape and the damper "burns" out. Not only is the noise level higher, the performance characteristic changes.

### Preparatory work

- Remove the main silencer. (📖 p. 113)





### Main work

- Remove screws ①.
- Pull out inner tube ②.
- Remove the glass fiber yarn filling ③ from the inner tube.
- Clean the parts that need to be reinstalled and check for damage.
- Fit the new glass fiber yarn filling ③ into the inner tube.
- Position outer tube ④ over the inner tube with the new glass fiber yarn filling.

### Info

Seal the connecting cap ⑤ to the outer tube with silicone.

- Mount and tighten screws ①.

### Guideline

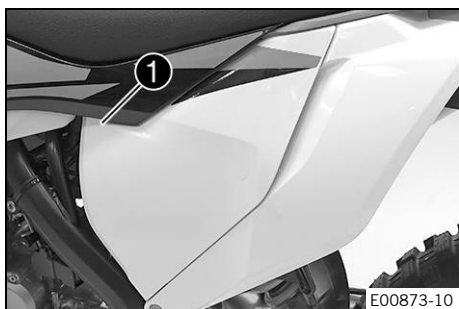
|                             |    |                   |
|-----------------------------|----|-------------------|
| Screws on the main silencer | M5 | 7 Nm (5.2 lbf ft) |
|-----------------------------|----|-------------------|

### Finishing work

- Install the main silencer. (📖 p. 114)



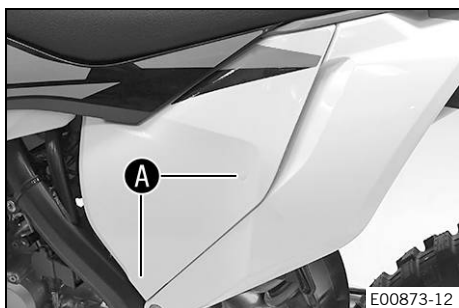
## 11.1 Removing the air filter box cover



### Condition

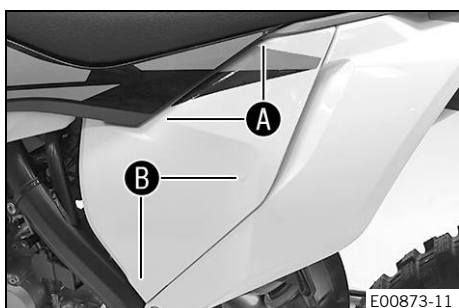
The air filter box cover is secured.

- Remove screw 1.

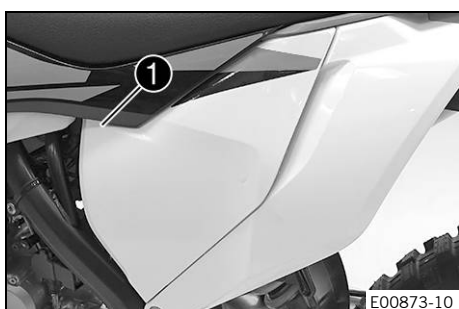


- Pull off the air filter box cover in area A sideways and take off toward the front.

## 11.2 Installing the air filter box cover



- Insert the air filter box cover in the area A and clip it into the area B.



### Condition

The air filter box cover is secured.

- Mount and tighten screw 1.

### Guideline

|                             |                             |                   |
|-----------------------------|-----------------------------|-------------------|
| Screw, air filter box cover | <b>EJOT PT®</b><br>K60x20-Z | 3 Nm (2.2 lbf ft) |
|-----------------------------|-----------------------------|-------------------|

## 11.3 Removing the air filter

### Note

**Engine damage** Unfiltered intake air has a negative effect on the service life of the engine. Dust and dirt will enter the engine without an air filter.

- Never start to use the vehicle without an air filter.



### Note

**Environmental hazard** Hazardous substances cause environmental damage.

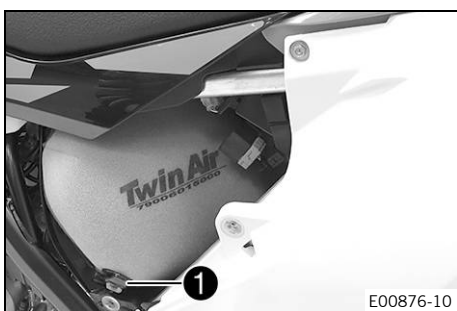
- Dispose of oils, grease, filters, fuel, cleaning agents, brake fluid, etc., correctly and in compliance with the applicable regulations.

### Preparatory work

- Remove the air filter box cover. (📖 p. 116)

### Main work

- Detach retaining tab **1**. Remove air filter with air filter support.
- Remove air filter from air filter support.

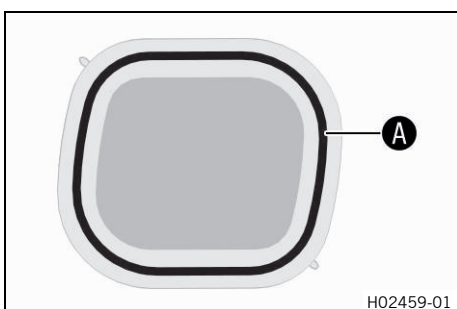


## 11.4 Installing the air filter

### Main work

- Mount the clean air filter on the air filter support.
- Grease the air filter in area **A**.

Long-life grease (📖 p. 360)



- Insert air filter and position retaining pin **1** in bushing **B**.  
✓ The air filter is correctly positioned.
- Insert retaining tab **2**.  
✓ Retaining pin **3** is secured with retaining tab **2**.



### Info

If the air filter is not mounted correctly, dust and dirt may enter the engine and result in damage.



### Finishing work

- Install the air filter box cover. (📖 p. 116)

## 11.5 Cleaning the air filter and air filter box



### 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

Do not clean the air filter with fuel or petroleum since these substances attack the foam.



### Preparatory work

- Remove the air filter box cover. (📖 p. 116)
- Remove the air filter. (📖 p. 117)

### Main work

- Wash the air filter thoroughly in special cleaning liquid and allow it to dry properly.

|                               |
|-------------------------------|
| Air filter cleaner (📖 p. 360) |
|-------------------------------|



### Info

Only squeeze the air filter to dry it; never wring it out.

- Oil the dry air filter with a high quality filter oil.

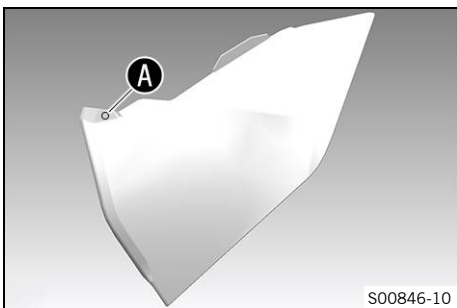
|                                    |
|------------------------------------|
| Oil for foam air filter (📖 p. 361) |
|------------------------------------|

- Clean the air filter box.
- Clean the intake flange and check it for damage and tightness.

### Finishing work

- Install the air filter. (📖 p. 117)
- Install the air filter box cover. (📖 p. 116)

## 11.6 Preparing air filter box cover for securing



### Preparatory work

- Remove the air filter box cover. (📖 p. 116)

### Main work

- Drill a hole at marking **A**.

Guideline

|          |                |
|----------|----------------|
| Diameter | 6 mm (0.24 in) |
|----------|----------------|

### Finishing work

- Install the air filter box cover. (📖 p. 116)

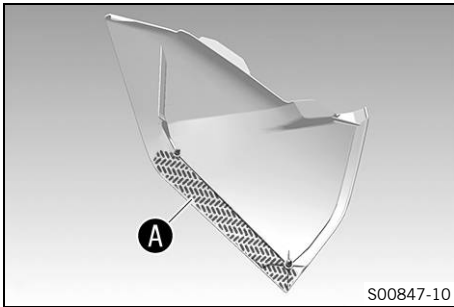
## 11.7 Sealing the air filter box

### Preparatory work

- Remove the air filter box cover. (📖 p. 116)

### Main work

- Seal the air filter box in the marked area **A**.



### Finishing work

- Install the air filter box cover. (📖 p. 116)



## 12.1 Opening the 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.

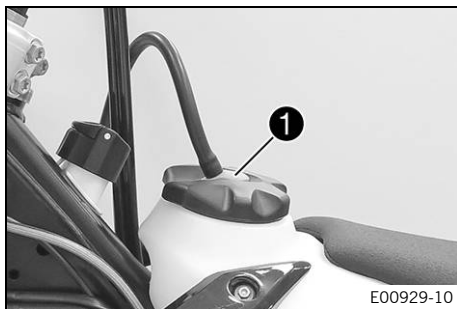
- Avoid skin, eye and clothing contact with fuel.
- Immediately consult a doctor if you swallow fuel.
- Do not inhale fuel vapors.
- In case of skin contact, rinse the affected area with plenty of water.
- Rinse the eyes thoroughly with water, and consult a doctor in case of fuel contact with the eyes.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

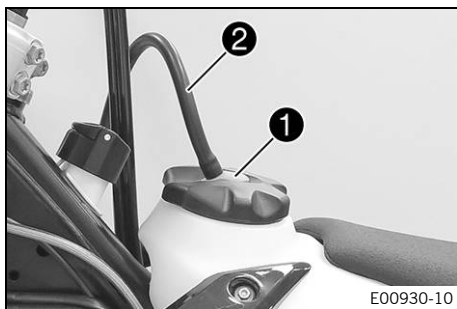
**Environmental hazard** Improper handling of fuel is a danger to the environment.

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



- Press release button **1**, turn the filler cap counterclockwise and lift it free.

## 12.2 Closing the filler cap



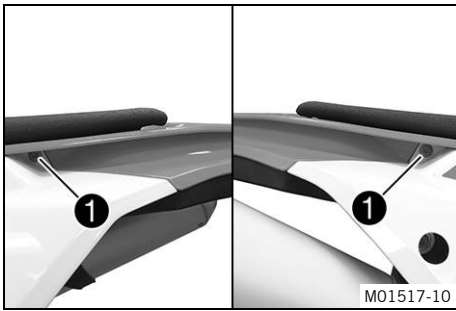
- Fit the filler cap and turn clockwise until release button **1** locks in place.



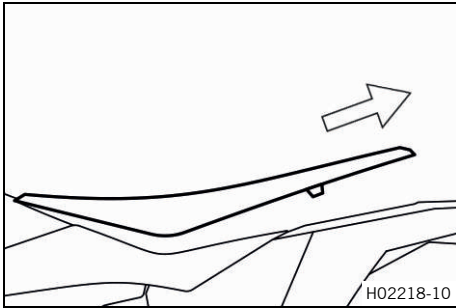
### Info

Route fuel tank breather hose **2** without kinks.

12.3 Removing the seat

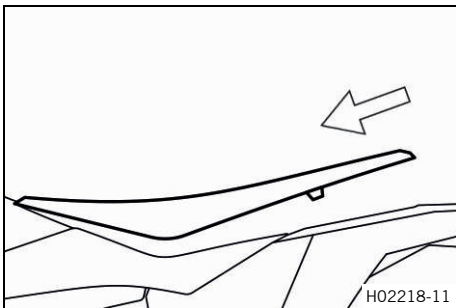


- Remove screws ①.

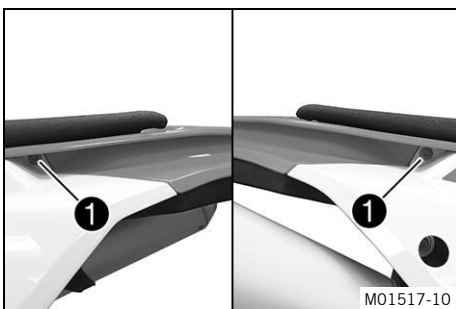


- Raise the rear of the seat, pull the seat back, and lift it off.

12.4 Mounting the seat



- Mount the front of the seat on the collar bushing of the fuel tank, lower the seat at the rear, and push the seat forward.
- Make sure that the seat is locked in correctly.



- Mount and tighten screws ①.

Guideline

|                              |    |                    |
|------------------------------|----|--------------------|
| Remaining screws,<br>chassis | M6 | 10 Nm (7.4 lbf ft) |
|------------------------------|----|--------------------|

## 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.

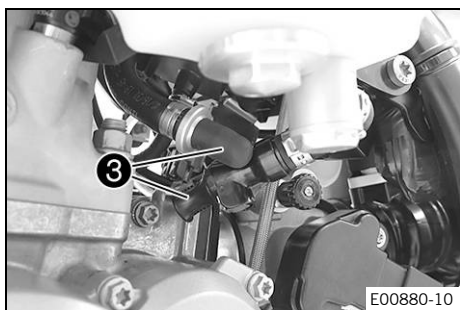
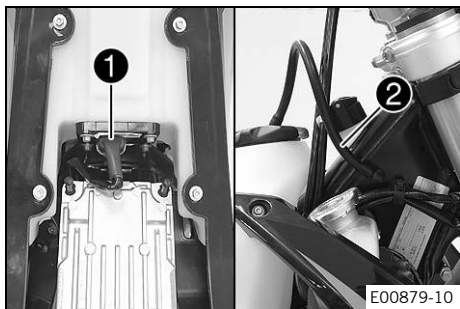
- Do not refuel the vehicle in the vicinity of open flames or lit cigarettes.
- Switch off the engine for refueling.
- Make sure that no fuel is spilled; particularly not on hot parts of the vehicle.
- If any fuel is spilled, wipe it off immediately.
- Observe the specifications for refueling.



### 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. 121)

### Main work

- Unplug connector ① of the fuel pump.
- Remove tube ② from the fuel tank breather.

- 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!

- Disconnect the plug-in connection of the fuel line.



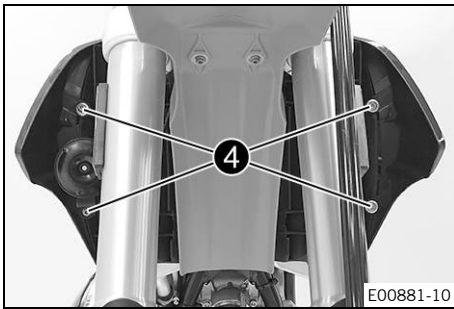
### Info

Remaining fuel may flow out of the fuel hose.

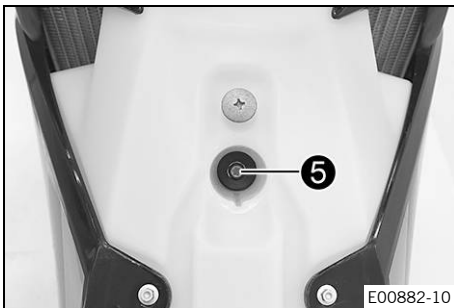
- Mount wash cap set ③.

Wash cap set (81212016100)

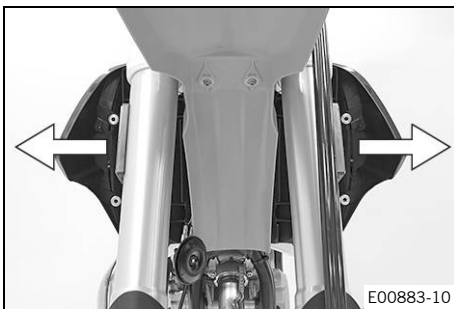




- Remove screws 4 with the collar bushings.
- (All EXC models)**
- Hang the horn and horn bracket to one side.



- Remove screw 5 with the rubber bushing.



- Pull both spoilers off laterally from the radiator bracket and lift 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.

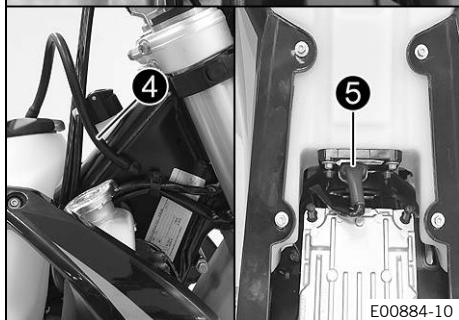
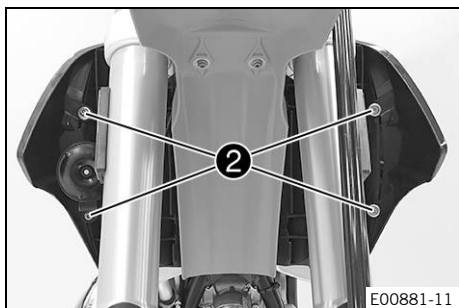
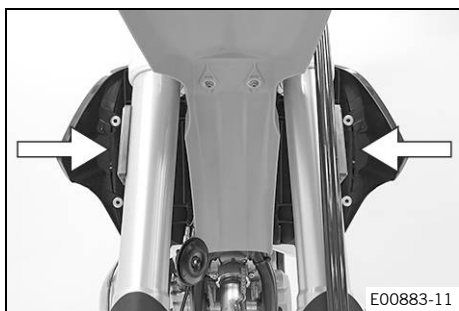
- Do not refuel the vehicle in the vicinity of open flames or lit cigarettes.
- Switch off the engine for refueling.
- Make sure that no fuel is spilled; particularly not on hot parts of the vehicle.
- If any fuel is spilled, wipe it off immediately.
- Observe the specifications for refueling.



### 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.



### Main work

- Check throttle cable routing. (📖 p. 70)
- Position the fuel tank and fit the two spoilers to the sides in front of the radiator bracket.
- Make sure that no cables or throttle cables are trapped or damaged.

- Mount and tighten screw **1** with the rubber bushing.

#### Guideline

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

### (All EXC models)

- Position the horn with the horn bracket.

- Mount and tighten screws **2** with the collar bushings.

#### Guideline

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

- Remove the wash cap set.
- 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!

- Lubricate the O-ring and connect plug-in connection **3** for the fuel line.



#### Info

Route the cable and fuel line at a safe distance from the exhaust system.

- Attach fuel tank breather hose **4**.
- Plug in connector **5** for the fuel pump.

## Finishing work

- Mount the seat. (📖 p. 121)



## 12.7 Changing the fuel screen



### 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.

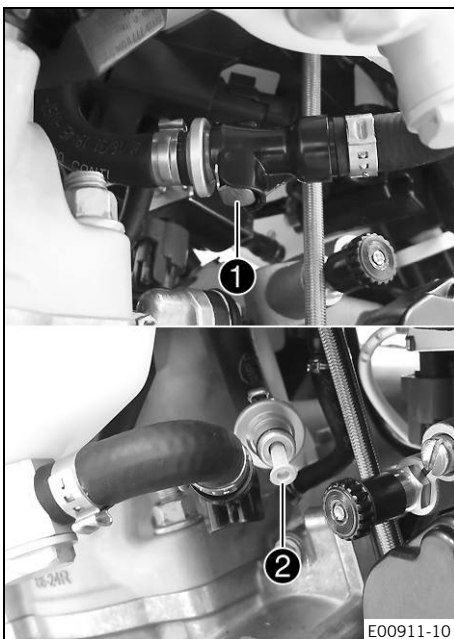
- Avoid skin, eye and clothing contact with fuel.
- Immediately consult a doctor if you swallow fuel.
- Do not inhale fuel vapors.
- In case of skin contact, rinse the affected area with plenty of water.
- Rinse the eyes thoroughly with water, and consult a doctor in case of fuel contact with the eyes.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



### Note

**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.



- Clean plug-in connection **1** of the fuel line thoroughly with compressed air.



### Info

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

- Disconnect the plug-in connection of the fuel line.



### Info

Remaining fuel may flow out of the fuel hose.

- Pull fuel screen **2** out of the connecting piece.
- Insert the new fuel screen all the way into the connecting piece.
- Lubricate the O-ring and join the plug-in connection of the fuel line.



## 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 an effective exhaust extraction system when starting or running the engine in an enclosed space.

- Start the engine and check the response.

## 12.8 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.



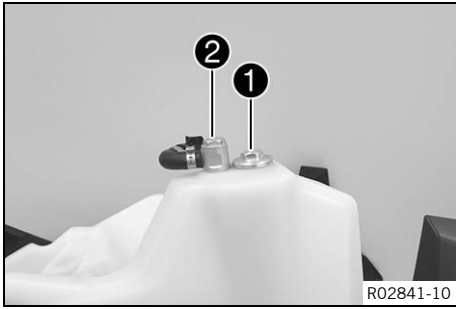
### Note

**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.

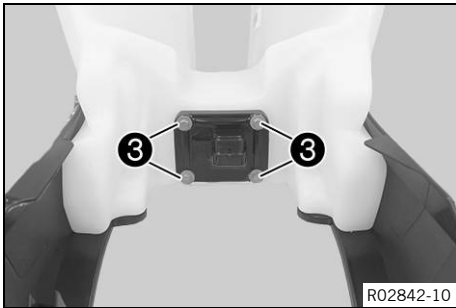
### Preparatory work

- Drain the fuel from the fuel tank into a suitable container.
- Remove the seat. (📖 p. 121)
- Remove the fuel tank. (📖 p. 122)

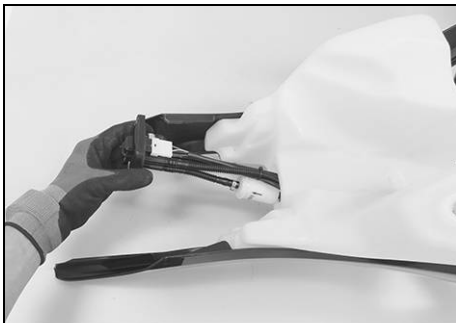


### Main work

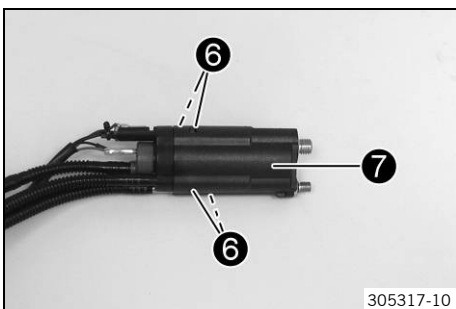
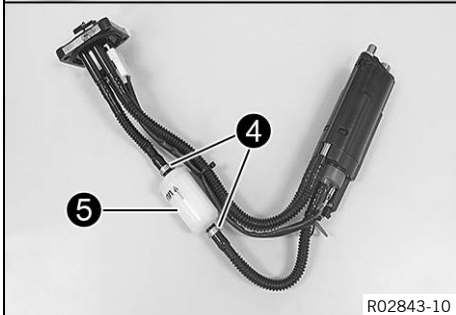
- Remove nut ① with the gasket.
- Remove fuel connection ② with the gasket.



- Remove screws ③.

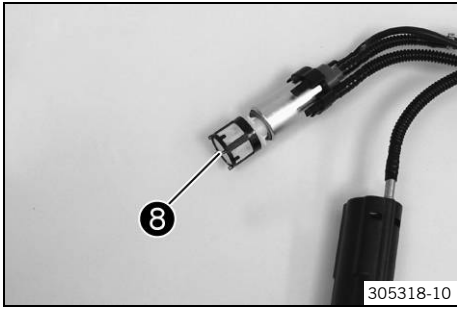


- Pull out the fuel pump.
- Remove hose clamps ④.
- Remove fuel filter ⑤.

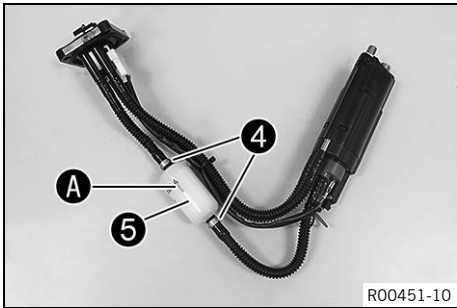


- Press locking mechanism ⑥.
- Pull back fuel pump housing ⑦.

# 12 FUEL TANK, SEAT, TRIM

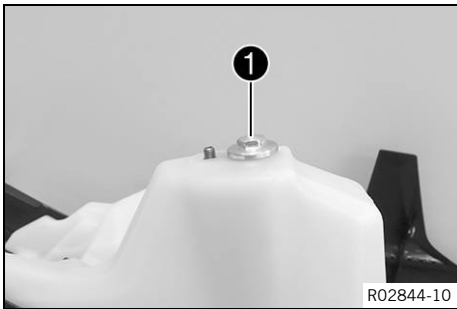


- Change fuel screen **8**.
- Mount the fuel pump housing.

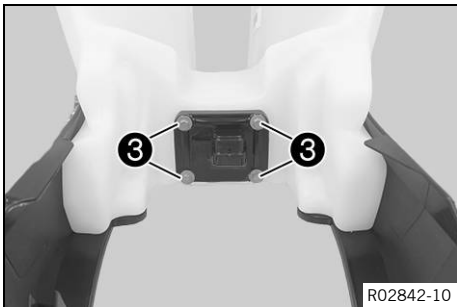


- Mount fuel filter **5**.  
✓ Arrow **A** points away from the fuel pump.
- Mount hose clamps **4**.

Hose clamp plier (60029057000) (📖 p. 369)



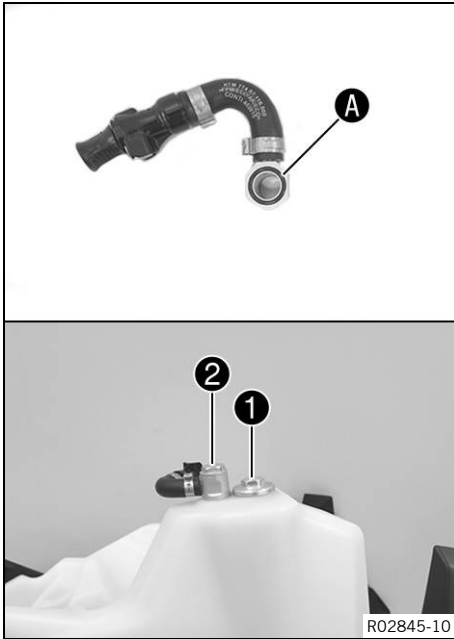
- Position the fuel pump.
- Mount nut **1** with gasket, but do not tighten yet.



- Mount and tighten screws **3**.

Guideline

|                  |          |                     |
|------------------|----------|---------------------|
| Screw, fuel pump | EJOT PT® | 2.3 Nm (1.7 lbf ft) |
|------------------|----------|---------------------|



- Grease O-ring **A** slightly.

|   |
|---|
| Multi-purpose grease (00062010051) (📖 p. 361) |
|---|



**Info**

Make sure that no grease gets into the fuel connection.

- Mount fuel connection **2** with the gasket but do not tighten yet.
- Tighten nut **1**.

Guideline

|                         |     |                     |
|-------------------------|-----|---------------------|
| Nut, fuel pump mounting | M12 | 15 Nm (11.1 lbf ft) |
|-------------------------|-----|---------------------|

- Tighten fuel connection **2**.

Guideline

|                              |    |                    |
|------------------------------|----|--------------------|
| Fuel connection on fuel pump | M8 | 10 Nm (7.4 lbf ft) |
|------------------------------|----|--------------------|

**Finishing work**

- Install the fuel tank. (📖 p. 123)
- Mount the seat. (📖 p. 121)

**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**

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

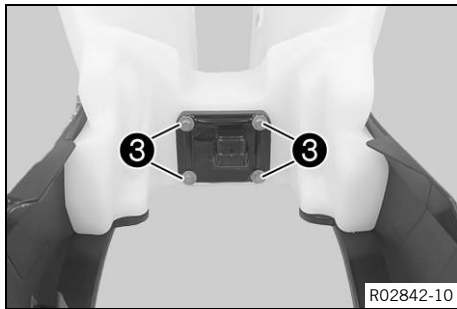
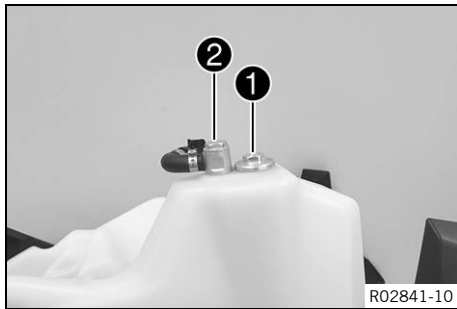
- Do not allow fuel to enter the groundwater, the soil, or the sewage system.

## Preparatory work

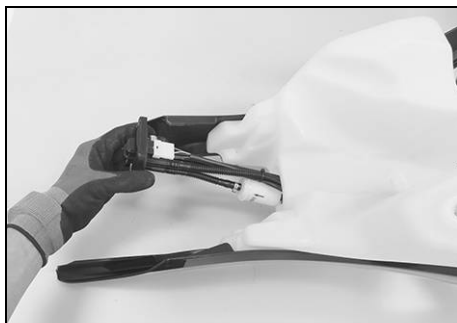
- Drain the fuel from the fuel tank into a suitable container.
- Remove the seat. (📖 p. 121)
- Remove the fuel tank. (📖 p. 122)

## Main work

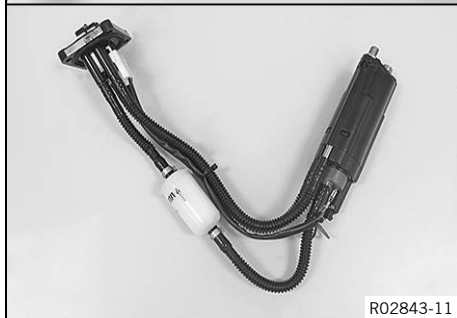
- Remove nut ❶ with the gasket.
- Remove fuel connection ❷ with the gasket.



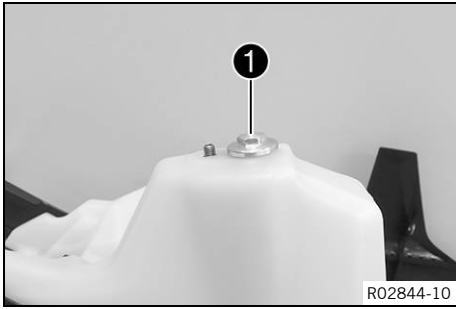
- Remove screws ❸.



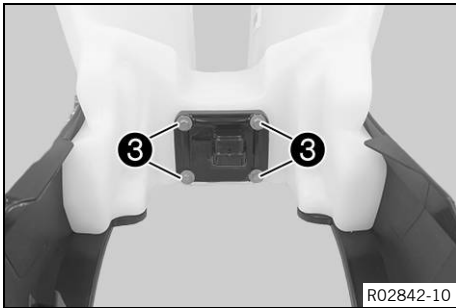
- Pull out the fuel pump.







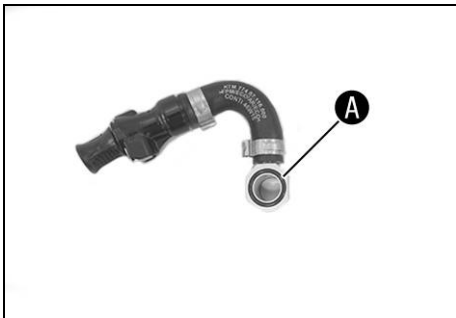
- Position the new fuel pump.
- Mount nut 1 with gasket, but do not tighten yet.



- Mount and tighten screws 3.

Guideline

|                  |          |                     |
|------------------|----------|---------------------|
| Screw, fuel pump | EJOT PT® | 2.3 Nm (1.7 lbf ft) |
|------------------|----------|---------------------|



- Grease O-ring A slightly.

|   |
|---|
| Multi-purpose grease (00062010051) (p. 361) |
|---|



**Info**

Make sure that no grease gets into the fuel connection.

- Mount fuel connection 2 with the gasket but do not tighten yet.
- Tighten nut 1.

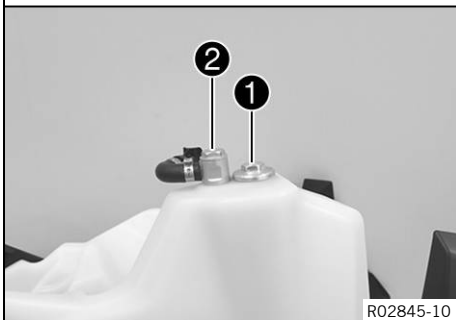
Guideline

|                         |     |                     |
|-------------------------|-----|---------------------|
| Nut, fuel pump mounting | M12 | 15 Nm (11.1 lbf ft) |
|-------------------------|-----|---------------------|

- Tighten fuel connection 2.

Guideline

|                              |    |                    |
|------------------------------|----|--------------------|
| Fuel connection on fuel pump | M8 | 10 Nm (7.4 lbf ft) |
|------------------------------|----|--------------------|



**Finishing work**

- Install the fuel tank. (p. 123)
- Mount the seat. (p. 121)



## 12.10 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.

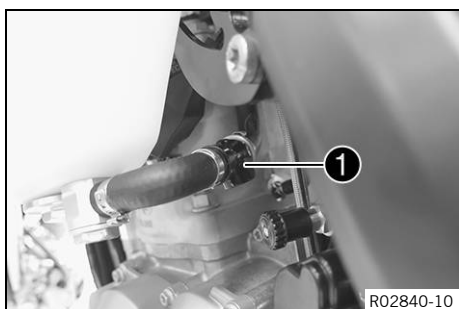
### Condition

The fuel tank is completely full.

Ensure that the battery voltage does not drop below 12.5 V.

The diagnostics tool is disconnected.

- 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!

- Press on the small metal plate and disconnect fuel hose connection ①.



### Info

Remaining fuel may flow out of the fuel hose.

- Mount special tool ②.

|  |
|--|
| Pressure testing tool (61029094000) (與 p. 369) |
|--|

- Mount special tool ③ with nozzle code **0,60**.

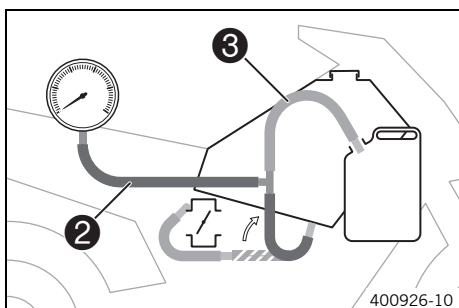
|                                       |
|---------------------------------------|
| Testing hose (61029093000) (與 p. 369) |
|---------------------------------------|

- Position the hose end in a fuel can.

### Guideline

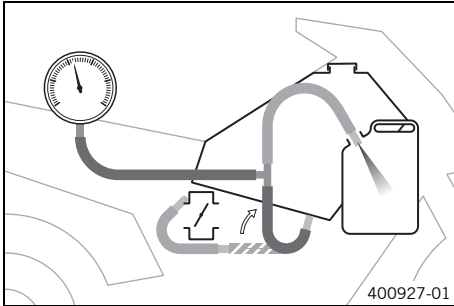
|                        |                   |
|------------------------|-------------------|
| Minimum size, fuel can | 10 l (2.6 US gal) |
|------------------------|-------------------|

- Connect the diagnostics tool and start it.
- Select "**Actuator test**" > "**Fuel pump**".



## Guideline

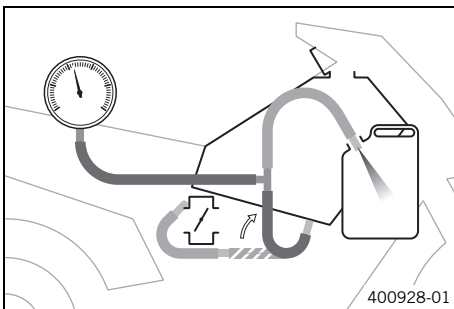
|                                       |       |
|---------------------------------------|-------|
| Maximum duration of the actuator test | 3 min |
|---------------------------------------|-------|



- Check the fuel pressure with the filler cap closed.

| Fuel pressure                |                                       |
|------------------------------|---------------------------------------|
| When the fuel pump is active | 3.35 ... 3.65 bar (48.6 ... 52.9 psi) |

- » If the specification is not reached:
  - Open the filler cap. (🔧 p. 120)
  - Check the tank air vent system.



- Check the fuel pressure with the filler cap open.

| Fuel pressure                |                                       |
|------------------------------|---------------------------------------|
| When the fuel pump is active | 3.35 ... 3.65 bar (48.6 ... 52.9 psi) |

- » If the specification is not reached:
  - Check that the fuel line is clear.
  - Change the fuel filter. (🔧 p. 126)
  - Change the fuel pump. (🔧 p. 129)
- Stop the "**Actuator test**" > "**Fuel pump**" by pressing the "**Quit**" button.
- Remove the special tools.
- Join the fuel hose connection.



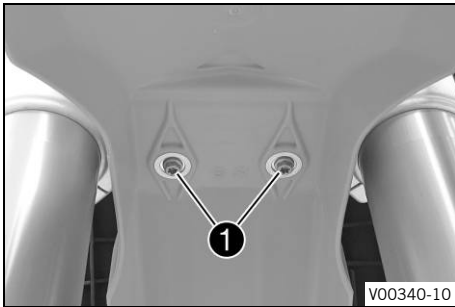
## 13.1 Removing front fender

### Preparatory work

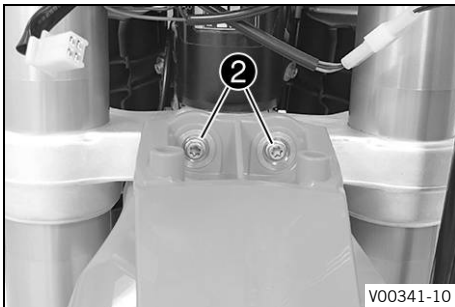
- Remove the headlight mask with the headlight. (📖 p. 135)

### Main work

- Remove screws ❶.



- Remove screws ❷. Take off front fender.



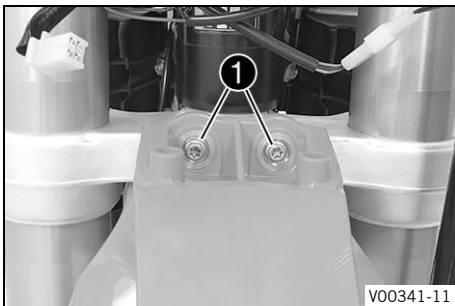
## 13.2 Installing front fender

### Main work

- Position front fender. Mount and tighten screws ❶.

#### Guideline

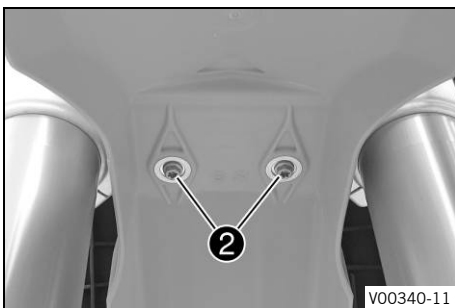
|                           |    |                    |
|---------------------------|----|--------------------|
| Remaining screws, chassis | M6 | 10 Nm (7.4 lbf ft) |
|---------------------------|----|--------------------|



- Mount and tighten screws ❷.

#### Guideline

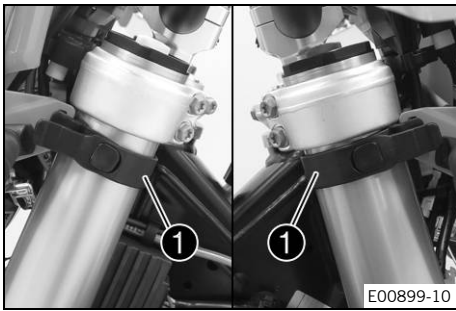
|                           |    |                    |
|---------------------------|----|--------------------|
| Remaining screws, chassis | M6 | 10 Nm (7.4 lbf ft) |
|---------------------------|----|--------------------|



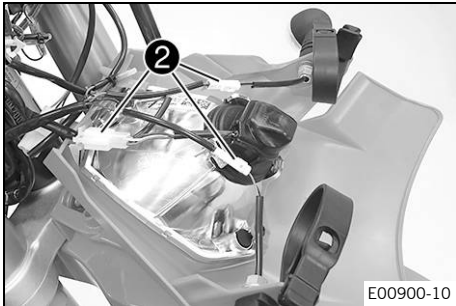
### Finishing work

- Install the headlight mask with the headlight. (📖 p. 135)
- Check the headlight setting. (📖 p. 183)

## 13.3 Removing the headlight mask with the headlight

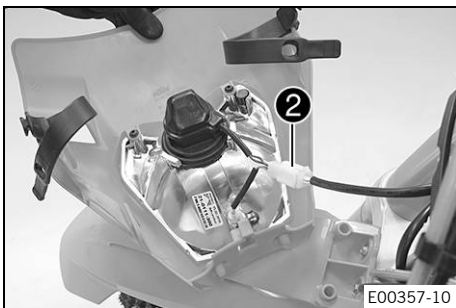


- Detach the brake line and wiring harness from the headlight mask.
- Release rubber bands ①. Slide the headlight mask up and swing it forward.



### (All EXC models)

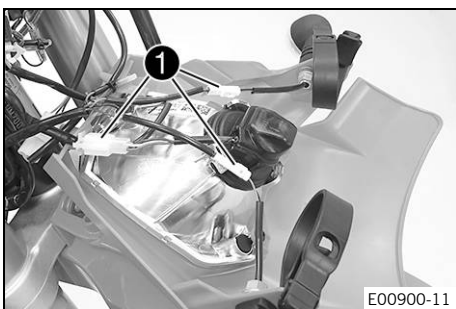
- Detach plug-in connectors ② and take off the headlight mask with the headlight.



### (All XC-W models)

- Detach plug-in connector ② and take off the headlight mask with the headlight.

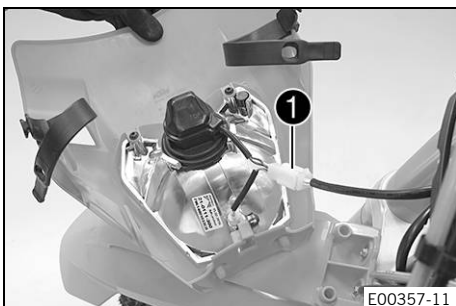
## 13.4 Installing the headlight mask with the headlight



### Main work

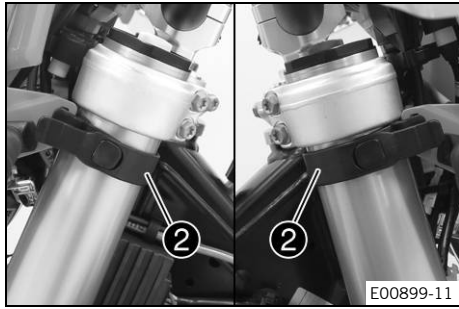
#### (All EXC models)

- Connect plug-in connectors ①.



#### (All XC-W models)

- Connect plug-in connector ①.



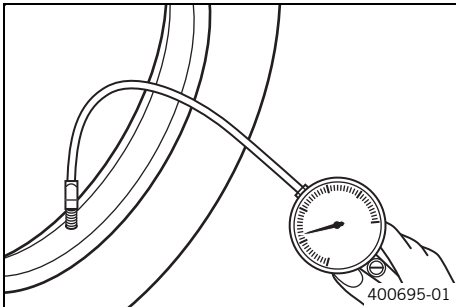
- Position the headlight mask and fix it with rubber bands ②.
  - ✓ The holding lugs engage in the fender.
- Position the brake line and wiring harness in the brake line guide.

### Finishing work

- Check the headlight setting. (📖 p. 183)

### 14.1 Checking the tire air pressure

**i Info**  
 Low tire air pressure leads to abnormal wear and overheating of the tire.  
 Correct tire air pressure ensures optimal riding comfort and maximum tire service life.



- Remove the dust cap.
- Check the tire air pressure when the tires are cold.

| Tire air pressure, road (All EXC models) |                  |
|--|------------------|
| front                                    | 1.5 bar (22 psi) |
| rear                                     | 1.5 bar (22 psi) |

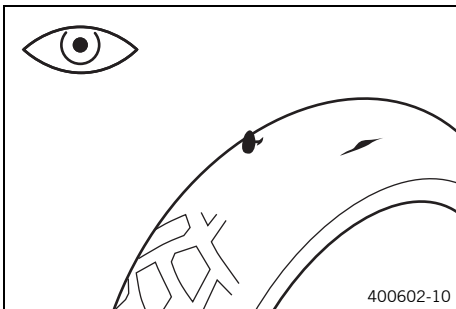
| Tire air pressure off road |                  |
|----------------------------|------------------|
| front                      | 1.0 bar (15 psi) |
| rear                       | 1.0 bar (15 psi) |

- » If the tire pressure does not meet specifications:
  - Correct the tire pressure.
- Mount the dust cap.



### 14.2 Checking the tire condition

**i Info**  
 Only mount tires approved and/or recommended by KTM.  
 Other tires could have a negative effect on handling characteristics.  
 The type, condition, and air pressure of the tires all have a major impact on the handling of the motorcycle.  
 Worn tires have a negative effect on handling characteristics, especially on wet surfaces.

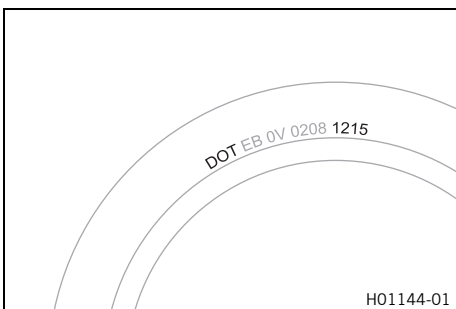


- Check the front and rear tires for cuts, run-in objects, and other damage.
  - » If the tires have cuts, run-in objects, or other damage:
    - Change the tires.
- Check the tread depth.

**i Info**  
 Adhere to the legally required minimum tread depth.

|                     |                               |
|---------------------|-------------------------------|
| Minimum tread depth | $\geq 2$ mm ( $\geq 0.08$ 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.

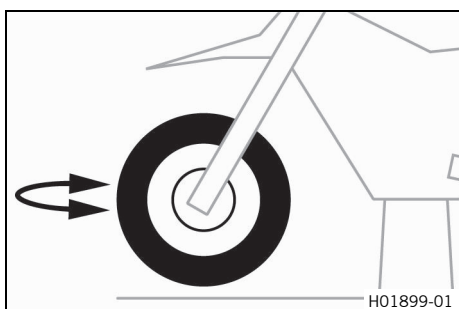
## 14.3 Checking the wheel bearing for play

### Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 12)
- 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.



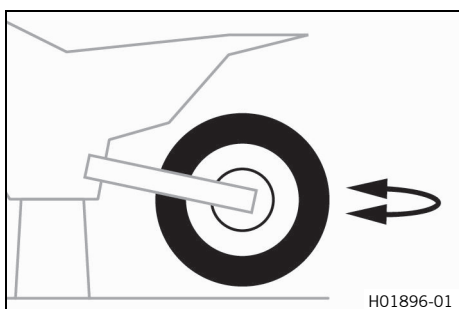

---

**i Info**  
 Hold the fork leg to check it.

---

- » If there is detectable play:
  - Change front wheel bearing. (📖 p. 143)

- 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 the swingarm to check it.

---

- » If there is detectable play:
  - Change the rear wheel bearing. (📖 p. 147)

### Finishing work

- Remove the motorcycle from the lift stand. (📖 p. 12)



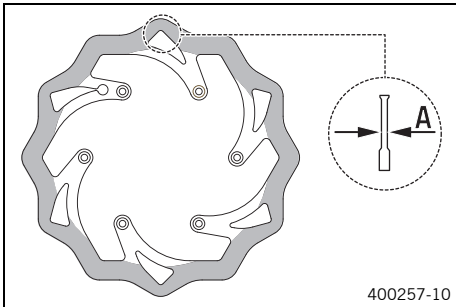
14.4 Checking the brake discs



**Warning**

**Danger of accidents** Worn-out brake discs reduce the braking effect.

- Make sure that worn-out brake discs are replaced immediately.



- Check the front and rear brake disc thickness at multiple points for the dimension **A**.



**Info**

Wear reduces the thickness of the brake disc around the contact surface of the brake linings.

| Brake discs - wear limit (All standard EXC/XC-W models) |                   |
|---|-------------------|
| front   | 2.5 mm (0.098 in) |
| rear  | 3.5 mm (0.138 in) |
| Brake discs - wear limit (All Six Days models)          |                   |
| front   | 2.5 mm (0.098 in) |
| rear  | 3.7 mm (0.146 in) |

- » If the brake disc thickness is less than the specified value:
  - Change the front brake disc. (📖 p. 142)
  - Change the rear brake disc. (📖 p. 146)
- Check the front and rear brake discs for damage, cracking, and deformation.
  - » If the brake disc exhibits damage, cracking, or deformation:
    - Change the front brake disc. (📖 p. 142)
    - Change the rear brake disc. (📖 p. 146)



14.5 Checking the rim run-out



**Warning**

**Danger of accidents** Incorrectly tensioned spokes impair the handling characteristic and result in secondary damage.

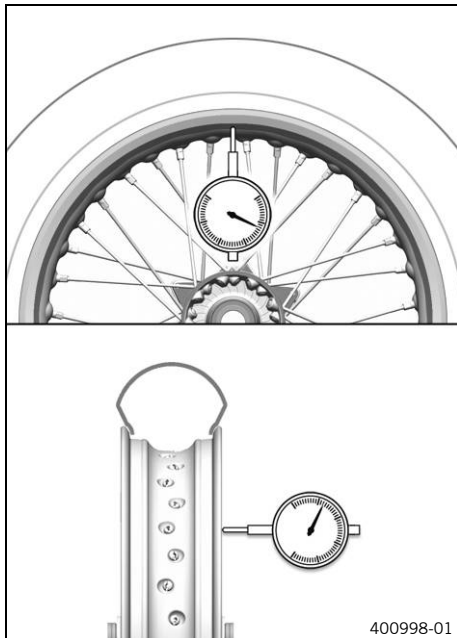
The spokes break due to being overloaded if they are too tightly tensioned. If the tension in the spokes is too low, then lateral and radial run-out will form in the wheel. Other spokes will become looser as a result.

- Check spoke tension regularly, and in particular on a new vehicle.



**Info**

A loose spoke can unbalance the wheel and other spokes may loosen within a short period. If the spokes are too tight, they can break due to local overload. Check the spoke tension regularly, especially on a new motorcycle.



- 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.

## 14.6 Checking spoke tension

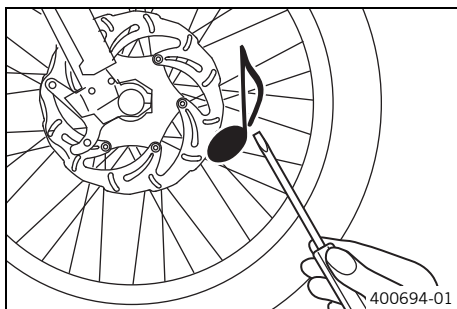


### Warning

**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 you hear different tone frequencies from different spokes of equal length and diameter, this is an indication of different spoke tensions.

You should hear a high note.

- » If the spoke tension differs:
  - Correct the spoke tension.

- Check the spoke torque.

Guideline

|                           |      |                   |
|---------------------------|------|-------------------|
| Spoke nipple, front wheel | M4.5 | 6 Nm (4.4 lbf ft) |
| Spoke nipple, rear wheel  | M4.5 | 6 Nm (4.4 lbf ft) |

Torque wrench kit (58429094000) (🗨️ p. 368)

## 14.7 Front wheel

### 14.7.1 Removing the front wheel

#### Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 12)

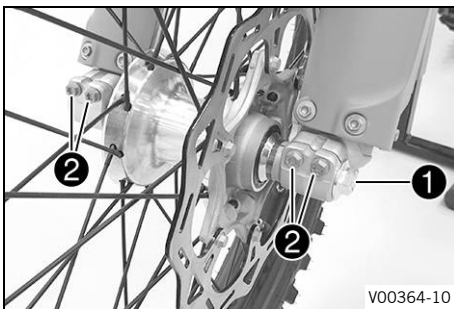
#### Main work

- Press the brake caliper onto the brake disc by hand in order to push back the brake pistons.

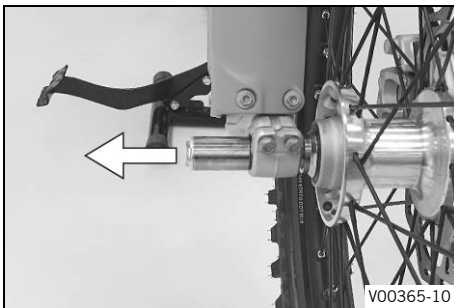


#### Info

Make sure that you do not press the brake caliper against the spokes when pushing back the brake pistons.



- Loosen screw ① by several rotations.
- Loosen screws ②.
- Press on screw ① to push the wheel spindle out of the axle clamp.
- Remove screw ①.



#### 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.

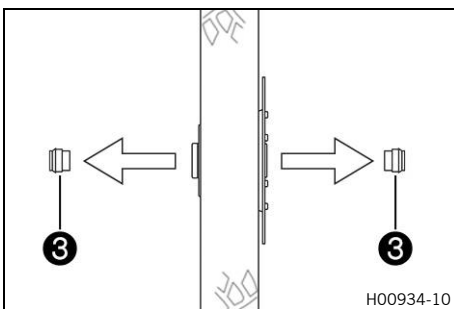
- Hold the front wheel and remove the wheel spindle. Take the front wheel out of the fork.



#### Info

Do not pull the hand brake lever when the front wheel is removed.

- Remove spacers ③.



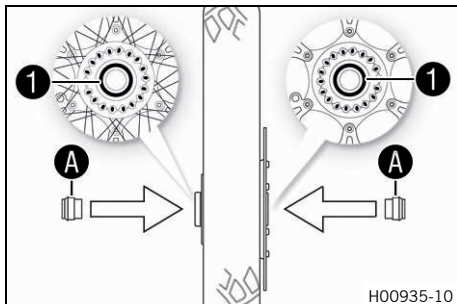
## 14.7.2 Installing the front wheel



### 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. 143)
- Clean and grease shaft seal rings 1 and contact surface A of the spacers.

Long-life grease (📖 p. 360)

- Insert the spacers.
- Clean and grease the wheel spindle.

Long-life grease (📖 p. 360)

- Lift the front wheel into the fork, position it, and insert the wheel spindle.

✓ The brake linings are correctly positioned.

- Mount and tighten screw 2.

Guideline

|                            |         |                     |
|----------------------------|---------|---------------------|
| Screw, front wheel spindle | M20x1.5 | 35 Nm (25.8 lbf ft) |
|----------------------------|---------|---------------------|

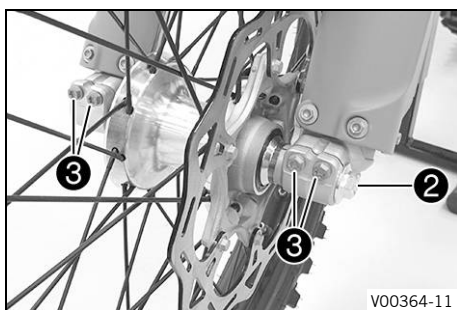
- Operate the hand brake lever several times until the brake linings are seated correctly against the brake disc.
- Remove the motorcycle from the lift stand. (📖 p. 12)
- Operate the front brake and compress the fork a few times firmly.

✓ The fork legs straighten.

- Tighten screws 3.

Guideline

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



## 14.7.3 Changing the front brake disc

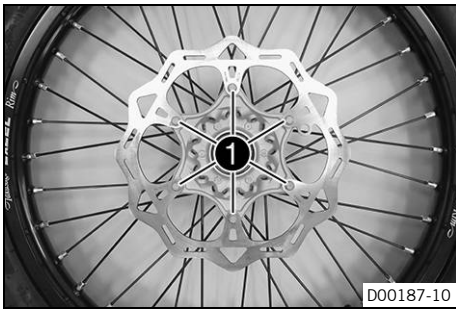


### Info

If the brake discs are changed, the brake linings must also be changed.

### Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 12)
- Remove the front wheel. (📖 p. 141)



**Main work**

**(All standard EXC/XC-W models)**

- Remove screws 1. Remove the brake disc.
- Clean the contact surface of the brake disc.
- Position the new brake disc with the label facing outward.
- Mount and tighten screws 1.

Guideline

|                            |    |  |
|----------------------------|----|--|
| Screw, front<br>brake disc | M6 | 14 Nm (10.3 lbf ft)<br><b>Loctite®243™</b> |
|----------------------------|----|--|



**(All Six Days models)**

- Remove screws 1. Remove the brake disc.
- Clean the contact surface of the brake disc.
- Position the new brake disc with the label facing outward.
- Mount and tighten screws 1.

Guideline

|                            |    |  |
|----------------------------|----|--|
| Screw, front<br>brake disc | M6 | 14 Nm (10.3 lbf ft)<br><b>Loctite®243™</b> |
|----------------------------|----|--|

**Finishing work**

- Install the front wheel. (📖 p. 142)

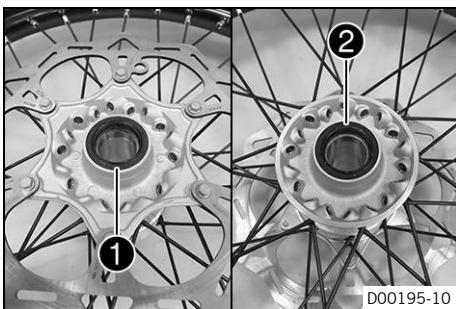
**14.7.4 Changing front wheel bearing**

**Preparatory work**

- Raise the motorcycle with a lift stand. (📖 p. 12)
- Remove the front wheel. (📖 p. 141)

**Main work**

- Remove shaft seal rings 1 and 2.



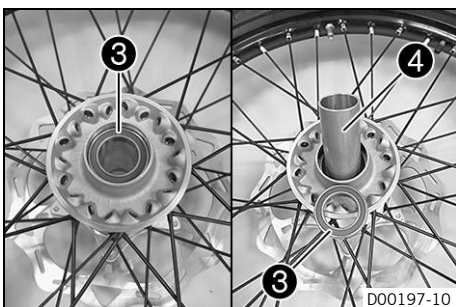
- Press out bearing 3 using a suitable tool.

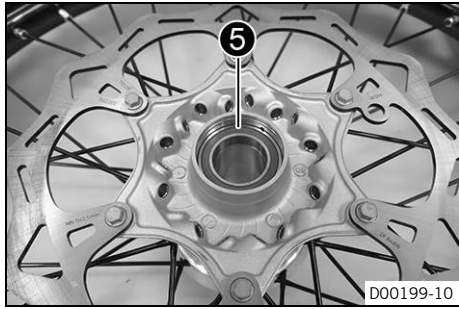


**Info**

Spacing tube 4 can be pushed aside.

- Remove spacing tube 4.



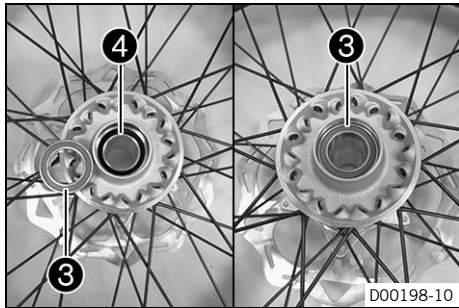


- Press out bearing **5** using a suitable tool.
- Press in new bearing **5** all the way using a suitable tool.



**Info**

Only press the bearing in via the outer ring otherwise the bearing will be damaged when it is pressed in.



- Clean, grease, and mount spacing tube **4**.

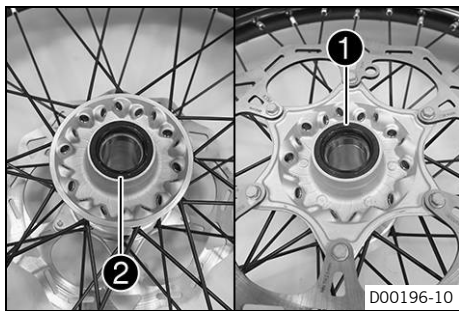
Long-life grease (📖 p. 360)

- Press in new bearing **3** all the way using a suitable tool.



**Info**

Only press the bearing in via the outer ring otherwise the bearing will be damaged when it is pressed in.



- Grease new shaft seal rings **2** and **1** and press in until they are flush.

**Finishing work**

- Install the front wheel. (📖 p. 142)

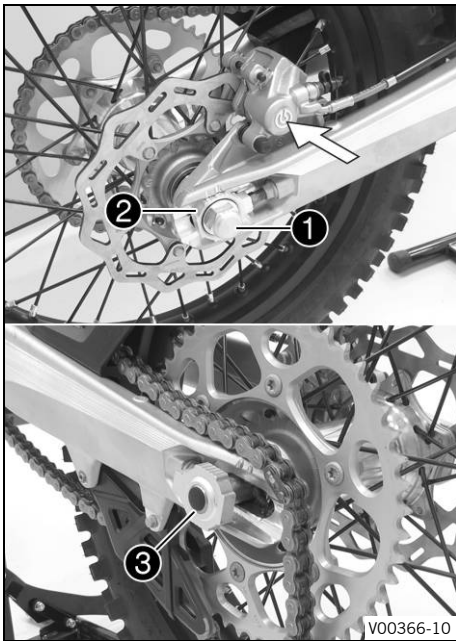
**14.8 Rear wheel**

**14.8.1 Removing the rear wheel**

**Preparatory work**

- Raise the motorcycle with a lift stand. (📖 p. 12)





### Main work

- Press the brake caliper onto the brake disc by hand in order to push back the brake piston.

**i Info**  
Make sure when pushing back the brake piston that you do not press the brake caliper against the spokes.

- Remove nut ①.
- Remove chain adjuster ②. Pull out wheel spindle ③ far enough to allow the rear wheel to be pushed forward.
- Push the rear wheel forward as far as possible. Remove the chain from the rear sprocket.

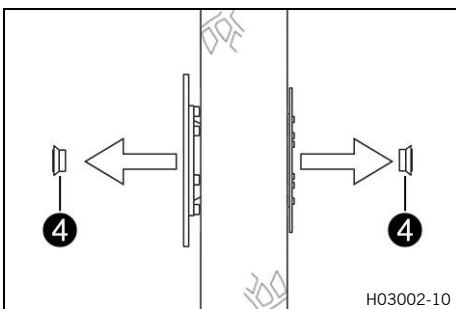
**i Info**  
Cover the components to protect them against damage.

**! 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.

- Hold the rear wheel and remove the wheel spindle. Take the rear wheel out of the swingarm.

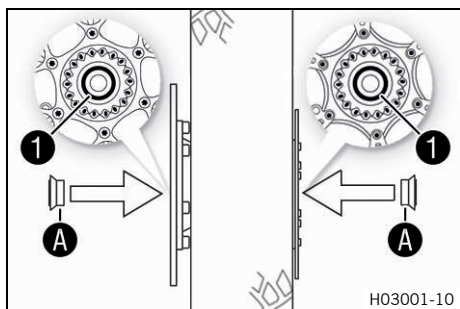
**i Info**  
Do not operate the foot brake lever when the rear wheel is removed.

- Remove spacers ④.



### 14.8.2 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.



### Main work

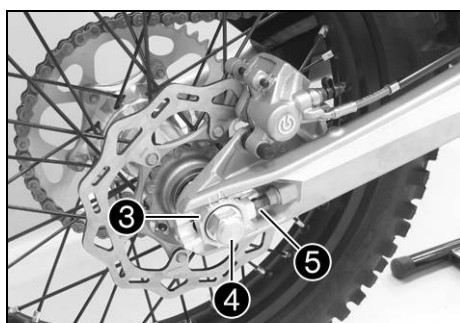
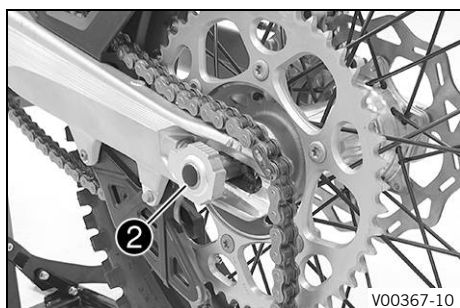
- Check the wheel bearing for damage and wear.
  - » If the wheel bearing is damaged or worn:
    - Change the rear wheel bearing. (📖 p. 147)
- Clean and grease shaft seal rings 1 and contact surface A of the spacers.

Long-life grease (📖 p. 360)

- Insert the spacers.
- Clean and grease the wheel spindle.

Long-life grease (📖 p. 360)

- Position the rear wheel and insert wheel spindle 2.
- Mount the chain.
  - ✓ The brake linings are correctly positioned.



- Position chain adjuster 3. Mount nut 4, but do not tighten it yet.
- Make sure that chain adjusters 3 are fitted correctly on adjusting screws 5.
- Check the chain tension. (📖 p. 150)
- Tighten nut 4.

### Guideline

|                         |         |                   |
|-------------------------|---------|-------------------|
| Nut, rear wheel spindle | M20x1.5 | 80 Nm (59 lbf ft) |
|-------------------------|---------|-------------------|

### Info

The wide adjustment range of the chain adjusters (32 mm (1.26 in)) enables different secondary ratios with the same chain length.  
Chain adjusters 3 can be turned by 180°.

- 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

- Remove the motorcycle from the lift stand. (📖 p. 12)

## 14.8.3 Changing the rear brake disc



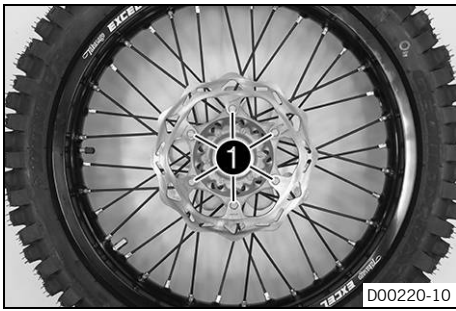
### Info

If the brake discs are changed, the brake linings must also be changed.

### Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 12)
- Remove the rear wheel. (📖 p. 144)





### Main work

#### (All standard EXC/XC-W models)

- Remove screws **1**. Remove the brake disc.
- Clean the contact surface of the brake disc.
- Position the new brake disc with the label facing outward.
- Mount and tighten screws **1**.

#### Guideline

|                           |    |  |
|---------------------------|----|--|
| Screw, rear<br>brake disc | M6 | 14 Nm (10.3 lbf ft)<br><b>Loctite®243™</b> |
|---------------------------|----|--|



#### (All Six Days models)

- Remove screws **1**. Remove the brake disc.
- Clean the contact surface of the brake disc.
- Position the new brake disc with the label facing outward.
- Mount and tighten screws **1**.

#### Guideline

|                           |    |  |
|---------------------------|----|--|
| Screw, rear<br>brake disc | M6 | 14 Nm (10.3 lbf ft)<br><b>Loctite®243™</b> |
|---------------------------|----|--|

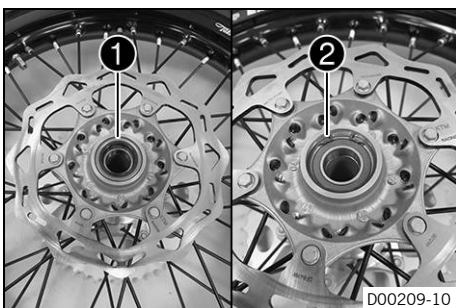
### Finishing work

- Install the rear wheel. (📖 p. 145)
- Remove the motorcycle from the lift stand. (📖 p. 12)

## 14.8.4 Changing the rear wheel bearing

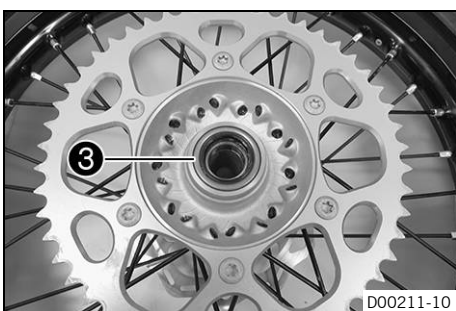
### Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 12)
- Remove the rear wheel. (📖 p. 144)

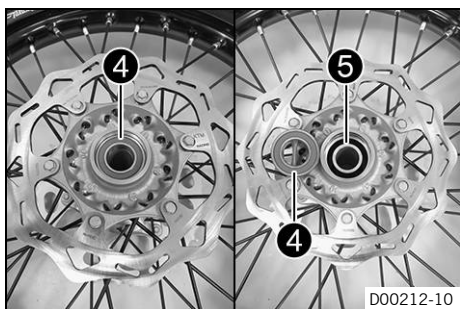


### Main work

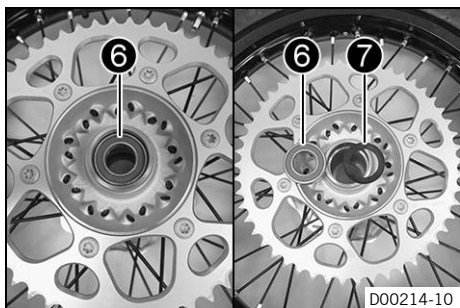
- Remove shaft seal ring **1**.
- Remove lock ring **2**.



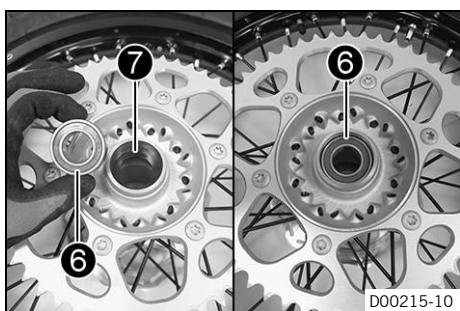
- Remove shaft seal ring **3**.



- Using a suitable tool, press bearing 4 out from the inside to the outside.
- Remove spacing tube 5.



- Using a suitable tool, press bearing 6 out from the inside to the outside.
- Check spacer washer 7 for damage and wear.
  - » If the spacer washer is damaged or worn:
    - Replace the spacer washer.

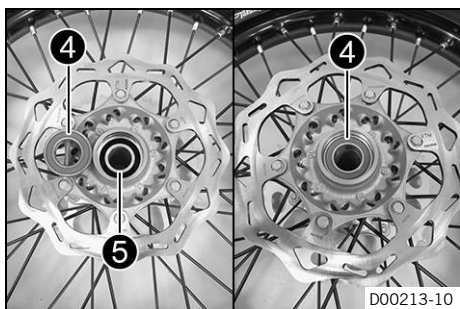


- Position spacer washer 7.
- Press new bearing 6 all the way in from the outside to the inside.

---

**i Info**  
Only press the bearing in via the outer ring otherwise the bearing will be damaged when it is pressed in.

---



- Clean, grease, and mount spacing tube 5.

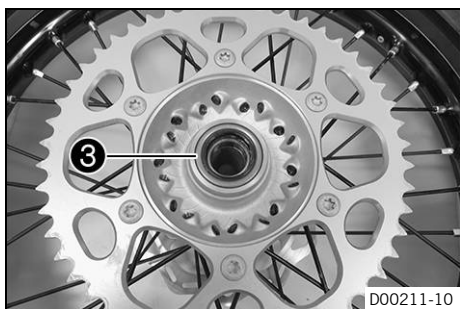
Long-life grease (📖 p. 360)

- Press new bearing 4 all the way in from the outside to the inside.

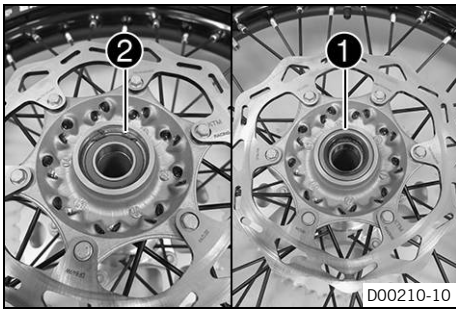
---

**i Info**  
Only press the bearing in via the outer ring otherwise the bearing will be damaged when it is pressed in.

---



- Grease new shaft seal ring 3 and press it in until it is flush.



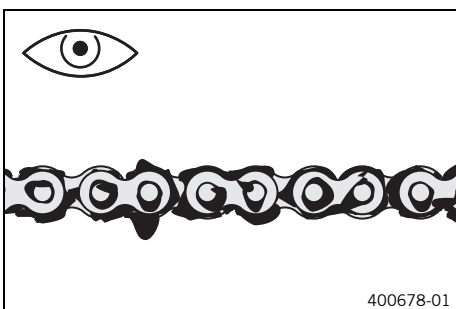
- Mount lock ring ②.
- ✓ The lock ring engages audibly.
- Grease new shaft seal ring ① and press it in until it is flush.

### Finishing work

- Install the rear wheel. (📖 p. 145)
- Remove the motorcycle from the lift stand. (📖 p. 12)



## 14.8.5 Checking the chain for dirt



- Check the chain for heavy soiling.
  - » If the chain is very dirty:
    - Clean the chain. (📖 p. 149)



## 14.8.6 Cleaning the chain



### Warning

**Danger of accidents** Oil or grease on the tires reduces the road grip.

- Remove the lubricant 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.

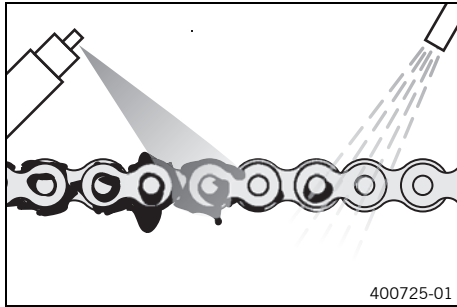


### Info

The service life of the chain depends largely on its maintenance.

### Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 12)



### Main work

- Rinse off loose dirt with a soft jet of water.
- Remove old grease residue with chain cleaner.

Chain cleaner (📖 p. 360)

- After drying, apply chain spray.

Off-road chain spray (📖 p. 361)

### Finishing work

- Remove the motorcycle from the lift stand. (📖 p. 12)

## 14.8.7 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 the motorcycle with a lift stand. (📖 p. 12)

### Main work

- Pull the chain at the end of the chain sliding piece upward to measure chain tension **A**.

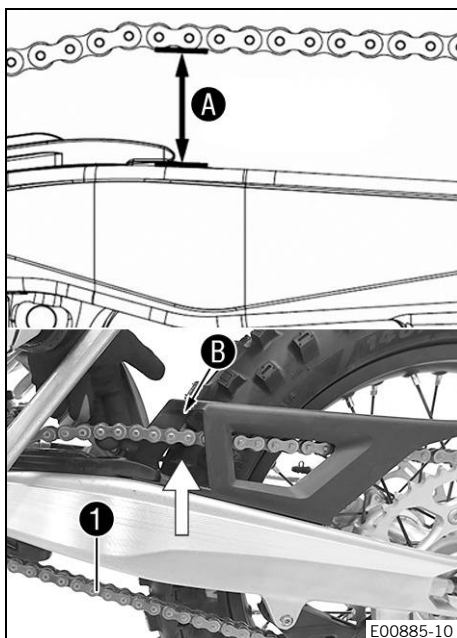


### Info

The bottom chain section **1** must be taut.

When the chain guard is mounted, it must be possible to pull up the chain at least to the point where it makes contact with chain guard **B**.

Chain wear is not always even, so you should repeat this measurement at different chain positions.



|               |                                 |
|---------------|---------------------------------|
| Chain tension | 55 ... 58 mm (2.17 ... 2.28 in) |
|---------------|---------------------------------|

- » If the chain tension does not meet specifications:
  - Adjust the chain tension. (📖 p. 153)

### Finishing work

- Remove the motorcycle from the lift stand. (📖 p. 12)

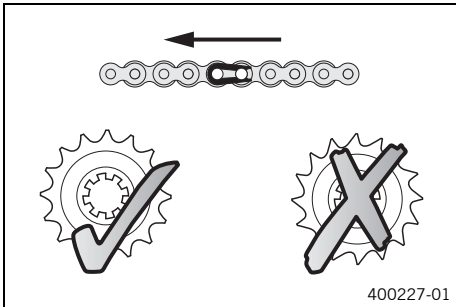
**14.8.8 Checking the chain, rear sprocket, engine sprocket, and chain guide**

**Preparatory work**

- Raise the motorcycle with a lift stand. (📖 p. 12)

**Main work**

- Shift the transmission to idle.
- 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. 154)



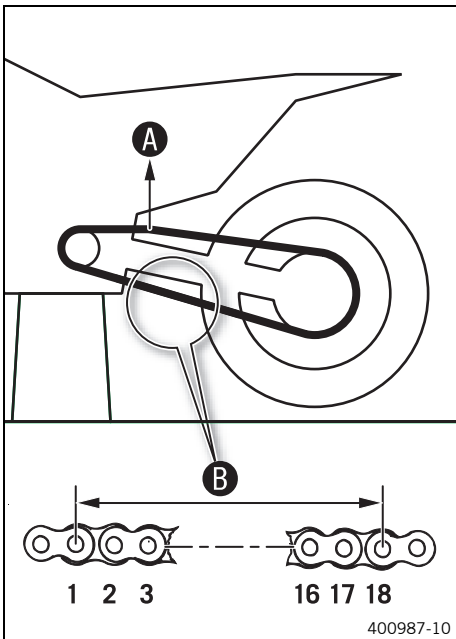
**i Info**  
The engine sprocket, rear sprocket and chain should always be replaced together.

- Pull at the top part of the chain with the specified weight **A**.

**Guideline**

|                                |                              |
|--------------------------------|------------------------------|
| Weight, chain wear measurement | 10 ... 15 kg (22 ... 33 lb.) |
|--------------------------------|------------------------------|

- Measure distance **B** of 18 chain rollers in the lower chain section.



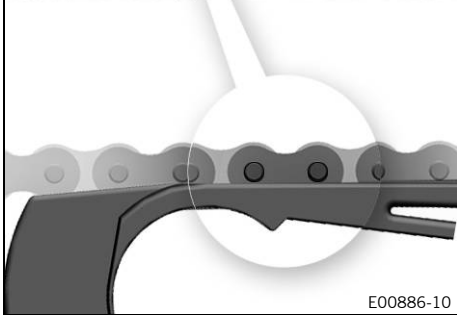
**i Info**  
Chain wear is not always even, so you should repeat this measurement at different chain positions.

|  |                   |
|--|-------------------|
| 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. 154)

**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.



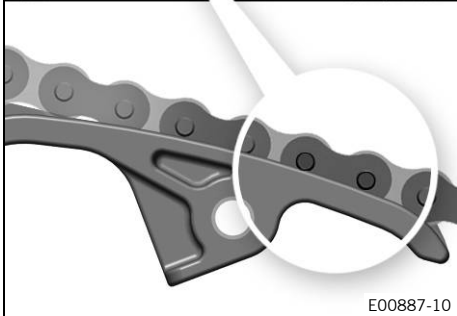


E00886-10

- Check the chain sliding guard for wear.
  - » If the lower edge of the chain pins is in line with, or below, the chain sliding guard:
    - Change the chain sliding guard.
- Check that the chain sliding guard is firmly seated.
  - » If the chain sliding guard is loose:
    - Tighten the screws on the chain sliding guard.

Guideline

|                            |    |  |
|----------------------------|----|--|
| Screw, chain sliding guard | M6 | 6 Nm (4.4 lbf ft)<br><b>Loctite®243™</b> |
|----------------------------|----|--|

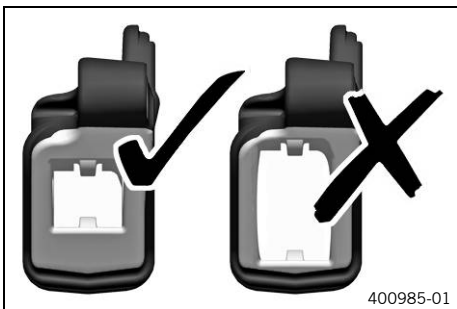


E00887-10

- Check the chain sliding piece for wear.
  - » If the lower edge of the chain pins is in line with or below the chain sliding piece:
    - Change the chain sliding piece.
- Check that the chain sliding piece is firmly seated.
  - » If the chain sliding piece is loose:
    - Tighten the screw on the chain sliding piece.

Guideline

|                            |    |                        |
|----------------------------|----|------------------------|
| Screw, chain sliding piece | M8 | 15 Nm<br>(11.1 lbf ft) |
|----------------------------|----|------------------------|



400985-01

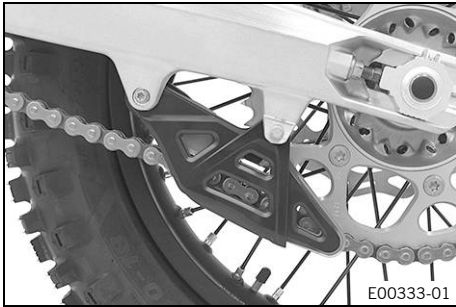
- Check the chain guide for wear.



**Info**

Wear can be seen on the front of the chain guide.

- » If the light part of the chain guide is worn:
  - Change the chain guide.



- Check that the chain guide is firmly seated.
  - » If the chain guide is loose:
    - Tighten the screws on the chain guide.

Guideline

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

### Finishing work

- Remove the motorcycle from the lift stand. (📖 p. 12)

## 14.8.9 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 the motorcycle with a lift stand. (📖 p. 12)
- Check the chain tension. (📖 p. 150)

### Main work

- Loosen nut ①.
- Loosen nuts ②.
- Adjust the chain tension by turning adjusting screws ③ left and right.

Guideline

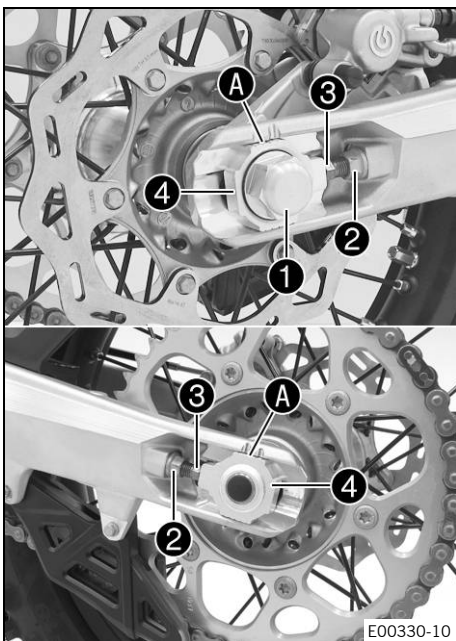
|               |                                 |
|---------------|---------------------------------|
| Chain tension | 55 ... 58 mm (2.17 ... 2.28 in) |
|---------------|---------------------------------|

Turn adjusting screws ③ on the left and right so that the markings on the left and right chain adjusters are in the same position relative to reference marks A. The rear wheel is then correctly aligned.

- Tighten nuts ②.
- Make sure that chain adjusters ④ are fitted correctly on adjusting screws ③.
- Tighten nut ①.

Guideline

|                         |         |                   |
|-------------------------|---------|-------------------|
| Nut, rear wheel spindle | M20x1.5 | 80 Nm (59 lbf ft) |
|-------------------------|---------|-------------------|



**i Info**

The wide adjustment range of the chain adjusters (32 mm (1.18 in)) enables different secondary ratios with the same chain length.  
Chain adjusters **4** can be turned by 180°.

**Finishing work**

- Remove the motorcycle from the lift stand. (📖 p. 12)

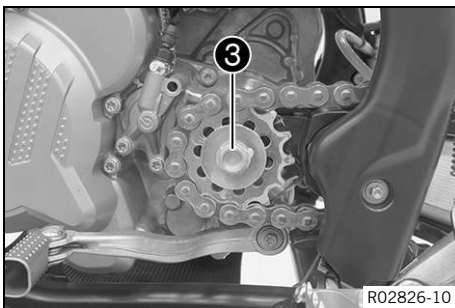
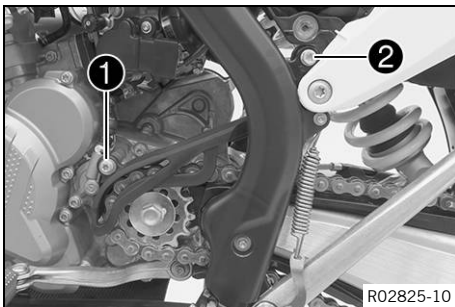
## 14.8.10 Changing the drivetrain kit

**Preparatory work**

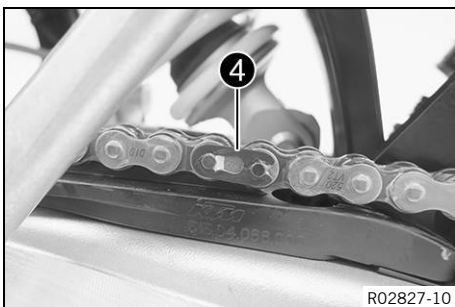
- Raise the motorcycle with a lift stand. (📖 p. 12)
- Remove the air filter box cover. (📖 p. 116)

**Main work**

- Remove screw **1**.
- Remove screw **2**.
- Take the engine sprocket cover off to the front.



- Have an assistant operate the rear brake.
- Remove screw **3** with the washer.



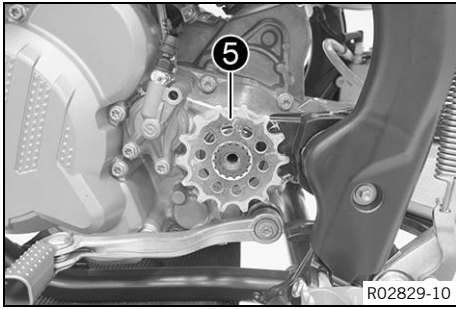
- Remove connecting link **4** of the chain.

**i Info**

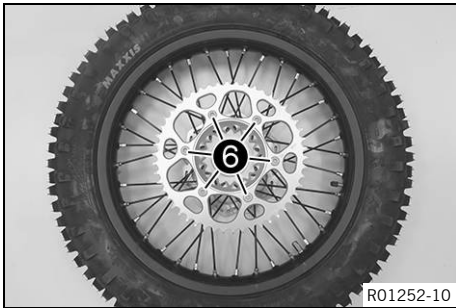
Cover the components to protect them against damage.

- Take off the chain.
- Remove the rear wheel. (📖 p. 144)





- Remove engine sprocket **5**.

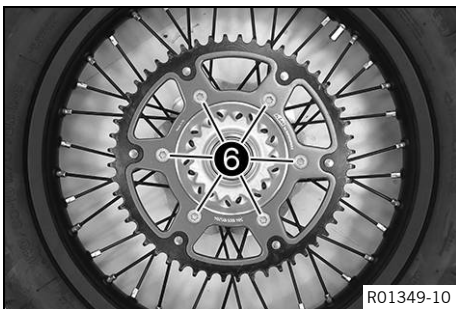


**(All standard EXC/XC-W models)**

- Remove fittings **6**. Take off the rear sprocket.
- Position the new rear sprocket. Mount and tighten the fittings.

Guideline

|                          |    |   |
|--------------------------|----|---|
| Nut, rear sprocket screw | M8 | 35 Nm (25.8 lbf ft)<br><b>Loctite®2701™</b> |
|--------------------------|----|---|

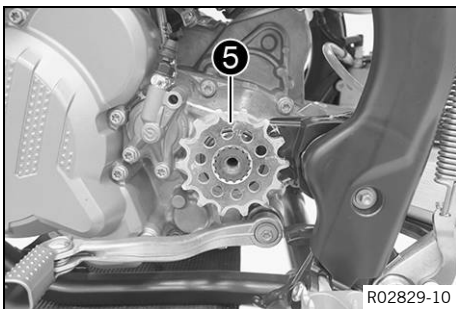


**(All Six Days models)**

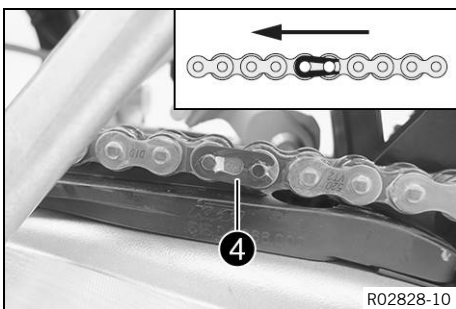
- Remove fittings **6**. Take off the rear sprocket.
- Position the new rear sprocket. Mount and tighten the fittings.

Guideline

|                          |    |   |
|--------------------------|----|---|
| Nut, rear sprocket screw | M8 | 35 Nm (25.8 lbf ft)<br><b>Loctite®2701™</b> |
|--------------------------|----|---|



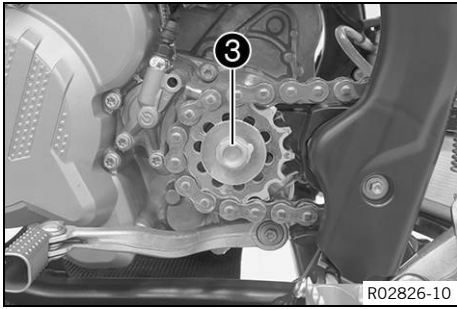
- Slide new engine sprocket **5** onto the countershaft.
- Install the rear wheel. (📖 p. 145)



- Mount the new chain.
- Connect the chain with connecting link **4**.

Guideline

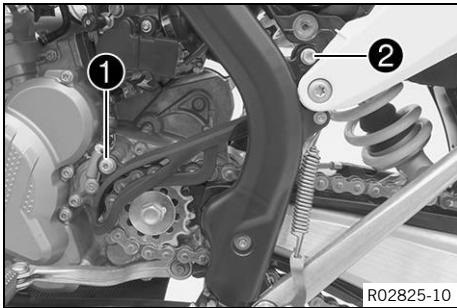
The closed side of the chain joint lock must face in the direction of travel.



- Have an assistant operate the rear brake.
- Mount and tighten screw ③ with the washer.

Guideline

|                                    |     |   |
|------------------------------------|-----|---|
| Screw, drive chain engine sprocket | M10 | 60 Nm (44.3 lbf ft)<br><b>Loctite®2701™</b> |
|------------------------------------|-----|---|



- Position the engine sprocket cover.
- Mount and tighten screw ①.

Guideline

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

- Mount and tighten screw ②.

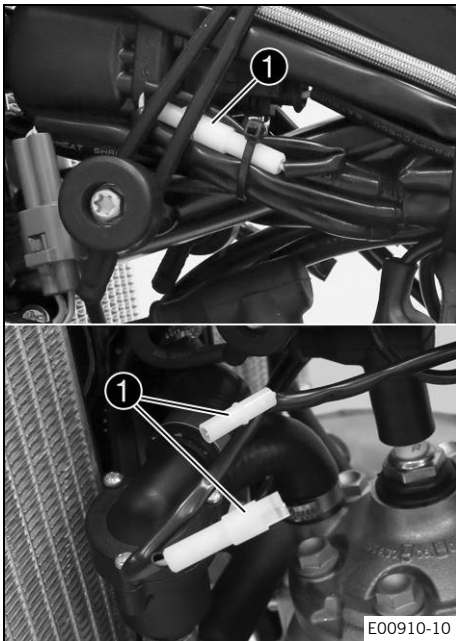
Guideline

|                              |    |                     |
|------------------------------|----|---------------------|
| Screw, engine sprocket cover | M8 | 20 Nm (14.8 lbf ft) |
|------------------------------|----|---------------------|

**Finishing work**

- Install the air filter box cover. (📖 p. 116)
- Check the chain tension. (📖 p. 150)
- Remove the motorcycle from the lift stand. (📖 p. 12)

## 15.1 Ignition curve plug-in connector



Plug-in connector **1** of the ignition timing map adjustment is located on the frame under the fuel tank.

### **i** Info

The ignition timing map connector has no function in the homologated (restricted) condition of the motorcycle.

### Possible states

- Soft – The plug-in connector of the ignition timing map adjustment is disconnected to achieve better rideability.
- Performance – The plug-in connector of the ignition timing map adjustment is joined to achieve higher performance.

## 15.2 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.

### Preparatory work

#### (All EXC models)

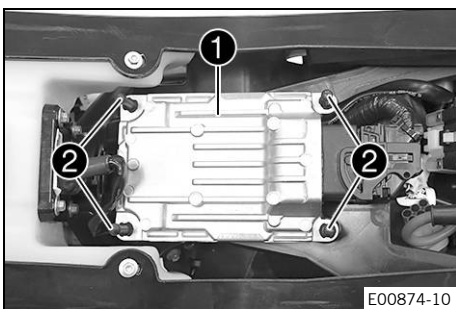
- Press and hold the kill switch  $\otimes$  while the engine is idling until the engine stops.

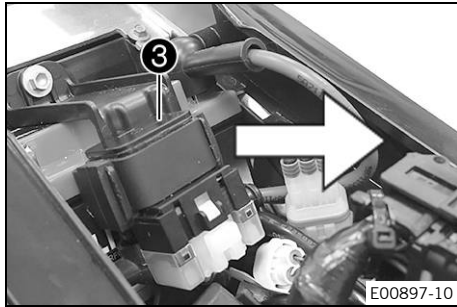
#### (All XC-W models)

- Press and hold the kill switch  $\otimes$  while the engine is idling until the engine stops.
- Remove the seat. (📖 p. 121)

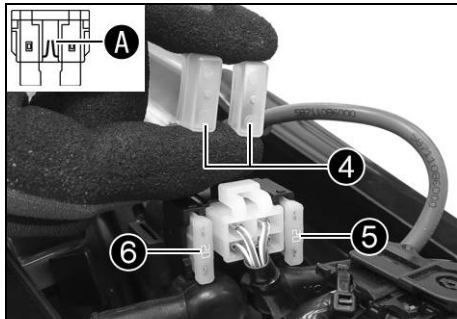
### Main work

- Pull the EFI control unit **1** upward off the rubber plugs **2** and hang to the side.





- Pull starter relay ③ from the holder.



- Take off protection caps ④.
- Remove faulty main fuse ⑤.

**i Info**

A faulty fuse has a burned-out fuse wire **A**.  
A spare fuse **6** is located in the starter relay.

- Install a new main fuse.

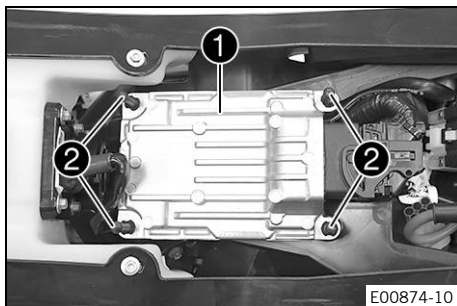
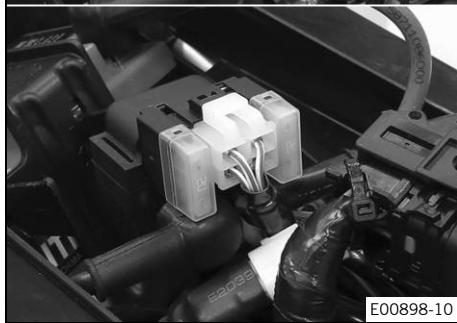
Fuse (58011109120) (📖 p. 317)

- Check that the electrical system is functioning properly.

**i Tip**

Insert a spare fuse so that it is available if needed.

- Attach the protection caps ④.
- Mount the starter relay ③ onto the holder and route the cable.



- Mount the EFI control unit ① on the rubber lugs ②.

**Finishing work**

- Mount the seat. (📖 p. 121)

## 15.3 Changing the fuses of individual power consumers

### **i** Info

The fuse box containing the fuses of individual power consumers is located under the seat.

#### Preparatory work

##### (All EXC models)

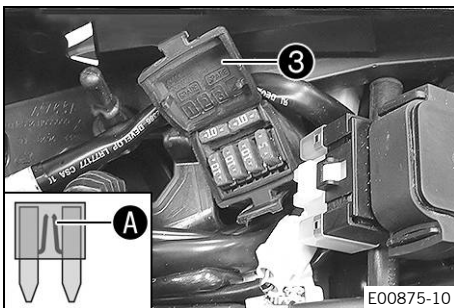
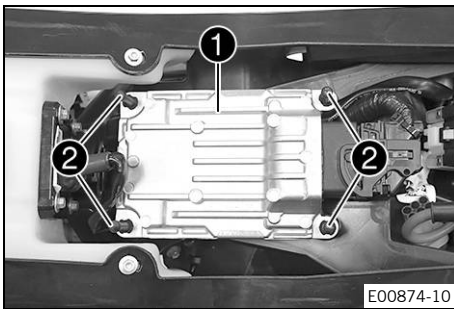
- Press and hold the kill switch  $\otimes$  while the engine is idling until the engine stops.

##### (All XC-W models)

- Press and hold the kill switch  $\otimes$  while the engine is idling until the engine stops.
- Remove the seat. (🗨 p. 121)

#### Main work

- Pull the EFI control unit **1** upward off the rubber plugs **2** and hang to the side.



- Open fuse box cover **3**.
- Remove the faulty fuse.

#### Guideline

##### (All EXC models)

|   |
|---|
| Fuse <b>1</b> - 10 A - EFI control unit, lambda sensor, oil pump, combination instrument, fuel injection, diagnostics connector |
| Fuse <b>2</b> - 10 A - horn, brake light, radiator fan (optional), turn signal (optional)                                       |
| Fuse <b>3</b> - 10 A - high beam, low beam, parking light, tail light, license plate lamp                                       |
| Fuse <b>4</b> - 5 A - fuel pump   |

##### (All XC-W models)

|  |
|--|
| Fuse <b>1</b> - 10 A - EFI control unit, oil pump, combination instrument, fuel injection, diagnostics connector |
| Fuse <b>2</b> - 10 A - radiator fan (optional)   |
| Fuse <b>3</b> - 10 A - low beam, parking light, tail light   |
| Fuse <b>4</b> - 5 A - fuel pump  |

|                                      |
|--------------------------------------|
| Fuses <b>res</b> - 10 A - spare fuse |
|--------------------------------------|

### **i** Info

A faulty fuse has a burned-out fuse wire **A**.



## Warning

**Fire hazard** Incorrect fuses overload the electrical system.

- Only use fuses with the required ampere value.
- Do not bypass or repair fuses.

- Insert spare fuse with the correct rating only.

|                               |
|-------------------------------|
| Fuse (75011088010) (📖 p. 317) |
|-------------------------------|

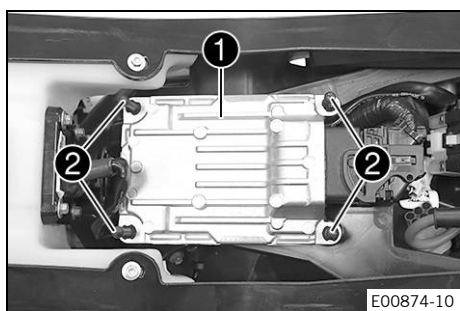
|                               |
|-------------------------------|
| Fuse (75011088005) (📖 p. 317) |
|-------------------------------|



## 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 ❸.
- Mount the EFI control unit ❶ on the rubber lugs ❷.



E00874-10

## Finishing work

- Mount the seat. (📖 p. 121)

## 15.4 Disconnecting the negative cable of the battery

### Preparatory work

#### (All EXC models)

- Press and hold the kill switch ☒ while the engine is idling until the engine stops.

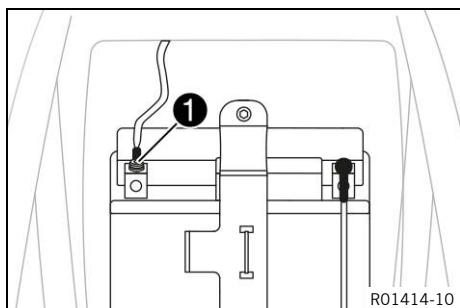
#### (All XC-W models)

- Press and hold the kill switch ☒ while the engine is idling until the engine stops.

- Remove the seat. (📖 p. 121)

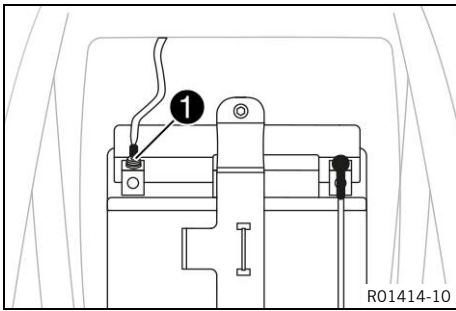
### Main work

- Disconnect negative cable ❶ of the battery.



R01414-10

## 15.5 Connecting the negative cable of the battery



### Main work

- Connect negative cable ① of the battery.

### Guideline

|                         |    |                         |
|-------------------------|----|-------------------------|
| Screw, battery terminal | M5 | 2.5 Nm<br>(1.84 lbf ft) |
|-------------------------|----|-------------------------|

### Finishing work

- Mount the seat. (📖 p. 121)



## 15.6 Removing the battery



### Note

**Environmental hazard** Batteries contain environmentally-hazardous materials.

- Do not dispose of batteries as household waste.
- Dispose of 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.

### Preparatory work

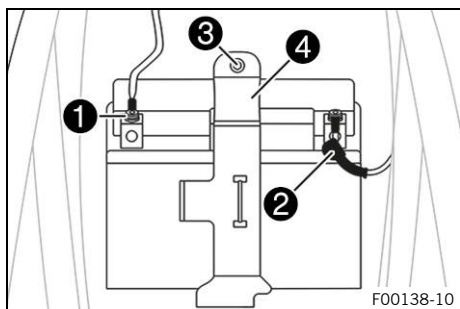
#### (All EXC models)

- Press and hold the kill switch ☒ while the engine is idling until the engine stops.

#### (All XC-W models)

- Press and hold the kill switch ☒ while the engine is idling until the engine stops.
- Remove the seat. (📖 p. 121)





## Main work



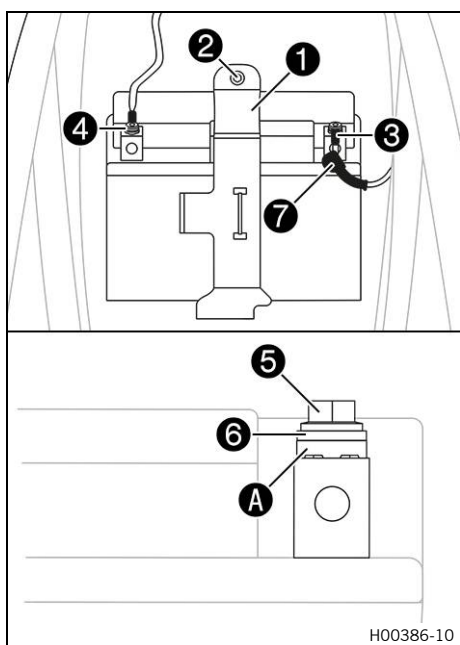
### Warning

**Risk of injury** Batteries contain harmful substances.

- Keep batteries out of the reach of children.
- Keep sparks and open flames away from the batteries.
- Only charge batteries in well-ventilated rooms.
- Maintain a minimum clearance from inflammable materials when charging batteries.  
Minimum clearance 1 m (3 ft)
- Do not charge deeply discharged batteries if charge is already below the minimum voltage.  
Minimum voltage before the start of the charge 9 V
- Dispose of batteries with less than the minimum voltage correctly.

- Disconnect negative cable ① from the battery.
- Pull back positive terminal cover ② and disconnect the positive cable from the battery.
- Remove screw ③.
- Pull holding bracket ④ forward and remove battery toward the top.

## 15.7 Installing the battery



## Main work

- Insert the battery into the battery compartment with the terminals facing forward and secure with holding bracket ①.

Battery (HJTZ5S-FP) (📖 p. 317)

- Mount and tighten screw ②.

Guideline

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

- Connect positive cable ③ to the battery.

Guideline

|                         |    |                      |
|-------------------------|----|----------------------|
| Screw, battery terminal | M5 | 2.5 Nm (1.84 lbf ft) |
|-------------------------|----|----------------------|

Contact disks **A** must be mounted under the screw ⑤ and the cable lug ⑥ with the claws toward the battery terminal.

- Slide positive terminal cover ⑦ over the positive terminal.
- Connect negative cable ④ to the battery.

Guideline

|                         |    |                      |
|-------------------------|----|----------------------|
| Screw, battery terminal | M5 | 2.5 Nm (1.84 lbf ft) |
|-------------------------|----|----------------------|



Contact disks **A** must be mounted under the screw **5** and the cable lug **6** with the claws toward the battery terminal.

#### Finishing work

- Mount the seat. (📖 p. 121)



## 15.8 Recharging the battery



### Warning

**Risk of injury** Batteries contain harmful substances.

- Keep batteries out of the reach of children.
- Keep sparks and open flames away from the batteries.
- Only charge batteries in well-ventilated rooms.
- Maintain a minimum clearance from inflammable materials when charging batteries.  
Minimum clearance 1 m (3 ft)
- Do not charge deeply discharged batteries if charge is already below the minimum voltage.  
Minimum voltage before the start of the charge 9 V
- Dispose of batteries with less than the minimum voltage correctly.



### Note

**Environmental hazard** Batteries contain environmentally-hazardous materials.

- Do not dispose of batteries as household waste.
- Dispose of 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 when there is no load on the battery, it discharges steadily.

The charging level and the method of charging are very important for the service life of the battery.

Rapid recharging with a high charging current shortens the service life of the battery.

If the charging current, charging voltage, or charging time are exceeded, the battery will be destroyed.


If the battery is depleted by repeated starting, the battery must be charged immediately.

If the battery is left in a discharged state for an extended period, it will become over-discharged and sulfated, destroying the battery.


The battery is maintenance-free.

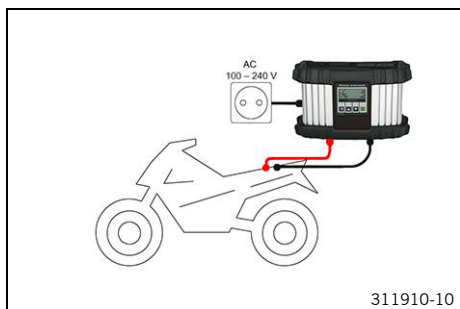
#### Preparatory work

##### (All EXC models)

- Press and hold the kill switch  while the engine is idling until the engine stops.

##### (All XC-W models)

- Press and hold the kill switch  while the engine is idling until the engine stops.
- Remove the seat. (📖 p. 121)
- Disconnect the negative cable of the battery. (📖 p. 160)



## Main work

- Connect the battery charger to the battery. Adjust the battery charger.

EU battery charger **XCharge-professional** (00029095050)  
(📖 p. 362)

## Alternative 1

US battery charger **XCharge-professional**  
(00029095051) (📖 p. 363)

## Alternative 2

UK battery charger **XCharge-professional**  
(00029095052) (📖 p. 363)

## Alternative 3

CH battery charger **XCharge-professional**  
(00029095053) (📖 p. 363)

## Info

Follow the instructions of the charger and the manual.

- Disconnect the battery charger after charging the battery.

## Guideline

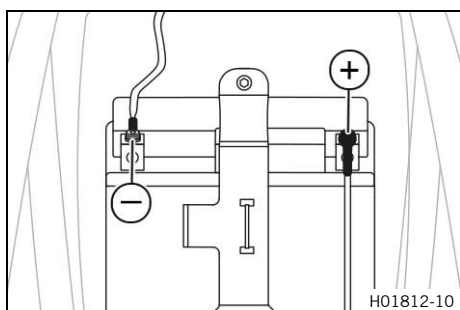
The charging current, charging voltage, and charging time must not be exceeded.

|  |          |
|--|----------|
| Charge the battery regularly when the motorcycle is not in use | 3 months |
|--|----------|

## Finishing work

- Connect the negative cable of the battery. (📖 p. 161)
- Mount the seat. (📖 p. 121)

## 15.9 Checking the charging voltage



## Condition

The battery must be fully functional and completely charged.

- Carry out the start procedure. (📖 p. 12)
- **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 the voltage regulator.

## 15.10 Checking the open-circuit current

### Preparatory work

#### (All EXC models)

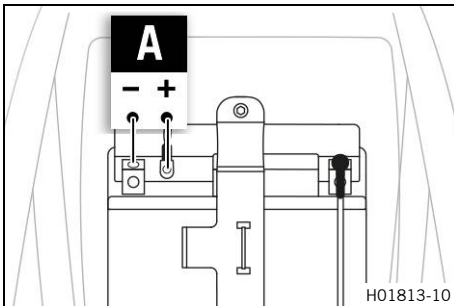
- Press and hold the kill switch ☒ while the engine is idling until the engine stops.

#### (All XC-W models)

- Press and hold the kill switch ☒ while the engine is idling until the engine stops.
- Remove the seat. (📖 p. 121)

### Main work

- Disconnect the negative cable of the battery.
- Measure the current between battery ground (–) and the negative cable.



### Info

The value of the open-circuit current only applies to vehicles in their original state without additional power consumers.

|                              |          |
|------------------------------|----------|
| 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.



## 15.11 Checking the starter relay

### Preparatory work

#### (All EXC models)

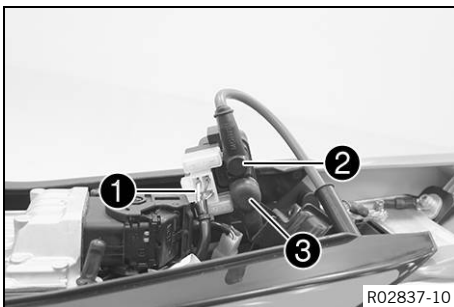
- Press and hold the kill switch ☒ while the engine is idling until the engine stops.

#### (All XC-W models)

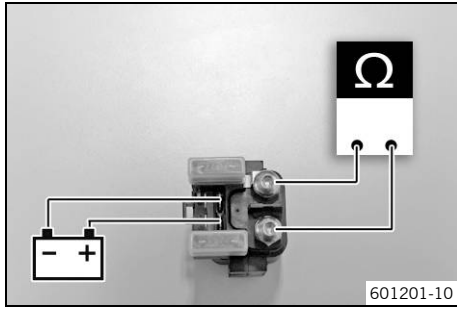
- Press and hold the kill switch ☒ while the engine is idling until the engine stops.
- Remove the seat. (📖 p. 121)
- Remove the air filter box cover. (📖 p. 116)

### Main work

- Disconnect the negative cable of the battery.
- Pull the starter relay off of the bracket.
- Unplug connector ①.
- Disconnect cables ② and ③ on the starter relay.



# 15 WIRING HARNESS, BATTERY

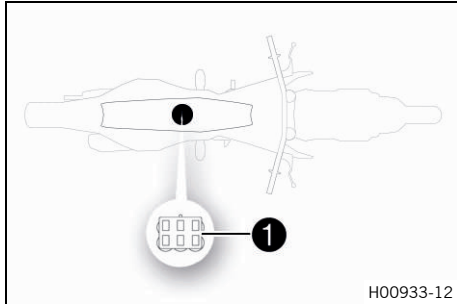


- Connect the starter relay to a 12 V power supply as per the figure.
- Measure the resistance between the specified points.

|                            |     |
|----------------------------|-----|
| Resistance of open circuit | 0 Ω |
|----------------------------|-----|

- » If the value displayed does not meet specifications:
  - Change the starter relay.

## 15.12 Diagnostics connector



Diagnostics connector **1** is located under the seat.

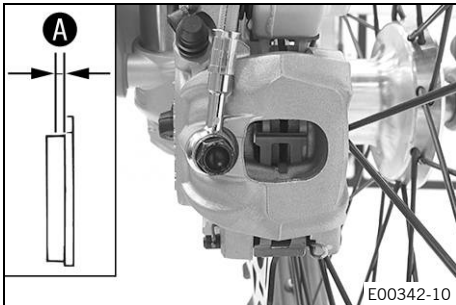
## 16.1 Checking the front brake linings



### Warning

**Danger of accidents** Worn-out brake linings reduce the braking effect.

- Ensure that worn-out brake linings are replaced immediately.



- 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 front brake linings. (🔧 p. 167)
- Check the brake linings for damage and cracking.
  - » If damage or wear is encountered:
    - Change the front brake linings. (🔧 p. 167)

## 16.2 Changing the front brake linings



### Warning

**Danger of accidents** Incorrect maintenance 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.

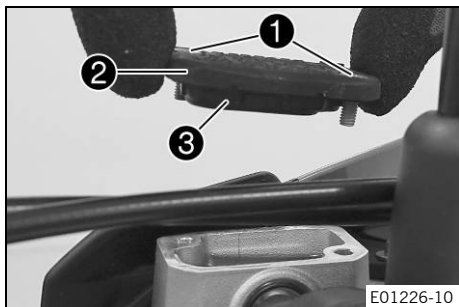


## Info

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.

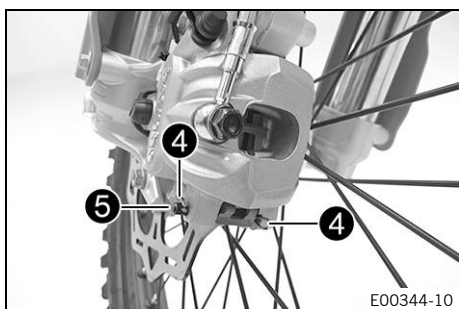


- Move the brake fluid reservoir mounted on the handlebar to a horizontal position.
- Remove screws **1**.
- Take off cover **2** with membrane **3**.
- Manually press the brake caliper toward the brake disc to push back the brake pistons. Ensure that brake fluid does not flow out of the brake fluid reservoir, if necessary extract excess.

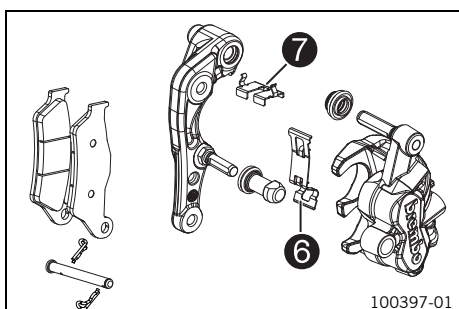


## Info

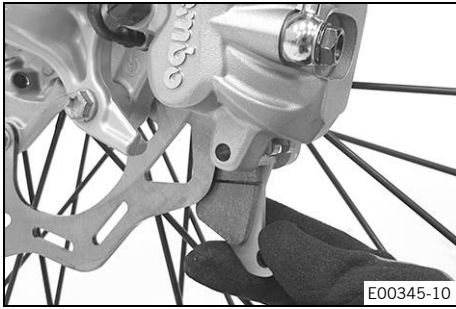
Make sure that you do not press the brake caliper against the spokes when pushing back the brake pistons.



- Remove cotter pin **4**, pull out pin **5**, and remove the brake linings.
- Clean the brake caliper and brake caliper support.



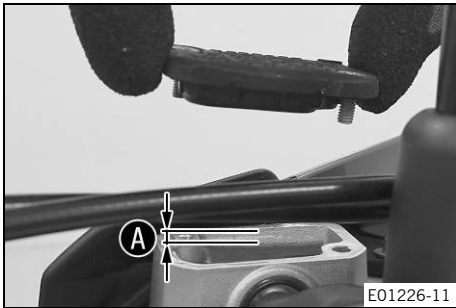
- Check that leaf spring **6** in the brake caliper and sliding plate **7** in the brake caliper support are seated correctly.



- Insert the new brake linings, insert the pin, and mount the cotter pins.

**i Info**  
Always change the brake linings in pairs.

- 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 quantity to level **A**.

Guideline

|  |               |
|--|---------------|
| Level <b>A</b> (brake fluid level below reservoir rim) | 5 mm (0.2 in) |
|--|---------------|

Brake fluid DOT 4 / DOT 5.1 (📖 p. 358)

- Position cover with membrane. Mount and tighten the screws.

**i Info**  
Clean up overflowed or spilled brake fluid immediately with water.

## 16.3 Checking the free travel of the hand brake lever

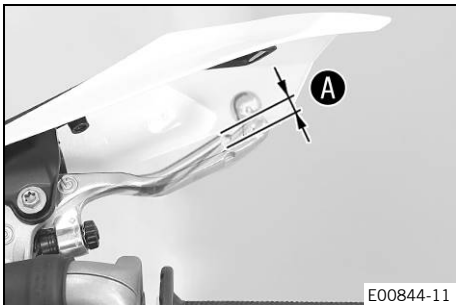


### Warning

**Danger of accidents** The brake system fails in the event of overheating.

If there is no free travel on the hand brake lever, pressure builds up on the front brake circuit.

- Set the free travel on the hand brake lever in accordance with the specification.

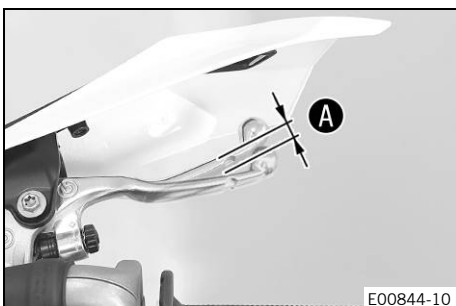


### (All EXC models)

- Push the hand brake lever to the handlebar and check free travel **A**.

|                                 |   |
|---------------------------------|---|
| Free travel of hand brake lever | $\geq 3 \text{ mm } (\geq 0.12 \text{ in})$ |
|---------------------------------|---|

- » If the free travel does not match the specification:
  - Adjust the free travel of the hand brake lever. (📖 p. 170)



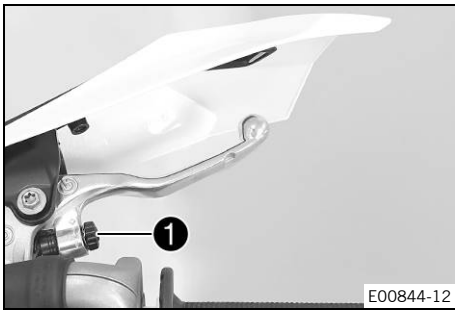
### (All XC-W models)

- Push the hand brake lever forward and check free travel **A**.

|                                 |   |
|---------------------------------|---|
| Free travel of hand brake lever | $\geq 3 \text{ mm } (\geq 0.12 \text{ in})$ |
|---------------------------------|---|

- » If the free travel does not match the specification:
  - Adjust the basic position of the hand brake lever. (📖 p. 170)

## 16.4 Adjusting free travel of hand brake lever (All EXC models)

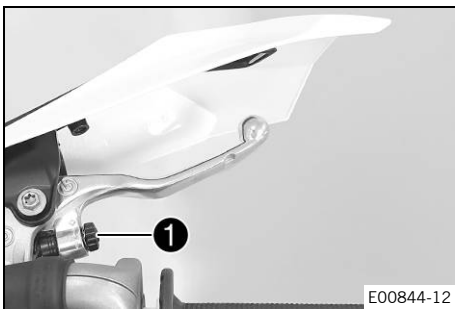


- Check the free travel of the hand brake lever. (📖 p. 169)
- Adjust the free travel of the hand brake lever with the adjustment screw ①.

### **i** Info

Turn the adjusting screw clockwise to reduce free travel. The pressure point moves away from the handlebar.  
Turn the adjusting screw counterclockwise to increase free travel. The pressure point moves towards the handlebar.  
The range of adjustment is limited.  
Turn the adjusting screw by hand only, and do not apply any force.  
Do not make any adjustments while riding!

## 16.5 Adjusting the basic position of the hand brake lever (All XC-W models)



- Check the free travel of the hand brake lever. (📖 p. 169)
- Adjust the basic setting of the hand brake lever to your hand size by turning adjusting screw ①.

### **i** Info

Turn the adjusting screw clockwise to increase the distance between the hand brake lever and the handlebar.  
Turn the adjusting screw counterclockwise to decrease the distance between the hand brake lever and the handlebar.  
The range of adjustment is limited.  
Turn the adjusting screw by hand only, and do not apply any force.  
Do not make any adjustments while riding!

## 16.6 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.

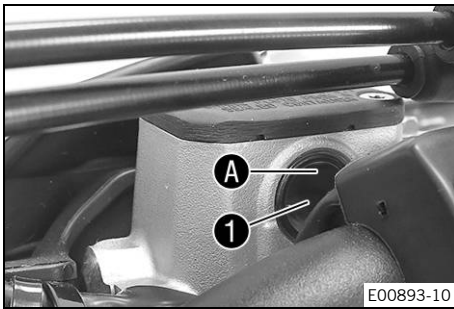


### **Warning**

**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 level viewer ①.
  - » If an air bubble is visible in upper range of the level viewer A:
  - Add front brake fluid. (📖 p. 171)

## 16.7 Adding 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

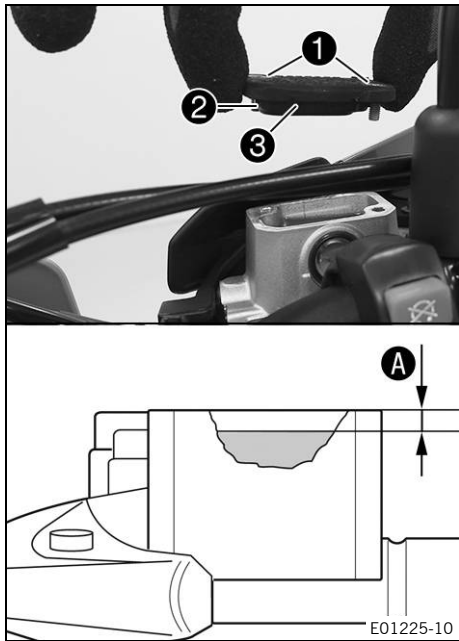
Never use DOT 5 brake fluid. It is silicone-based and purple in color. Oil seals and brake lines are not designed for DOT 5 brake fluid.

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. 167)



## 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 to level A.

### Guideline

|   |               |
|---|---------------|
| Level A (brake fluid level below reservoir rim) | 5 mm (0.2 in) |
|---|---------------|

|  |
|--|
| Brake fluid DOT 4 / DOT 5.1 (見 p. 358) |
|--|

- Position the cover with the membrane. Mount and tighten the screws.

### Info

Clean up overflowed or spilled brake fluid immediately with water.

## 16.8 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.

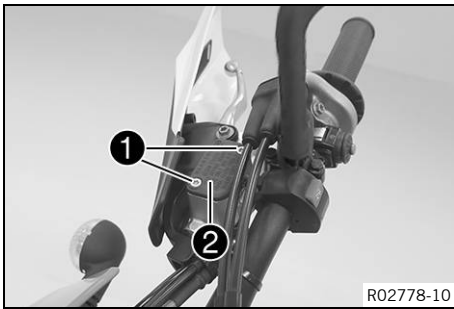


### Info

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.

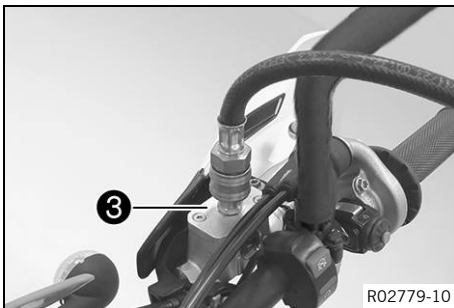
Only use clean brake fluid from a sealed container.



- Move the brake fluid reservoir mounted on the handlebar to a horizontal position.
- Cover painted parts.
- Remove screws **1**.
- Take off cover **2** with the membrane.
- Extract the old brake fluid out of the brake fluid reservoir using a syringe and fill with fresh brake fluid.

|                                  |
|----------------------------------|
| Syringe (50329050000) (📖 p. 364) |
|----------------------------------|

|  |
|--|
| Brake fluid DOT 4 / DOT 5.1 (📖 p. 358) |
|--|

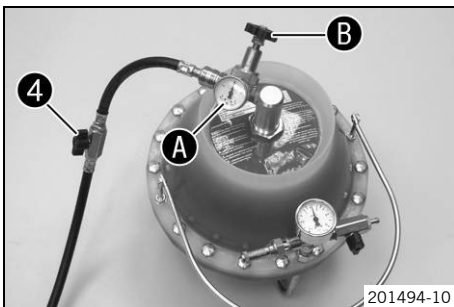


- Mount bleeder cover **3**.

|  |
|--|
| Bleeder cover (00029013005) (📖 p. 362) |
|--|

- Connect the bleeding device.

|  |
|--|
| Bleeding device (00029013100) (📖 p. 362) |
|--|



- Open shut-off valve **4**.

**i** **Info**

Follow the instructions in the Owner's Manual of the bleeding device.

- Ensure that the filling pressure is set on pressure gauge **A**. Correct the filling pressure on pressure regulator **B** if necessary.

**Guideline**

|                  |                               |
|------------------|-------------------------------|
| Filling pressure | 2 ... 2.5 bar (29 ... 36 psi) |
|------------------|-------------------------------|

- Pull off protection cap **5** of the brake caliper bleeder screw. Connect the bleeder bottle hose.

|  |
|--|
| Bleeding device (00029013100) (📖 p. 362) |
|--|

- Open bleeder screw **6** by approx. one half turn.

**i** **Info**

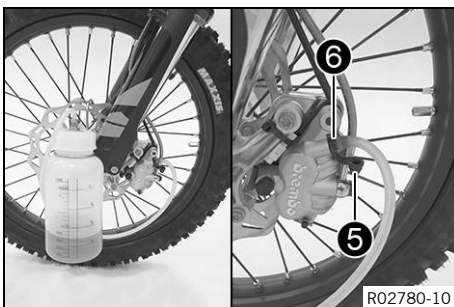
Drain until fresh brake fluid emerges in the bleeder bottle hose without bubbles.

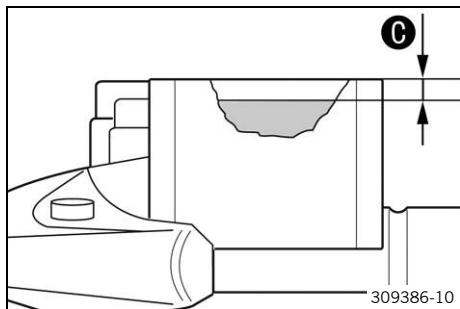
- Tighten the bleeder screw.
- Close shut-off valve **4**.
- Open the bleeder screw again until brake fluid stops emerging.

**i** **Info**

Overfilling of the brake fluid reservoir is prevented.

- Tighten the bleeder screw. Remove the bleeder bottle hose. Attach the protection cap.
- Disconnect the bleeding device. Remove the bleeder cover.





- Add brake fluid up to level **C**.

Guideline

|                    |               |
|--------------------|---------------|
| Dimension <b>C</b> | 5 mm (0.2 in) |
|--------------------|---------------|

|  |
|--|
| Brake fluid DOT 4 / DOT 5.1 (📖 p. 358) |
|--|

- Position the cover with the membrane. Mount and tighten the screws.



**Info**

Clean up overflowed or spilled brake fluid immediately with water.

- Check the hand brake lever for a firm pressure point.

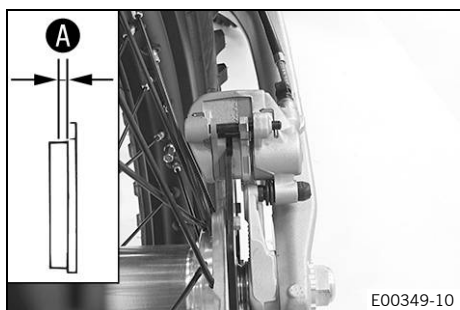
## 16.9 Checking the brake linings of the rear brake



**Warning**

**Danger of accidents** Worn-out brake linings reduce the braking effect.

- Ensure that worn-out brake linings are replaced immediately.



- 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 rear brake linings. (📖 p. 174)
- Check the brake linings for damage and cracking.
  - » If damage or wear is encountered:
    - Change the rear brake linings. (📖 p. 174)

## 16.10 Changing the rear brake linings



**Warning**

**Danger of accidents** Incorrect maintenance 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** 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.

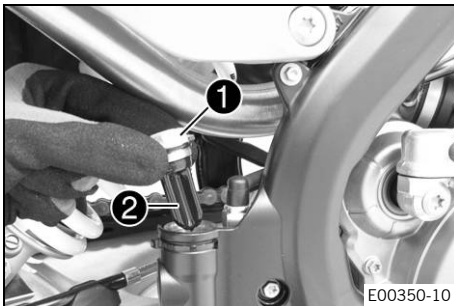


## Info

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.

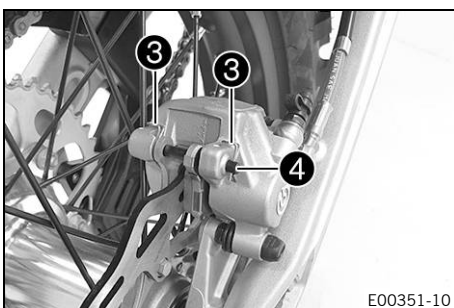


- Stand the vehicle upright.
- Remove screw cap ① with membrane ② and the O-ring.
- Press the brake piston back into the basic position and ensure that brake fluid does not flow out of the brake fluid reservoir; extract some if necessary.

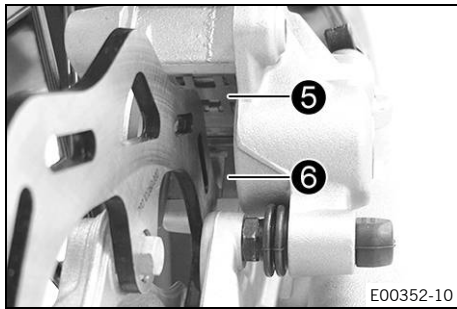


## Info

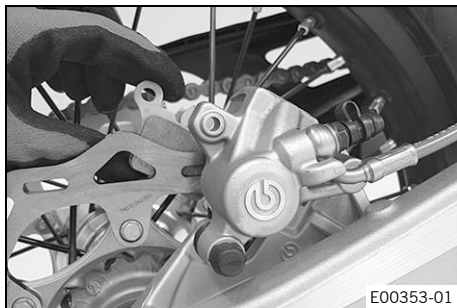
Make sure when pushing back the brake piston that you do not press the brake caliper against the spokes.



- Remove cotter pin ③, pull out pin ④, and remove the brake linings.
- Clean the brake caliper and brake caliper support.



- Check that leaf spring **5** in the brake caliper and sliding plate **6** in the brake caliper support are seated correctly.



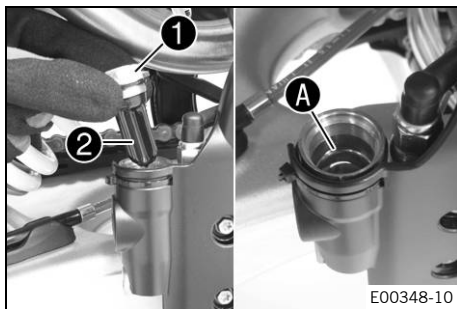
- Insert the new brake linings, insert the pin, and mount the cotter pins.



**Info**

Always change the brake linings in pairs.

- Operate the foot brake lever repeatedly until the brake linings are in contact with the brake disc and there is a pressure point.



- Add brake fluid to level **A**.

|  |
|--|
| Brake fluid DOT 4 / DOT 5.1 (📖 p. 358) |
|--|

- Mount screw cap **1** with membrane **2** and O-ring.



**Info**

Clean up overflowed or spilled brake fluid immediately with water.

## 16.11 Checking the free travel of foot brake lever

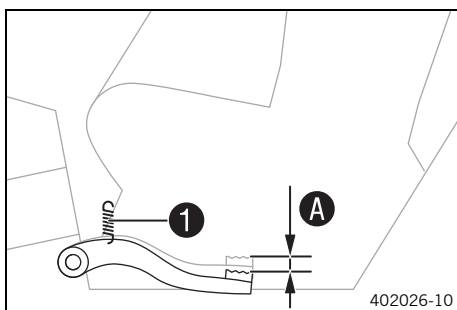


**Warning**

**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.



- Disconnect 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 meet specifications:

- Adjust the basic position of the foot brake lever. (📖 p. 177)

- Reconnect spring **1**.

## 16.12 Adjusting the basic position of the foot brake lever

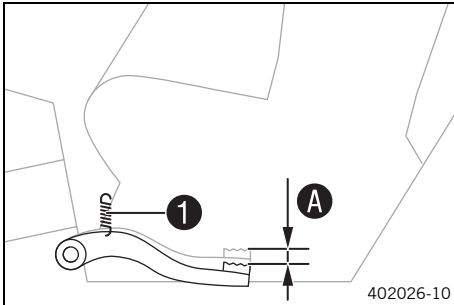


### Warning

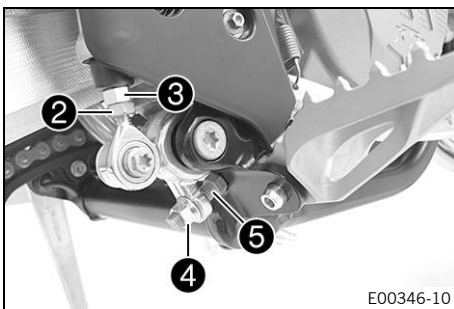
**Danger of accidents** The brake system fails in the event of overheating.

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.



- Disconnect spring **1**.



- Loosen nut **2** and, with push rod **3**, turn it back until you have maximum free travel.
- To adjust the basic position of the foot brake lever to individual requirements, loosen nut **4** and turn screw **5** accordingly.



### Info

The range of adjustment is limited.

- Turn push rod **3** accordingly until you have free travel **A**. 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

|                            |    |                     |
|----------------------------|----|---------------------|
| Nut, foot brake lever stop | M8 | 20 Nm (14.8 lbf ft) |
|----------------------------|----|---------------------|

- Hold push rod **3** and tighten nut **2**.

#### Guideline

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

- Reconnect spring **1**.





## 16.13 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 specified marking or the specified value, the brake system is leaking or the brake linings are worn down.

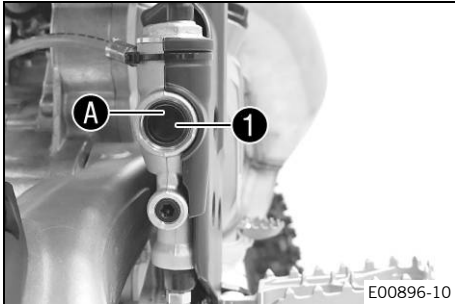
- Check the brake system and do not continue riding until the problem is eliminated.



### 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.



- Stand the vehicle upright.
- Check the brake fluid level in the viewer ①.
  - » If the fluid has dropped below marking A in the level viewer:
    - Add rear brake fluid. (🗨️ p. 178)

## 16.14 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 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**

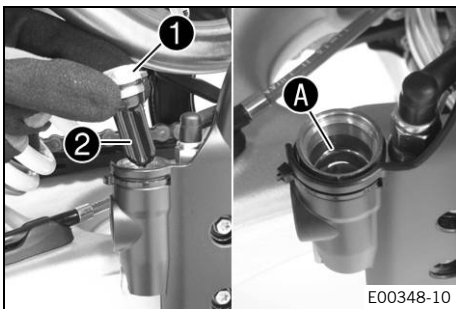
- Check the brake linings of the rear brake. (📖 p. 174)

**Main work**

- Stand the vehicle upright.
- Remove screw cap ① with membrane ② and the O-ring.
- Add brake fluid to level A.

Brake fluid DOT 4 / DOT 5.1 (📖 p. 358)

- Mount and tighten the screw cap with the membrane and O-ring.

**Info**

Clean up overflowed or spilled brake fluid immediately with water.

## 16.15 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.

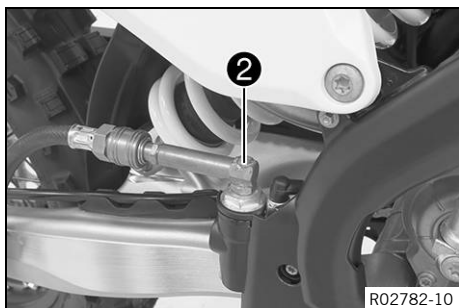
Only use clean brake fluid from a sealed container.



- Cover painted parts.
- Remove screw cap 1 with the membrane and the O-ring.
- Extract the old brake fluid out of the brake fluid reservoir using a syringe and fill with fresh brake fluid.

|                                   |
|-----------------------------------|
| Syringe (50329050000) (🗨️ p. 364) |
|-----------------------------------|

|   |
|---|
| Brake fluid DOT 4 / DOT 5.1 (🗨️ p. 358) |
|---|

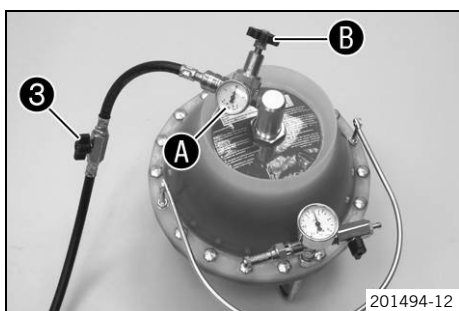


- Mount bleeder cover 2.

|   |
|---|
| Bleeder cover (00029013006) (🗨️ p. 362) |
|---|

- Connect the bleeding device.

|   |
|---|
| Bleeding device (00029013100) (🗨️ p. 362) |
|---|



- Open shut-off valve 3.

**i Info**

Follow the instructions in the Owner's Manual of the bleeding device.

- Ensure that the filling pressure is set on pressure gauge A. Correct the filling pressure on pressure regulator B if necessary.

Guideline

|                  |                               |
|------------------|-------------------------------|
| Filling pressure | 2 ... 2.5 bar (29 ... 36 psi) |
|------------------|-------------------------------|

- Pull off protection cap 4 of the bleeder screw. Connect the bleeder bottle hose.

|   |
|---|
| Bleeding device (00029013100) (🗨️ p. 362) |
|---|

- Open bleeder screw 5 by approx. one half turn.

**i Info**

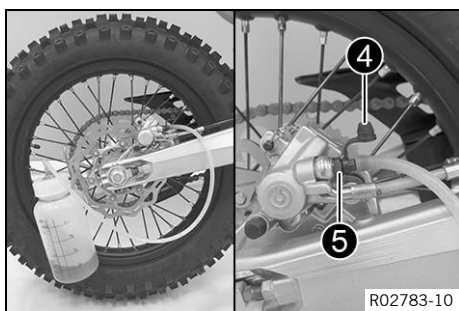
Drain until fresh brake fluid emerges in the bleeder bottle hose without bubbles.

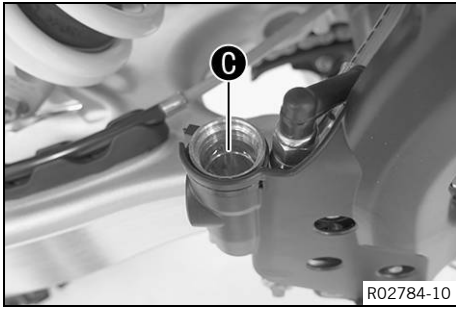
- Tighten the bleeder screw.
- Close shut-off valve 3.
- Open the bleeder screw again until brake fluid stops emerging.

**i Info**

Overfilling of the brake fluid reservoir is prevented.

- Tighten the bleeder screw. Remove the bleeder bottle hose. Attach the protection cap.
- Disconnect the bleeding device. Remove the bleeder cover.





- Stand the vehicle upright.
- Correct the brake fluid to marking **C**.

Brake fluid DOT 4 / DOT 5.1 (📖 p. 358)

- Mount and tighten the screw cap with the membrane and O-ring.

**Info**

Clean up overflowed or spilled brake fluid immediately with water.

- Check the foot brake lever for a firm pressure point.



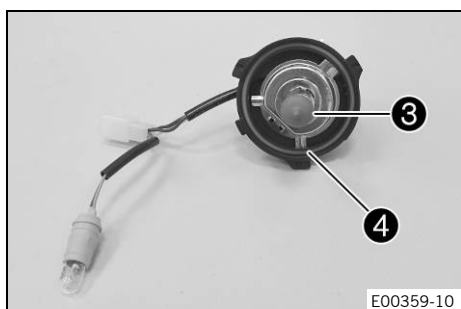
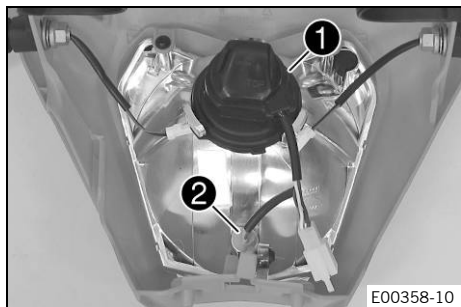
## 17.1 Changing the headlight bulb

### Note

**Damage to reflector** Grease on the reflector reduces the brightness.

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.



### Preparatory work

- Remove the headlight mask with the headlight. (📖 p. 135)

### Main work

- Turn protection cap ① together with the underlying bulb socket counterclockwise all the way and remove it.
- Pull bulb socket ② of the position light out of the reflector.

- Pull out headlight bulb ③.

- Insert the new headlight bulb.

Headlight (HS1/socket BX43t) (📖 p. 317)

- Insert the protection cap with the bulb socket into the reflector and turn it clockwise all the way.

### Info

Ensure that O-ring ④ is seated properly.

- Insert the bulb socket of the position light into the reflector.

### Finishing work

- Install the headlight mask with the headlight. (📖 p. 135)
- Check the headlight setting. (📖 p. 183)

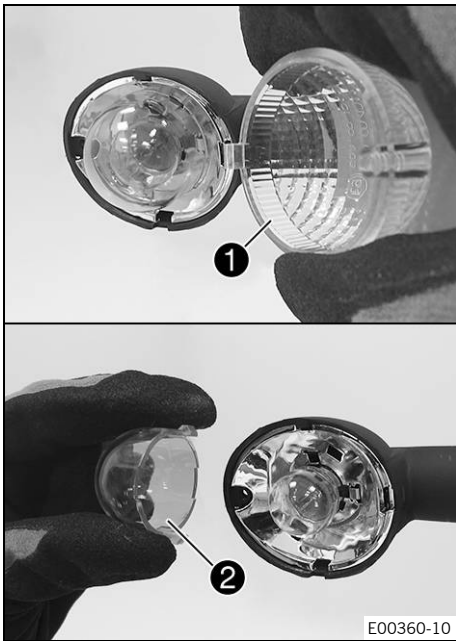
## 17.2 Changing the turn signal bulb (All EXC models)

### Note

**Damage to reflector** Grease on the reflector reduces the brightness.

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.



### Main work

- Remove the screw on the rear of the turn signal housing.
- Carefully remove turn signal glass ①.
- Lightly squeeze orange cap ② in the area of the holding lugs and take it off.
- Press the turn signal bulb lightly into the socket, turn it counterclockwise by about 30°, and take it out of the socket.

### Info

Do not touch the reflector with your fingers and keep it free from grease.

- Press the new turn signal bulb carefully into the socket and turn it clockwise until it stops.

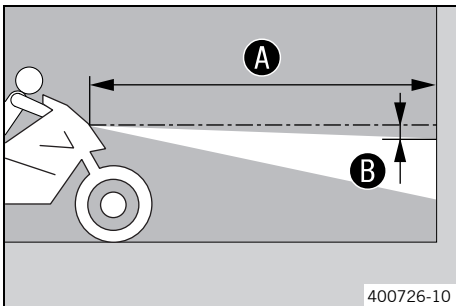
|  |
|--|
| Turn signal (R10W / socket BA15s) (📖 p. 317) |
|--|

- Mount the orange cap.
- Position the turn signal glass.
- Insert the screw and first turn counterclockwise until it engages in the thread with a small jerk. Tighten the screw lightly.

### Finishing work

- Check that the turn signal system is functioning properly.

## 17.3 Checking the headlight setting



- Position the vehicle upright on a horizontal surface in front of a light wall and make a marking at the height of the center of the low beam headlight.

- Make another mark at a distance ② under the first marking.

#### Guideline

|            |             |
|------------|-------------|
| Distance ② | 5 cm (2 in) |
|------------|-------------|

- Position the vehicle vertically at a distance ① away from the wall.

#### Guideline

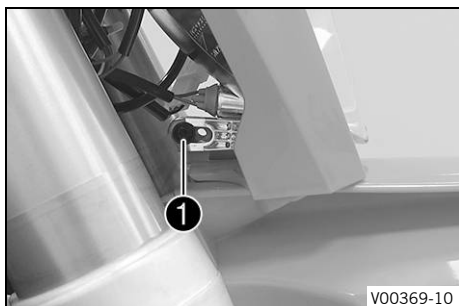
|            |             |
|------------|-------------|
| Distance ① | 5 m (16 ft) |
|------------|-------------|

- The rider now sits down on the motorcycle.
- Switch on the low beam.
- Check the headlight setting.

|  |
|--|
| The boundary between light and dark must be exactly on the lower mark for a motorcycle with rider. |
|--|

- » If the light-dark border does not meet specifications:
  - Adjust the headlight range. (📖 p. 184)

## 17.4 Adjusting the headlight range



### Preparatory work

- Check the headlight setting. (📖 p. 183)

### Main work

- Loosen screw ❶.
- Adjust the headlight range by pivoting the headlight.

### Guideline

The boundary between light and dark must be exactly on the lower marking for a motorcycle with rider (instructions on how to apply the marking: Checking the headlight setting).

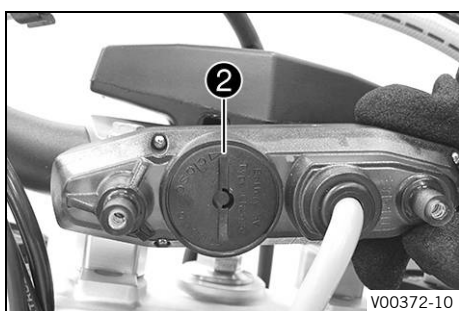
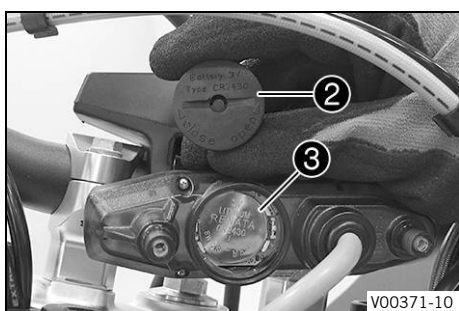
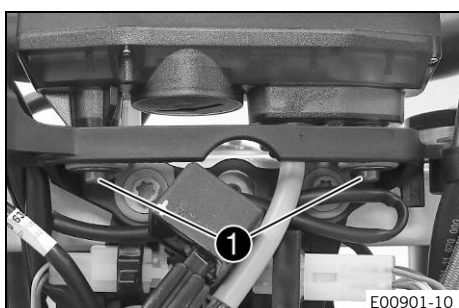


### Info

If you have a payload, you may have to correct the headlight range.

- Tighten screw ❶.

## 17.5 Changing the combination instrument



### Preparatory work

- Remove the headlight mask with the headlight. (📖 p. 135)

### Main work

- Remove screws ❶.
- Pull the combination instrument upward out of the holder.

- Using a coin, turn protection cap ❷ all the way counterclockwise and remove it.
- Remove combination instrument ❸.
- Insert the new battery with the label facing outward.

Combination instrument battery (CR 2430) (📖 p. 317)

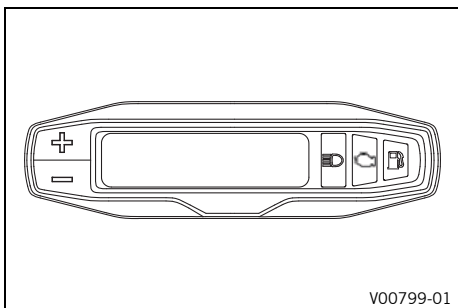
- Check the O-ring of the protection cap for correct seating.
- Position protection cap ❷ and turn all the way clockwise using a coin.
- Press any button on the combination instrument.
  - ✓ The combination instrument is activated.
- Position the combination instrument in the holder.
- Mount and tighten the screws with washers.

## Finishing work

- Install the headlight mask with the headlight. (📖 p. 135)
- Check the headlight setting. (📖 p. 183)
- Set kilometers or miles. (📖 p. 185)
- Adjust the combination instrument function. (📖 p. 186)
- Set the clock. (📖 p. 187)



## 17.6 Combination instrument overview

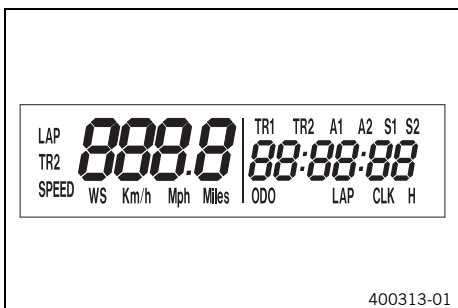


- The button is used to select menus and make settings.
- The button is used to select menus and make settings.

### Info

When the vehicle is delivered, only the **SPEED/H** and **SPEED/ODO** display modes are activated.

## 17.7 Activation and test

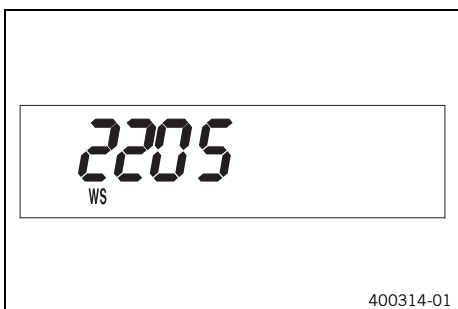


### Activating combination instrument

The combination instrument is activated when one of the buttons is pressed or an impulse comes from the wheel speed sensor.

### Display test

To enable you to check that the display is functioning properly, all display segments light up briefly.



### WS (wheel size)

After the display function check, the wheel circumference **WS** is displayed briefly.

### Info

The number 2205 equals the circumference of the 21" front wheel with standard tires.

The display then changes to the last selected mode.

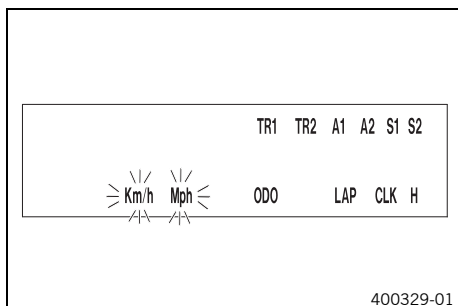
## 17.8 Setting the kilometers or miles




### Info

If you change the unit, the value **ODO** is retained and converted accordingly. The values **TR1**, **TR2**, **A1**, **A2** and **S1** are cleared when the unit of measure is changed.


### Condition

The motorcycle is stationary.




- Repeatedly press the button  briefly until **H** appears at the bottom right of the display.
- Press the button  for 2–3 seconds.
  - ✓ The Setup menu is displayed and the active functions are shown.
- Repeatedly press the button  briefly until **Km/h/Mph** flashes.

#### Setting the Km/h

- Press the button .

#### Setting the Mph

- Press the button .
- Wait 3 - 5 seconds.
  - ✓ The settings are stored.



#### Info

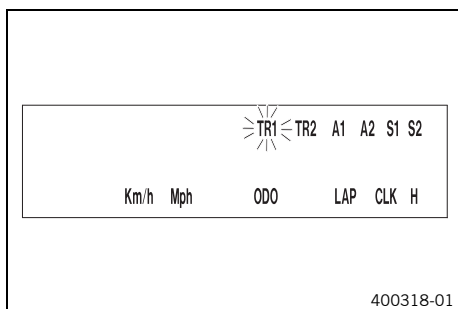
If no button is pressed for 10-12 seconds, or if an impulse comes from the wheel speed sensor, the settings are automatically saved and the setup menu is closed.

## 17.9 Adjusting the combination instrument function





#### Info

When the vehicle is delivered, only the **SPEED/H** and **SPEED/ODO** display modes are activated.



#### Condition


The motorcycle is stationary.

- Repeatedly press the button  briefly until **H** appears at the bottom right of the display.
- Press the button  for 2–3 seconds.
  - ✓ The Setup menu is displayed and the active functions are shown.




#### Info


If no button is pressed for 10 - 12 seconds, the settings are automatically saved.  
If no button is pressed for 20 seconds, or if an impulse comes from the wheel speed sensor, the settings are automatically saved and the setup menu is closed.

- Repeatedly press the button  briefly until the desired function flashes.
  - ✓ The selected function flashes.

#### Activating the function

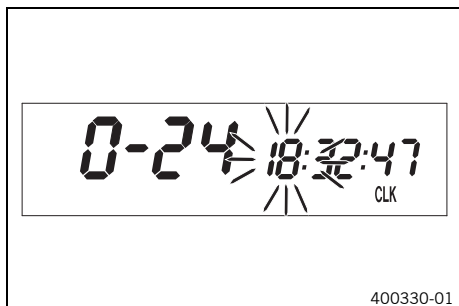
- Press the button .
  - ✓ The symbol continues to appear in the display and the next function appears.

#### Deactivating a function

- Press the button .
  - ✓ The symbol disappears in the display and the next function appears.



## 17.10 Setting the clock



### Condition

The motorcycle is stationary.

- Repeatedly press the button **+** briefly until **CLK** appears at the bottom right of the display.
- Press the button **+** for 2-3 seconds.
  - ✓ The hour display flashes.
- Set the hour display with the button **+** and/or button **-**.
- Wait 3 - 5 seconds.
  - ✓ The next segment of the display flashes and can be set.
- You can set the following segments in the same way as the hours by pressing the button **+** and the button **-**.

### Info

The seconds can only be set to zero. If no button is pressed for 15 - 20 seconds, or if an impulse comes from the wheel speed sensor, the settings are automatically saved and the setup menu is closed.



## 17.11 Activating additional functions



### Danger

**Voiding of the government approval for road use and the insurance coverage** The vehicle is only authorized for operation on public roads in the homologated version.

- If the vehicle is modified in any way, it may only be used on designated tracks away from public roads. Advise the vehicle owner and rider of this.
- If you undertake any modifications, please insist on receiving a signed workshop order from your customer in which you inform the customer in writing that these modifications are performed at the customer's own risk and that the vehicle will no longer be approved for use on public roads once modified.

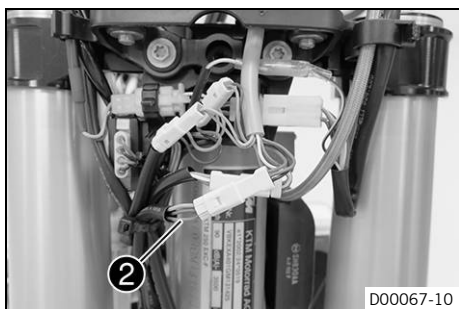
### Preparatory work

- Remove the headlight mask with the headlight. (📖 p. 135)

### Main work

- Expose plug-in connector **CZ** ①.





- Sever black/brown cable ②.
- Insulate both cable ends.

### Finishing work

- Install the headlight mask with the headlight. (🔧 p. 135)
- Check the headlight setting. (🔧 p. 183)

## 17.12 Setting the wheel circumference




### Condition

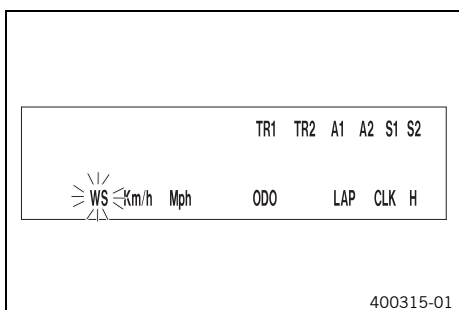
The motorcycle is stationary.

### Preparatory work

- Remove the headlight mask with the headlight. (🔧 p. 135)
- Activate additional functions. (🔧 p. 187)

### Main work

- Repeatedly press the button  briefly until **H** appears at the bottom right of the display.
- Press the button  for 2–3 seconds.
- When **WS** flashes, press the  button briefly.




### Info

The wheel circumference is displayed in millimeters.

### Enlarging the wheel circumference

- Press the button .

### Reducing the wheel circumference

- Press the button .



### Info

If no button is pressed for 20 seconds, or if no impulse comes from the wheel speed sensor, the settings are automatically saved and the Setup menu is closed.

## 17.13 Viewing the lap time

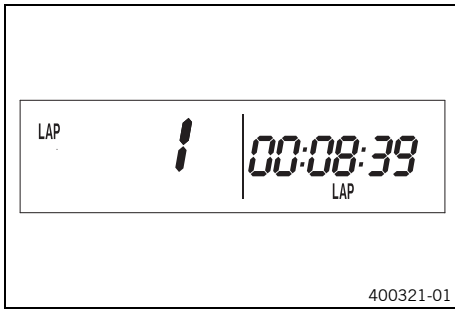


### Info

This function can only be opened if lap times have actually been timed.

### Condition

The motorcycle is stationary.



- Repeatedly press the button briefly until **LAP** appears at the bottom right of the display.
- Briefly press the button .
- ✓ **LAP 1** appears on the left side of the display.
- The laps 1 - 10 can be viewed with the button .
- Press and hold the button for 3 - 5 seconds.
- ✓ The lap times are deleted.
- Briefly press the button .
- ✓ Next display mode

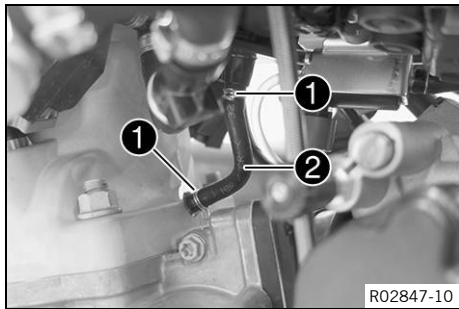


### Info

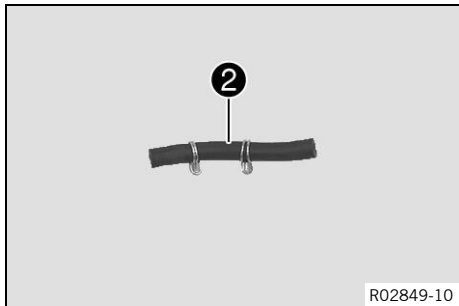
When a signal from the wheel speed sensor arrives, the left side of the display changes back to the **SPEED** mode.



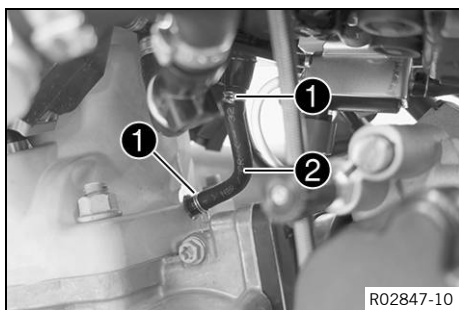
## 18.1 Cleaning the pressure sensor hose



- Push back hose clamps ①.
- Pull off pressure sensor hose ②.



- Clean hose ② thoroughly and blow out with compressed air.



- Mount pressure sensor hose ②.
- Position hose clamps ①.

## 18.2 Removing the engine

### Preparatory work

#### (All Six Days models)

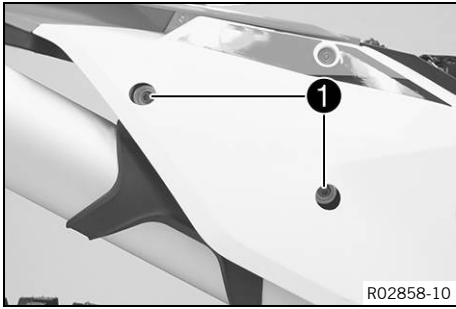
- Remove the engine guard. (📖 p. 74)
- Raise the motorcycle with a lift stand. (📖 p. 12)

#### (All EXC models)

- Press and hold the kill switch ☒ while the engine is idling until the engine stops.

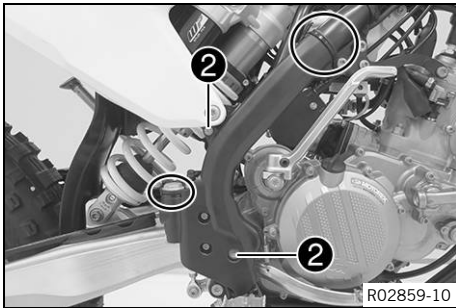
#### (All XC-W models)

- Press and hold the kill switch ☒ while the engine is idling until the engine stops.
- Remove the seat. (📖 p. 121)
- Disconnect the negative cable of the battery. (📖 p. 160)
- Drain the coolant. (📖 p. 287)
- Remove the manifold. (📖 p. 111)
- Remove the air filter box cover. (📖 p. 116)

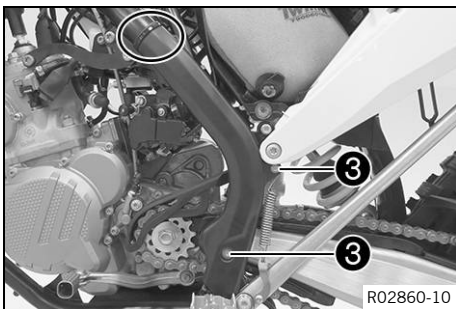


### Main work

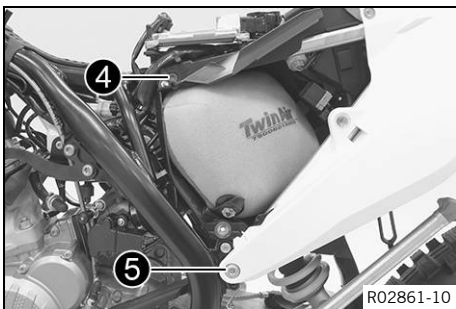
- Remove screws **1** with the washers.
- Take off the main silencer.



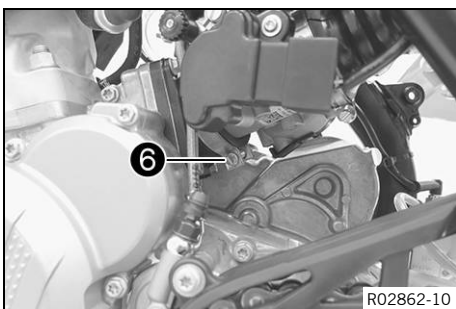
- Remove screws **2** with the washers.
- Remove the cable ties.
- Take off the frame protector.



- Remove screws **3** with the washers.
- Remove the cable tie.
- Take off the frame protector.



- Loosen screw **4**.
- Remove screw **5**.
- Repeat these steps on the opposite side.



- Remove hose clip **6**.

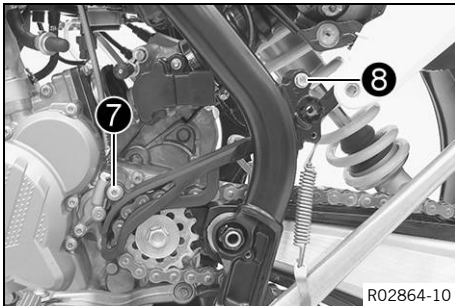


- Raise the subframe slightly and secure.

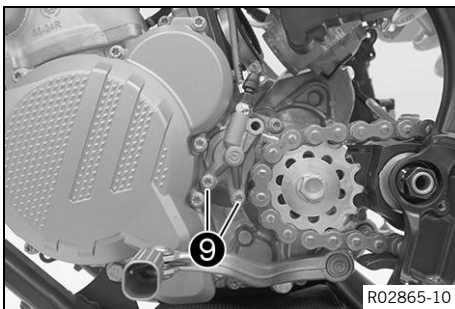


**Info**

Pay attention to the oil pump hose.



- Remove screw 7.
- Remove screw 8.
- Take off the engine sprocket cover.



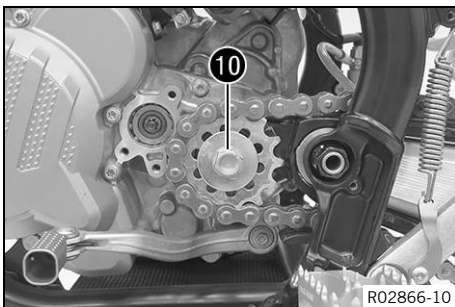
- Remove screws 9.
- Take off the slave cylinder of the clutch and hang it to one side.



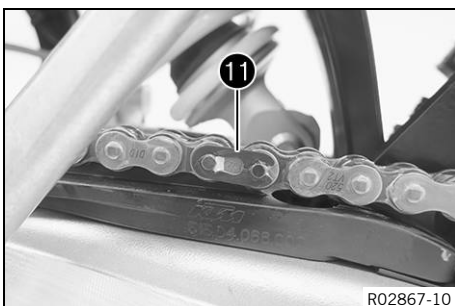
**Info**

Do not kink the clutch line.

Do not activate the clutch lever while the slave cylinder of the clutch is removed.



- Have an assistant operate the rear brake.
- Remove screw 10 with the washer.



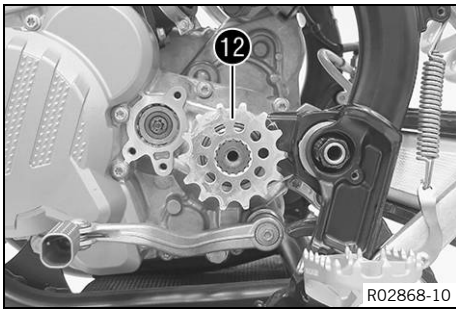
- Remove connecting link 11 of the chain.



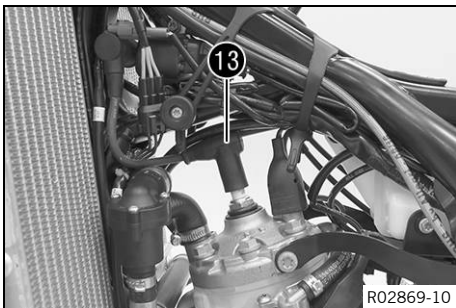
**Info**

Cover the components to protect them against damage.

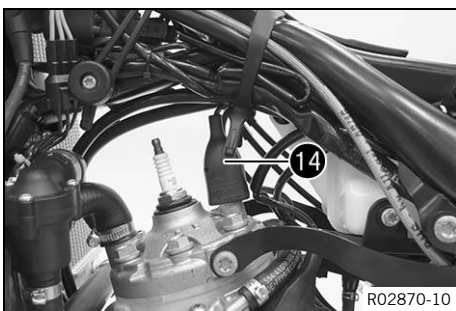
- Take off the chain.



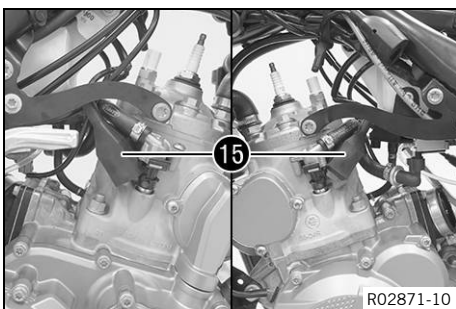
- Remove engine sprocket **12**.



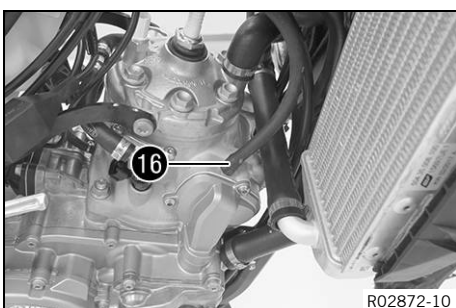
- Disconnect spark plug connector **13**.



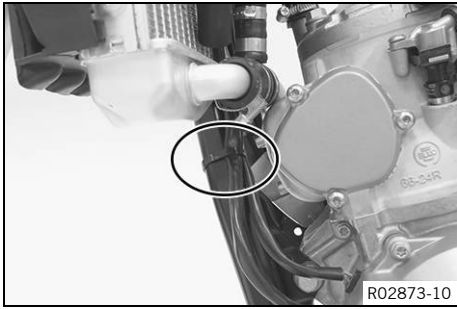
- Push back protection cap **14**.
- Disconnect engine coolant temperature sensor connector.



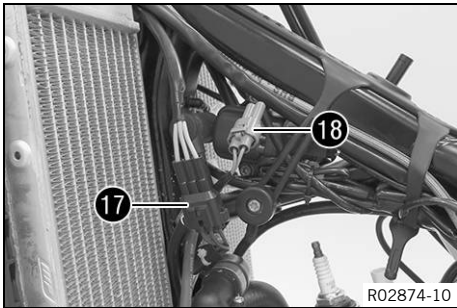
- Push back protection caps **15**.
- Disconnect connector.



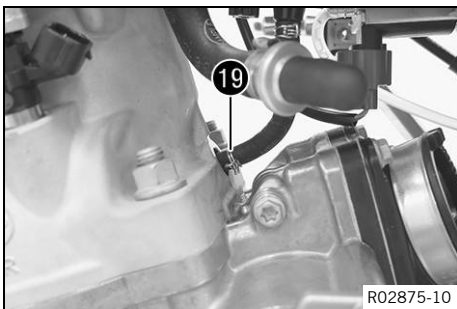
- Pull off air release hose **16**.



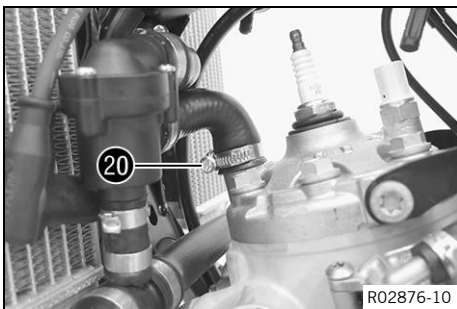
- Remove the cable tie.



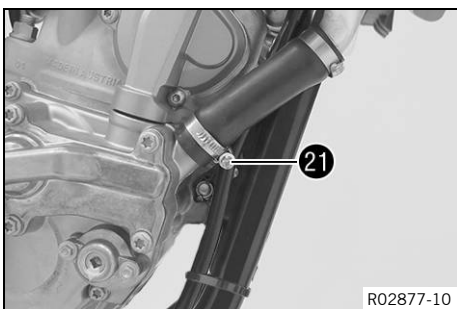
- Disconnect plug-in connector 17.
- Disconnect plug-in connector 18.
- Expose the cable.



- Push back hose clamp 19.
- Pull off pressure sensor hose.

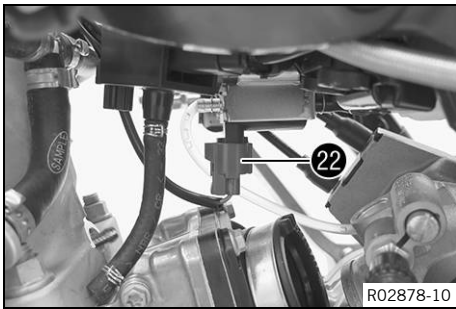


- Loosen hose clip 20.
- Pull off the radiator hose.

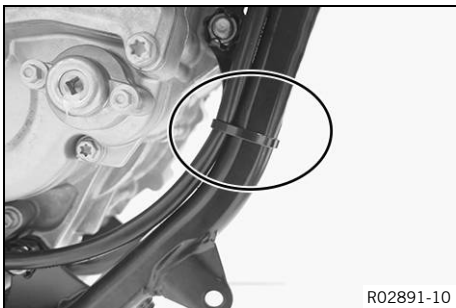


- Loosen hose clip 21.
- Pull off the radiator hose.

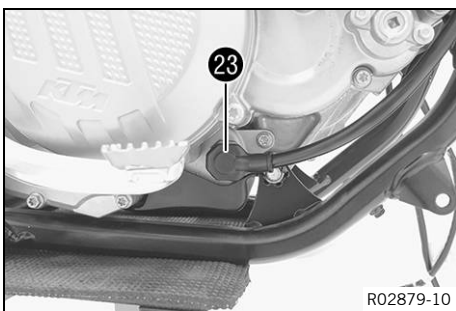




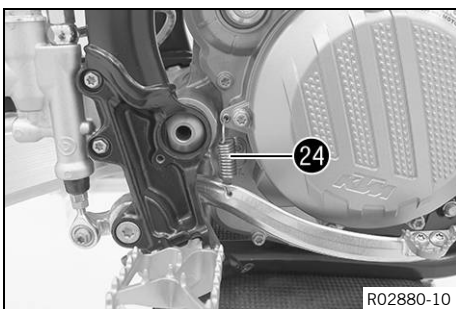
- Disconnect oil pump connector 22.



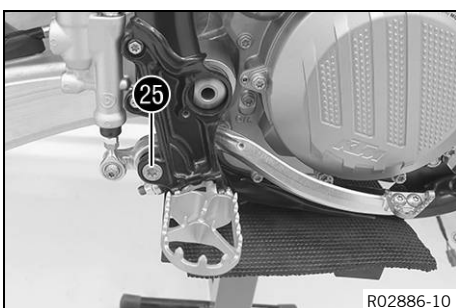
- Remove the cable tie.



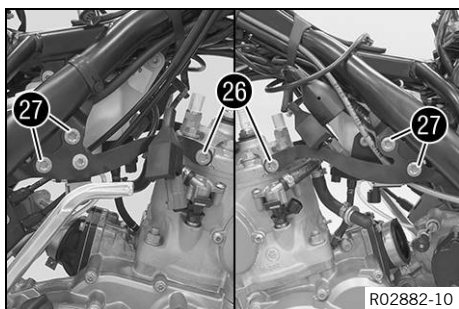
- Push back protection cap 23 and remove the nut.
- Hang the positive cable to the side.



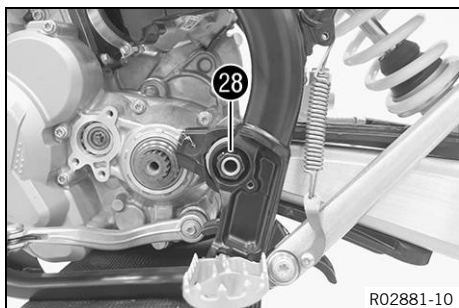
- Remove spring 24.



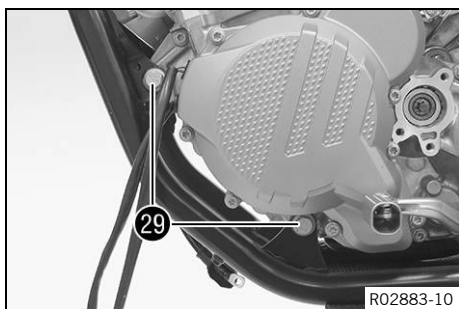
- Remove fitting 25.
- Slip the foot brake lever out toward the rear.



- Remove screws 26 and 27.
- Take off the engine braces.



- Remove nut 28.
- Remove the swingarm pivot.
- Carefully pull the swingarm back, and secure the swingarm.



- Remove screws 29.



- Lift out the engine sideways to the right.

**i Info**

Pay attention to the oil pump.  
The help of an assistant is useful in this step.  
Make sure that the engine is sufficiently secured against falling over.  
Protect the frame and attachments against damage.

## 18.3 Installing the engine

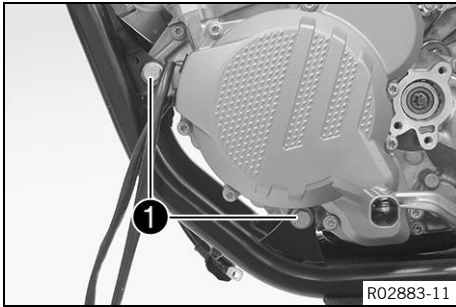


**Main work**

- Position the engine in the frame.

**i Info**

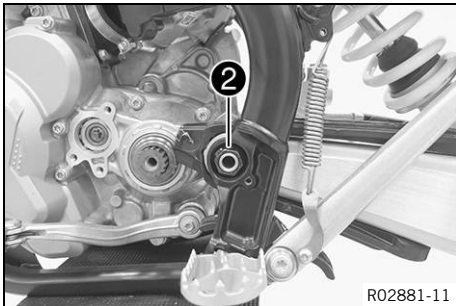
The help of an assistant is useful in this step.  
Make sure that the engine is sufficiently secured against falling over.  
Protect the frame and attachments against damage.  
Pay attention to the oil pump.



- Mount screws **1** but do not tighten yet.

Guideline

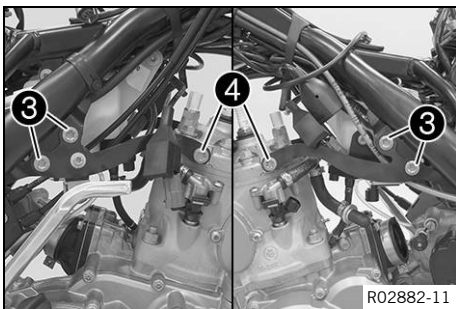
|                      |     |                     |
|----------------------|-----|---------------------|
| Engine bracket screw | M10 | 60 Nm (44.3 lbf ft) |
|----------------------|-----|---------------------|



- Position the swingarm.
- Mount the swingarm pivot.
- Mount nut **2**, but do not tighten it yet.

Guideline

|                     |         |                         |
|---------------------|---------|-------------------------|
| Nut, swingarm pivot | M16x1.5 | 100 Nm<br>(73.8 lbf ft) |
|---------------------|---------|-------------------------|



- Position the engine braces.
- Mount and tighten screws **3** and **4**.

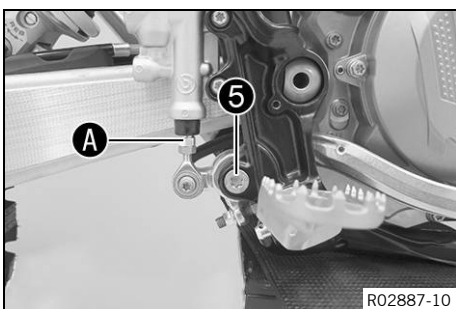
Guideline

|                     |    |   |
|---------------------|----|---|
| Screw, engine brace | M8 | 25 Nm (18.4 lbf ft)<br><b>Loctite®2701™</b> |
|---------------------|----|---|

- Tighten screws **1** and nut **2**.

Guideline

|                      |         |                         |
|----------------------|---------|-------------------------|
| Engine bracket screw | M10     | 60 Nm (44.3 lbf ft)     |
| Nut, swingarm pivot  | M16x1.5 | 100 Nm<br>(73.8 lbf ft) |

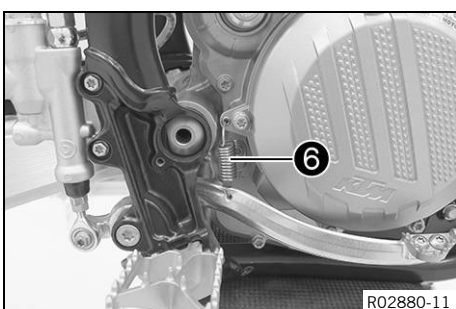


- Slip in the foot brake lever and position it.
- Mount and tighten fitting **5**.

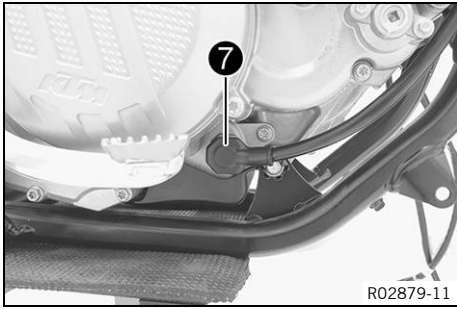
Guideline

|                       |    |                     |
|-----------------------|----|---------------------|
| Nut, foot brake lever | M8 | 15 Nm (11.1 lbf ft) |
|-----------------------|----|---------------------|

- ✓ Push rod **A** engages in the foot brake cylinder.
- ✓ The dust boot is correctly positioned.



- Mount spring **6**.

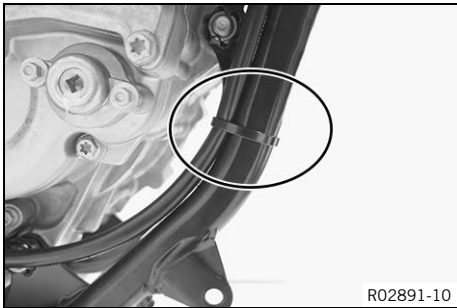


- Position the positive cable on the starter motor.
- Mount and tighten the nut.

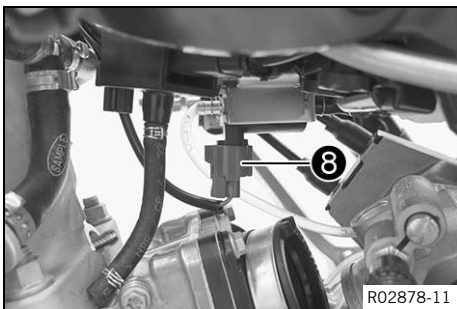
Guideline

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

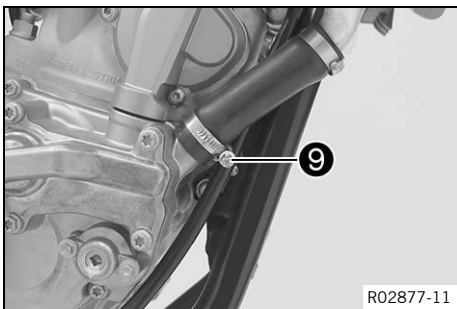
- Position protection cap **7**.



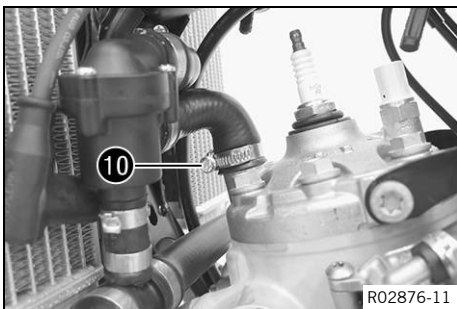
- Mount the cable tie.



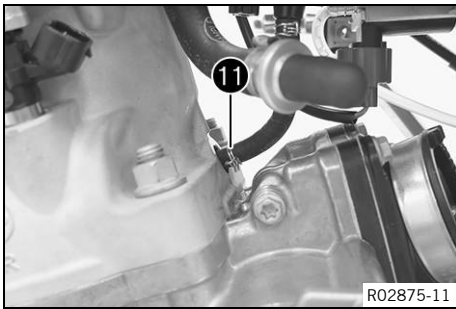
- Plug in oil pump connector **8**.



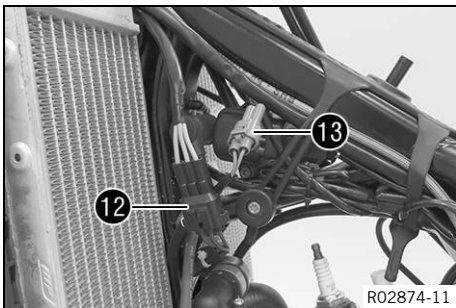
- Mount the radiator hose.
- Position and tighten hose clip **9**.



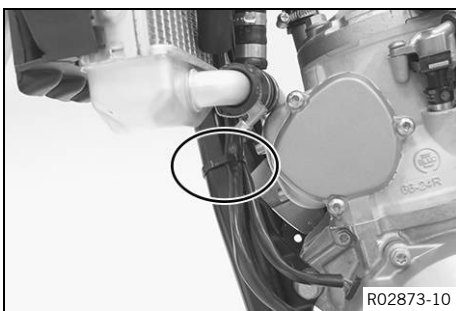
- Mount the radiator hose.
- Position and tighten hose clip **10**.



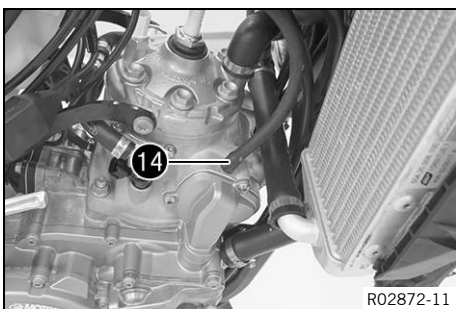
- Position pressure sensor hose.
- Position hose clamp 11.



- Join plug-in connectors 12 and 13.



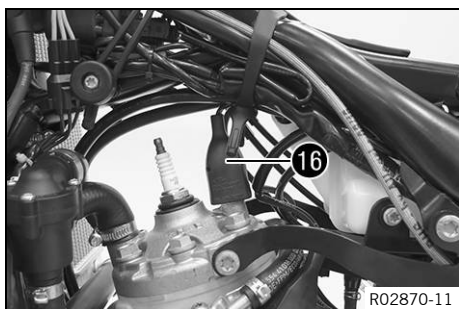
- Route the cable without tension and secure with cable tie(s).



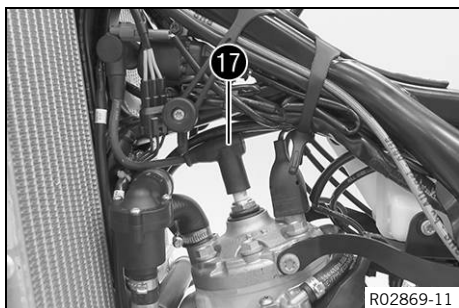
- Mount vent hose 14.



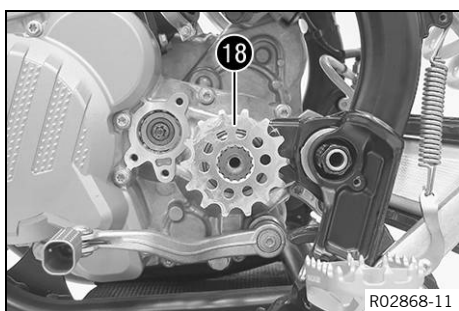
- Plug in the connectors.
- Position protection caps 15.



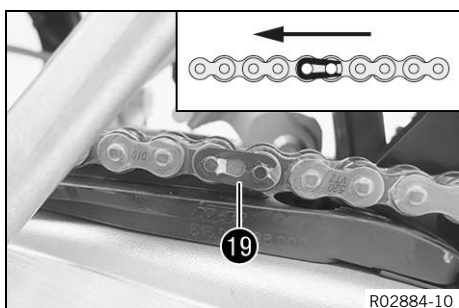
- Plug in the connector of the engine coolant temperature sensor.
- Position protection cap **16**.



- Plug in spark plug connector **17**.



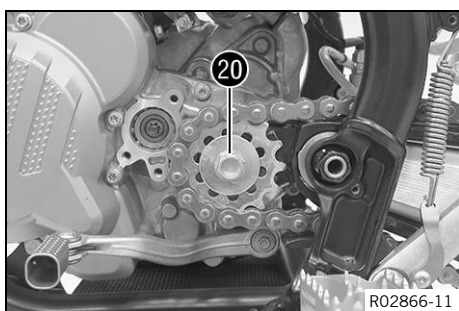
- Slide engine sprocket **18** onto the countershaft.



- Mount the chain.
- Connect the chain with connecting link **19**.

Guideline

The closed side of the chain joint lock must face in the direction of travel.

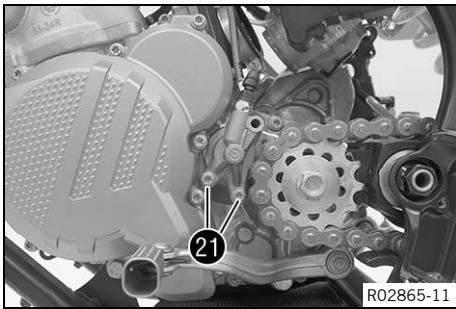


- Have an assistant operate the rear brake.
- Mount and tighten screw **20** with the washer.

Guideline

|                                    |     |   |
|------------------------------------|-----|---|
| Screw, drive chain engine sprocket | M10 | 60 Nm (44.3 lbf ft)<br><b>Loctite®2701™</b> |
|------------------------------------|-----|---|

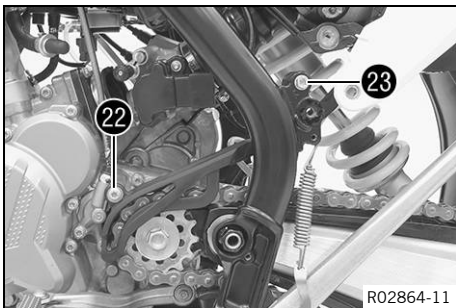




- Position the clutch slave cylinder with the gasket.
- Mount and tighten screws 21.

Guideline

|                              |    |                    |
|------------------------------|----|--------------------|
| Screw, clutch slave cylinder | M6 | 10 Nm (7.4 lbf ft) |
|------------------------------|----|--------------------|



- Position the engine sprocket cover.
- Mount and tighten screw 22.

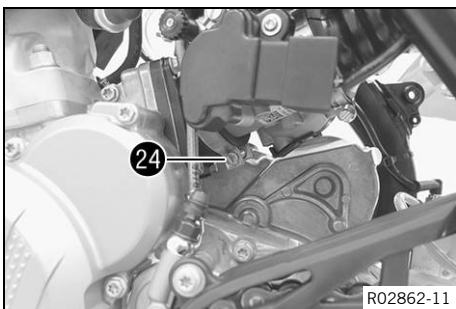
Guideline

|                              |    |                    |
|------------------------------|----|--------------------|
| Screw, clutch slave cylinder | M6 | 10 Nm (7.4 lbf ft) |
|------------------------------|----|--------------------|

- Mount and tighten screw 23.

Guideline

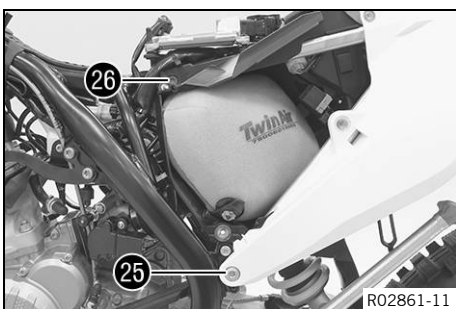
|                              |    |                     |
|------------------------------|----|---------------------|
| Screw, engine sprocket cover | M8 | 20 Nm (14.8 lbf ft) |
|------------------------------|----|---------------------|



- Remove the locking piece and position the subframe.

**i Info**  
Watch out for the intake flange.

- Position hose clip 24 but do not tighten yet.



- Mount and tighten screw 25.

Guideline

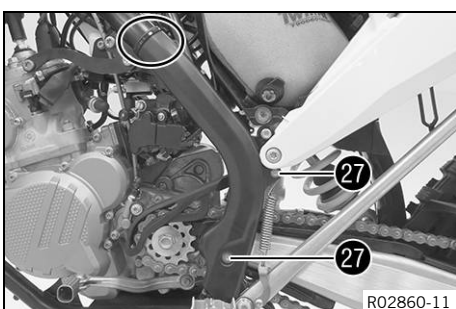
|                  |    |   |
|------------------|----|---|
| Screw, sub-frame | M8 | 35 Nm (25.8 lbf ft)<br><b>Loctite®2701™</b> |
|------------------|----|---|

- Remove screw 26.
- Mount and tighten screw 26.

Guideline

|                  |    |   |
|------------------|----|---|
| Screw, sub-frame | M8 | 35 Nm (25.8 lbf ft)<br><b>Loctite®2701™</b> |
|------------------|----|---|

- Repeat these steps on the opposite side.
- Tighten hose clip 24.

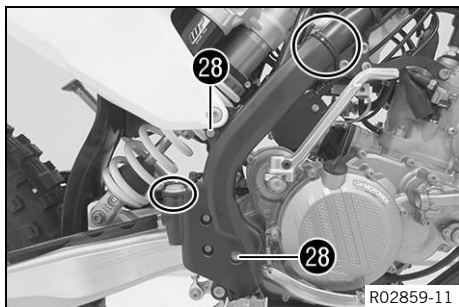


- Position the frame protector.
- Mount and tighten screws 27 with the washers.

Guideline

|                        |    |                   |
|------------------------|----|-------------------|
| Screw, frame protector | M5 | 3 Nm (2.2 lbf ft) |
|------------------------|----|-------------------|

- Mount the cable tie.

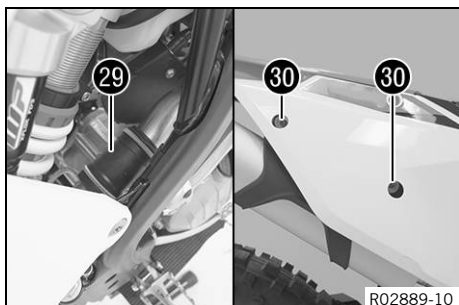


- Position the frame protector.
- Mount and tighten screws 28 with the washers.

Guideline

|                        |    |                   |
|------------------------|----|-------------------|
| Screw, frame protector | M5 | 3 Nm (2.2 lbf ft) |
|------------------------|----|-------------------|

- Mount the cable ties.
- Install the manifold. (📖 p. 112)

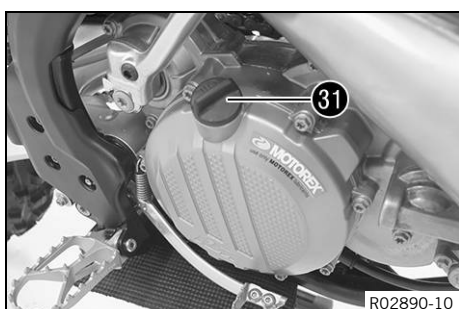


- Mount the main silencer with rubber sleeve 29.
- Mount and tighten screws 30 with the washers.

Guideline

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

- Connect the negative cable of the battery. (📖 p. 161)
- Install the fuel tank. (📖 p. 123)
- Install the air filter box cover. (📖 p. 116)
- Mount the seat. (📖 p. 121)



- Remove filler plug 31 with the O-ring, and fill up with gear oil.

|          |                      |                                      |
|----------|----------------------|--------------------------------------|
| Gear oil | 0.80 l<br>(0.85 qt.) | Engine oil<br>(15W/50)<br>(📖 p. 358) |
|----------|----------------------|--------------------------------------|

- Mount and tighten filler plug 31 with the O-ring.

### Finishing work

- Remove the motorcycle from the lift stand. (📖 p. 12)

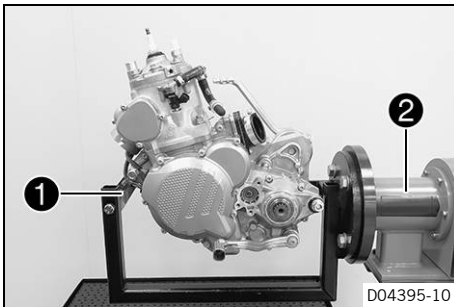
#### (All Six Days models)

- Install the engine guard. (📖 p. 74)
- Refill with coolant. (📖 p. 288)
- Go for a short test ride.
- Check the engine for leak tightness.
- Check the gear oil level. (📖 p. 295)
- Check the coolant level. (📖 p. 287)



## 18.4 Engine disassembly

### 18.4.1 Clamping the engine into the engine work stand



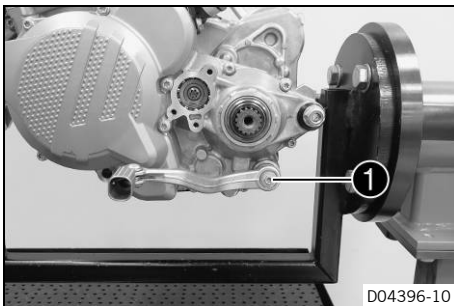
- Mount special tool **1** on engine work stand **2**.

Engine work stand (61229001000) (📖 p. 370)

Holder and fitting for work stand (55429002000)  
(📖 p. 365)

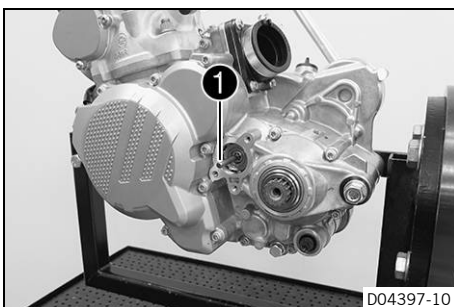
- Mount the engine on special tool **1**.

### 18.4.2 Removing the shift lever



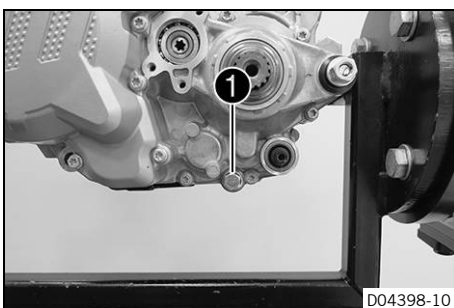
- Remove screw **1** with the washers. Take off the shift lever.

### 18.4.3 Removing the clutch push rod



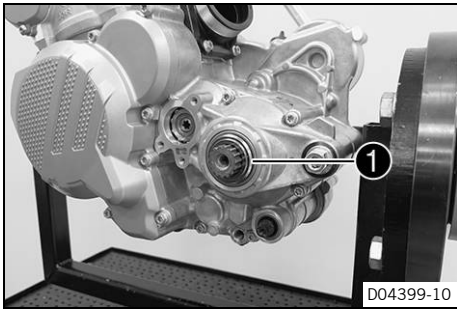
- Remove clutch push rod **1**.

### 18.4.4 Draining the gear oil

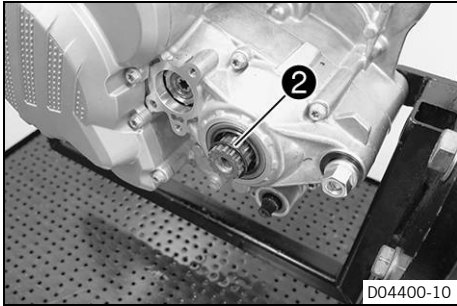


- Remove gear oil drain plug **1** with the magnet and seal ring.
- Let the gear oil drain fully.

## 18.4.5 Removing the spacer

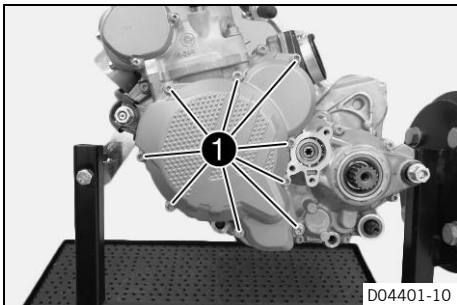


- Remove spacer ①.

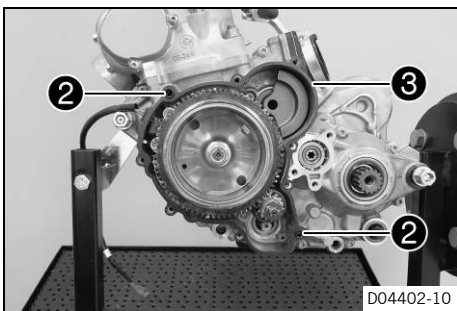


- Take off O-ring ②.

## 18.4.6 Removing the alternator cover

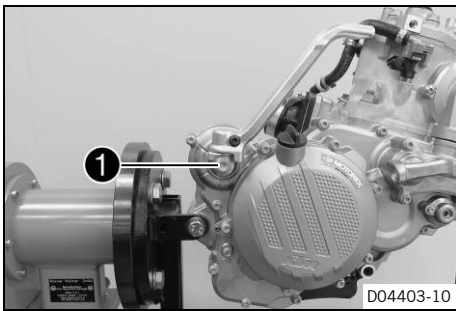


- Remove screws ①. Take off the alternator cover.



- Remove the dowels ② and alternator cover gasket ③.

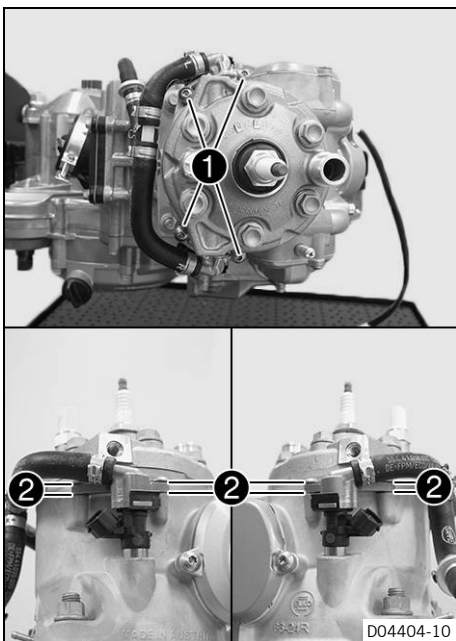
### 18.4.7 Removing the kick starter



- Remove screw ① with the washer.
- Take off the kick starter.



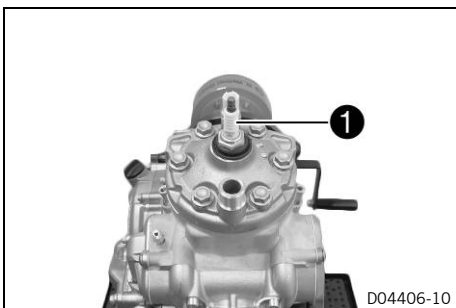
### 18.4.8 Removing injection valves



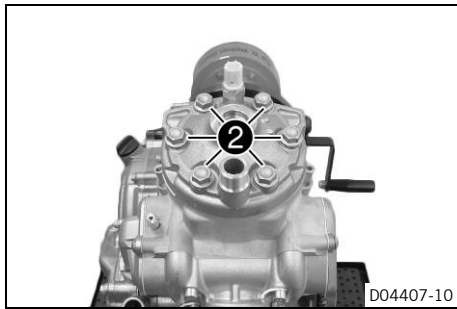
- Remove screws ① with insulating washers ②.
- Take off injection valves on both sides.



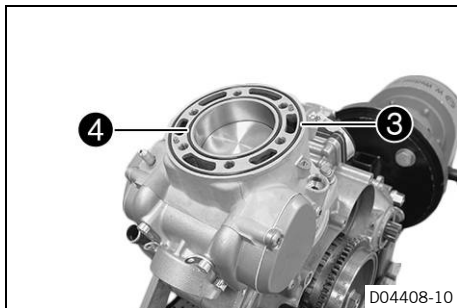
### 18.4.9 Removing the cylinder head



- Remove spark plug ①.

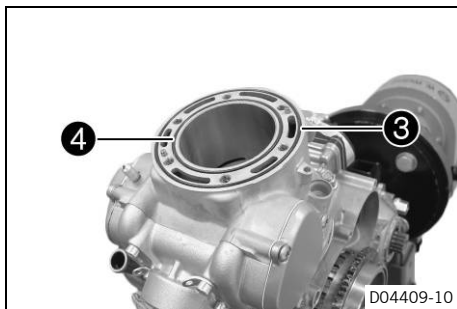


- Loosen screws **2** in a crisscross pattern and remove them.
- Remove the cylinder head.



(All 250 models)

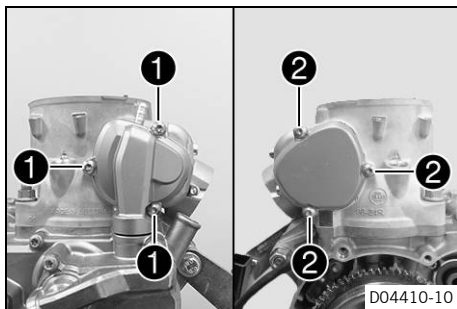
- Remove O-rings **3** and **4**.



(All 300 models)

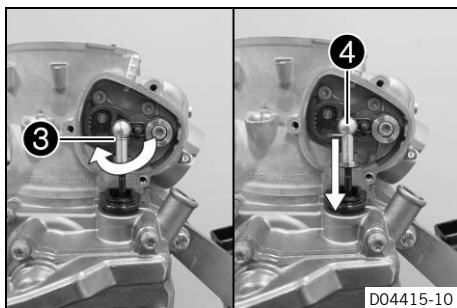
- Remove O-rings **3** and **4**.

## 18.4.10 Removing the cylinder

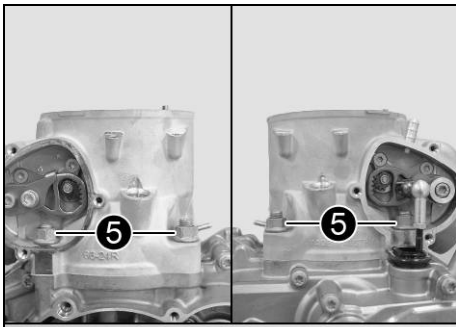


(All 250 models)

- Remove screws **1** and **2**.
- Take off both covers.



- Remove retainer **3** of ball socket **4**.
- Pull off the ball socket.
- Remove the gaskets on both sides.



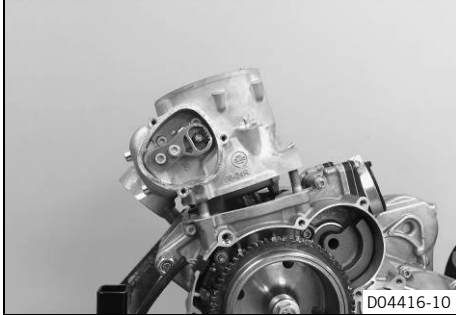
- Remove nuts ⑤.



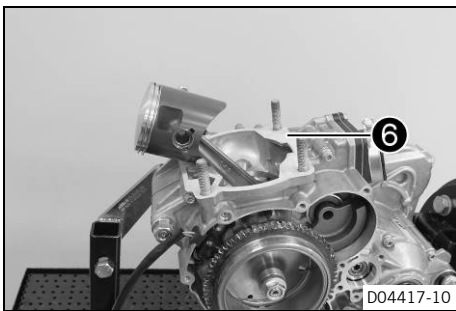
### Info

Raise the cylinder slightly to be able to remove the front nuts.

- Carefully slide the cylinder up and take it off.

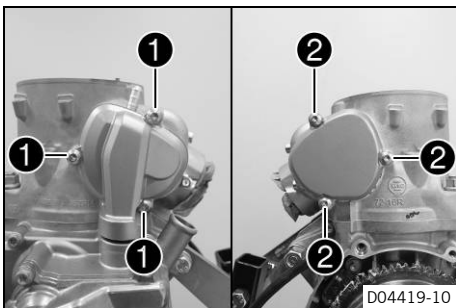


D04416-10



D04417-10

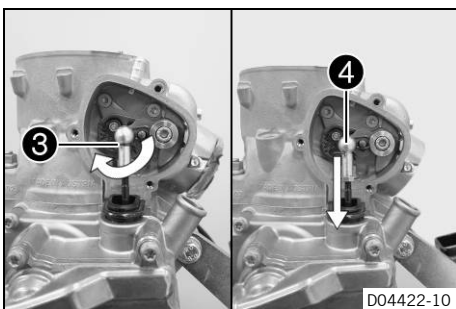
- Take off gasket ⑥.



D04419-10

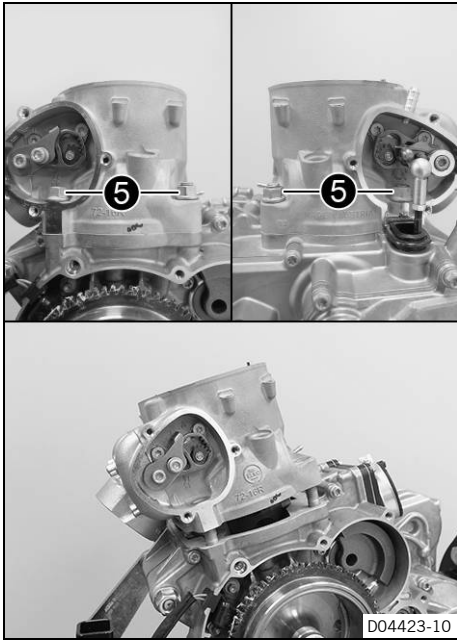
### (All 300 models)

- Remove screws ① and ②.
- Take off both covers.



D04422-10

- Remove retainer ③ of ball socket ④.
- Pull off the ball socket.
- Remove the gaskets on both sides.



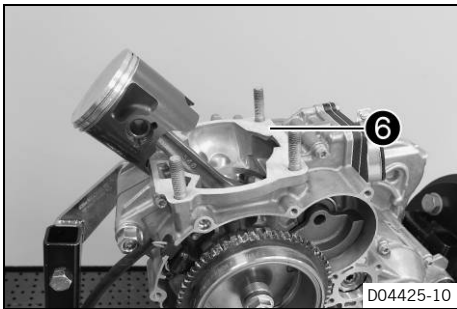
- Remove nuts **5**.

---

**i Info**  
Raise the cylinder slightly to be able to remove the front nuts.

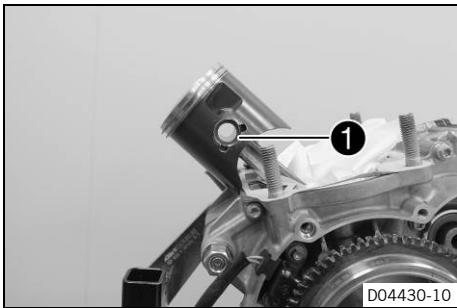
---

- Carefully slide the cylinder up and take it off.



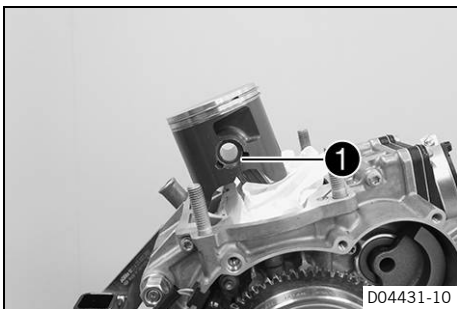
- Take off gasket **6**.

## 18.4.11 Removing the piston



### (All 250 models)

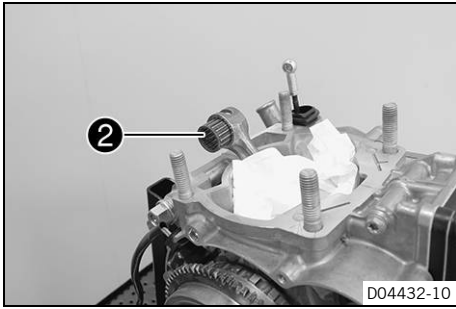
- Uncover the crankcase.
- Remove piston ring lock **1**.
- Remove the piston pin.
- Take off the piston.



### (All 300 models)

- Uncover the crankcase.
- Remove piston ring lock **1**.
- Remove the piston pin.
- Take off the piston.

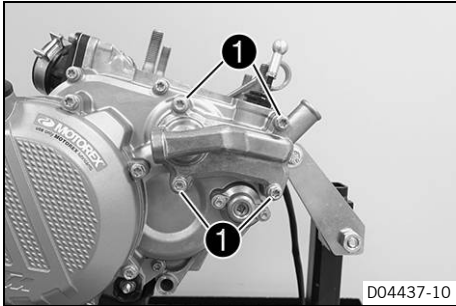




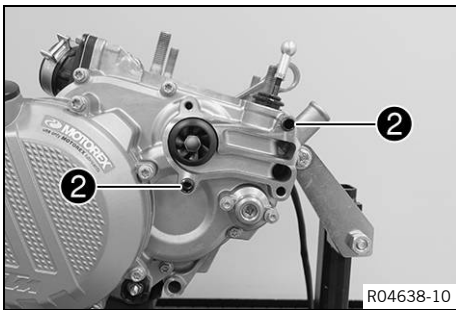
- Remove upper conrod bearing ②.



**18.4.12 Removing the water pump cover**



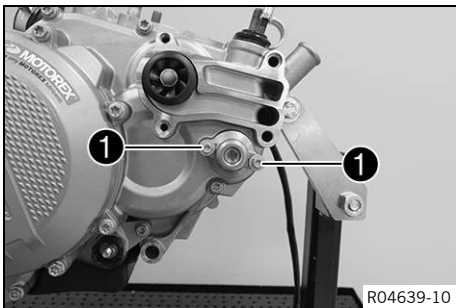
- Remove screws ①.
- Take off the water pump cover.
- Remove the form ring.



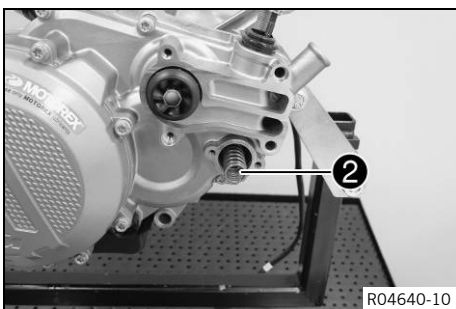
- Remove dowels ②.



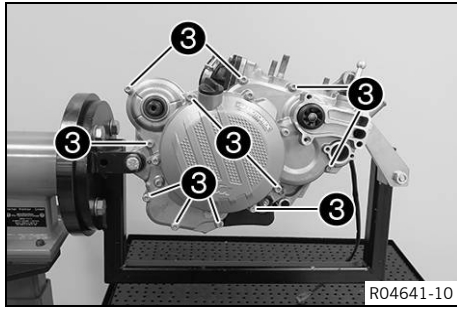
**18.4.13 Removing the clutch cover**



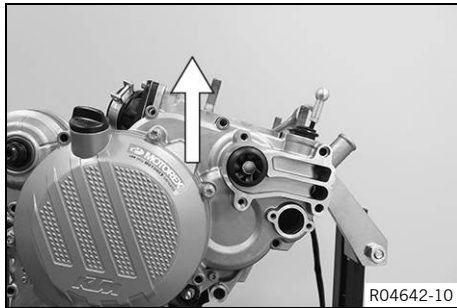
- Remove screws ①.
- Take off the cap.



- Remove adjusting spring ② with the auxiliary spring and spring insert.



- Remove screws ③.

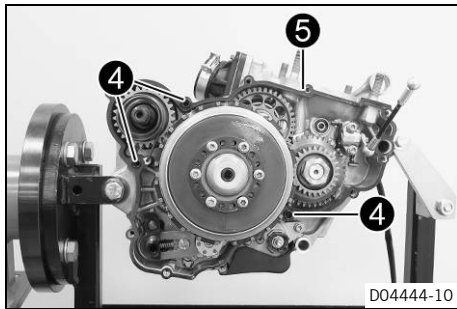


- Take off the clutch cover at the top and slip out the linkage.

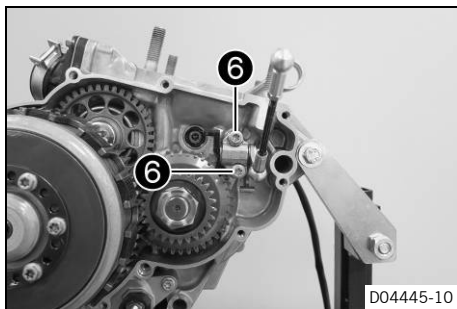


**Info**

Ensure that the kick starter shaft remains in the engine case.

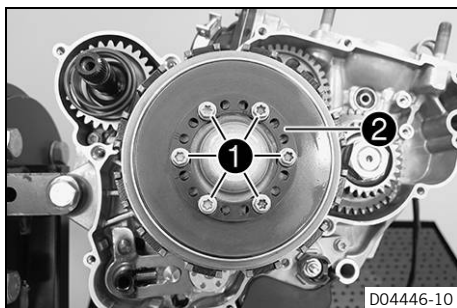


- Remove dowels ④ and clutch cover gasket ⑤.



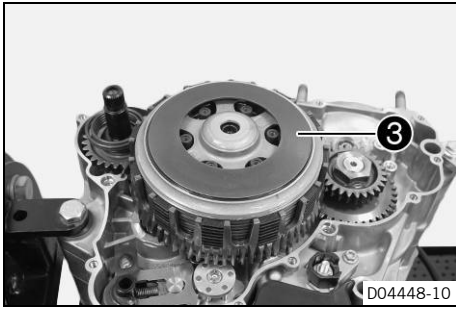
- Remove screws ⑥.
- Take off the bearing support with the linkage and angle lever.

## 18.4.14 Removing the clutch discs

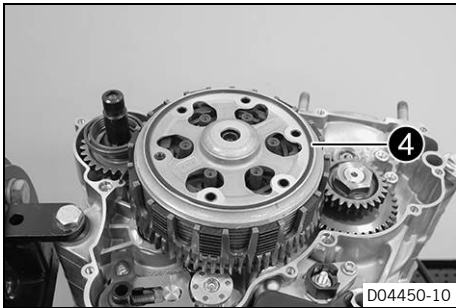


- Remove screws ①.
- Take off spring retainer ②.

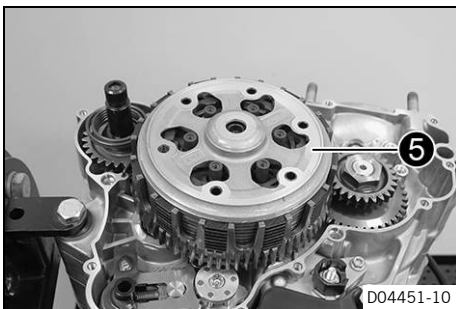




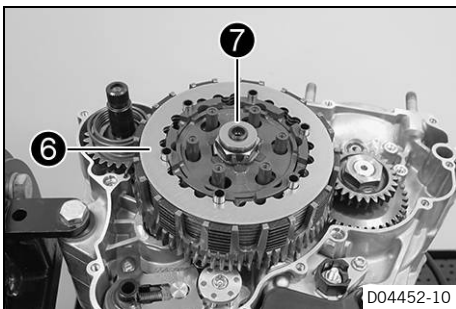
- Take off spring washer **3**.



- Take off pretension ring **4**.

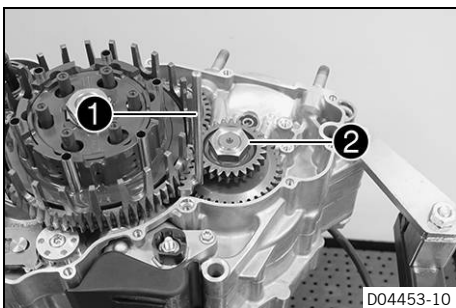


- Take off pressure cap **5**.



- Remove clutch disc pack **6** completely.
- Remove clutch throw-out **7**.

### 18.4.15 Removing the clutch basket



- Hold the primary gear using special tool **1**.

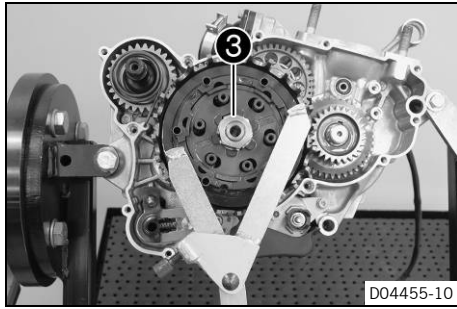
Gear segment (56012004000) (📖 p. 366)

- Remove nut **2** with the washer.



#### Info

Left-handed thread!

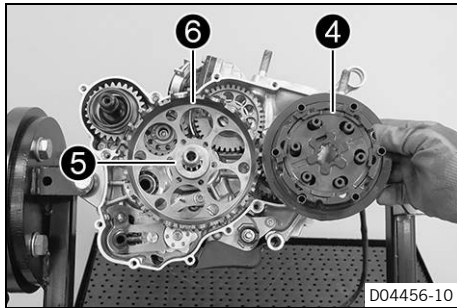


D04455-10

- Bend up the lock washer.
- Hold the inner clutch hub with the special tool. Loosen nut ③.

Holding wrench (51129003000) (📖 p. 364)

- Remove the nut with the lock washer.



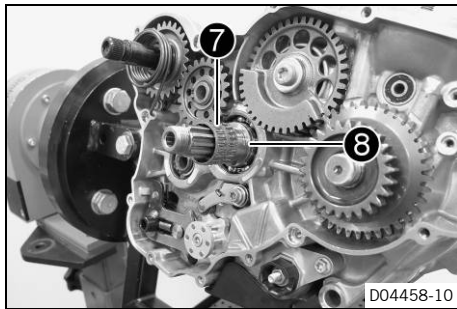
D04456-10

- Take off inner clutch hub ④ and washer ⑤.

**i Info**

The washer usually sticks to the inner clutch hub.

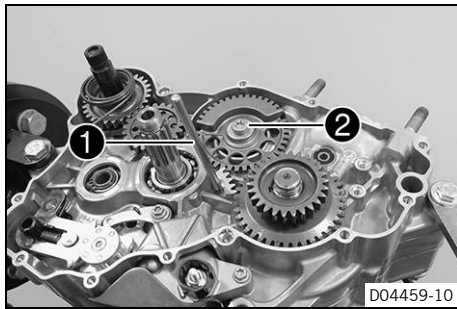
- Take off clutch basket ⑥.



D04458-10

- Take off needle bearing ⑦ and collar bushing ⑧.

## 18.4.16 Removing the balancer shaft

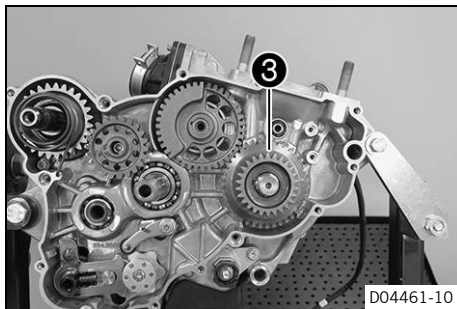


D04459-10

- Position the special tool.
- Hold the balancer shaft in place using the special tool ①.

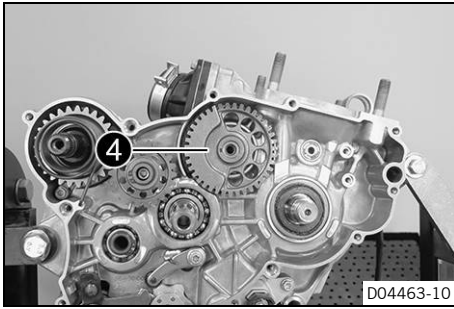
Gear segment (56012004000) (📖 p. 366)

- Remove screw ② with the washer.

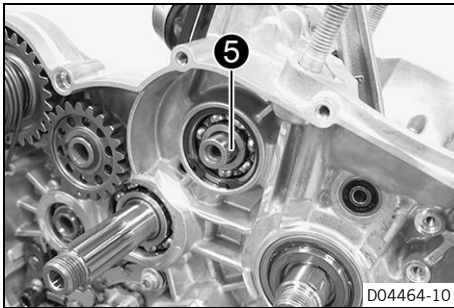


D04461-10

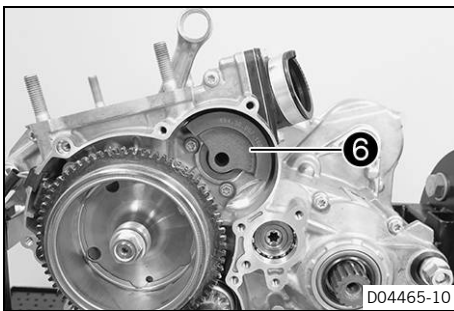
- Remove primary gear ③.



- Remove balancer shaft drive wheel ④.

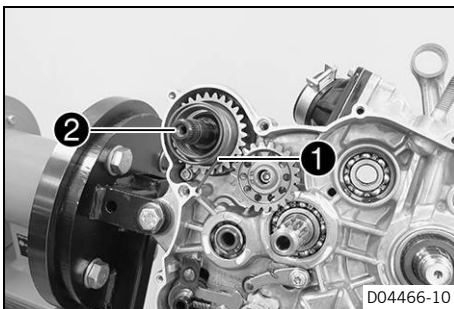


- Remove woodruff key ⑤.



- Remove balancer shaft ⑥.

### 18.4.17 Removing the kick starter shaft



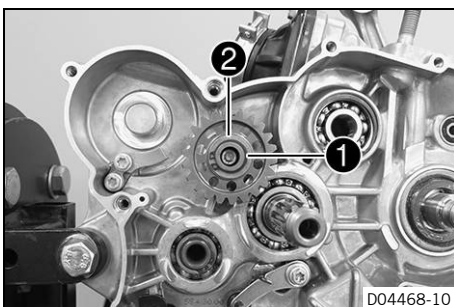
- Detach kick starter spring ①.
- Remove kick starter shaft ②.



#### Info

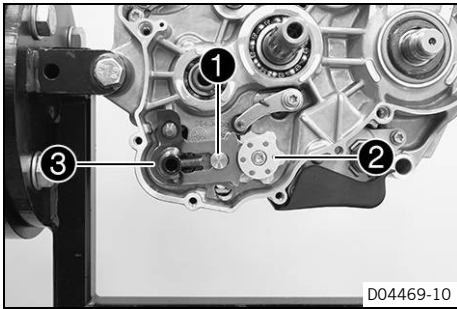
Turn the kick starter shaft slightly to the left.

### 18.4.18 Removing the intermediate kick starter gear



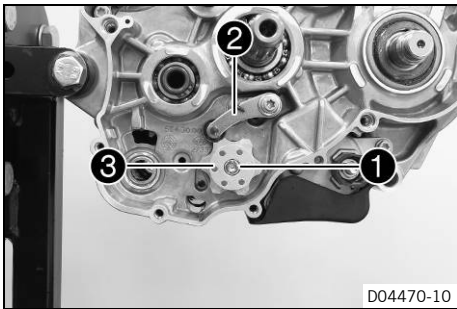
- Remove lock ring ① with washer ②.
- Take off intermediate kick starter gear.

## 18.4.19 Removing the shift shaft



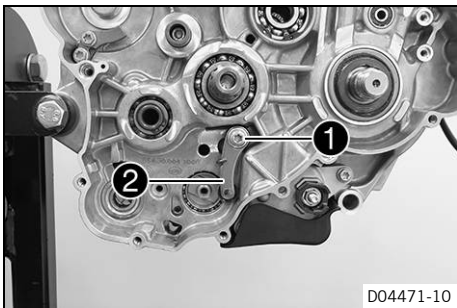
- Push sliding plate **1** away from shift drum locating unit **2**. Remove shift shaft **3** with washer.

## 18.4.20 Removing the shift drum locating unit



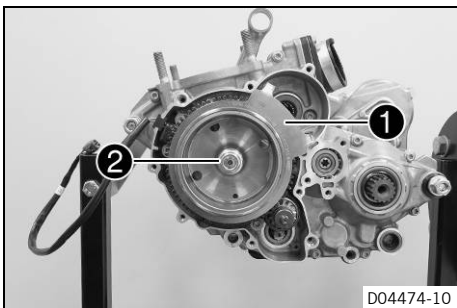
- Remove screw **1**.
- Push locking lever **2** away from shift drum locating unit **3** and take off the shift drum locating unit.
- Relieve tension from the locking lever.

## 18.4.21 Removing the locking lever



- Remove screw **1** with the washer.
- Take off locking lever **2** with the sleeve and spring.

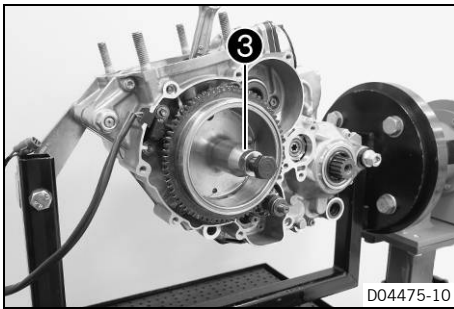
## 18.4.22 Removing the rotor



- Hold the rotor with special tool **1**.  

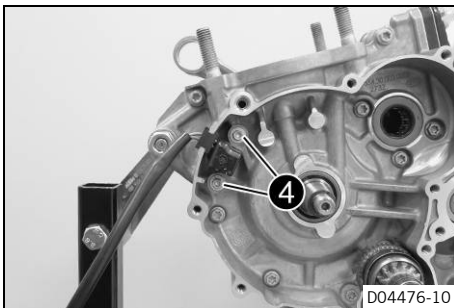
Holding wrench (55429012000) (📖 p. 366)
- Remove nut **2** with the washer.



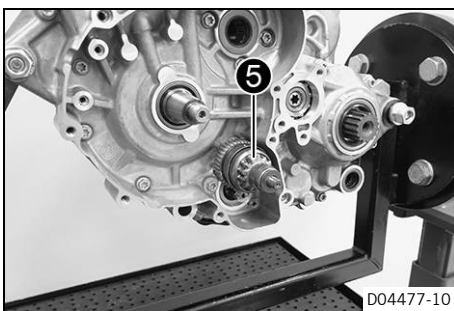


- Mount special tool **3**, apply counterpressure, and pull off the rotor by screwing in the screw.

Puller (58012009000) (📖 p. 367)

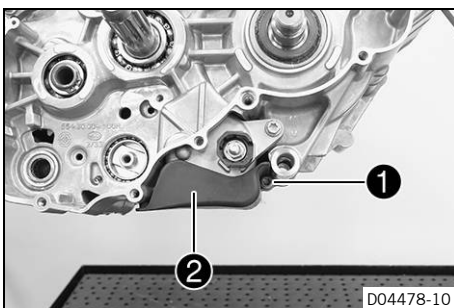


- Remove screws **4**.
- Take off the crankshaft position sensor.

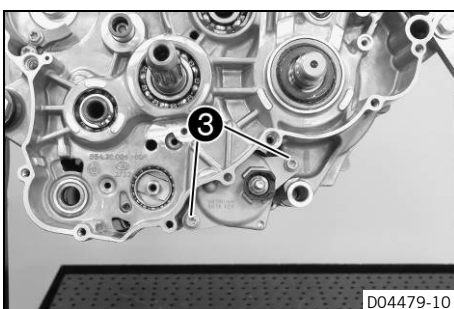


- Take off Bendix **5**.

### 18.4.23 Removing the starter motor



- Remove screw **1**.
- Take off cover **2**.

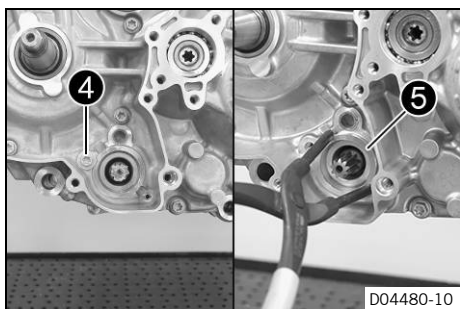


- Remove screws **3**.
- Pull the starter motor out of the engine case as far as possible.



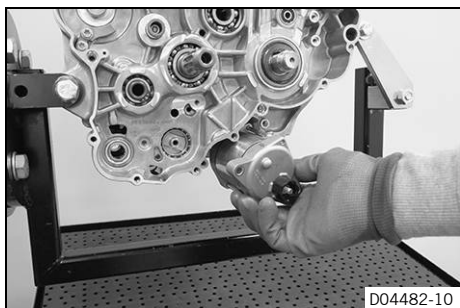
#### Info

It is not possible to completely remove the starter motor.

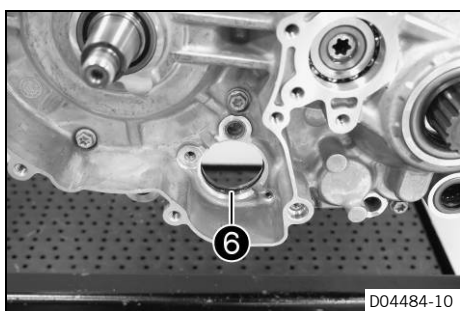


- Remove screw ④.
- Remove spacer ⑤ using the special tool.

Footrest spring plier (58429083000) (📖 p. 367)

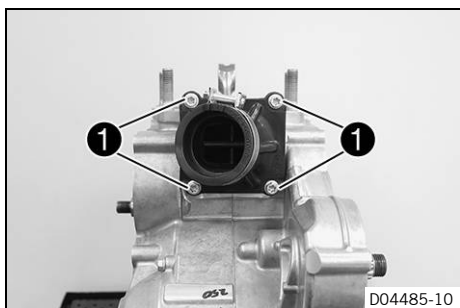


- Remove the starter motor.

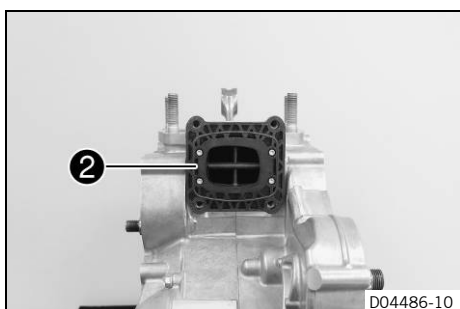


- Remove O-ring ⑥.

## 18.4.24 Removing the reed valve housing

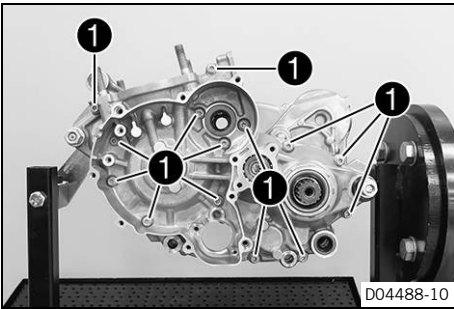


- Remove screws ①.
- Take off intake flange and gasket.



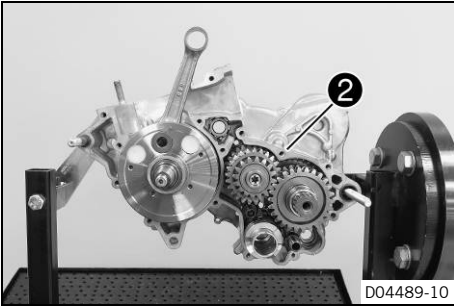
- Remove reed valve housing ②.
- Take off the gasket.

## 18.4.25 Removing the left engine case section



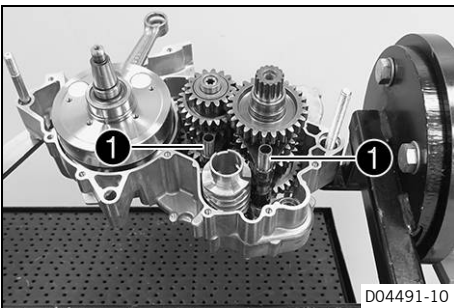
- Remove screws ①.
- Tilt the left section of the engine case upward and remove the fitting of the engine fixing arm.
- Loosen the left section of the engine case by striking it lightly with a plastic hammer and remove it.

**i Info**  
Do not pry it apart with screwdrivers, since the sealing areas are easily damaged.



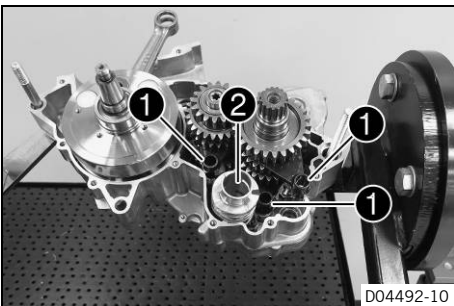
- Remove engine case gasket ②.

## 18.4.26 Removing the shift rails



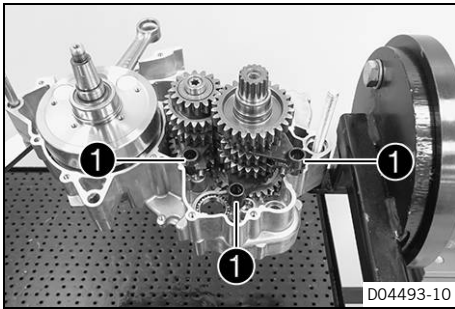
- Remove shift rails ①.

## 18.4.27 Removing the shift drum



- Tilt shift forks ① to the side.
- Remove shift drum ②.

## 18.4.28 Removing the shift forks



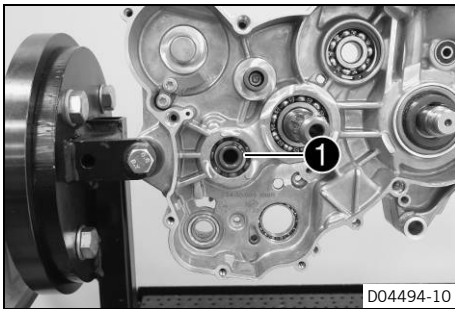
- Remove shift forks ①.



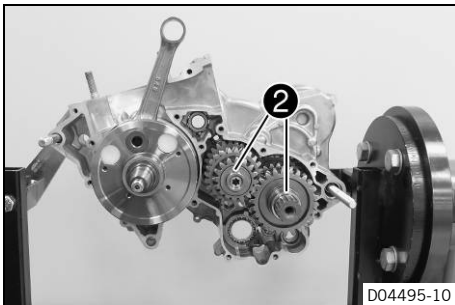
### Info

Do not misplace the shift rollers.

## 18.4.29 Removing the transmission shafts



- Remove lock ring ①.



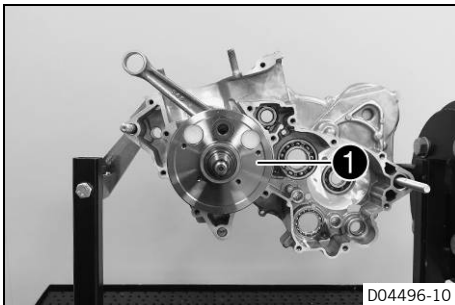
- Pull both transmission shafts ② out of the bearing seats together.



### Info

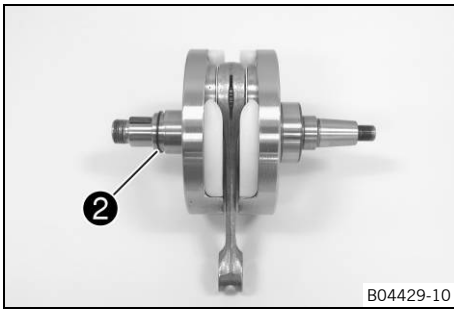
The stop disks of the transmission shafts usually stick to the bearings.

## 18.4.30 Removing the crankshaft

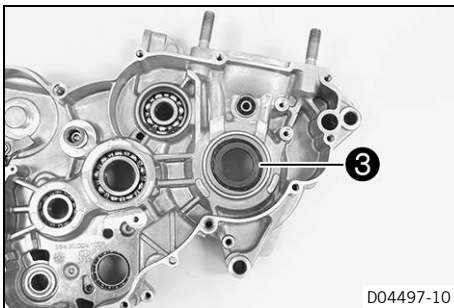


- Remove crankshaft ①.





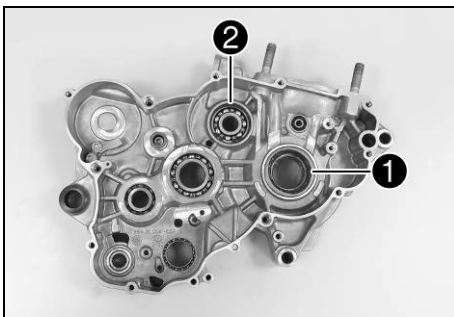
- Remove O-ring ②.



- Remove distance sleeve ③.

## 18.5 Working on individual parts

### 18.5.1 Working on the right section of the engine case



- Remove all dowels.
- Remove shaft seal ring ① of the crankshaft.
- Remove lock ring ②.
- Remove screws ③. Remove the bearing retainers.
- Clean the engine case section thoroughly.
- Warm the engine case section in an oven.

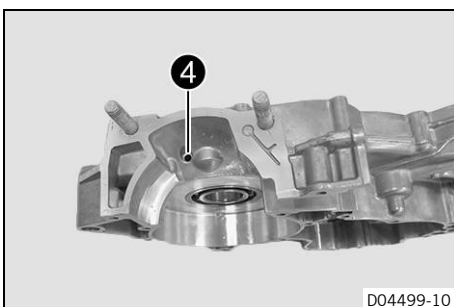
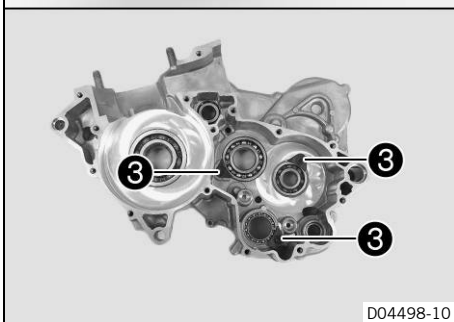
Guideline

|                 |
|-----------------|
| 180 °C (356 °F) |
|-----------------|

- Knock the engine case section 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 engine case section must be removed using a suitable tool.



- Blow out lubrication bore ④ with compressed air and check that it is clear.
- Insert the new cold bearings in the bearing seats 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 the bearings in, ensure that the engine case section is level to prevent damage.  
Only press the bearings in via the outer ring; otherwise, the bearings will be damaged when they are pressed in.

- After the engine case section 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.

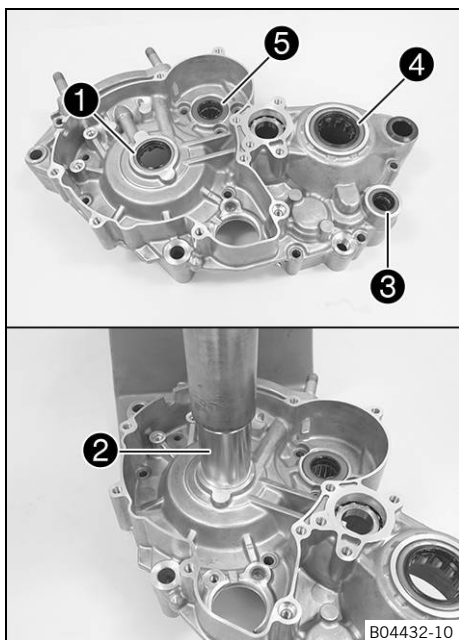
- Press in shaft seal ring **1** for the crankshaft so it is flush, with the open side facing inward.
- Mount lock ring **2**.
- Mount and tighten screws **3** with the bearing retainers.

Guideline

|                         |    |  |
|-------------------------|----|--|
| Screw, bearing retainer | M5 | 7 Nm (5.2 lbf ft)<br><b>Loctite®243™</b> |
|-------------------------|----|--|

- Mount the dowels.

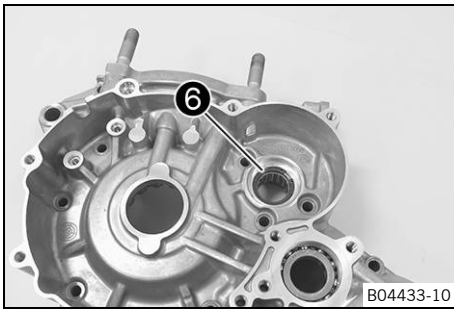
## 18.5.2 Working on the left section of the engine case



- Remove all dowels.
- Press shaft seal ring **1** of the crankshaft from the outside to the inside using special tool **2**.

Pressing tool (75029044010) (🗨️ p. 370)

- Remove shaft seal ring **3** from the shift shaft and **4** from the countershaft.
- Remove shaft seal ring **5** from the balancer shaft.



- Remove lock ring **6**.
- Clean the engine case section thoroughly.
- Warm the engine case section in an oven.

Guideline

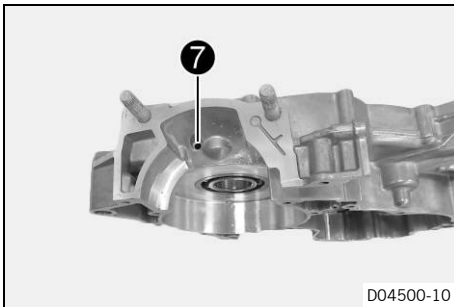
180 °C (356 °F)

- Knock the engine case section against a level wooden board. This will cause the bearings to drop out of the bearing seats.

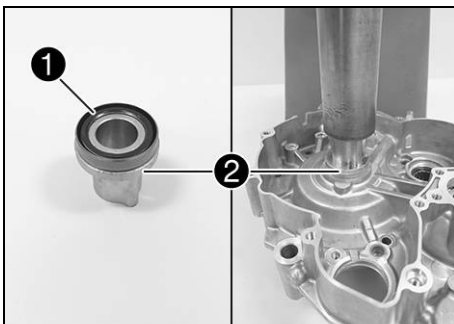


**Info**

Any bearings that remain in the engine case section must be removed using a suitable tool.



- Blow out lubrication bore **7** with compressed air and check that it is clear.



- Insert the new cold bearings in the bearing seats 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.



**Info**

When pressing in, ensure that the section of the engine case lies flat in order prevent damage. Only press the bearings in via the outer ring; otherwise, the bearings will be damaged when they are pressed in.

- After the engine case section has cooled, check that the bearings are firmly seated.



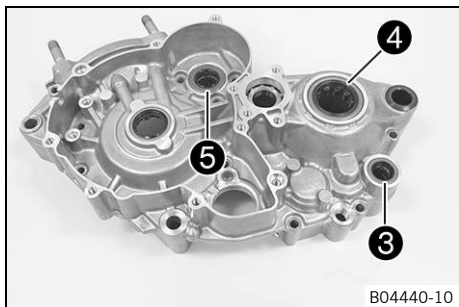
**Info**

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.

- Position shaft seal ring **1** for the crankshaft on special tool **2**.

Pressing tool (50429005000) (📖 p. 364)

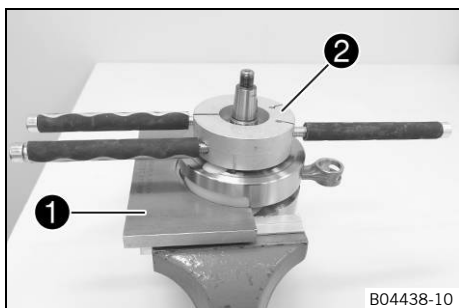
- Press the shaft seal ring of the crankshaft from the outside to the inside with the open side facing inward.
- Mount lock ring **6**.



B04440-10

- Press in shaft seal ring **3** of the shift shaft so it is flush, with the open side facing inward.
- Press in shaft seal ring **4** of the countershaft so it is flush with the open side facing in.
- Press in shaft seal ring **5** for the balancer shaft so it is flush, with the open side facing inward.

### 18.5.3 Removing the crankshaft bearing inner race



B04438-10

- Fixate the crankshaft in the vice with special tool **1**.

Separator plate (54829009000) (📖 p. 365)

**i Info**  
Use soft jaws.

- Warm up special tool **2**.

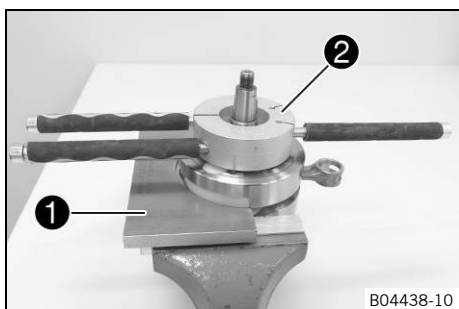
Guideline

180 °C (356 °F)

Puller (58429037043) (📖 p. 367)

- Push the warmed up special tool **2** onto the crankshaft bearing inner race, press firmly together, and pull jointly from the crankshaft.

### 18.5.4 Installing the crankshaft bearing inner race



B04438-10

- Fixate the crankshaft in the vice with special tool **1**.

Separator plate (54829009000) (📖 p. 365)

**i Info**  
Use soft jaws.

- Heat the crankshaft bearing inner race in special tool **2** and mount together.

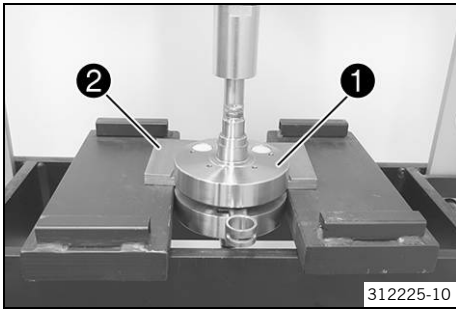
Guideline

120 °C (248 °F)

Puller (58429037043) (📖 p. 367)

- Ensure that the new crankshaft bearing inner race is flush.

**18.5.5 Changing the connecting rod, conrod bearing, and crank pin**



**Main work**

- Position crankshaft **1** in the press using special tool **2**.

Separator plate (54829009000) (📖 p. 365)

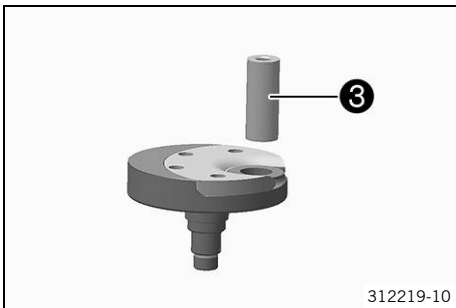
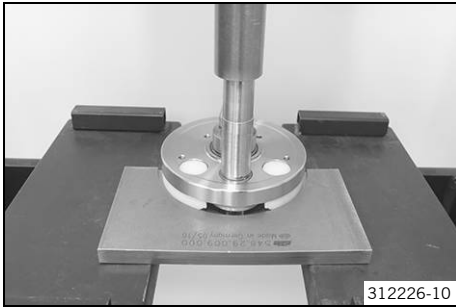
- Press the crank pin out of the upper crankweb with a suitable tool.



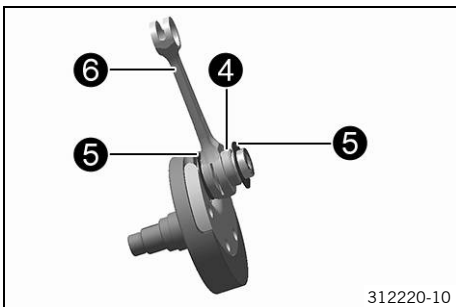
**Info**

Hold the lower crankweb.

- Remove the connecting rod and bearing.
- Press the crank pin out of the lower crankweb.



- Lubricate the new crank pin **3** and push in up to the stop.

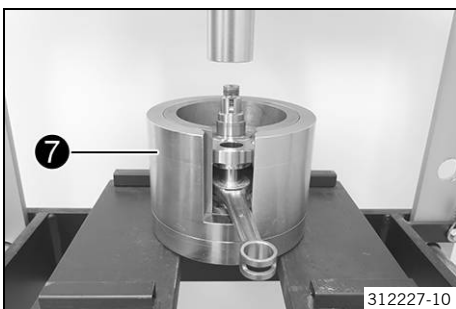


- Mount new bearing **4** with washers **5** and connecting rod **6**.



**Info**

Thoroughly oil the bearing.

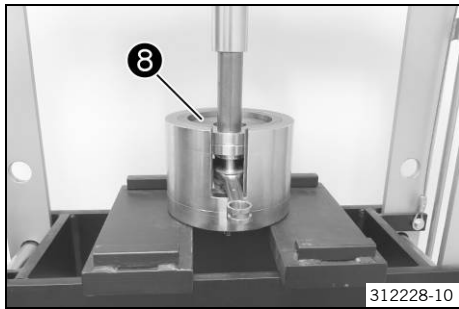


- Position special tool **7** on the press.

Crankshaft pressing tool (75029047000) (📖 p. 370)

Crankshaft pressing tool insert (54829108000) (📖 p. 365)

- Insert the crankweb with the connecting rod and bearing. Position the second crankweb.



- Position special tool **8** with the heel pointing down.

Crankshaft pressing tool insert (54829108000) (📖 p. 365)

- Press in the upper crankweb as far as possible.



### Info

The press mandrel must be positioned over the crank pin.

- Take the crankshaft out of the special tool and check that the connecting rod can move freely.

- Measure axial play **A** between the connecting rod and the crankwebs using the special tool.

Feeler gauge (59029041100) (📖 p. 369)

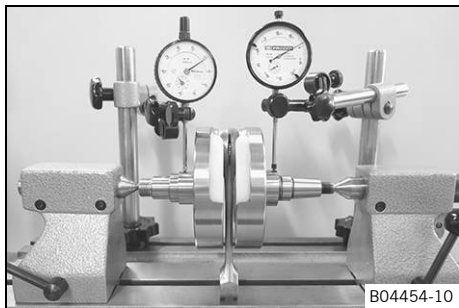
|   |   |
|---|---|
| Connecting rod - axial play of lower conrod bearing | 0.60 ... 0.70 mm (0.0236 ... 0.0276 in) |
|---|---|

- » If the measured value is less than the specification:
  - Correct it so the dimension is equal to the specified value.

### Finishing work

- Check the crankshaft run-out at the bearing pin. (📖 p. 224)

## 18.5.6 Checking the crankshaft run-out at the bearing pin

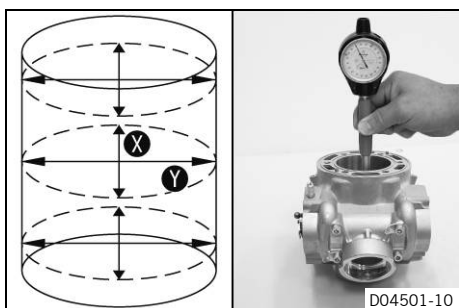


- Position the crankshaft on a roller block.
- Turn the crankshaft slowly.
- Check the crankshaft run-out on both bearing pins.

|                                     |   |
|-------------------------------------|---|
| Crankshaft - run-out at bearing pin | $\leq 0.03 \text{ mm}$ ( $\leq 0.0012 \text{ in}$ ) |
|-------------------------------------|---|

- » If the crankshaft run-out at the bearing pin is larger than the specification:
  - Align the crankshaft.

## 18.5.7 Checking/measuring the cylinder

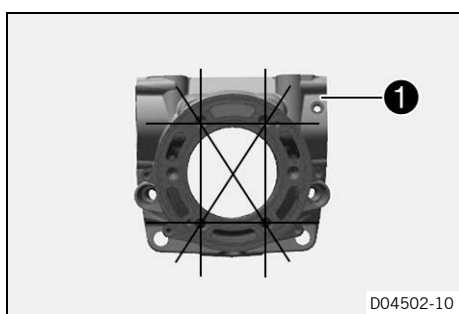


- Check the cylinder bearing surface for damage.
  - » If the cylinder bearing surface is damaged:
    - Change the cylinder and piston.
- Measure the cylinder diameter at several locations on the **X** and **Y** axes using a micrometer to identify oval wear.

## Guideline

| Cylinder - drill hole diameter (All 250 models) |  |
|---|--|
| Size I  | 66.400 ... 66.412 mm<br>(2.61417 ... 2.61464 in) |
| Size II   | 66.412 ... 66.425 mm<br>(2.61464 ... 2.61515 in) |
| Cylinder - drill hole diameter (All 300 models) |  |
| Size I  | 72.000 ... 72.012 mm<br>(2.83464 ... 2.83511 in) |
| Size II   | 72.012 ... 72.025 mm<br>(2.83511 ... 2.83562 in) |

**i Info**  
The cylinder size ❶ is labeled on the right side of the cylinder.



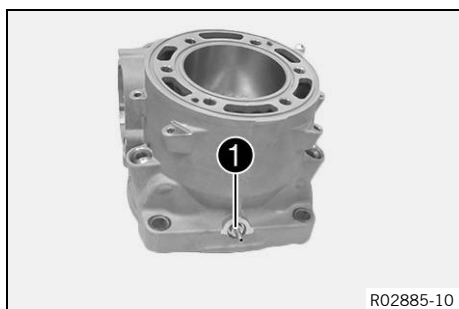
- Using a straightedge and the special tool, check the sealing surface of the cylinder head for distortion.

Feeler gauge (59029041100) (📖 p. 369)

|  |                         |
|--|-------------------------|
| Cylinder/cylinder head - distortion of sealing surface | ≤ 0.10 mm (≤ 0.0039 in) |
|--|-------------------------|

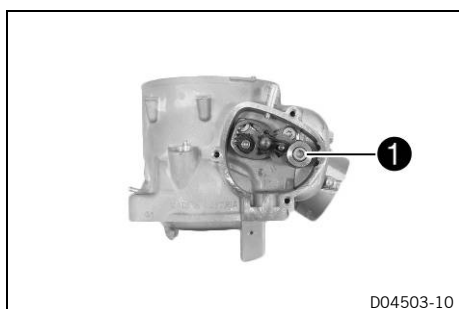
- » If the measured value does not meet specifications:
  - Change the cylinder.

## 18.5.8 Cleaning the pressure sensor cylinder connection



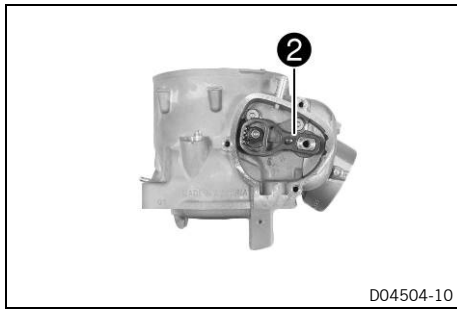
- Clean cylinder connection ❶ thoroughly and blow out with compressed air.

## 18.5.9 Removing the exhaust control

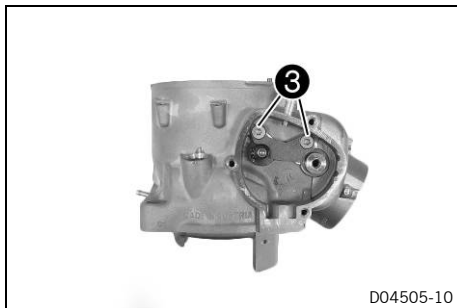


- Remove screw ❶ with the bushing and spring.

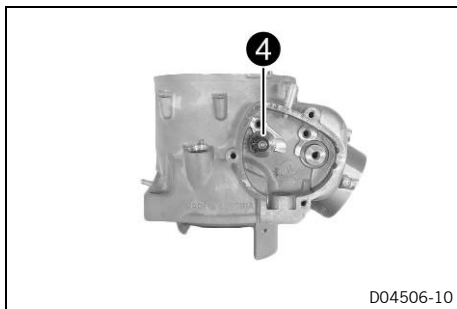




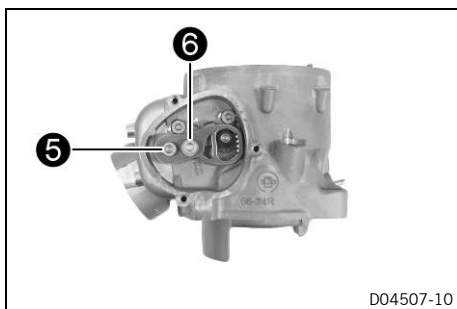
- Take off gear segment ②.



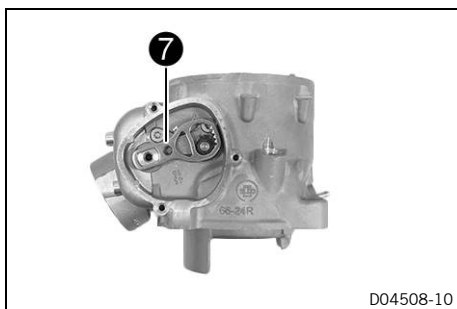
- Remove screws ③.
- Take off the retaining bracket.



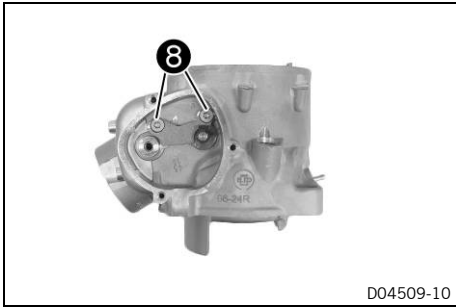
- Remove control shaft ④.



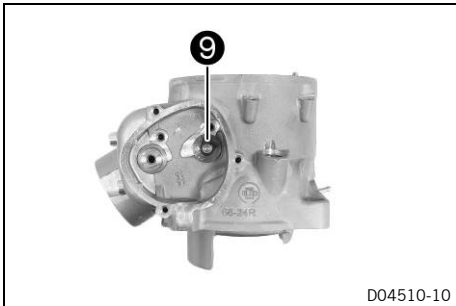
- Remove screw ⑤.
- Remove screw ⑥ with washer.
- Take off the stop plate.



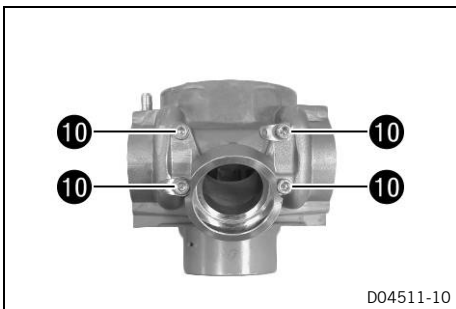
- Take off gear segment ⑦.



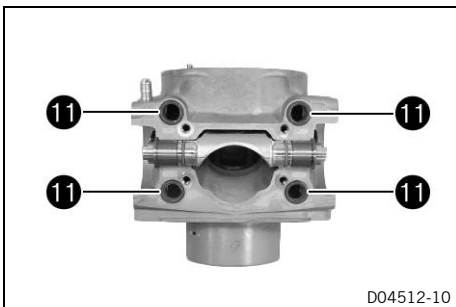
- Remove screws 8.
- Take off the retaining bracket.



- Remove control shaft 9.



- Remove screws 10.
- Take off the exhaust flange.

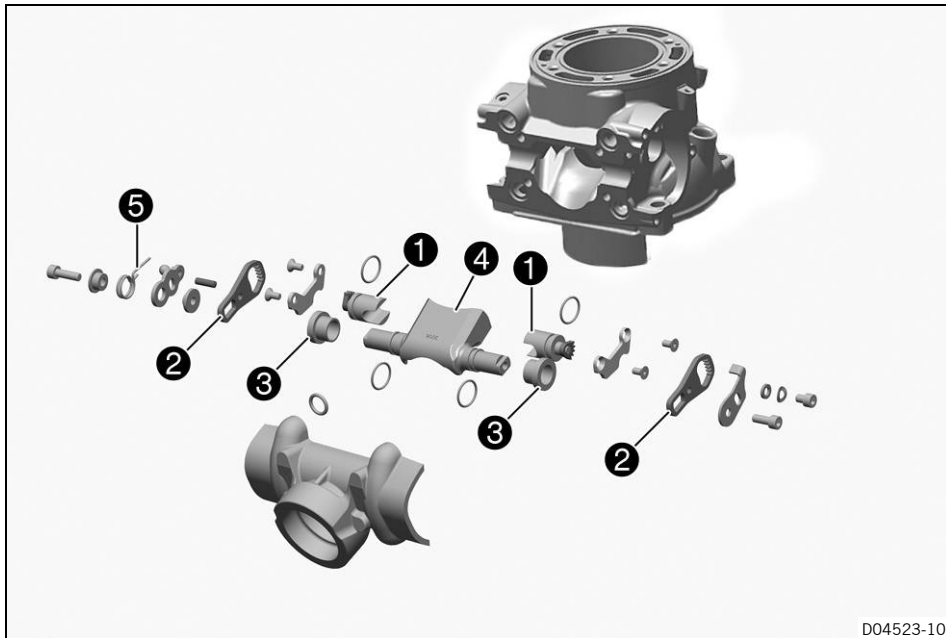


- Remove O-rings 11.
- Take off the control flap.

### 18.5.10 Checking the exhaust control

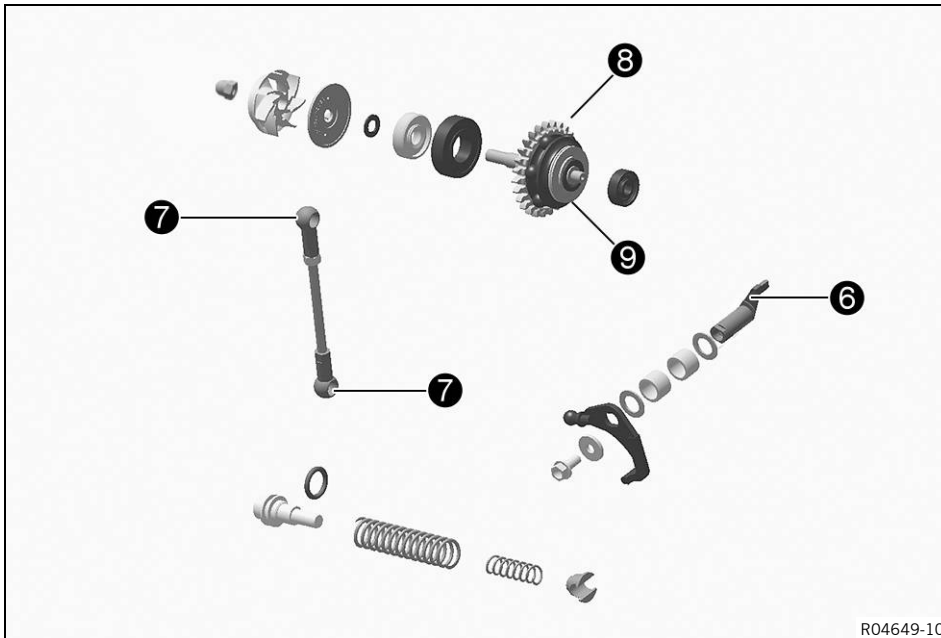
**Condition**

The exhaust control and centrifugal timer are removed.



D04523-10

- Check control shafts **1** for damage and wear.
  - » If there is damage or wear:
    - Change the control shaft.
- Check gear segments **2** for damage and wear.
  - » If there is damage or wear:
    - Change the gear segments.
- Check bearing sleeves **3** for damage and wear.
  - » If there is damage or wear:
    - Change the bearing sleeves.
- Check control flap **4** for damage and wear.
  - » If there is damage or wear:
    - Change the control flap.
- Check spring **5** for damage and wear.
  - » If there is damage or wear:
    - Change the spring.

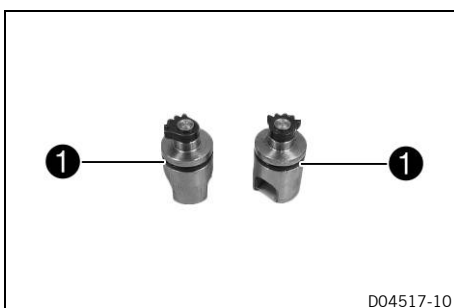


R04649-10

- Check pins **6** of the control lever for damage and wear.
  - » If there is damage or wear:
    - Change the control lever.
- Check ball head **7** on the linkage for damage and wear.
  - » If there is damage or wear:
    - Change the linkage.
- Check centrifugal timer **8** for damage and wear.
  - » If there is damage or wear:
    - Change the centrifugal timer.
- Check axial bearing **9** for damage and wear.
  - » If there is damage or wear:
    - Change the axial bearing.



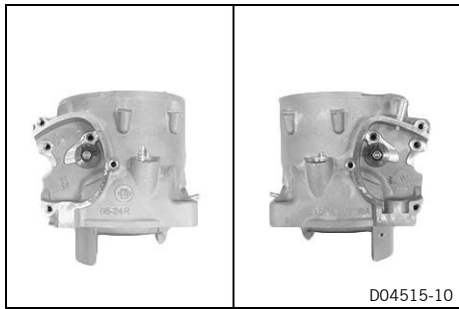
### 18.5.11 Installing the exhaust control



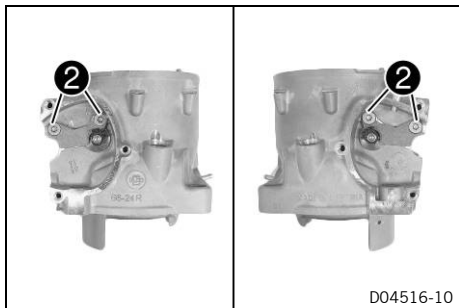
D04517-10

- Mount and grease O-rings **1**.

Long-life grease (🗨️ p. 360)



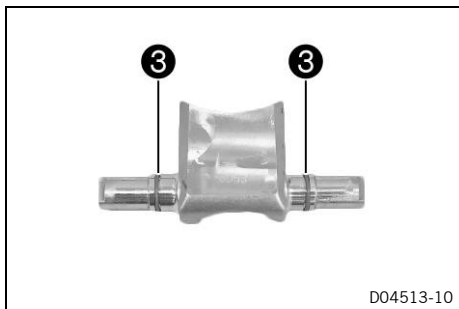
- Mount the control shafts.
- ✓ The control shaft with marking **Lis** installed on the left.



- Mount the retaining brackets.
- Mount and tighten screws **2**.

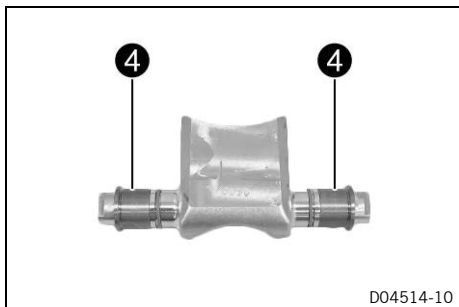
Guideline

|   |    |   |
|---|----|---|
| Screw, retaining bracket of exhaust control | M5 | 7 Nm (5.2 lbf ft)<br><b>Loctite®2701™</b> |
|---|----|---|



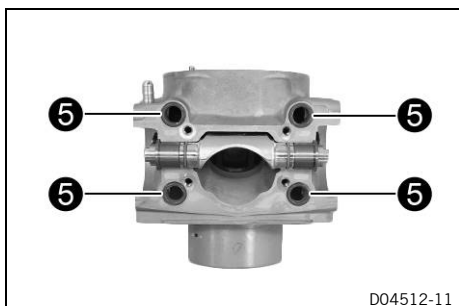
- Mount and grease O-rings **3**.

Long-life grease (📖 p. 360)

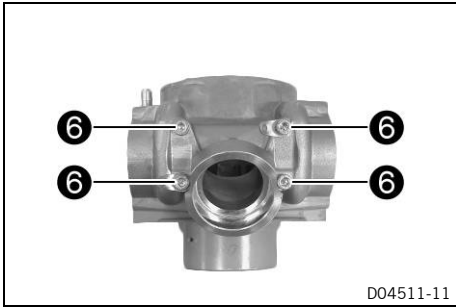


- Mount and grease bearing sleeves **4**.

Long-life grease (📖 p. 360)



- Set the control flap to the open position.
- Mount O-rings **5**.



- Degrease the sealing surface and coat thinly with sealant.

**Loctite® 5910**

- Position the exhaust flange.
- Mount and tighten screws ⑥.

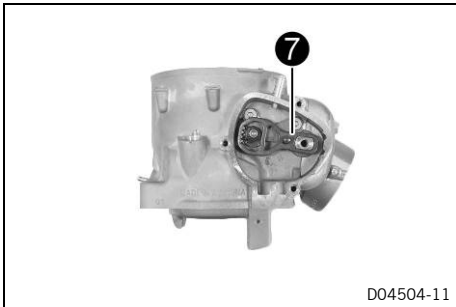
Guideline

|                       |    |                   |
|-----------------------|----|-------------------|
| Screw, exhaust flange | M6 | 8 Nm (5.9 lbf ft) |
|-----------------------|----|-------------------|

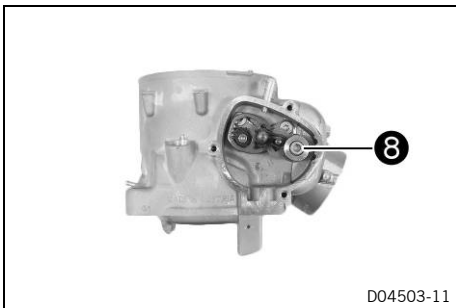


**Info**

Do not forget the spring hangers.



- Position gear segment ⑦.



- Position the spring with the short leg toward the outside.
- Mount screw ⑧ with the bushing and spring but do not tighten yet.

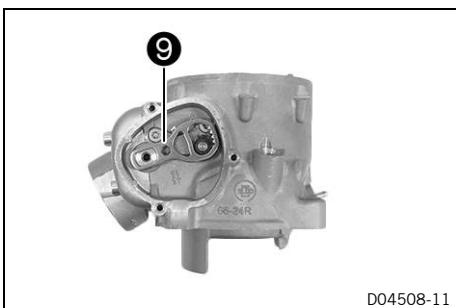
Guideline

|                                      |    |   |
|--------------------------------------|----|---|
| Screw, control flap, exhaust control | M6 | 10 Nm (7.4 lbf ft)<br><b>Loctite®243™</b> |
|--------------------------------------|----|---|

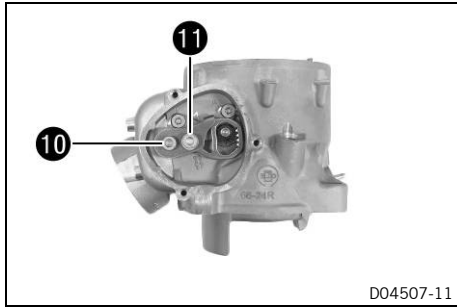
- Attach the spring to the cylinder pin.
- Tighten the screw.

Guideline

|                                      |    |   |
|--------------------------------------|----|---|
| Screw, control flap, exhaust control | M6 | 10 Nm (7.4 lbf ft)<br><b>Loctite®243™</b> |
|--------------------------------------|----|---|



- Position gear segment ⑨.



- Position the stop plate.
- Mount screw 10 but do not tighten yet.
- Mount screw 11 with the washer but do not tighten yet.



**Info**

The screws are tightened when the Z dimension is adjusted.

## 18.5.12 Cylinder - Nikasil® coating



**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.

## 18.5.13 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.



**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.

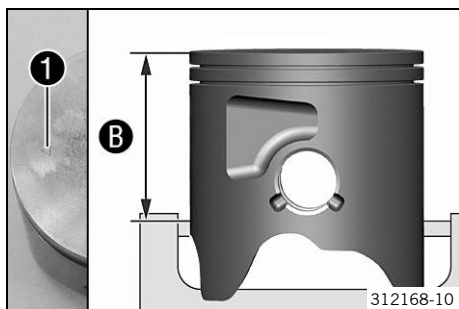


**Info**

Mount the piston ring with the marking facing upward.

- Check the piston pins for discoloration or signs of wear.
  - » If the piston pin shows severe discoloration/signs of wear:
    - Change the piston pin.
- Place the upper conrod bearing and piston pin in the connecting rod and check the seating for play.
  - » If the piston pin seating has excessive play:
    - Change the connecting rod, conrod bearing, and crank pin.





- Measure the piston at the piston skirt, at right angles to the piston pin, at a distance **B**.

Guideline

|                                    |  |
|------------------------------------|--|
| Distance <b>B</b>                  | 50 mm (1.97 in)                                  |
| Piston - diameter (All 250 models) |  |
| Size I                             | 66.340 ... 66.350 mm<br>(2.61181 ... 2.6122 in)  |
| Size II                            | 66.351 ... 66.360 mm<br>(2.61224 ... 2.61259 in) |
| Piston - diameter (All 300 models) |  |
| Size I                             | 71.940 ... 71.950 mm<br>(2.83228 ... 2.83267 in) |
| Size II                            | 71.951 ... 71.960 mm<br>(2.83271 ... 2.83307 in) |

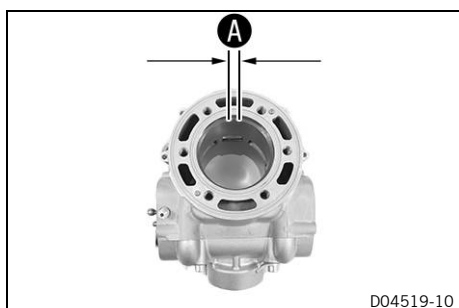


### Info

Piston dimensions **1** are marked on the piston head.



## 18.5.14 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 | 20 mm (0.79 in) |
|--------------------------------------|-----------------|

- Measure end gap **A** with a feeler gauge.

Guideline

|                       |                         |
|-----------------------|-------------------------|
| Piston ring - end gap |                         |
| Ring 1                | ≤ 0.40 mm (≤ 0.0157 in) |
| Ring 2                | ≤ 0.40 mm (≤ 0.0157 in) |

- » If the end gap is greater than the specified value:
  - Check/measure the cylinder. (📖 p. 224)
- » If cylinder wear lies within the specified tolerance:
  - Change the piston ring.
- Mount the piston ring with the marking facing toward the piston head.



## 18.5.15 Measuring the piston/cylinder mounting clearance



- Check/measure the cylinder. (📖 p. 224)
- Check/measure the piston. (📖 p. 232)
- The smallest piston/cylinder mounting clearance equals the smallest cylinder bore diameter minus the largest piston diameter. The largest piston/cylinder mounting clearance equals the largest cylinder bore diameter minus the smallest piston diameter.

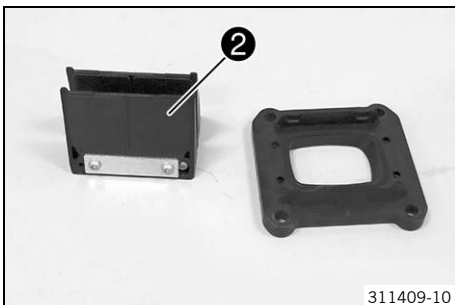
## Guideline

|   |  |
|---|--|
| Piston/cylinder - mounting clearance (All 250 models) |  |
| New condition   | 0.050 ... 0.074 mm<br>(0.00197 ... 0.00291 in) |
| Wear limit  | 0.10 mm (0.0039 in)                            |
| Piston/cylinder - mounting clearance (All 300 models) |  |
| New condition   | 0.050 ... 0.085 mm<br>(0.00197 ... 0.00335 in) |
| Wear limit  | 0.10 mm (0.0039 in)                            |

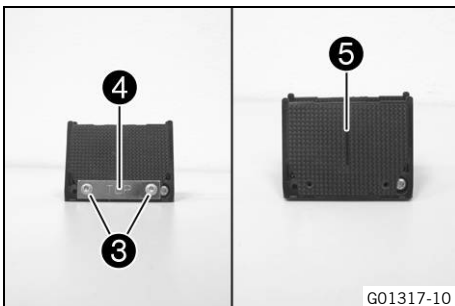
### 18.5.16 Disassemble the reed valve housing



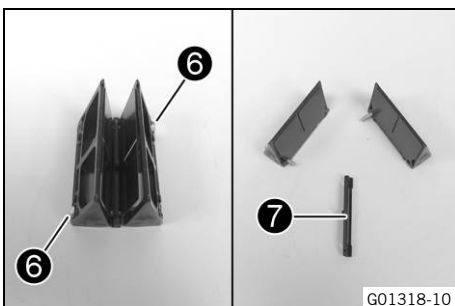
- Remove screws **1**.



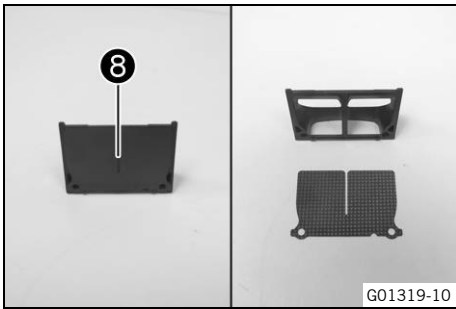
- Remove the reed valve housing **2** from the support plate.



- Remove screws **3** on both sides.
- Take off clamping plate **4** on both sides.
- Remove the outer reed valve **5** on both sides.



- Remove screws **6**.
- Separate the reed valve holders. Remove holding strip **7**.



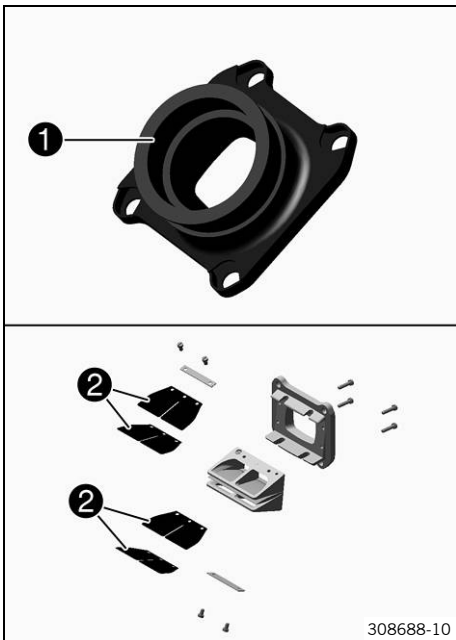
- Take off the inner reed valve **8** from both reed valve holders.



### 18.5.17 Checking the reed valve housing, reed valve and intake flange

**Condition**

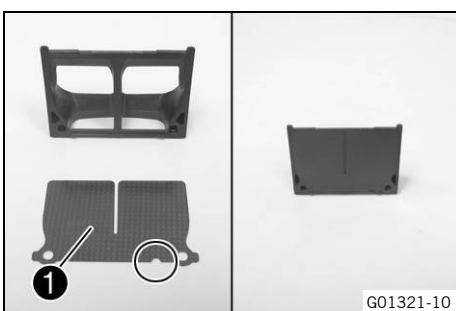
Reed valve housing has been removed.



- Check intake flange **1** for damage and wear.
  - » If there is damage or wear:
    - Change the intake flange.
- Check reed valve **2** for damage and wear.
  - » If there is damage or wear:
    - Change the reed valve.
- Check the reed valve housing for damage and wear.
  - » If there is damage or wear:
    - Change the reed valve housing.



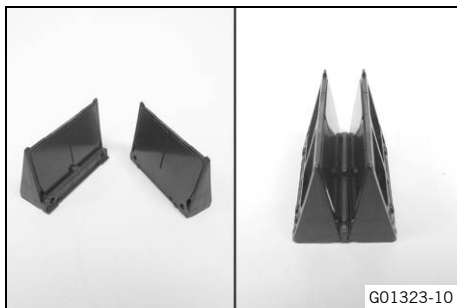
### 18.5.18 Assemble the reed valve housing



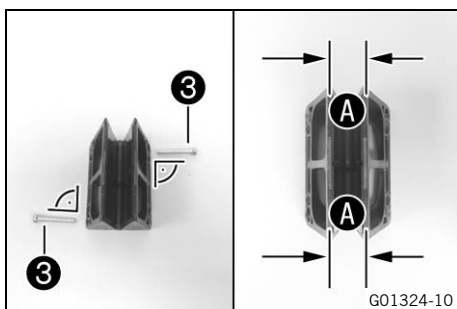
- Position the inner reed valve **1** on both reed valve holders.
  - ✓ The recesses are located on the right side.



- Position holding strip **2**.
- ✓ The pins engage in the drilled holes.



- Position the reed valve holders.



- Mount screws **3** and screw in all the way.



**Info**

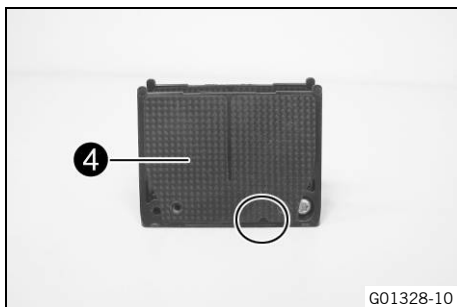
Mount the screws at right angles to prevent damage.

- Loosen screws **3** and tighten again.

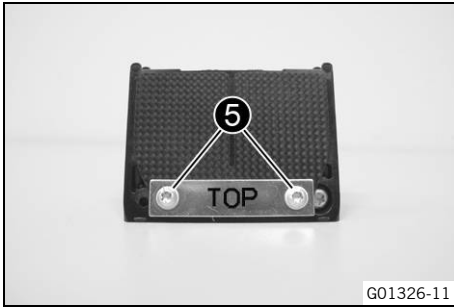
Guideline

|                              |                               |                   |
|------------------------------|-------------------------------|-------------------|
| Screw, inner membrane sheets | <b>EJOTDELTA PT®</b><br>35x25 | 1 Nm (0.7 lbf ft) |
|------------------------------|-------------------------------|-------------------|

- ✓ Distance **A** is equal on both sides.



- Position the outer reed valve **4** on both sides.
- ✓ The recesses are located on the right side.



- Position the clamping plates on both sides.
- ✓ After installation, the **TOP** marking must be visible as shown.
- Mount screws **5** on both sides and screw in all the way.
- Loosen screws **5** and tighten again.

Guideline

|                              |                              |                   |
|------------------------------|------------------------------|-------------------|
| Screw, outer membrane sheets | <b>EJOTDELTA PT®</b><br>30x6 | 1 Nm (0.7 lbf ft) |
|------------------------------|------------------------------|-------------------|



- Position gasket **6**.



- Position the reed valve housing in the support plate.
- ✓ The outer recess is located on the right in the direction of travel when installed.
- Mount and tighten screws **7**.

Guideline

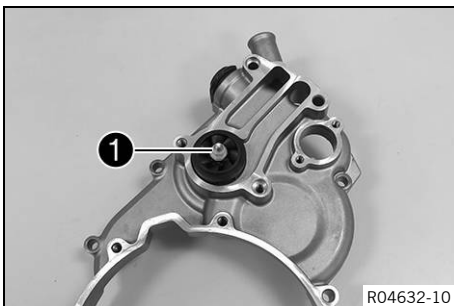
|                               |                               |                   |
|-------------------------------|-------------------------------|-------------------|
| Screw, membrane support plate | <b>EJOTDELTA PT®</b><br>30x12 | 1 Nm (0.7 lbf ft) |
|-------------------------------|-------------------------------|-------------------|

### 18.5.19 Working on the clutch cover

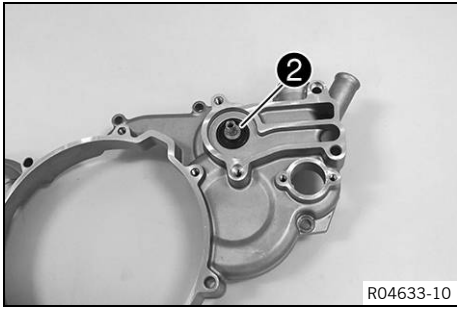


**Info**

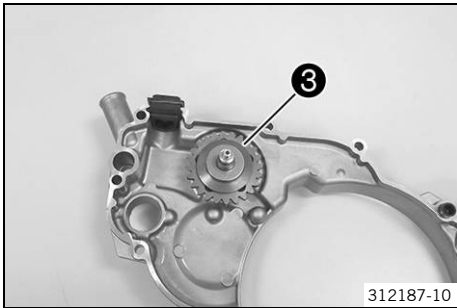
Remove the outer clutch cover to avoid damage.



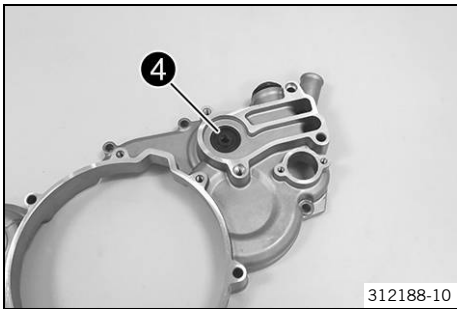
- Remove nut **1**.
- Take off the water pump impeller.



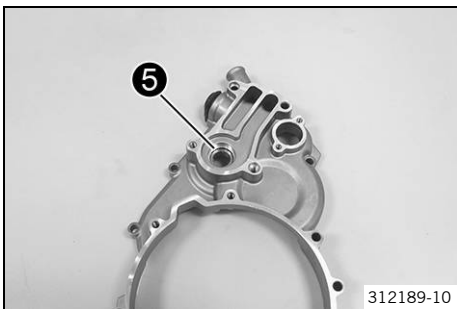
- Remove form washer **2**.



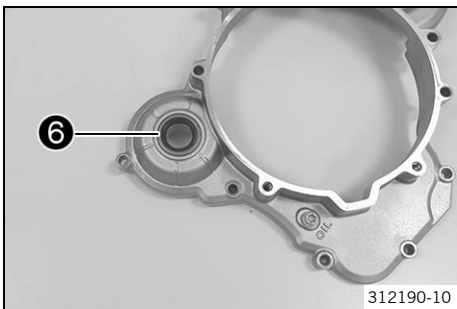
- Remove centrifugal timer **3**.



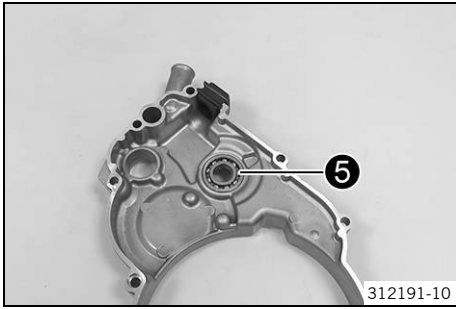
- Remove shaft seal ring **4**.



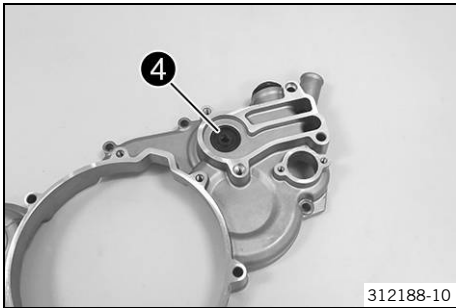
- Press out bearing **5** toward the inside.



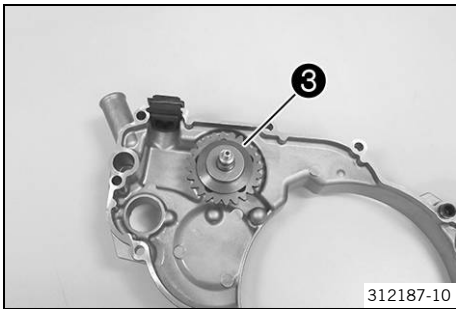
- Remove shaft seal ring **6**.
- Press in the new shaft seal ring all the way to the stop.



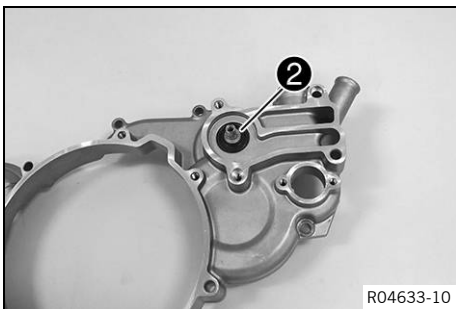
- Press bearing **5** all the way in to the stop from the inside.



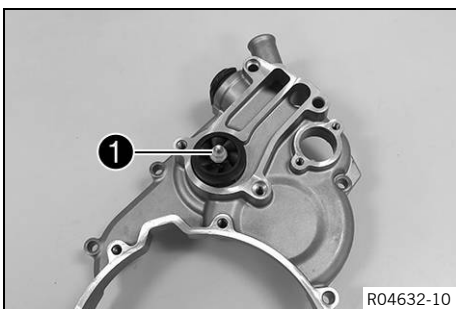
- Press shaft seal ring **4** so it is flush.
- Ensure that the bearing can turn freely and does not touch the shaft seal ring.



- Mount centrifugal timer **3**.



- Position form washer **2**.

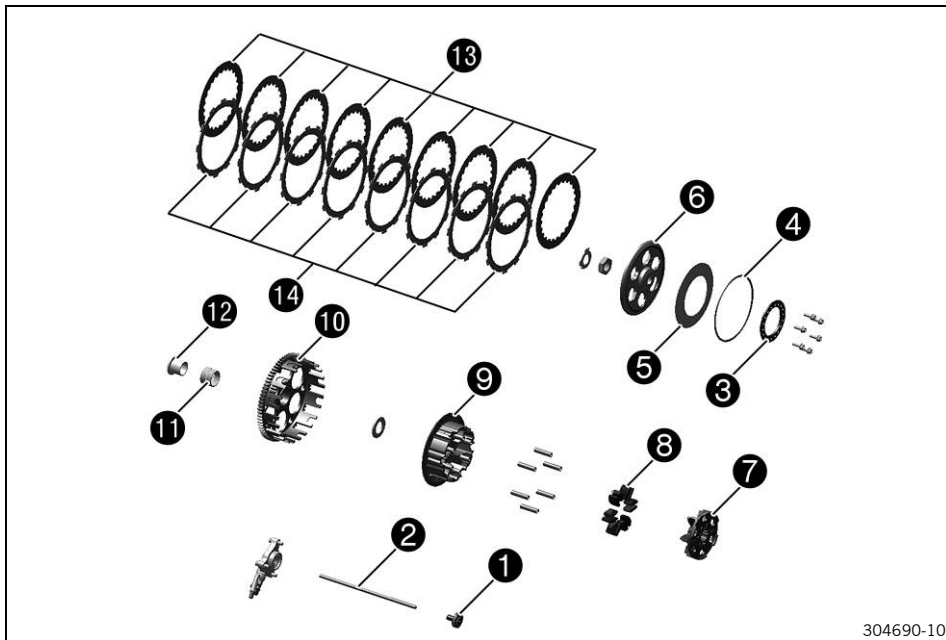


- Mount the water pump impeller.
- Mount and tighten nut **1**.

Guideline

|                              |    |  |
|------------------------------|----|--|
| Cap nut, water pump impeller | M6 | 6 Nm (4.4 lbf ft)<br><b>Loctite®243™</b> |
|------------------------------|----|--|

## 18.5.20 Checking the clutch



304690-10

- Check clutch push rod **1** for damage and wear.
  - » If there is damage or wear:
    - Change the clutch push rod.
- Place clutch push rod **2** on a flat surface and check for run-out.
  - » If there is run-out:
    - Change the clutch push rod.
- Check spring retainer **3** for damage and wear.
  - » If there is damage or wear:
    - Change the spring retainer.
- Check pretension ring **4** for damage and wear.
  - » If there is damage or wear:
    - Change the pretension ring.
- Check spring washer **5** for damage and wear.
  - » If there is damage or wear:
    - Change the spring washer.
- Check the contact surface of pressure cap **6** for damage and wear.
  - » If there is damage or wear:
    - Change the pressure cap.
- Check clutch center **7** for damage and wear.
  - » If there is damage or wear:
    - Change the clutch center.
- Check damping rubber pieces **8** for damage and wear.
  - » If there is damage or wear:
    - Change the damping rubber pieces.
- Check inner clutch hub **9** for damage and wear.
  - » If there is damage or wear:
    - Change the inner clutch hub.
- Check the thrust surfaces of the clutch facing discs in clutch basket **10** for damage and wear.



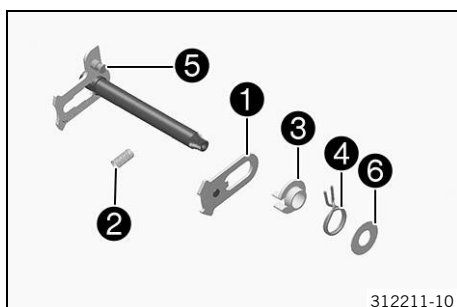
- » If there is damage or wear:
  - Change the clutch facing discs and the clutch basket.
- Check needle bearing **11** and collar sleeve **12** for damage and wear.
  - » If there is damage or wear:
    - Change the needle bearing and collar sleeve.
- Check intermediate discs **13** for damage and wear.
  - » If the intermediate discs are not flat or have punctiform outbreaks:
    - Change all intermediate discs.
- Check clutch facing discs **14** for discoloration and scoring.
  - » If there is discoloration or scoring:
    - Change all clutch facing discs.
- Check the thickness of clutch facing discs **14**.

|                                |  |
|--------------------------------|--|
| Clutch facing disc - thickness | $\geq 1.9 \text{ mm } (\geq 0.075 \text{ in})$ |
|--------------------------------|--|

- » If the clutch facing disc does not meet specifications:
  - Change all clutch facing discs.



### 18.5.21 Preassembling shift shaft



- Secure the short end of the shift shaft in the bench vise.

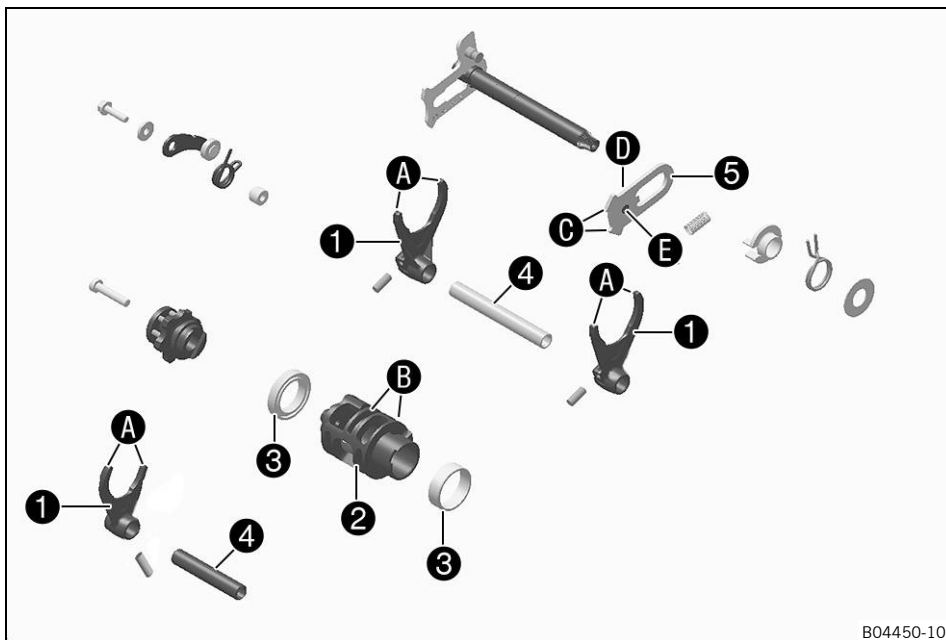
Guideline

|                |
|----------------|
| Use soft jaws. |
|----------------|

- Mount sliding plate **1** with the guide pin facing downward and put the guide pin on the shift quadrant.
- Mount pressure spring **2**.
- Slide on spring guide **3**, push return spring **4**, with the offset end facing upward, over the spring guide and lift the offset end over abutment bolt **5**.
- Mount stop disk **6**.



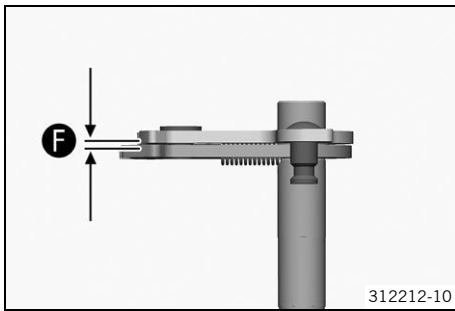
## 18.5.22 Checking the shift mechanism



B04450-10

- Check shift forks **1** on plate **A** for damage and wear (visual check).
  - » If there is damage or wear:
    - Change the shift fork.
- 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 bearing **3** for stiffness and wear.
  - » If the bearings do not move freely or are worn:
    - Change the bearings.
- Check the shift rollers for damage and wear.
  - » If there is damage or wear:
    - Change the shift rollers.
- Check shift rails **4** for run-out on a flat surface.
  - » 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.



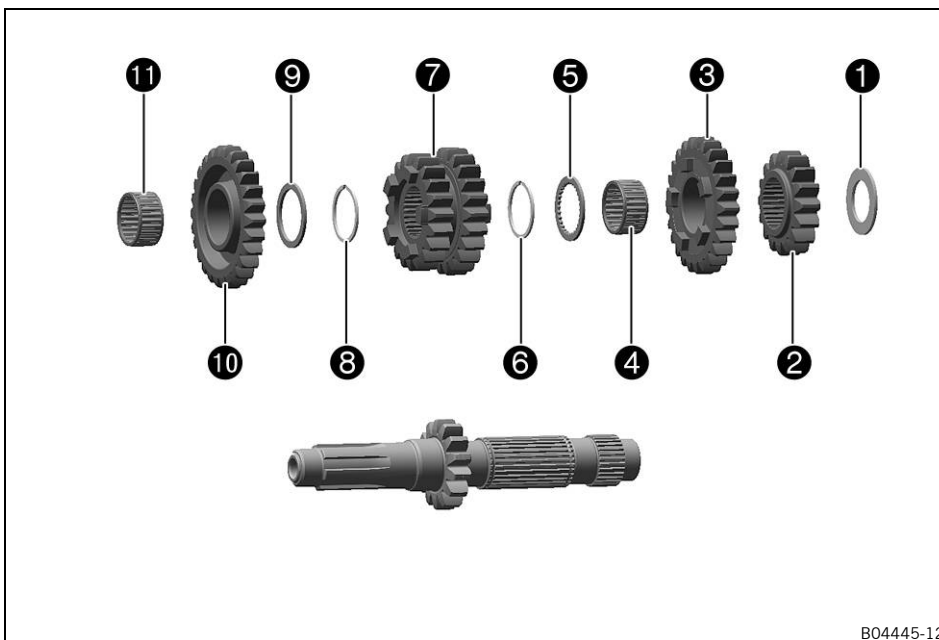
- Preassemble the shift shaft. (📖 p. 241)
- Check clearance **F** between the sliding plate and the shift quadrant.

|   |   |
|---|---|
| Shift shaft - sliding plate/shift quadrant play | 0.40 ... 0.80 mm (0.0157 ... 0.0315 in) |
|---|---|

- » If the measured value does not meet specifications:
  - Change the sliding plate.



### 18.5.23 Disassembling the main shaft



B04445-12

- Secure the main shaft with the toothed end facing downward in the vise.

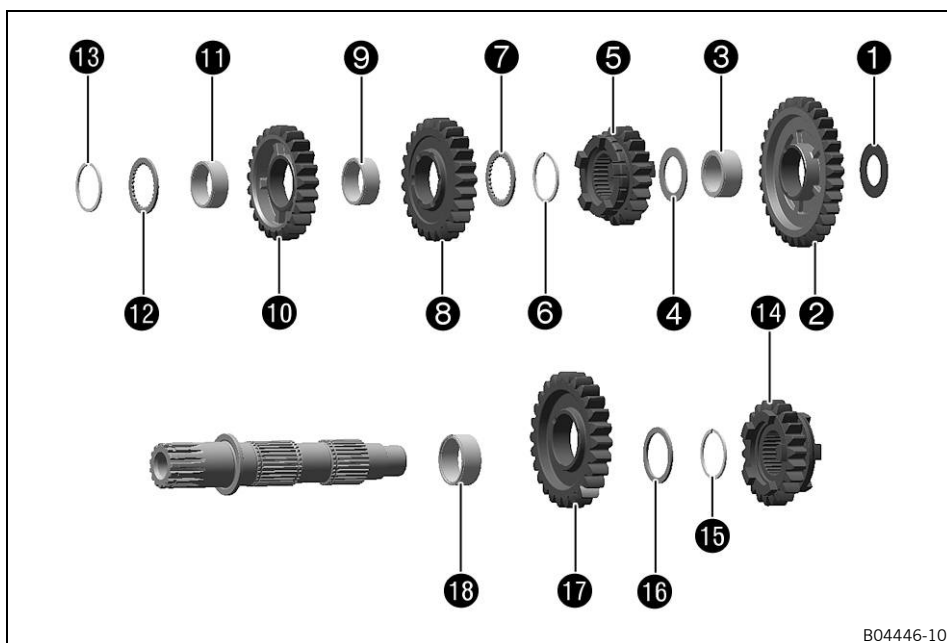
Guideline

Use soft jaws.

- Remove stop disk **1** and second-gear fixed gear **2**.
- Remove fifth-gear idler gear **3** and needle bearing **4**.
- Remove stop disk **5**.
- Remove lock ring **6**.
- Remove third/fourth-gear sliding gear **7**.
- Remove lock ring **8**.
- Remove stop disk **9**.
- Remove sixth-gear idler gear **10**.
- Remove needle bearing **11**.



## 18.5.24 Disassembling the countershaft



B04446-10

- Secure the countershaft in the bench vise with the toothed end facing downward.

Guideline

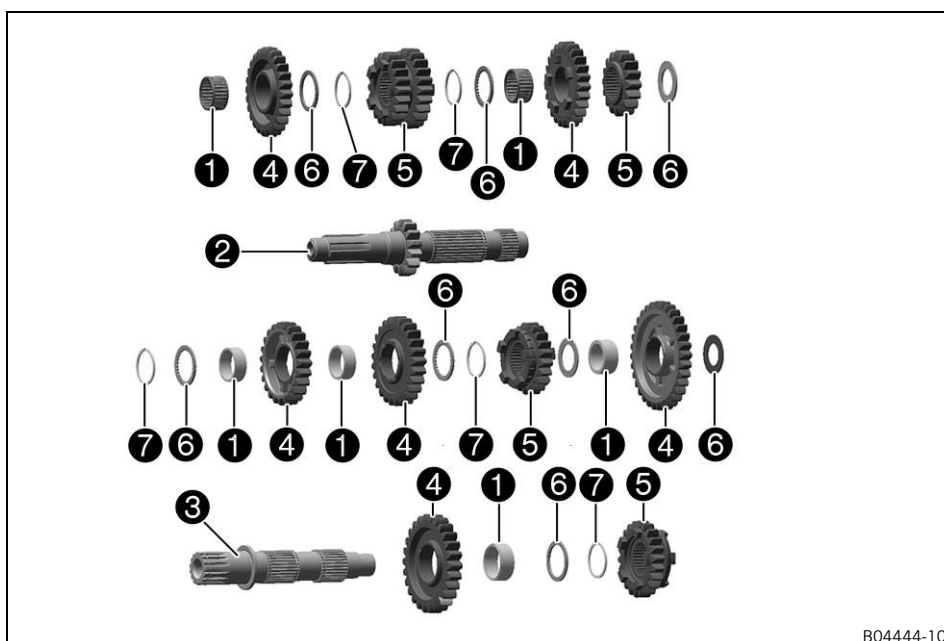
Use soft jaws.

- Remove stop disk **1** and first-gear idler gear **2**.
- Remove needle bearing **3** and stop disk **4**.
- Remove sixth-gear sliding gear **5**.
- Remove lock ring **6**.
- Remove stop disk **7**.
- Remove third-gear idler gear **8** and needle bearing **9**.
- Remove fourth-gear idler gear **10**.
- Remove needle bearing **11**.
- Remove stop disk **12** and lock ring **13**.
- Remove fifth-gear sliding gear **14**.
- Remove lock ring **15**.
- Remove stop disk **16**.
- Remove second-gear idler gear **17** and needle bearing **18**.

## 18.5.25 Checking the transmission

### Condition

The transmission has been disassembled.



B04444-10

- Check needle bearings **1** for damage and wear.
  - » If there is damage or wear:
    - Change the needle bearings.
- 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 gears **5** for smooth operation in the profile of main shaft **2**.
  - » If the sliding gear does not move freely:
    - Change the sliding gear or the main shaft.
- Check sliding gears **5** for smooth operation in the profile of countershaft **3**.
  - » If the sliding gear does not move freely:
    - 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.

## 18.5.26 Assembling the main shaft

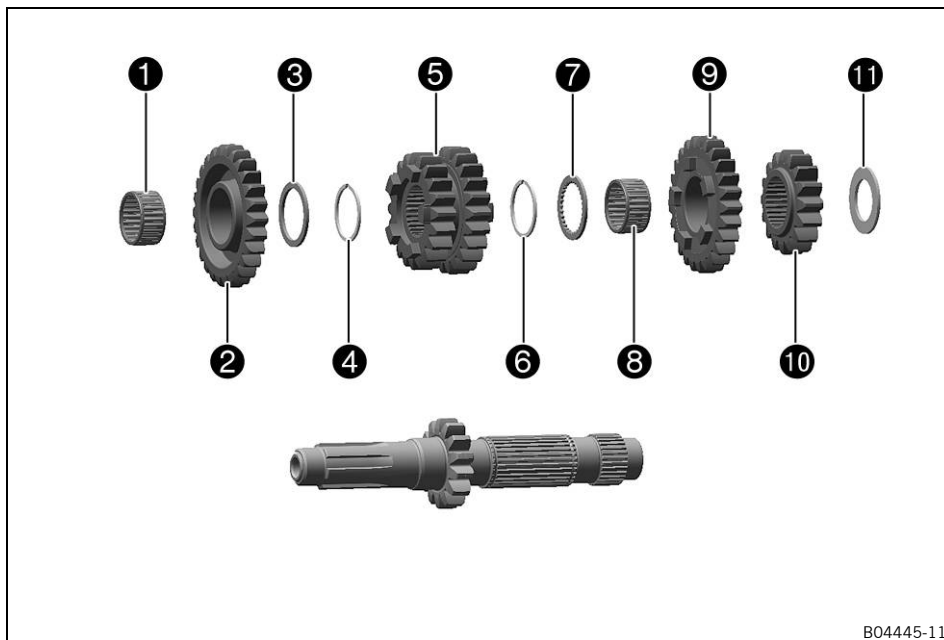


### Info

Use new lock rings with every repair.

### Preparatory work

- Check the transmission. (🔊 p. 244)
- Carefully lubricate all parts before assembling.



### Main work

- Secure the main shaft in the vise with the gear teeth facing downward.

Guideline

Use soft jaws.

- Mount needle bearing **1**.
- Mount sixth-gear idler gear **2**.
- Mount stop disk **3** and lock ring **4**.
- Mount third/fourth-gear sliding gear **5**.
- Mount lock ring **6** and stop disk **7**.
- Mount needle bearing **8**.
- Mount fifth-gear idler gear **9**.
- Mount second-gear fixed gear **10** and stop disk **11**.
- Finally, check all the gear wheels for smooth operation.

## 18.5.27 Assembling the countershaft

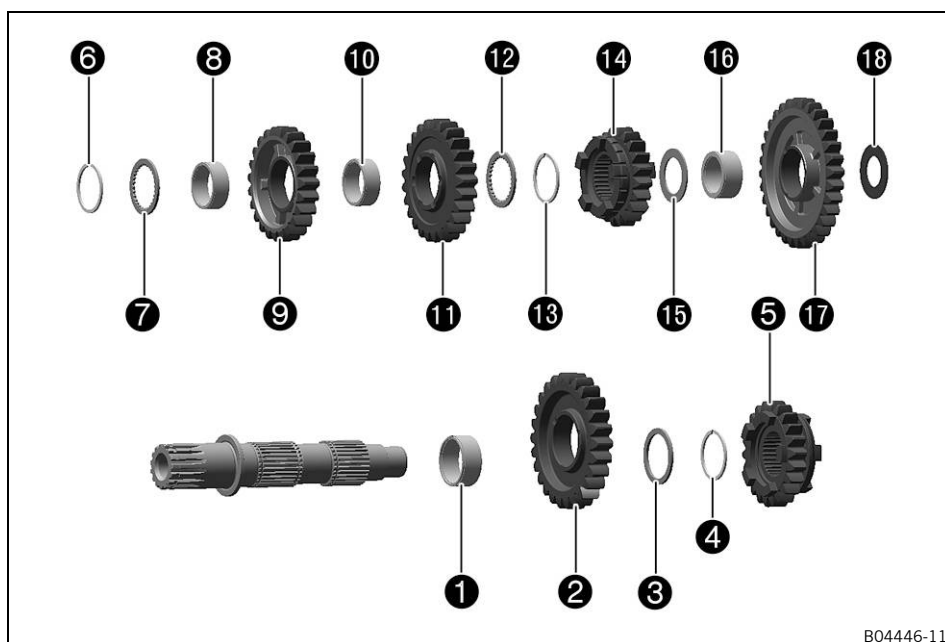


### Info

Use new lock rings with every repair.

**Preparatory work**

- Check the transmission. (📖 p. 244)
- Carefully lubricate all parts before assembling.

**Main work**

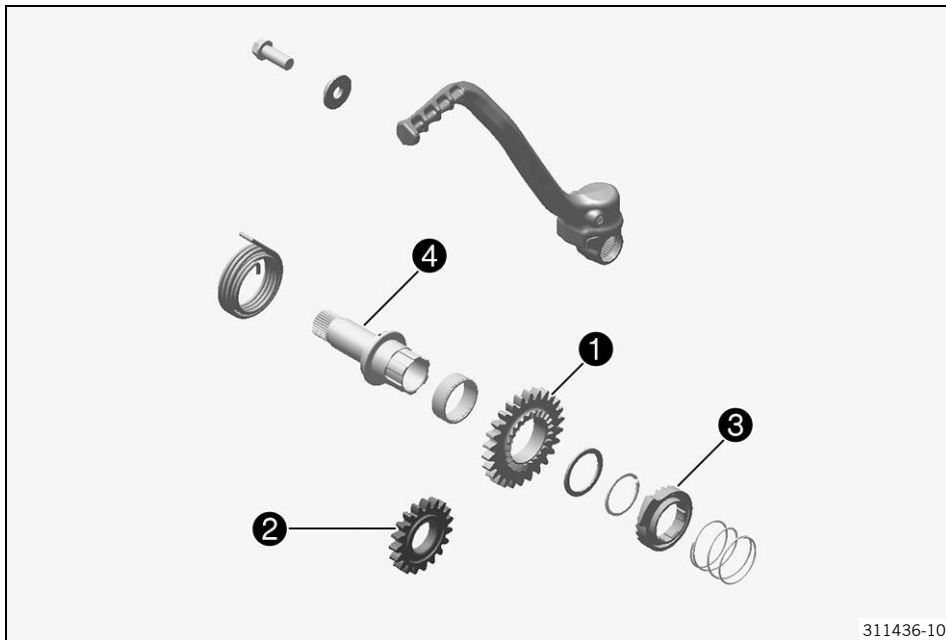
- Secure the countershaft in the bench vise with the toothed end facing downward.

## Guideline

Use soft jaws.

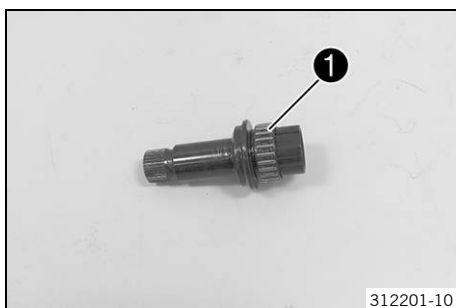
- Mount needle bearing **1** and second-gear idler gear **2** onto the countershaft with the protruding collar facing downward.
- Mount stop disk **3** and lock ring **4**.
- Mount fifth-gear sliding gear **5** with the shift groove facing up.
- Mount lock ring **6** and stop disk **7**.
- Mount needle bearing **8** and fourth-gear idler gear **9**.
- Mount needle bearing **10**.
- Mount third-gear idler gear **11**.
- Mount stop disk **12** and lock ring **13**.
- Mount sixth-gear sliding gear **14** with the shift groove facing downward.
- Mount stop disk **15**.
- Mount needle bearing **16** and first-gear idler gear **17**.
- Mount stop disk **18**.
- Finally, check all the gear wheels for smooth operation.

## 18.5.28 Checking the kick starter



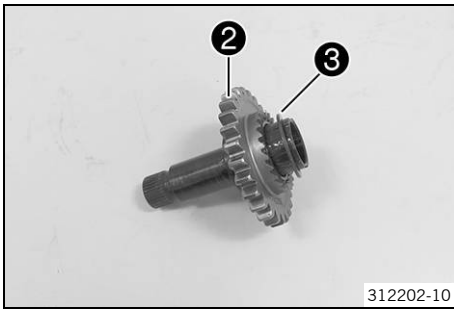
- Check the gear teeth and bearing of kick starter gear **1** for damage and wear.
  - » If there is damage or wear:
    - Change the kick starter gear.
- Check the gear teeth and bearing of intermediate kick starter gear **2** for damage and wear.
  - » If there is damage or wear:
    - Change the intermediate kick starter gear.
- Check the gear teeth and contact surface of kick starter ratchet wheel **3** for damage and wear.
  - » If there is damage or wear:
    - Change the kick starter ratchet wheel.
- Check the gear teeth and bearing of kick starter shaft **4** for damage and wear.
  - » If there is damage or wear:
    - Change the kick starter shaft.

## 18.5.29 Preassembling the kick starter shaft

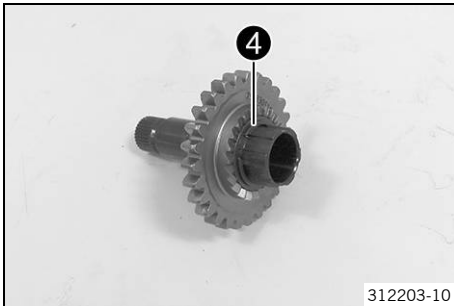


- Mount bearing **1**.

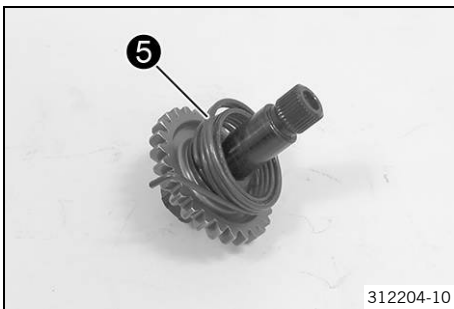




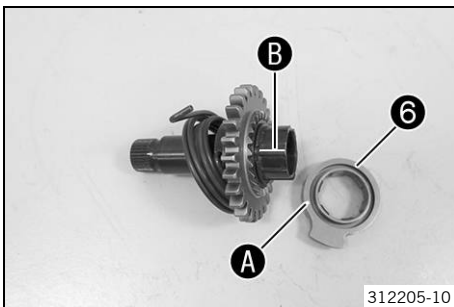
- Mount kick starter gear ② with washer ③.



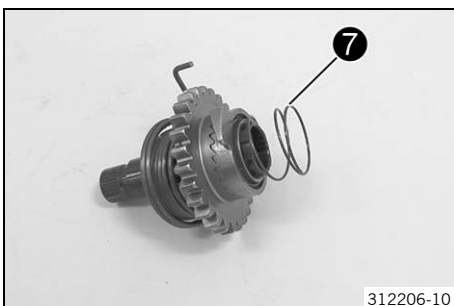
- Mount lock ring ④.



- Mount kick starter spring ⑤.  
✓ The end of the kick starter spring engages in the hole.



- Mount kick starter ratchet wheel ⑥.  
✓ Align markings ① and ②.

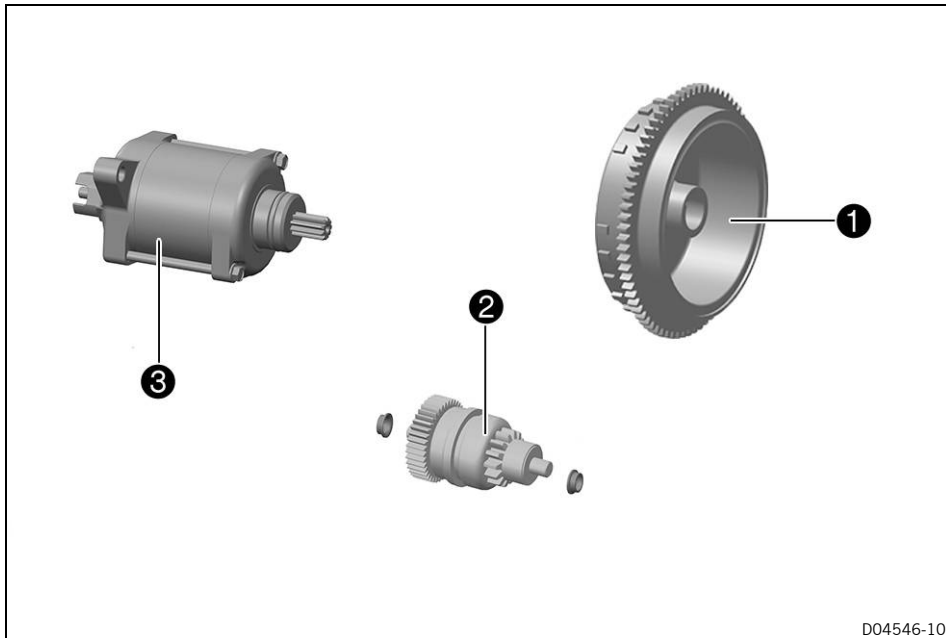


- Mount spring ⑦.

### 18.5.30 Checking the electric starter drive

#### Condition

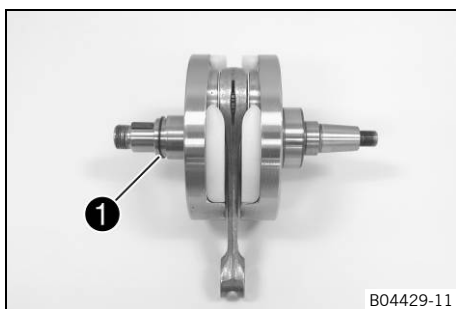
Bendix has been removed.



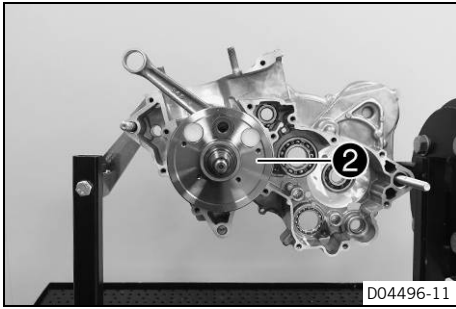
- Check the gear teeth of rotor **1** for damage and wear.
  - » If there is damage or wear:
    - Change the rotor.
- Check the gear teeth and bearing of the Bendix **2** for smooth operation, damage, and wear.
  - » If damaged or worn, or if the Bendix does not move easily:
    - Change the Bendix.
- Check the gear mesh of starter motor **3** for damage and wear.
  - » If there is damage or wear:
    - Change 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.

## 18.6 Engine assembly

### 18.6.1 Installing the crankshaft



- Mount O-ring **1**.



- Position the right section of the engine case in the engine work stand.

Engine work stand (61229001000) (📖 p. 370)

Holder and fitting for work stand (55429002000)  
(📖 p. 365)

- Warm up the crankshaft bearing.

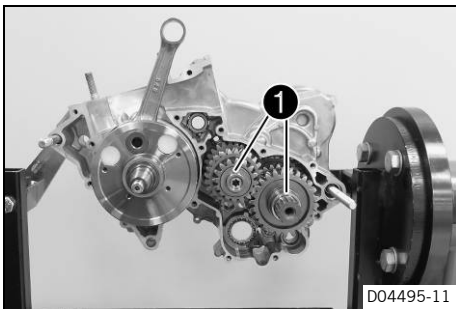
Guideline

100 °C (212 °F)

- Slide crankshaft **2** all the way into the bearing seat of the right section of the engine case.



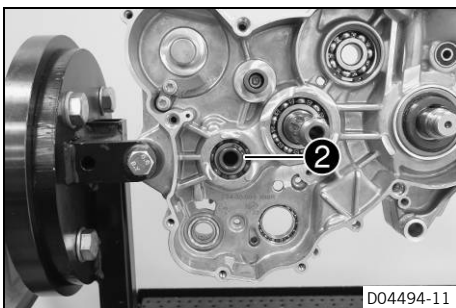
## 18.6.2 Installing the transmission shafts



- Oil all bearings.

Engine oil (15W/50) (📖 p. 358)

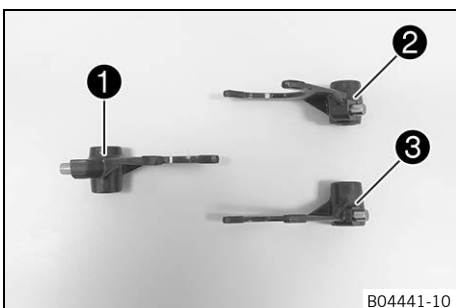
- Assemble the two transmission shafts **1** and slide them into the bearing seats together.



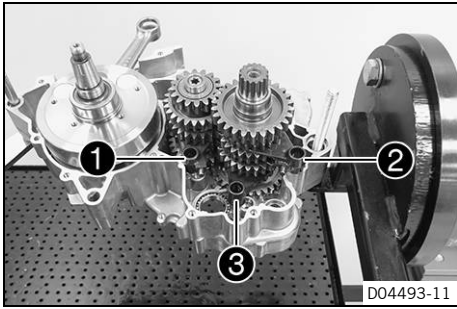
- Mount lock ring **2**.



## 18.6.3 Installing the shift forks

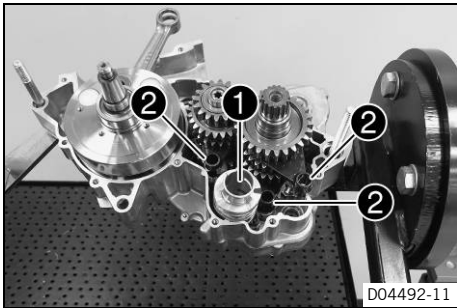


- Arrange shift forks **1**, **2**, and **3** as shown.



- Position shift forks **1**, **2**, and **3** in the sliding gears.

## 18.6.4 Installing the shift drum



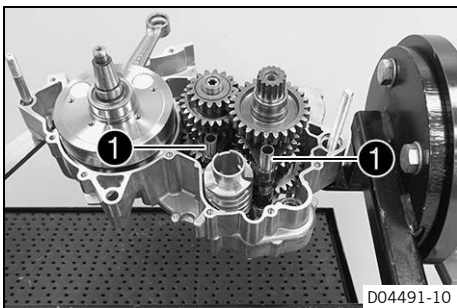
- Push shift drum **1** into the bearing seat.
- Position shift forks **2** in the shift grooves.



### Info

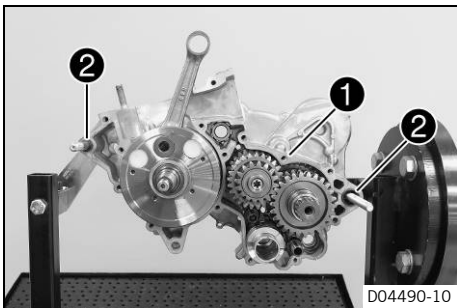
Do not misplace the shift rollers.

## 18.6.5 Installing the shift rails

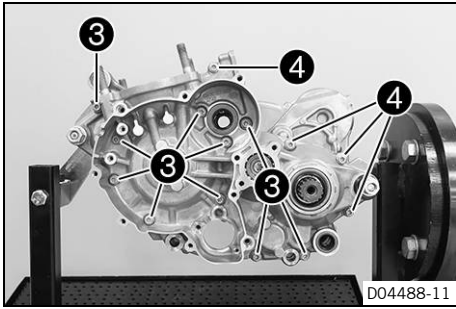


- Mount shift rails **1**.

## 18.6.6 Installing the left engine case section



- Coat the sealing area thinly with grease.
- Mount engine case gasket **1**.
- Check that dowels **2** are seated correctly.



- Mount the left section of the engine case.

**i Info**  
Do not use the screws to pull the two sections of the engine case together.

- Mount screws 3 and, once all screws of the left section of the engine case have been mounted, tighten.

Guideline

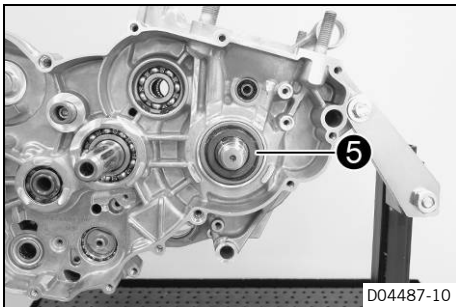
|                    |       |                    |
|--------------------|-------|--------------------|
| Screw, engine case | M6x45 | 10 Nm (7.4 lbf ft) |
|--------------------|-------|--------------------|

- Mount screws 4 and, once all screws of the left section of the engine case have been mounted, tighten.

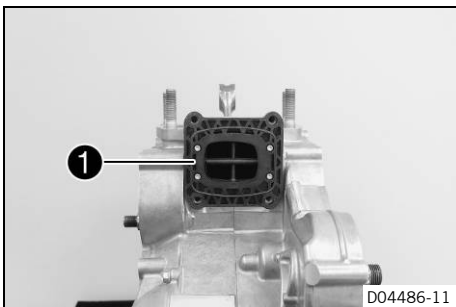
Guideline

|                    |       |                    |
|--------------------|-------|--------------------|
| Screw, engine case | M6x60 | 10 Nm (7.4 lbf ft) |
|--------------------|-------|--------------------|

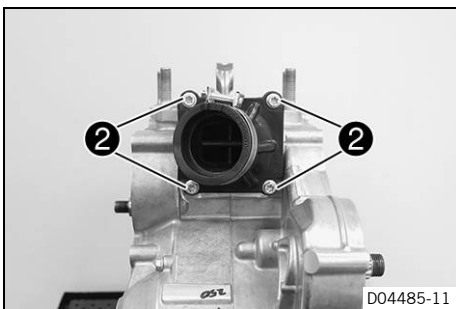
- Fix the engine in the engine work stand.
- Remove the excess lengths of the engine case gasket in the area of the cylinder support and the reed valve housing.
- Grease the shaft seal ring and mount distance sleeve 5.



### 18.6.7 Installing the reed valve housing



- Position the gasket.
- Position reed valve housing 1 in the engine case opening.

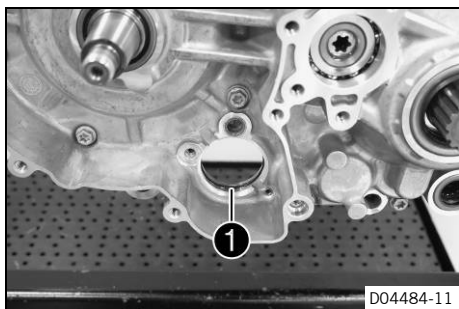


- Position the intake flange with the gasket.
- Mount and tighten screws 2.

Guideline

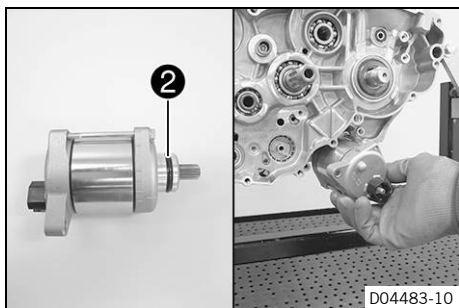
|   |    |                   |
|---|----|-------------------|
| Screw, intake flange/reed valve housing | M6 | 6 Nm (4.4 lbf ft) |
|---|----|-------------------|

## 18.6.8 Installing the starter motor



- Grease and mount O-ring ①.

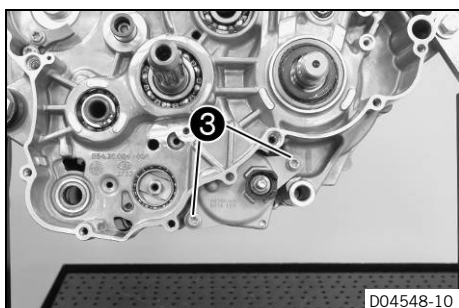
|                              |
|------------------------------|
| Long-life grease (🗨️ p. 360) |
|------------------------------|



- Grease O-ring ②.

|                              |
|------------------------------|
| Long-life grease (🗨️ p. 360) |
|------------------------------|

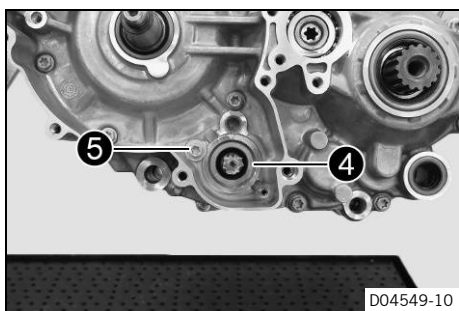
- Position the starter motor in the engine case.



- Mount screws ③ but do not tighten yet.

Guideline

|                      |    |                    |
|----------------------|----|--------------------|
| Screw, starter motor | M6 | 10 Nm (7.4 lbf ft) |
|----------------------|----|--------------------|

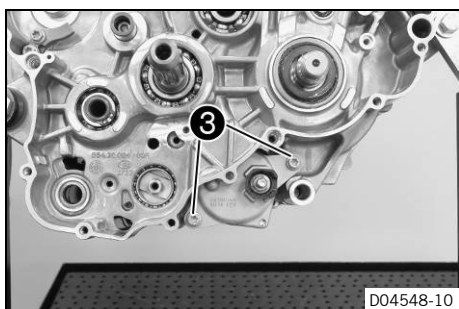


- Mount spacer ④ flush in the engine case.

- Mount and tighten screw ⑤.

Guideline

|                                   |    |   |
|-----------------------------------|----|---|
| Screw, starter motor bearing bush | M6 | 10 Nm (7.4 lbf ft)<br><b>Loctite®243™</b> |
|-----------------------------------|----|---|

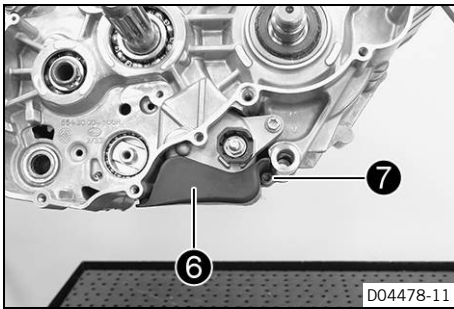


- Tighten screws ③.

Guideline

|                      |    |                    |
|----------------------|----|--------------------|
| Screw, starter motor | M6 | 10 Nm (7.4 lbf ft) |
|----------------------|----|--------------------|



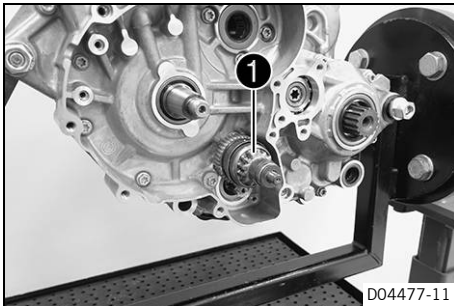


- Position cover **6**.
- Mount and tighten screw **7**.

Guideline

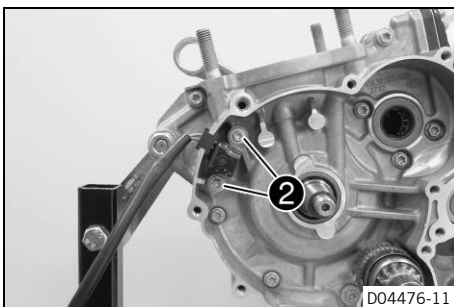
|                                     |    |                   |
|-------------------------------------|----|-------------------|
| Screw, starter motor protection cap | M6 | 8 Nm (5.9 lbf ft) |
|-------------------------------------|----|-------------------|

### 18.6.9 Installing the rotor



- Grease and mount Bendix **1**.

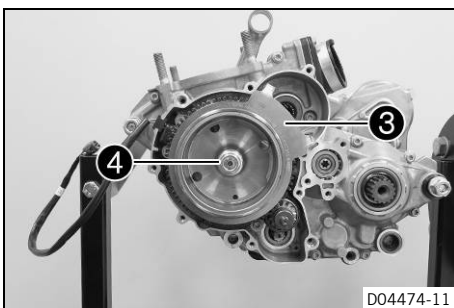
|                             |
|-----------------------------|
| Lubricant (T625) (📖 p. 360) |
|-----------------------------|



- Position the crankshaft position sensor.
- Mount and tighten screws **2**.

Guideline

|                                   |    |  |
|-----------------------------------|----|--|
| Screw, crankshaft position sensor | M5 | 6 Nm (4.4 lbf ft)<br><b>Loctite®243™</b> |
|-----------------------------------|----|--|



- Ensure that the woodruff key is seated properly.
- Grease the cone.
- Mount the rotor and hold it with special tool **3**.

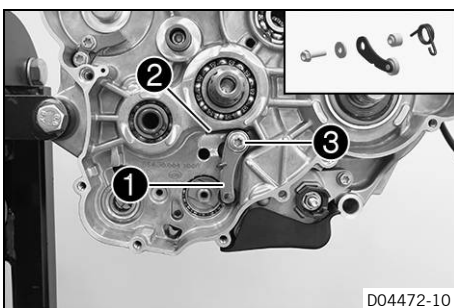
|   |
|---|
| Holding wrench (54629012200) (📖 p. 364) |
|---|

- Mount washer and nut **4**. Tighten the nut.

Guideline

|            |       |                     |
|------------|-------|---------------------|
| Nut, rotor | M12x1 | 60 Nm (44.3 lbf ft) |
|------------|-------|---------------------|

### 18.6.10 Installing the locking lever

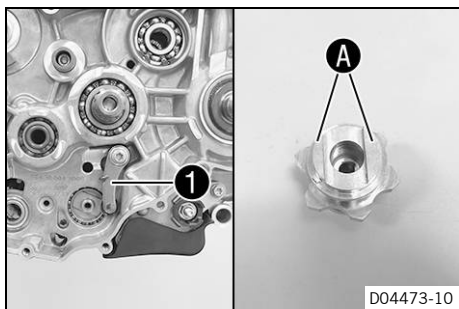


- Position locking lever **1** with the sleeve and spring **2**.
- Mount and tighten screw **3** with the washer.

Guideline

|                      |    |  |
|----------------------|----|--|
| Screw, locking lever | M5 | 6 Nm (4.4 lbf ft)<br><b>Loctite®243™</b> |
|----------------------|----|--|

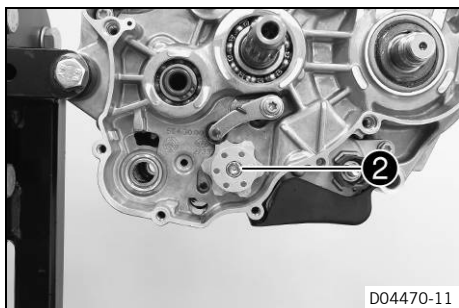
## 18.6.11 Installing the shift drum locating unit



- Press locking lever **1** to the left and position the shift drum locating unit.

**i Info**  
The flat surfaces **A** of the shift drum locating unit are not symmetric.

- Relieve tension from the locking lever.

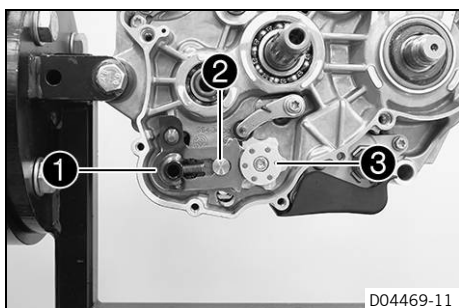


- Mount and tighten screw **2**.

Guideline

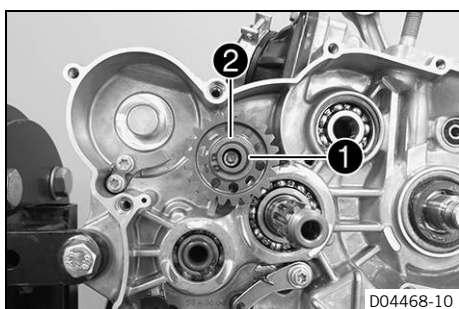
|                            |    |   |
|----------------------------|----|---|
| Screw, shift drum locating | M6 | 10 Nm (7.4 lbf ft)<br><b>Loctite®243™</b> |
|----------------------------|----|---|

## 18.6.12 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.
- Let the sliding plate engage in the shift drum locating unit.
- Shift through the transmission.

## 18.6.13 Installing the intermediate kick starter gear



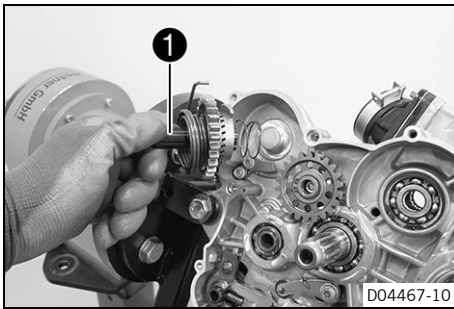
- Mount intermediate kick starter gear.
- Mount lock ring **1** with washer **2**.

## 18.6.14 Installing the kick starter shaft

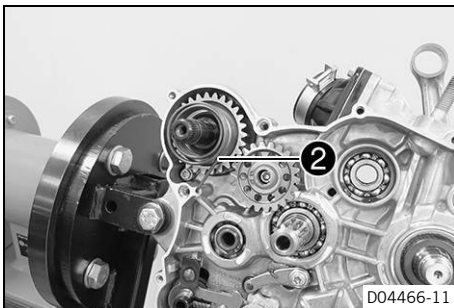
### Preparatory work

- Preassemble the kick starter shaft. (📖 p. 248)



**Main work**

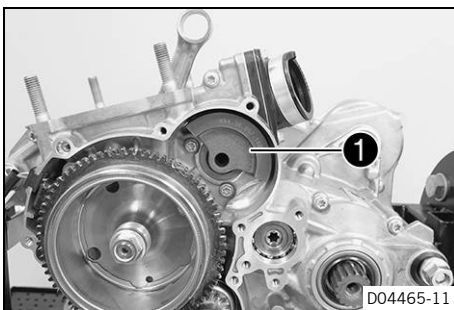
- Mount preassembled kick starter shaft ①.



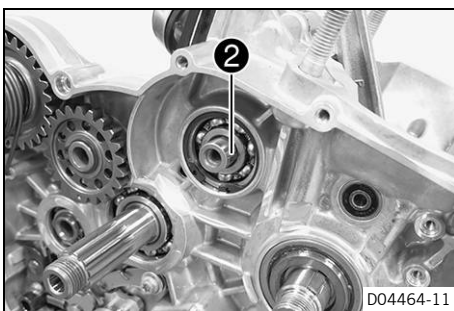
- Tension and attach kick starter spring ②.

**Info**

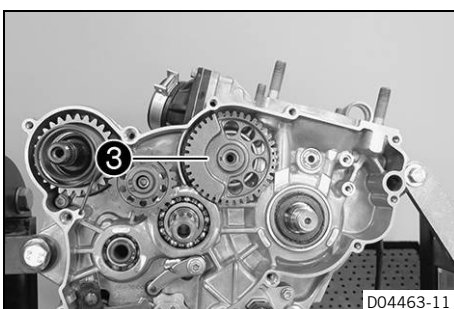
Ensure that the distance from the kick starter spring to the kick starter shaft is the same all around.

**18.6.15 Installing the balancer shaft**

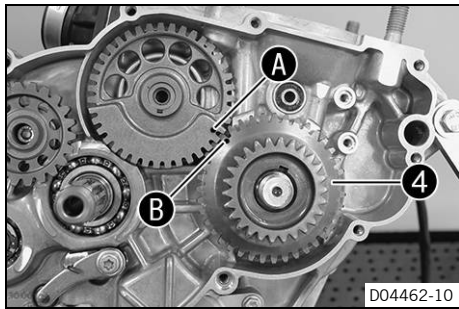
- Mount balancer shaft ①.



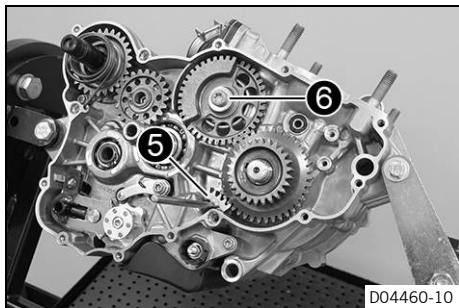
- Mount woodruff key ②.



- Mount balancer shaft drive wheel ③.



- Mount primary gear 4.
- ✓ Align markings A and B.



- Hold the primary gear using special tool 5.

Gear segment (56012004000) (📖 p. 366)

- Mount and tighten screw 6 with the washer.

Guideline

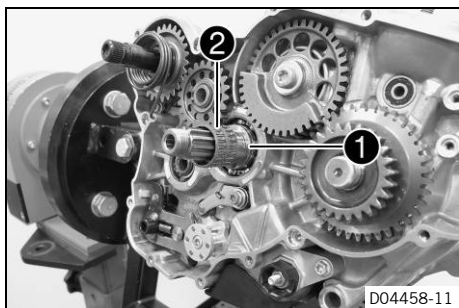
|                       |    |  |
|-----------------------|----|--|
| Screw, balancer shaft | M8 | 30 Nm (22.1 lbf ft)<br><b>Loctite®243™</b> |
|-----------------------|----|--|



**Info**

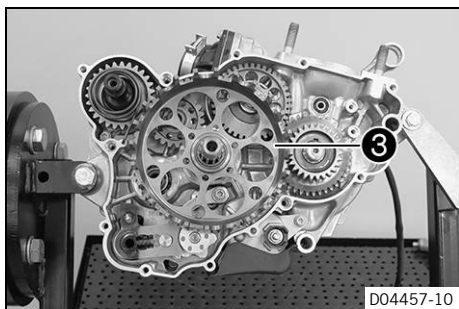
Use a new screw for every repair.

## 18.6.16 Installing the clutch basket

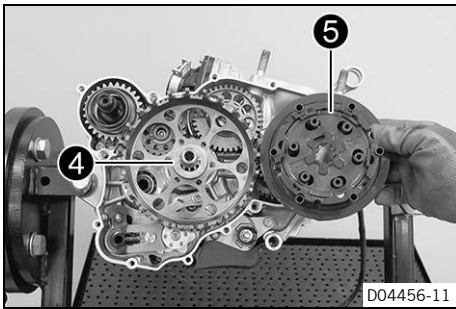


- Mount collar bushing 1.
- Oil and mount needle bearing 2.

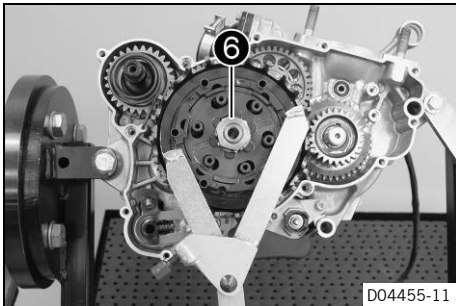
Engine oil (15W/50) (📖 p. 358)



- Slide clutch basket 3 onto the gearbox main shaft.



- Slide on washer 4 and inner clutch hub 5.



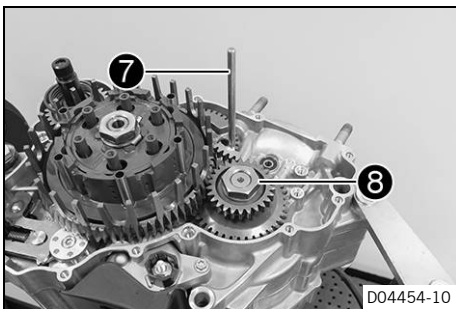
- Position the new lock washer and mount nut 6. Tighten the nut, holding the inner clutch hub with a special tool.

Guideline

|                       |         |  |
|-----------------------|---------|--|
| Nut, inner clutch hub | M18x1.5 | 100 Nm (73.8 lbf ft)<br><b>Loctite® 648™</b> |
|-----------------------|---------|--|

Holding wrench (51129003000) (p. 364)

- Secure the nut with the lock washer.



- Hold the primary gear using special tool 7.

Gear segment (56012004000) (p. 366)

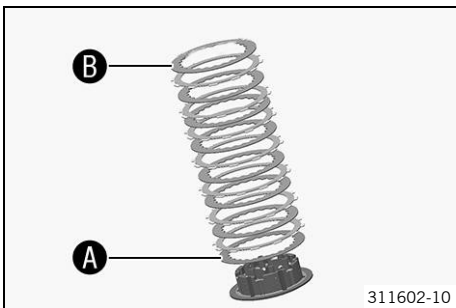
- Mount and tighten nut 8 with the washer.

Guideline

|                   |           |   |
|-------------------|-----------|---|
| Nut, primary gear | M18LHx1.5 | 150 Nm (110.6 lbf ft)<br><b>Loctite® 648™</b> |
|-------------------|-----------|---|

- Crank the engine to ensure that it can move easily.

### 18.6.17 Installing the clutch discs



- Thoroughly oil the clutch facing discs.
- Mount intermediate clutch disc A with marking S.

Guideline

|   |                   |
|---|-------------------|
| Thickness of intermediate clutch disc A | 1.0 mm (0.039 in) |
|---|-------------------|

- Alternately place the clutch facing and 7 intermediate discs into the clutch basket.

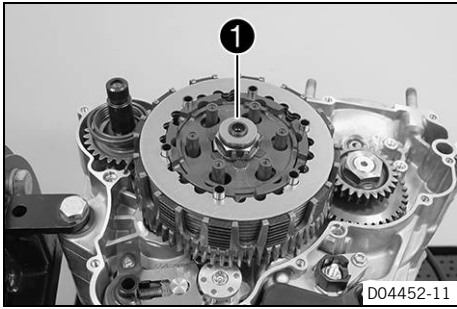
Guideline

|  |                   |
|--|-------------------|
| Thickness of intermediate clutch discs | 1.4 mm (0.055 in) |
|--|-------------------|

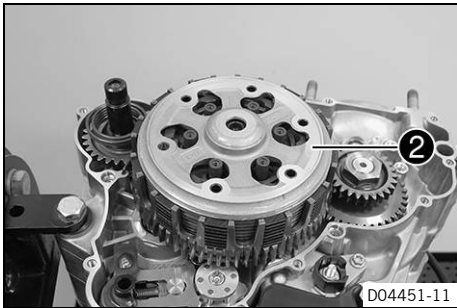
- Place intermediate clutch disc B into the clutch basket.

Guideline

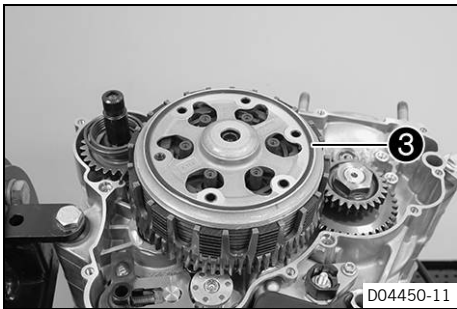
|   |                   |
|---|-------------------|
| Thickness of intermediate clutch disc B | 1.0 mm (0.039 in) |
|---|-------------------|



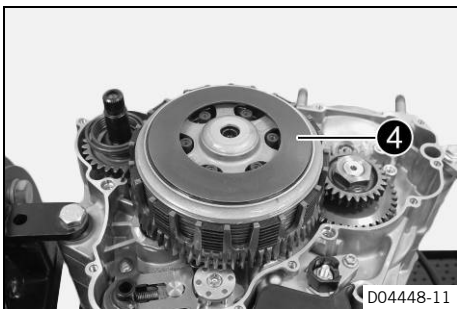
- Mount clutch throw-out ①.



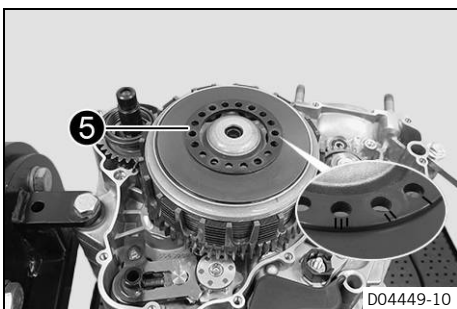
- Position pressure cap ②.



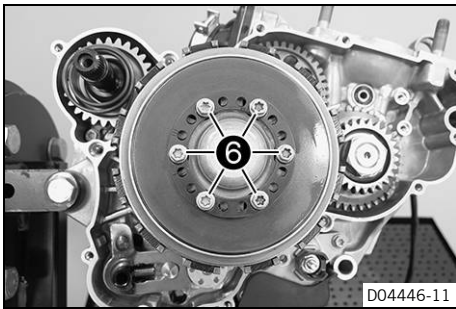
- Mount pretension ring ③ with marking **Top** facing up.



- Position spring washer ④.



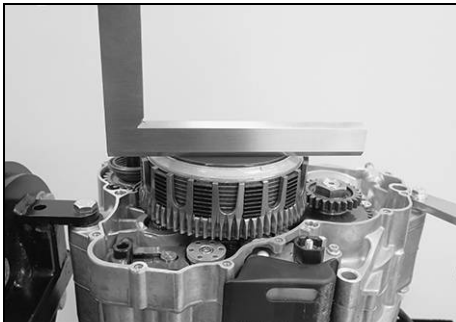
- Position spring retainer ⑤ with marking **I**.



- Mount screws **6** and tighten in a crisscross pattern.

Guideline

|                               |    |                   |
|-------------------------------|----|-------------------|
| Screw, clutch spring retainer | M5 | 6 Nm (4.4 lbf ft) |
|-------------------------------|----|-------------------|

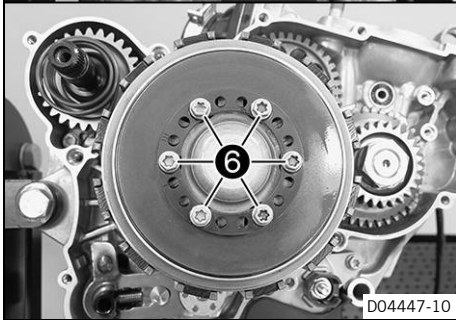


- Using a straightedge and the special tool, check the spring washer for distortion.

|                                       |  |  |
|---------------------------------------|--|--|
| Feeler gauge (59029041100) (📖 p. 369) |  |  |
|---------------------------------------|--|--|

|                          |                                 |  |
|--------------------------|---------------------------------|--|
| Spring washer distortion | 0 ... 0.10 mm (0 ... 0.0039 in) |  |
|--------------------------|---------------------------------|--|

- » If the specified value is not reached:
  - Remove screws **6** and mount the spring retainer with marking **II**.



- Using a straightedge and the special tool, check the spring washer for distortion.

|                                       |  |  |
|---------------------------------------|--|--|
| Feeler gauge (59029041100) (📖 p. 369) |  |  |
|---------------------------------------|--|--|

|                          |                                 |  |
|--------------------------|---------------------------------|--|
| Spring washer distortion | 0 ... 0.10 mm (0 ... 0.0039 in) |  |
|--------------------------|---------------------------------|--|

- » If the specified value is not reached:
  - Remove screws **6** and mount the spring retainer with marking **III**.

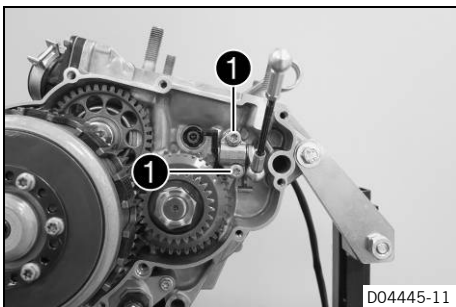
- Using a straightedge and the special tool, check the spring washer for distortion.

|                                       |  |  |
|---------------------------------------|--|--|
| Feeler gauge (59029041100) (📖 p. 369) |  |  |
|---------------------------------------|--|--|

|                          |                                 |  |
|--------------------------|---------------------------------|--|
| Spring washer distortion | 0 ... 0.10 mm (0 ... 0.0039 in) |  |
|--------------------------|---------------------------------|--|

- » If the specified value is not reached:
  - Change the clutch facing discs.

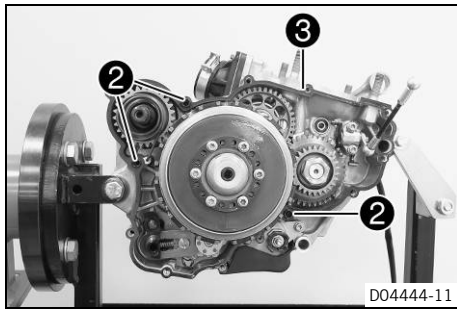
### 18.6.18 Installing the clutch cover



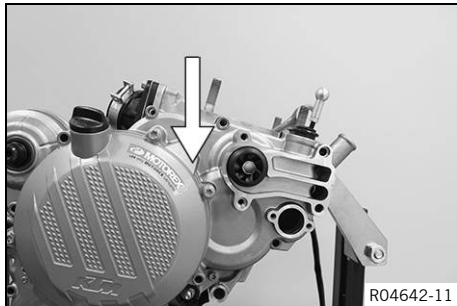
- Position the bearing support with the angle lever and linkage.
- Mount and tighten screws **1**.

Guideline

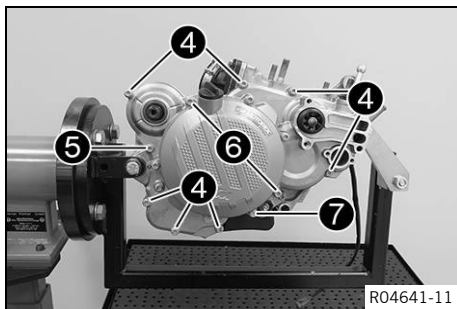
|  |    |  |
|--|----|--|
| Screw, exhaust control bearing support | M5 | 6 Nm (4.4 lbf ft)<br><b>Loctite®243™</b> |
|--|----|--|



- Mount dowels **2**.
- Mount clutch cover gasket **3**.



- Position the clutch cover and thread in the linkage.



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

Guideline

|                                  |       |                    |
|----------------------------------|-------|--------------------|
| Screw, intermediate clutch cover | M6x25 | 10 Nm (7.4 lbf ft) |
|----------------------------------|-------|--------------------|

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

Guideline

|                                  |       |                    |
|----------------------------------|-------|--------------------|
| Screw, intermediate clutch cover | M6x30 | 10 Nm (7.4 lbf ft) |
|----------------------------------|-------|--------------------|

- Mount screws **6** but do not tighten yet.

Guideline

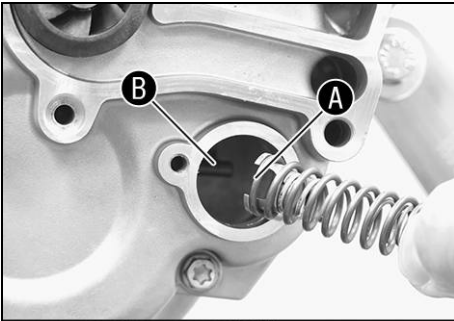
|                                  |       |                    |
|----------------------------------|-------|--------------------|
| Screw, intermediate clutch cover | M6x60 | 10 Nm (7.4 lbf ft) |
|----------------------------------|-------|--------------------|

- Mount screw **7** and tighten all screws in a crisscross pattern.

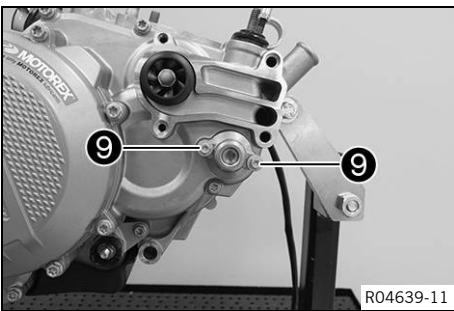
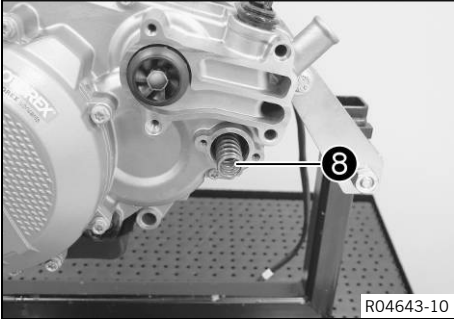
Guideline

|                                  |       |                    |
|----------------------------------|-------|--------------------|
| Screw, intermediate clutch cover | M6x55 | 10 Nm (7.4 lbf ft) |
|----------------------------------|-------|--------------------|





- Mount adjusting spring **8** with the auxiliary spring and spring insert.
- ✓ The recess **A** in the spring insert engages in angle lever **B**.

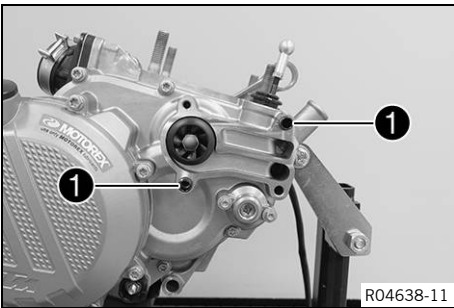


- Position the cap.
- Mount and tighten screws **9**.

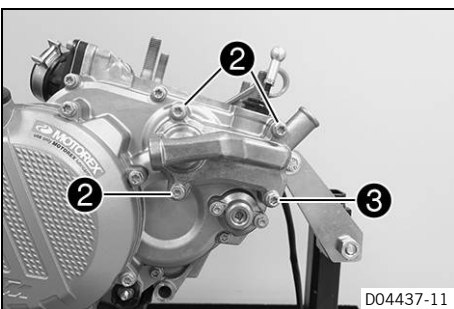
Guideline

|                            |    |                   |
|----------------------------|----|-------------------|
| Screw, exhaust control cap | M5 | 5 Nm (3.7 lbf ft) |
|----------------------------|----|-------------------|

### 18.6.19 Installing the water pump cover



- Mount dowels **1**.



- Mount the molded ring.
- Position the water pump cover.
- Mount and tighten screws **2**.

Guideline

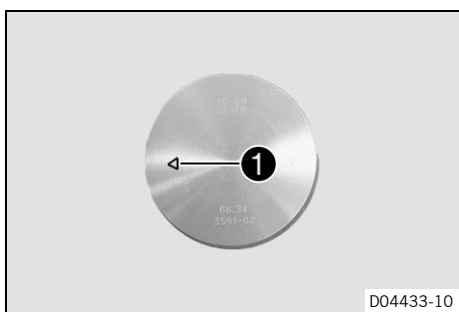
|                         |    |                    |
|-------------------------|----|--------------------|
| Screw, water pump cover | M6 | 10 Nm (7.4 lbf ft) |
|-------------------------|----|--------------------|

- Mount and tighten screw **3** with the seal ring.

Guideline

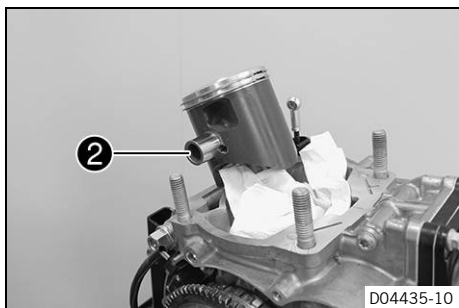
|                         |    |                    |
|-------------------------|----|--------------------|
| Screw, water pump cover | M6 | 10 Nm (7.4 lbf ft) |
|-------------------------|----|--------------------|

## 18.6.20 Installing the piston

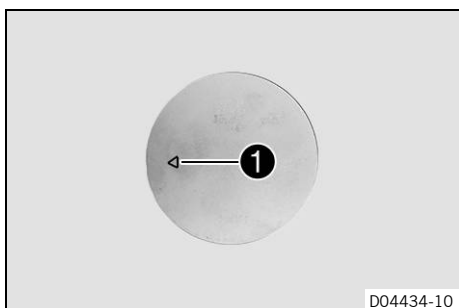


### (All 250 models)

- Oil the upper conrod bearing and position it in the connecting rod.
- Position the piston.
  - ✓ Piston marking **1** must face the exhaust side.

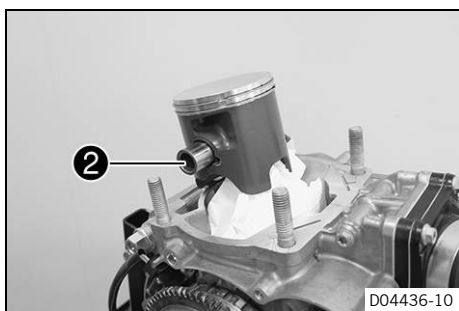


- Cover the engine case opening with a cloth.
- Slide piston pin **2** into the connecting rod by hand.

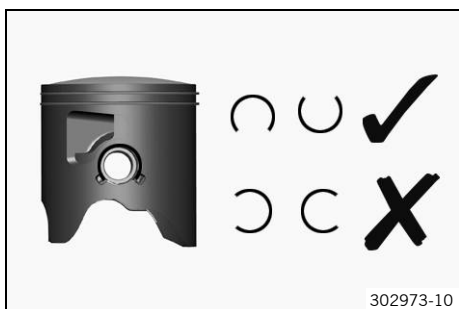


### (All 300 models)

- Oil the upper conrod bearing and position it in the connecting rod.
- Position the piston.
  - ✓ Piston marking **1** must face the exhaust side.



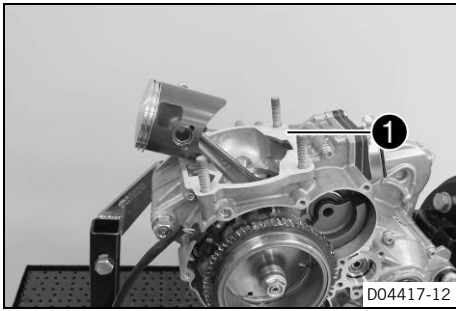
- Cover the engine case opening with a cloth.
- Slide piston pin **2** into the connecting rod by hand.



- Position the piston ring locks in the 6 o'clock or 12 o'clock position.
- Ensure that the piston ring lock is in the correct position on both sides.
- Remove the cloth.



## 18.6.21 Installing the cylinder



(All 250 models)

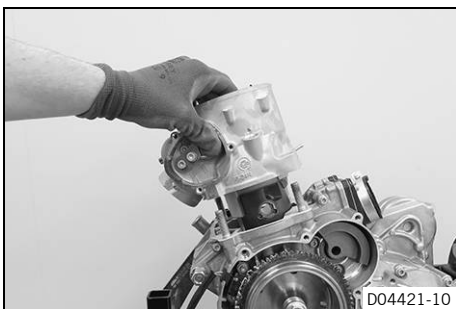
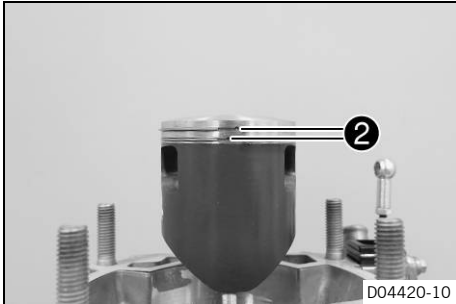
- Place the new cylinder base gasket **1** into position.



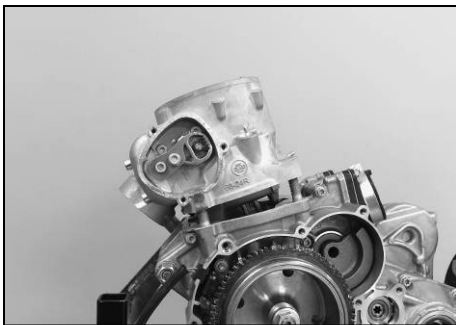
### Info

If neither the piston, cylinder, crankshaft, or engine case need to be changed, the same gasket thickness can be used as before.

- Oil the cylinder and piston.
- Position the piston ring.
  - ✓ The anti-rotation lock engages in piston ring end **2**.



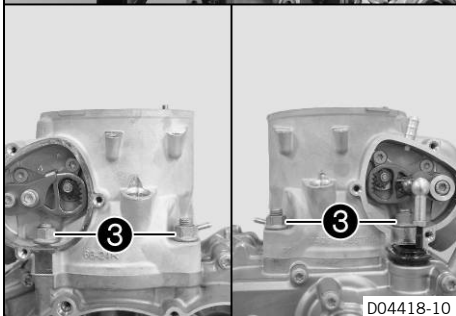
- Slide the cylinder over the piston.
- Push the cylinder down carefully.

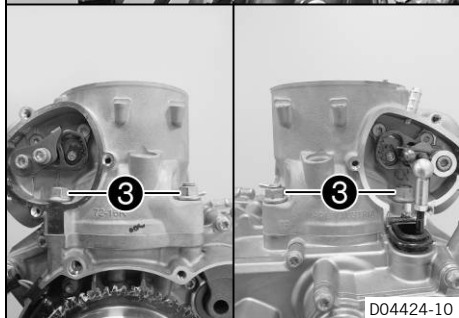
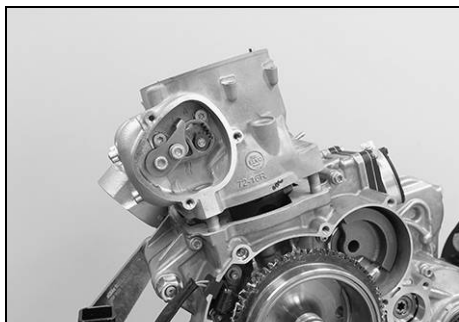
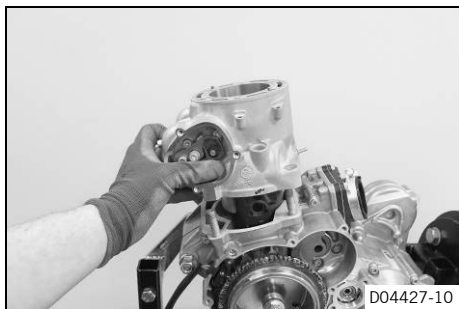
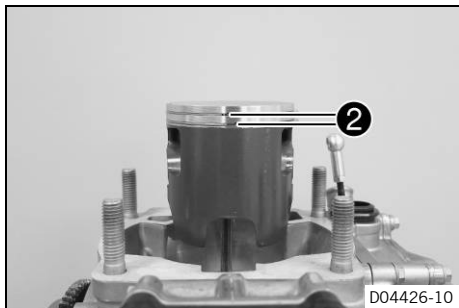
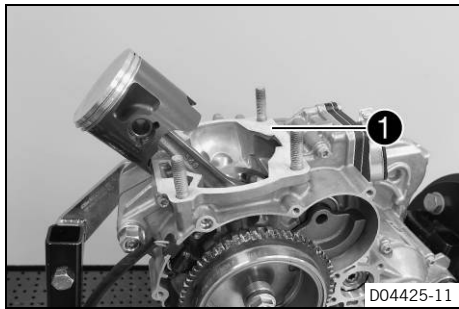


- Mount nuts **3** on both sides and tighten in a crisscross pattern.

Guideline

|                    |     |                        |
|--------------------|-----|------------------------|
| Nut, cylinder base | M10 | 35 Nm<br>(25.8 lbf ft) |
|--------------------|-----|------------------------|





**(All 300 models)**

- Place new cylinder base gasket **1** in position.

**i Info**  
If neither the piston, cylinder, crankshaft, or engine case need to be changed, the same gasket thickness can be used as before.

- Oil the cylinder and piston.
- Position the piston ring.
  - ✓ The anti-rotation lock engages in piston ring end **2**.

- Slide the cylinder over the piston.
- Push the cylinder down carefully.

- Mount nuts **3** on both sides and tighten in a crisscross pattern.

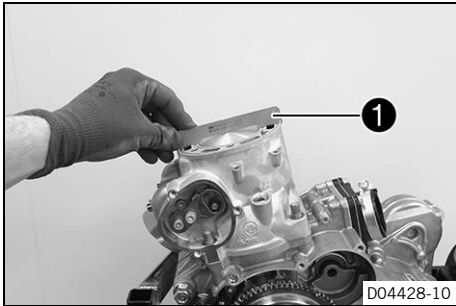
Guideline

|                    |     |                        |
|--------------------|-----|------------------------|
| Nut, cylinder base | M10 | 35 Nm<br>(25.8 lbf ft) |
|--------------------|-----|------------------------|

**18.6.22 Checking the X-distance**

**i Info**

The X-distance is the distance defined for the piston protrusion, when the cylinder is clamped down and the piston is at top dead center.  
 The X-distance must be checked very carefully. If the X-distance is too large, the compression decreases and the engine loses power. If the X-distance is too small, the engine knocks and overheats.



**(All 250 models)**

- Apply special tool 1 to the cylinder.

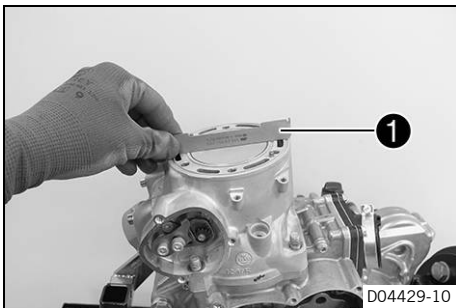
|  |
|--|
| Setting gauge (54829001100) (📖 p. 365) |
|--|

- Position the piston at top dead center.
- Check the X-distance using the special tool.

|                                       |
|---------------------------------------|
| Feeler gauge (59029041100) (📖 p. 369) |
|---------------------------------------|

|   |                                 |
|---|---------------------------------|
| X distance (upper edge of piston to upper edge of cylinder) | 0 ... 0.10 mm (0 ... 0.0039 in) |
|---|---------------------------------|

- » If the specified value is not reached:
  - Adjust the X-distance. (📖 p. 267)



**(All 300 models)**

- Apply special tool 1 to the cylinder.

|  |
|--|
| Setting gauge (54829001100) (📖 p. 365) |
|--|

- Position the piston at top dead center.
- Check the X-distance using the special tool.

|                                       |
|---------------------------------------|
| Feeler gauge (59029041100) (📖 p. 369) |
|---------------------------------------|

|   |                                 |
|---|---------------------------------|
| X distance (upper edge of piston to upper edge of cylinder) | 0 ... 0.10 mm (0 ... 0.0039 in) |
|---|---------------------------------|

- » If the specified value is not reached:
  - Adjust the X-distance. (📖 p. 267)

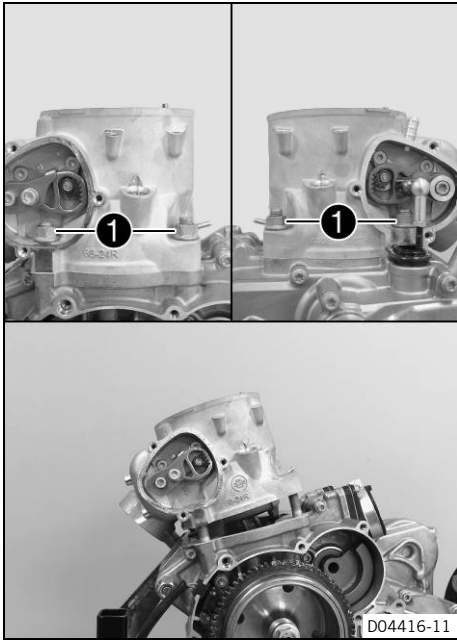
**18.6.23 Adjusting the X-distance**

**i Info**

The X-distance is adjusted by inserting cylinder base gaskets of various thicknesses.

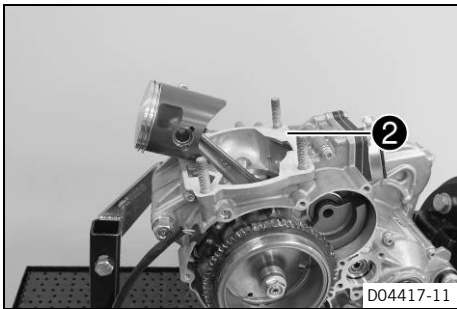
**Preparatory work**

- Check the X-distance. (📖 p. 267)



**Main work**  
**(All 250 models)**

- Remove nuts **1**.
- Carefully slide the cylinder up and take it off.

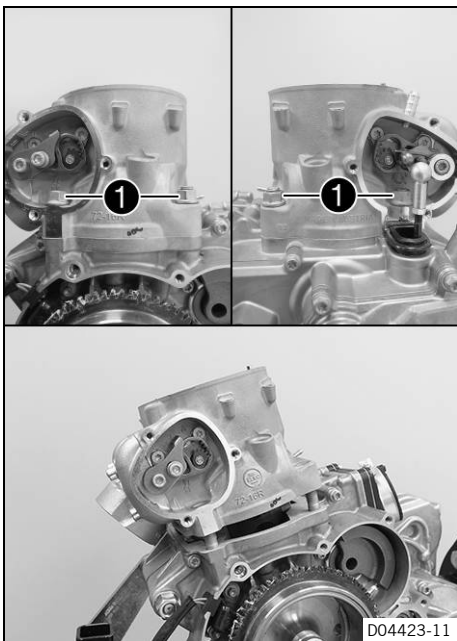


- Replace cylinder base gasket **2** with a cylinder base gasket of the required X-distance.

---

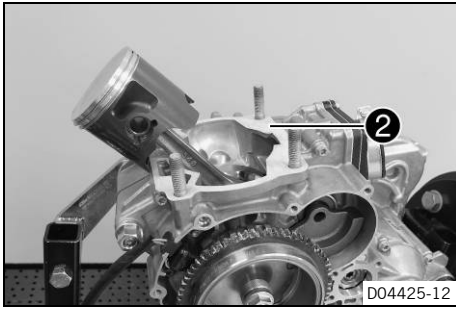
**i Info**  
Multiple cylinder base gaskets can be combined.

---



**(All 300 models)**

- Remove nuts **1**.
- Carefully slide the cylinder up and take it off.



- Replace cylinder base gasket **2** with a cylinder base gasket of the required X-distance.

**i Info**  
Multiple cylinder base gaskets can be combined.

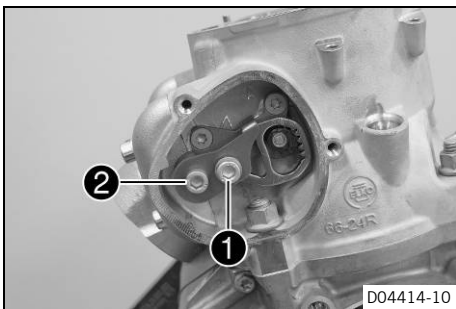
### Finishing work

- Install the cylinder. (📖 p. 265)



## 18.6.24 Adjusting the Z-distance

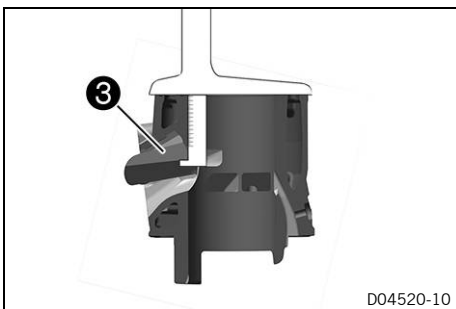
**i Info**  
The Z-distance is the distance from the lower edge of the control flap to the upper edge of the cylinder, measured in the middle of the exhaust port.



- Remove screws **1** and **2**.
- Remove screws **1** and **2** but do not tighten yet.

#### Guideline

|                                      |    |   |
|--------------------------------------|----|---|
| Screw, control flap, exhaust control | M6 | 10 Nm (7.4 lbf ft)<br><b>Loctite®243™</b> |
|--------------------------------------|----|---|

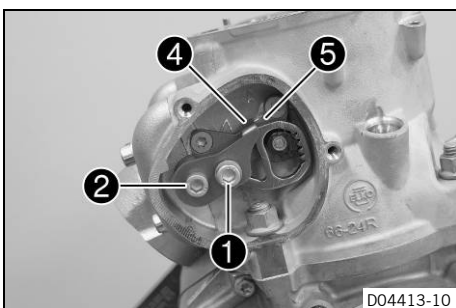


- Adjust the Z dimension using the depth gauge.

#### Guideline

|  |                    |
|--|--------------------|
| Z distance (height of control flap) (All 250 models) | 49.0 mm (1.929 in) |
| Z distance (height of control flap) (All 300 models) | 49.5 mm (1.949 in) |

- Move control flap **3** up and position the depth gauge.



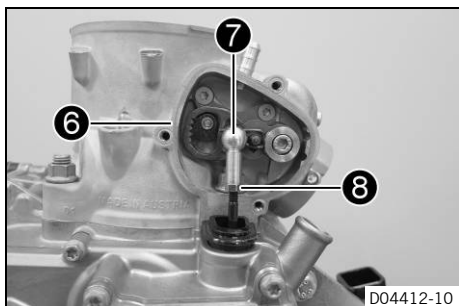
- Position stop plate **4** so it is in contact with retaining bracket **5**.

- Tighten screws **1** and **2**.

#### Guideline

|                                      |    |   |
|--------------------------------------|----|---|
| Screw, control flap, exhaust control | M6 | 10 Nm (7.4 lbf ft)<br><b>Loctite®243™</b> |
|--------------------------------------|----|---|

- Check the Z dimension.



D04412-10

- Mount gasket ⑥.
- Push the control flap down all the way to the stop.
- Mount ball socket ⑦.

**i Info**

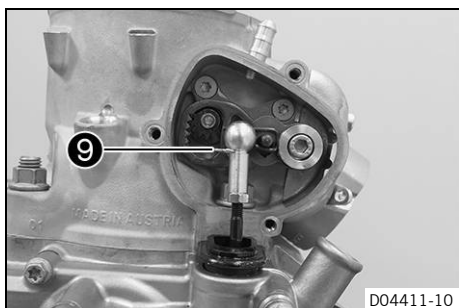
The linkage may only be pulled upward slightly. The control flap must not be swung upward.

- Check the movement of the linkage.

Guideline

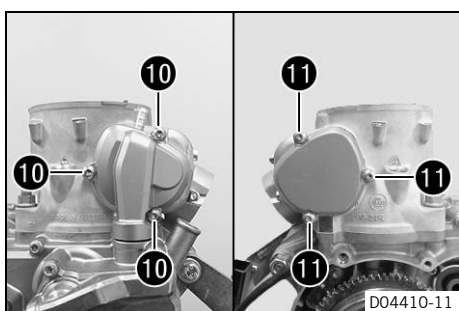
|   |
|---|
| $\leq 1 \text{ mm } (\leq 0.04 \text{ in})$ |
|---|

- » If the linkage is pulled up further:
  - Loosen lock nut ③.
  - Turn the ball socket until the linkage reaches the right length.
  - Tighten the lock nut.



D04411-10

- Mount retainer ⑨.



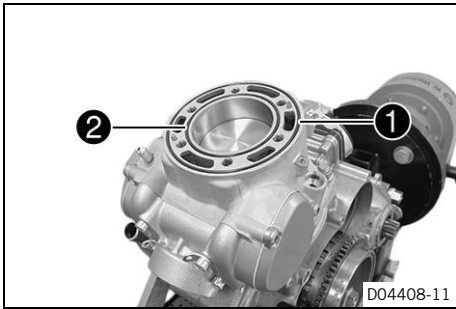
D04410-11

- Position the gasket.
- Position both covers.
- Mount and tighten screws ⑩ and ⑪.

Guideline

|                              |    |   |
|------------------------------|----|---|
| Screw, exhaust control cover | M5 | 4 Nm (3 lbf ft)<br><b>Loctite® 222™</b> |
|------------------------------|----|---|

18.6.25 Installing the cylinder head



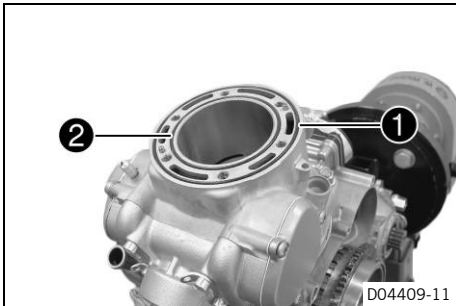
(All 250 models)

- Mount O-rings ① and ②.



**Info**

Ensure that the pins are seated correctly.



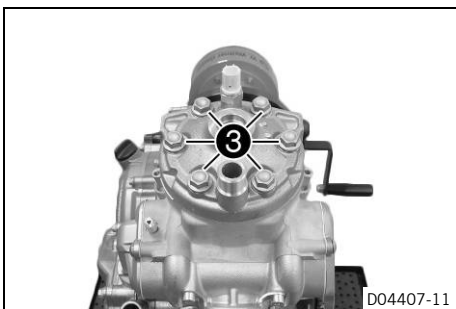
(All 300 models)

- Mount O-rings ① and ②.



**Info**

Ensure that the pins are seated correctly.



- Put the cylinder head in place.
- Mount screws ③ with the washers and tighten them in a crisscross pattern.

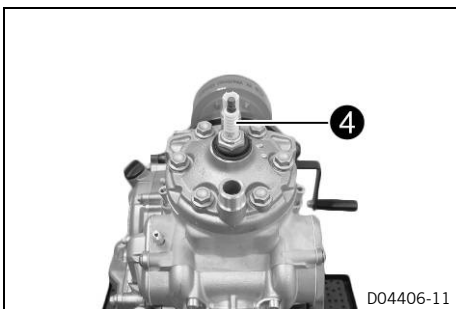
Guideline

|                      |    |                     |
|----------------------|----|---------------------|
| Screw, cylinder head | M8 | 27 Nm (19.9 lbf ft) |
|----------------------|----|---------------------|



**Info**

Use new washers.



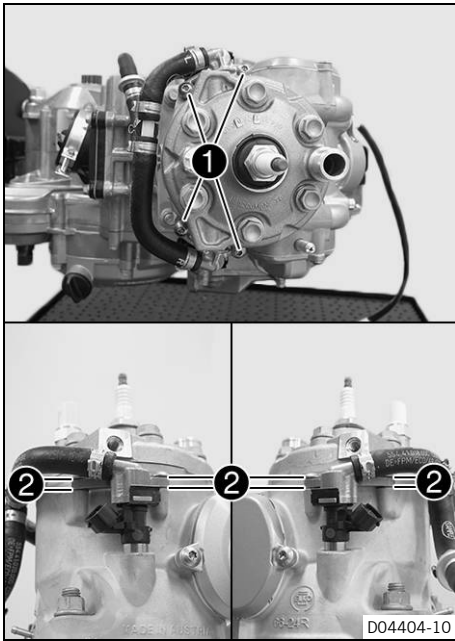
- Mount and tighten spark plug ④.

Guideline

|            |          |                     |
|------------|----------|---------------------|
| Spark plug | M14x1.25 | 25 Nm (18.4 lbf ft) |
|------------|----------|---------------------|



## 18.6.26 Installing injection valves

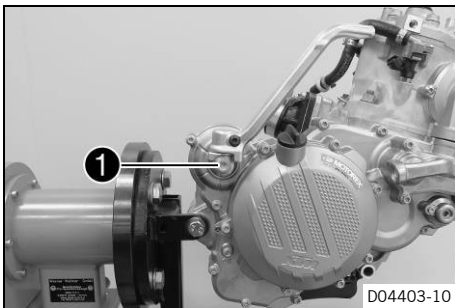


- Position injection valves on both sides.
- Mount and tighten screws **1** with insulating washers **2**.

Guideline

|                               |    |  |
|-------------------------------|----|--|
| Screw, injection valve holder | M5 | 5 Nm (3.7 lbf ft)<br><b>Loctite®243™</b> |
|-------------------------------|----|--|

## 18.6.27 Installing the kick starter

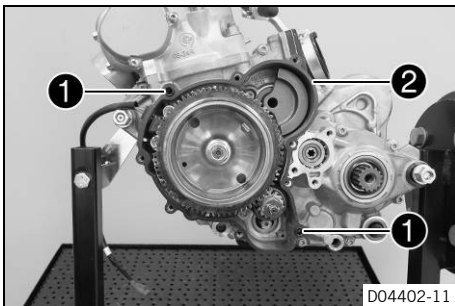


- Position the kick starter.
- Mount and tighten screw **1** with the washer.

Guideline

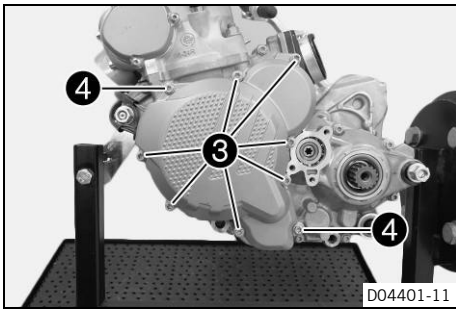
|                     |    |   |
|---------------------|----|---|
| Screw, kick starter | M8 | 25 Nm (18.4 lbf ft)<br><b>Loctite®2701™</b> |
|---------------------|----|---|

## 18.6.28 Installing the alternator cover



- Mount dowels **1** and put alternator cover gasket **2** in place.





- Position the alternator cover.
- Mount and tighten screws ③.

Guideline

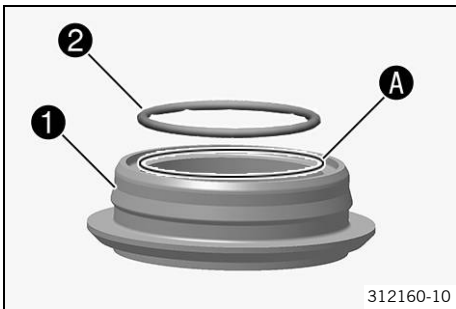
|                         |       |                   |
|-------------------------|-------|-------------------|
| Screw, alternator cover | M6x20 | 8 Nm (5.9 lbf ft) |
|-------------------------|-------|-------------------|

- Mount and tighten screws ④.

Guideline

|                         |       |                   |
|-------------------------|-------|-------------------|
| Screw, alternator cover | M6x25 | 8 Nm (5.9 lbf ft) |
|-------------------------|-------|-------------------|

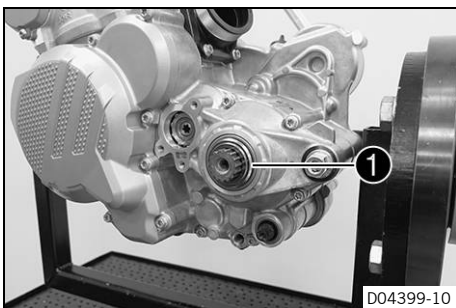
### 18.6.29 Installing the spacer



- Before mounting, grease spacer ① in area A and O-ring ②.

Long-life grease (🗨️ p. 360)

- Position the O-ring in the cut-out of the spacer.

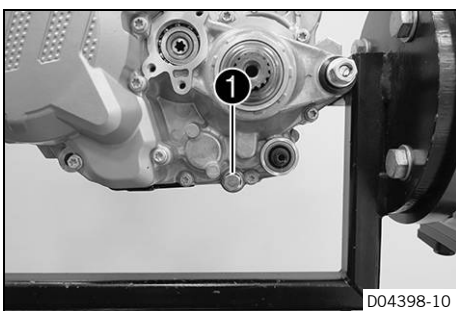


- Grease the shaft seal ring.

Long-life grease (🗨️ p. 360)

- Push spacer ① with the O-ring onto the countershaft with a twisting motion.
  - ✓ The cut-out with the O-ring must face inward.
  - ✓ The shaft seal ring rests against the spacer along its entire circumference.

### 18.6.30 Installing the gear oil drain plug

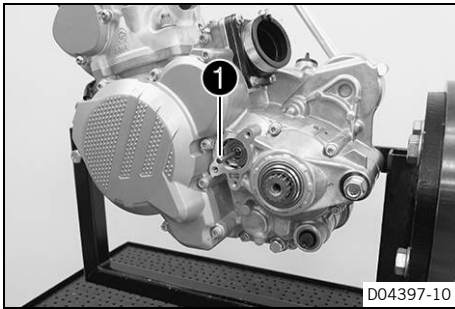


- Mount and tighten gear oil drain plug ① with the magnet and the new seal ring.

Guideline

|                                 |         |                     |
|---------------------------------|---------|---------------------|
| Gear oil drain plug with magnet | M12x1.5 | 20 Nm (14.8 lbf ft) |
|---------------------------------|---------|---------------------|

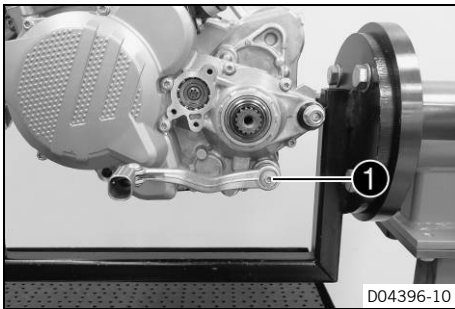
## 18.6.31 Installing the clutch push rod



D04397-10

- Mount clutch push rod ①.

## 18.6.32 Installing the shift lever



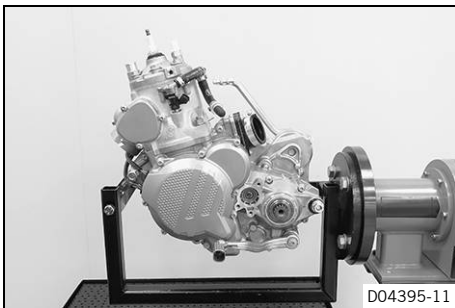
D04396-10

- Position the shift lever. Mount and tighten screw ① with the washers.

Guideline

|                    |    |  |
|--------------------|----|--|
| Screw, shift lever | M6 | 14 Nm (10.3 lbf ft)<br><b>Loctite®243™</b> |
|--------------------|----|--|

## 18.6.33 Removing the engine from the engine work stand



D04395-11

- Remove the fitting from the special tool.

|   |
|---|
| Holder and fitting for work stand (55429002000)<br>(📖 p. 365) |
|---|

- Remove the engine from the engine work stand.

## 19.1 Checking/correcting the fluid level of the hydraulic clutch



### 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.



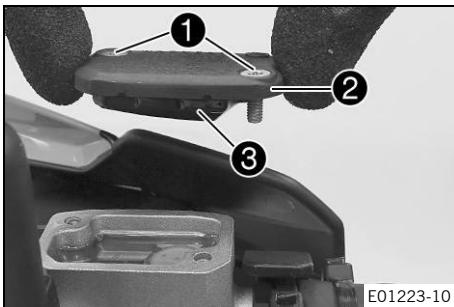
### Info

The fluid level rises with increasing wear of the clutch facing discs.

Never use DOT 5 brake fluid. It is silicone-based and purple in color. Oil seals and clutch 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 clutch fluid reservoir mounted on the handlebar to a horizontal position.
- Remove screws ①.
- Remove cover ② with membrane ③.
- Check the fluid level.

|                                 |                |
|---------------------------------|----------------|
| Fluid level below container rim | 4 mm (0.16 in) |
|---------------------------------|----------------|

» If the level of the fluid does not meet specifications:

- Correct the fluid level of the hydraulic clutch.

|  |
|--|
| Brake fluid DOT 4 / DOT 5.1 (📖 p. 358) |
|--|

- Position the cover with the membrane. Mount and tighten the screws.



### Info

Clean up overflowed or spilled brake fluid immediately with water.

## 19.2 Changing the hydraulic clutch 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.

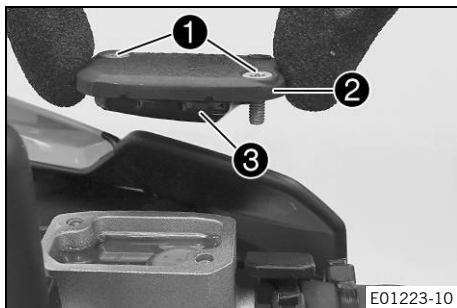


### Info

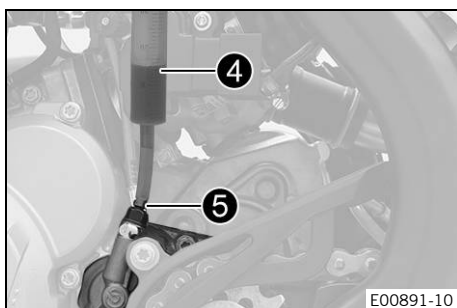
Never use DOT 5 brake fluid. It is silicone-based and purple in color. Oil seals and clutch lines are not designed for DOT 5 brake fluid.

Avoid contact between brake fluid and painted parts. Brake fluid attacks paint.

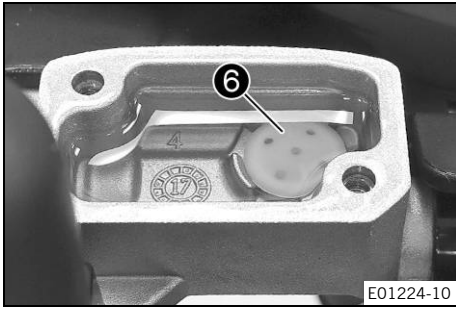
Only use clean brake fluid from a sealed container.



- Move the clutch fluid reservoir mounted on the handlebar to a horizontal position.
- Remove screws ①.
- Take off cover ② with membrane ③.



- Fill bleeding syringe ④ with the appropriate hydraulic fluid.
- |  |
|--|
| Syringe (50329050000) (📖 p. 364)       |
| Brake fluid DOT 4 / DOT 5.1 (📖 p. 358) |
- On the clutch slave cylinder, remove bleeder protection cap, release the bleeder screw ⑤ and mount bleeding syringe ④.



- Now press the fluid into the system until it emerges from the hole **6** of the master cylinder without bubbles.
- Now and then, extract fluid from the master cylinder reservoir to prevent overflow.
- Remove the bleeding syringe. Tighten the bleeder screw. Mount protection cap.
- Correct the fluid level of the hydraulic clutch.

**Guideline**

|                                 |                |
|---------------------------------|----------------|
| Fluid level below container rim | 4 mm (0.16 in) |
|---------------------------------|----------------|

- Position cover with membrane. Mount and tighten screws.

**i Info**  
Clean up overflowed or spilled brake fluid immediately with water.

## 19.3 Checking the clutch

**! 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.

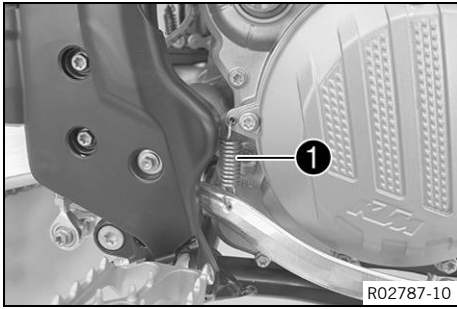
- Avoid skin, eye and clothing contact with fuel.
- Immediately consult a doctor if you swallow fuel.
- Do not inhale fuel vapors.
- In case of skin contact, rinse the affected area with plenty of water.
- Rinse the eyes thoroughly with water, and consult a doctor in case of fuel contact with the eyes.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



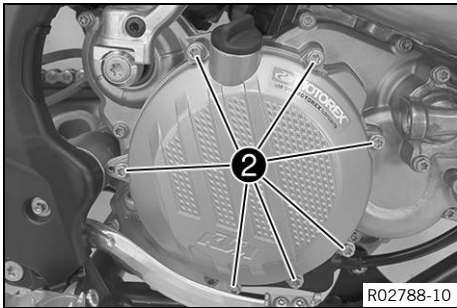
**Main work**

- Drain the fuel from the fuel tank into a suitable container.
- Lay the vehicle on its side on the work stand.

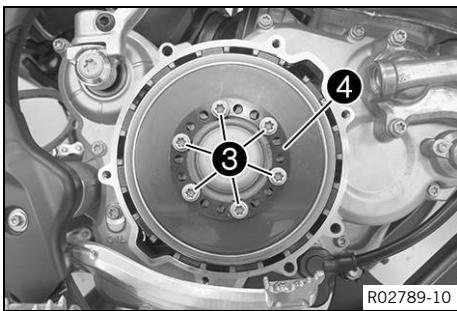
**i Info**  
Cover the components to protect them against damage. Remaining fuel may flow out of the fuel tank.



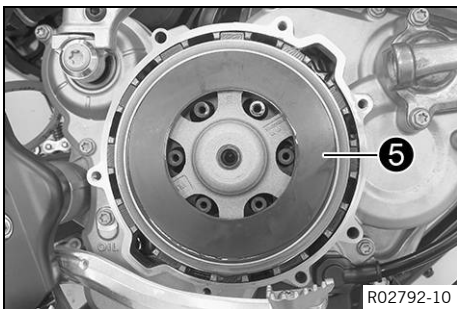
- Detach spring ①.



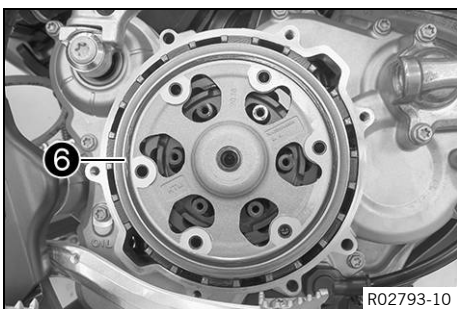
- Remove screws ②.
- Take off the clutch cover with the gasket.



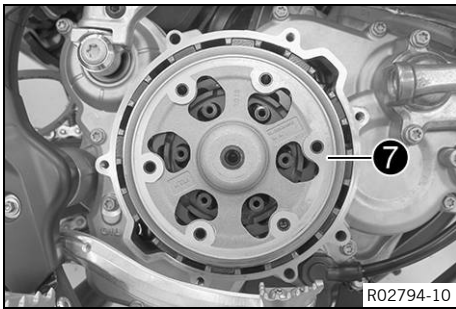
- Loosen screws ③ in a crisscross pattern and remove them.
- Take off spring retainer ④.



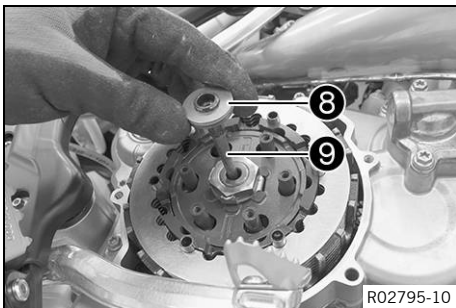
- Take off spring washer ⑤.



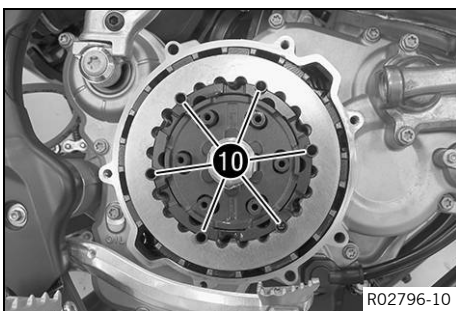
- Take off pretension ring ⑥.



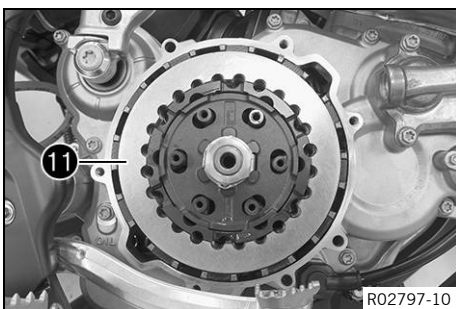
- Take off pressure cap **7**.



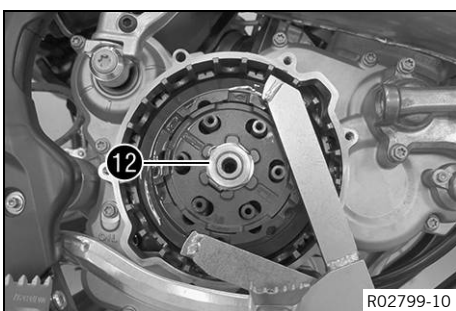
- Take off clutch throw-out **8** with clutch push rod **9**.



- Remove sleeves **10**.



- Remove clutch discs **11** completely.

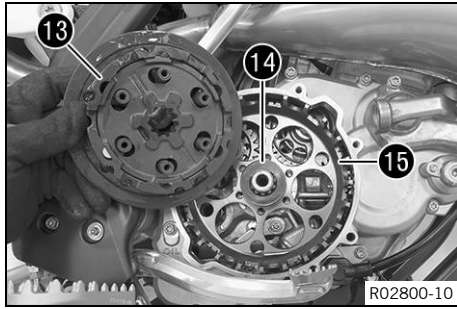


- Bend up the lock washer.
- Hold the inner clutch hub with the special tool. Loosen nut **12**.

Holding wrench (51129003000) (📖 p. 364)

- Remove the nut with the lock washer.





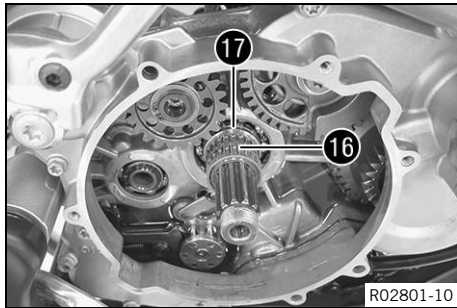
- Take off inner clutch hub **13** and washer **14**.



**Info**

The washer usually sticks to the inner clutch hub.

- Take off clutch basket **15**.

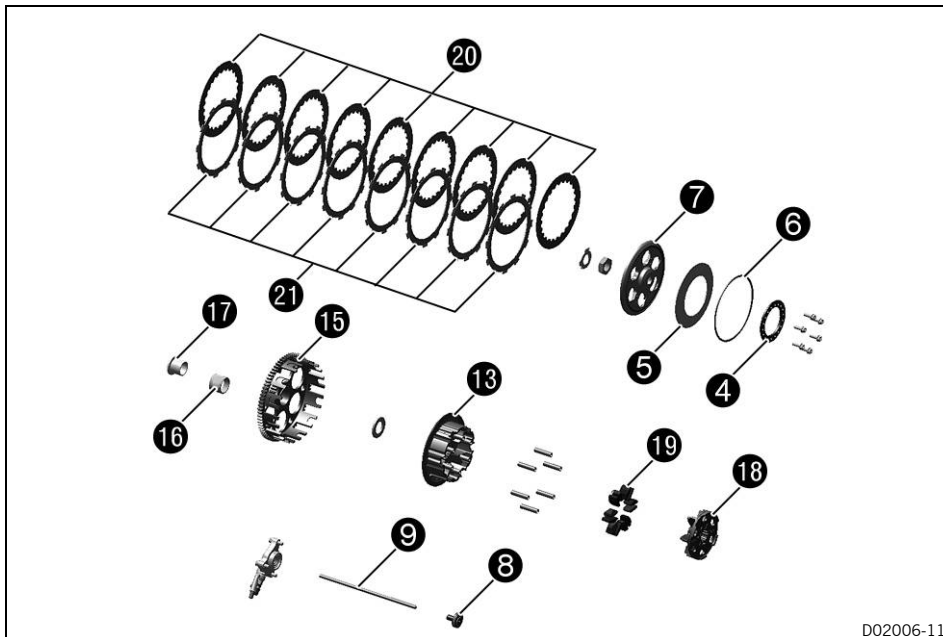


- Take off needle bearing **16** and collar bushing **17**.



**Info**

The needle bearing and collar sleeve may be in the clutch basket.



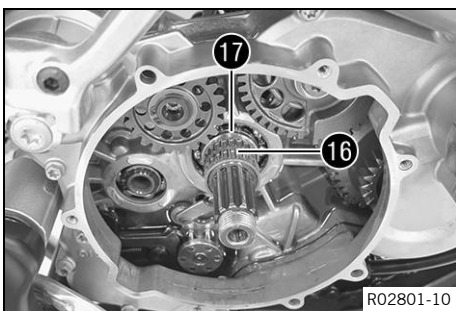
- Check clutch push rod **8** for damage and wear.
  - » If there is damage or wear:
    - Change the clutch push rod.
- Place the clutch push rod **9** on a flat surface and check for run-out.
  - » If there is run-out:
    - Change the clutch push rod.
- Check spring retainer **4** for damage and wear.
  - » If there is damage or wear:
    - Change the spring retainer.
- Check pretension ring **6** for damage and wear.
  - » If there is damage or wear:
    - Change the pretension ring.
- Check spring washer **5** for damage and wear.



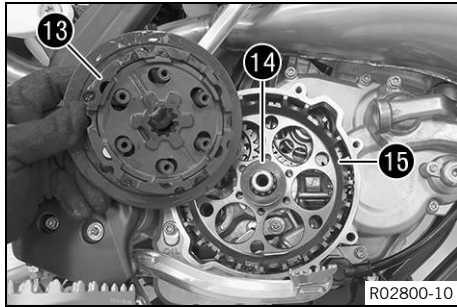
- » If there is damage or wear:
  - Change the spring washer.
- Check the contact surface of pressure cap **7** for damage and wear.
  - » If there is damage or wear:
    - Change the pressure cap.
- Check clutch center **18** for damage and wear.
  - » If there is damage or wear:
    - Change the clutch center.
- Check damping rubber pieces **19** for damage and wear.
  - » If there is damage or wear:
    - Change the damping rubber pieces.
- Check inner clutch hub **13** for damage and wear.
  - » If there is damage or wear:
    - Change the inner clutch hub.
- Check the thrust surfaces of the clutch facing discs in clutch basket **15** for damage and wear.
  - » If there is damage or wear:
    - Change the clutch facing discs and the clutch basket.
- Check needle bearing **16** and collar bushing **17** for damage and wear.
  - » If there is damage or wear:
    - Change the needle bearings and collar bushing.
- Check intermediate clutch discs **20** for damage and wear.
  - » If the intermediate clutch discs are not level and are pitted:
    - Change all intermediate clutch discs.
- Check clutch facing discs **21** for discoloration and scoring.
  - » If there is discoloration or scoring:
    - Change all the clutch facing discs.
- Check the thickness of clutch facing discs **21**.

|                                |  |
|--------------------------------|--|
| Clutch facing disc - thickness | $\geq 1.9 \text{ mm } (\geq 0.075 \text{ in})$ |
|--------------------------------|--|

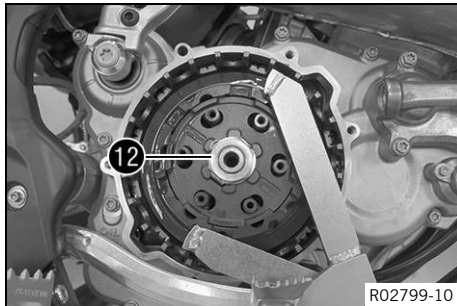
- » If the clutch facing disc does not meet the specifications:
  - Change all the clutch facing discs.



- Mount collar bushing **17** and needle bearing **16**.



- Mount clutch basket **15**.
- ✓ Turn the clutch basket until the gear teeth of the intermediate kick starter gear mesh.
- Mount washer **14** and inner clutch hub **13**.



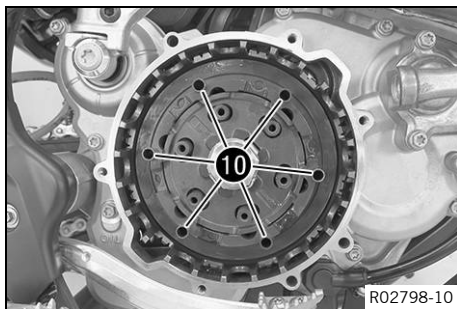
- Position the new lock washer and mount nut **12**. Tighten the nut, holding the inner clutch hub with a special tool.

Guideline

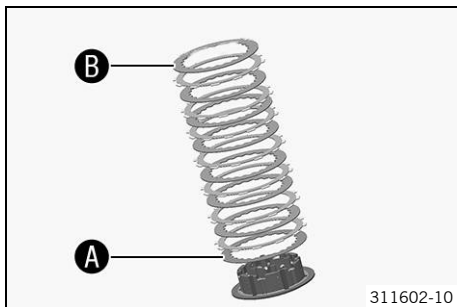
|                       |         |  |
|-----------------------|---------|--|
| Nut, inner clutch hub | M18x1.5 | 100 Nm (73.8 lbf ft)<br><b>Loctite® 648™</b> |
|-----------------------|---------|--|

Holding wrench (51129003000) (📖 p. 364)

- Secure the nut with the lock washer.



- Mount sleeves **10**.



- Oil the clutch facing discs thoroughly.
- Mount intermediate clutch disc **A** with marking **S**.

Guideline

|  |                   |
|--|-------------------|
| Thickness of intermediate clutch disc <b>A</b> | 1.0 mm (0.039 in) |
|--|-------------------|

- Alternately place the clutch facing and 7 intermediate discs into the clutch basket.

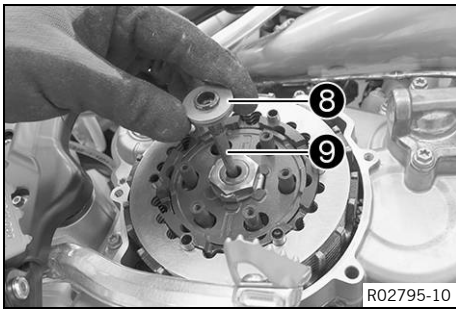
Guideline

|  |                   |
|--|-------------------|
| Thickness of intermediate clutch discs | 1.4 mm (0.055 in) |
|--|-------------------|

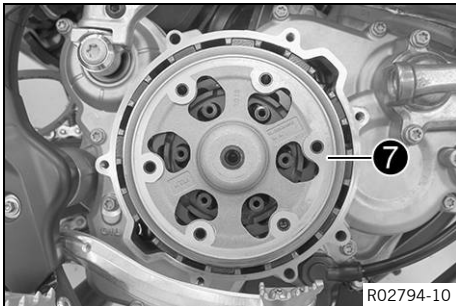
- Place intermediate clutch disc **B** into the clutch basket.

Guideline

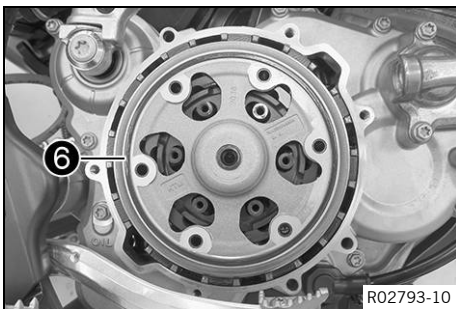
|  |                   |
|--|-------------------|
| Thickness of intermediate clutch disc <b>B</b> | 1.0 mm (0.039 in) |
|--|-------------------|



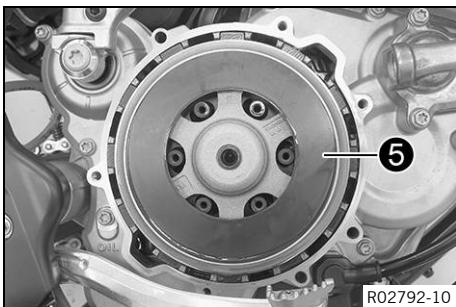
- Mount clutch throw-out **8** with clutch push rod **9**.



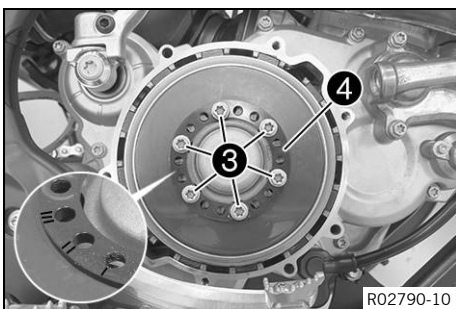
- Position pressure cap **7**.



- Mount pretension ring **6** with marking **Top** facing up.



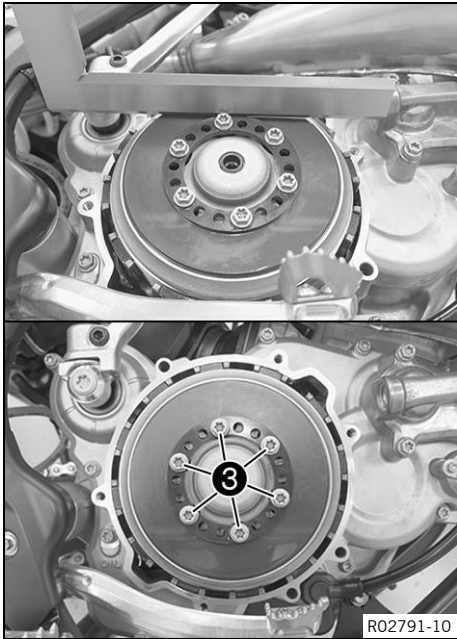
- Position spring washer **5**.



- Position spring retainer **4** with marking **I**.
- Mount screws **3** and tighten in a crisscross pattern.

Guideline

|                               |    |                   |
|-------------------------------|----|-------------------|
| Screw, clutch spring retainer | M5 | 6 Nm (4.4 lbf ft) |
|-------------------------------|----|-------------------|



R02791-10

- Using a straightedge and the special tool, check the spring washer for distortion.

|                                       |  |
|---------------------------------------|--|
| Feeler gauge (59029041100) (調 p. 369) |  |
|---------------------------------------|--|

|                          |                                 |
|--------------------------|---------------------------------|
| Spring washer distortion | 0 ... 0.10 mm (0 ... 0.0039 in) |
|--------------------------|---------------------------------|

- » If the specified value is not reached:
  - Remove screws **3** and mount the spring retainer with marking **II**.

- Using a straightedge and the special tool, check the spring washer for distortion.

|                                       |  |
|---------------------------------------|--|
| Feeler gauge (59029041100) (調 p. 369) |  |
|---------------------------------------|--|

|                          |                                 |
|--------------------------|---------------------------------|
| Spring washer distortion | 0 ... 0.10 mm (0 ... 0.0039 in) |
|--------------------------|---------------------------------|

- » If the specified value is not reached:
  - Remove screws **3** and mount the spring retainer with marking **III**.

- Using a straightedge and the special tool, check the spring washer for distortion.

|                                       |  |
|---------------------------------------|--|
| Feeler gauge (59029041100) (調 p. 369) |  |
|---------------------------------------|--|

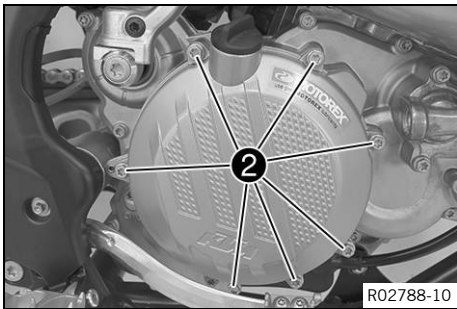
|                          |                                 |
|--------------------------|---------------------------------|
| Spring washer distortion | 0 ... 0.10 mm (0 ... 0.0039 in) |
|--------------------------|---------------------------------|

- » If the specified value is not reached:
  - Change the clutch facing discs.

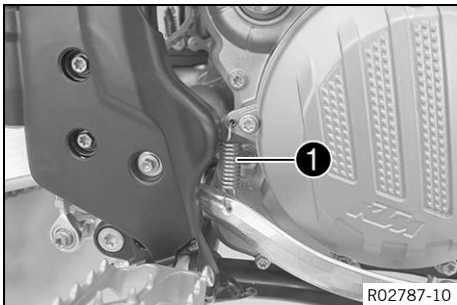
- Position the clutch cover with the gasket.
- Mount and tighten screws **2**.

Guideline

|                                  |    |                    |
|----------------------------------|----|--------------------|
| Screw, intermediate clutch cover | M6 | 10 Nm (7.4 lbf ft) |
|----------------------------------|----|--------------------|



R02788-10



R02787-10

- Attach spring **1**.



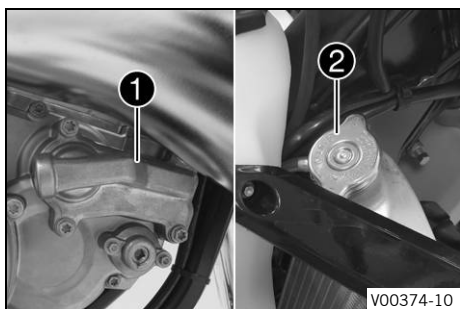
- Place vehicle in upright position and lean on the side stand.

**Finishing work**

- Check the gear oil level. (📖 p. 295)



## 20.1 Cooling system



Water pump **1** in the engine ensures forced circulation of the coolant.  
 The pressure resulting from the warming of the cooling system is regulated by a valve in radiator cap **2**. This ensures that operating the vehicle at the specified coolant temperature will not result in a risk of malfunctions.

120 °C (248 °F)

Cooling is effected by the air stream.  
 The lower the speed, the less the cooling effect. Dirty cooling fins also reduce the cooling effect.

## 20.2 Checking the antifreeze and coolant level



### 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.

- Stand the motorcycle upright on a horizontal surface.
- Remove the radiator cap.
- Check the coolant antifreeze.

-25 ... -45 °C (-13 ... -49 °F)

» If the antifreeze in the coolant does not match the specified value:

- Correct the coolant antifreeze.

- Check the coolant level in the radiator.

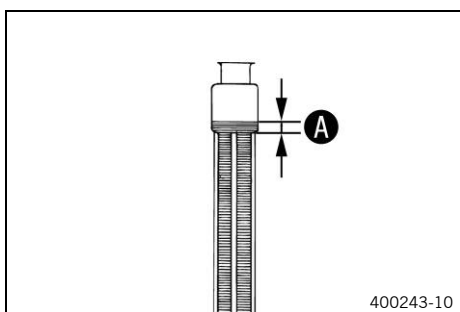
|  |                 |
|--|-----------------|
| Coolant level <b>A</b> above the radiator fins | 10 mm (0.39 in) |
|--|-----------------|

» If the coolant level does not match the specified value:

- Correct the coolant level.

Coolant (📖 p. 358)

- Mount the radiator cap.



## 20.3 Checking the coolant level



### 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.



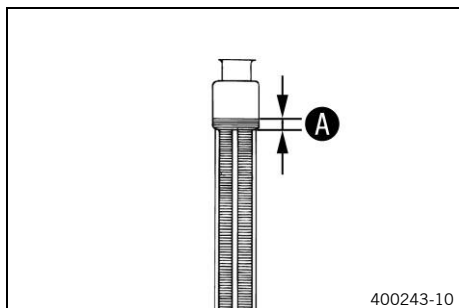
### Warning

**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.



- Stand the motorcycle upright on a horizontal surface.
- Remove the radiator cap.
- Check the coolant level in the radiator.

|  |                 |
|--|-----------------|
| Coolant level <b>A</b> above the radiator fins | 10 mm (0.39 in) |
|--|-----------------|

» If the coolant level does not match the specified value:

- Correct the coolant level.

|                    |
|--------------------|
| Coolant (📖 p. 358) |
|--------------------|

- Mount the radiator cap.



## 20.4 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.

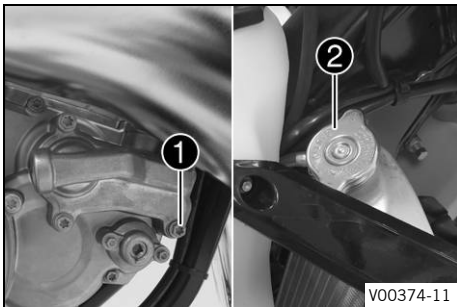
## Condition

The engine is cold.

- Position the motorcycle upright.
- Place a suitable container under the water pump cover.
- Remove screw **1**. Take off radiator cap **2**.
- Completely drain the coolant.
- Mount and tighten screw **1** with a new seal ring.

## Guideline

|                         |    |                    |
|-------------------------|----|--------------------|
| Screw, water pump cover | M6 | 10 Nm (7.4 lbf ft) |
|-------------------------|----|--------------------|



## 20.5 Refilling with coolant



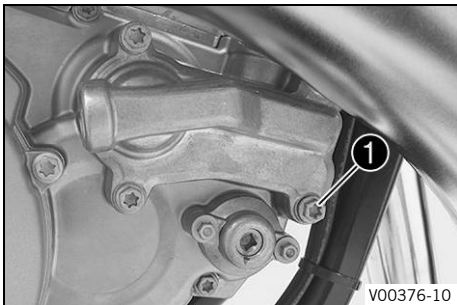
## Warning

**Danger of poisoning** Coolant is toxic and a health hazard.

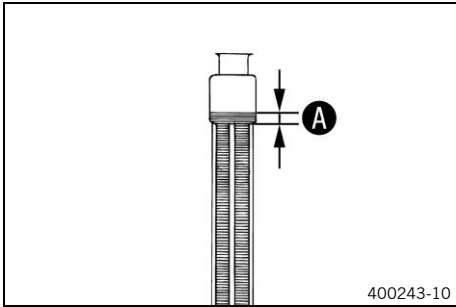
- Keep coolant out of the reach of children.
- Do not allow coolant to come into contact with the skin, the eyes and clothing.
- Consult a doctor immediately if coolant is swallowed.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly with water and consult a doctor immediately if coolant gets into the eyes.
- Change clothing if coolant spills onto your clothing.

## Main work

- Make sure that screw **1** is tightened.
- Position the motorcycle upright.



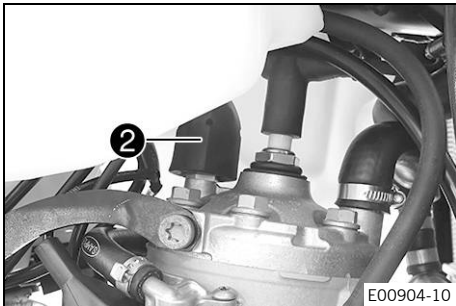




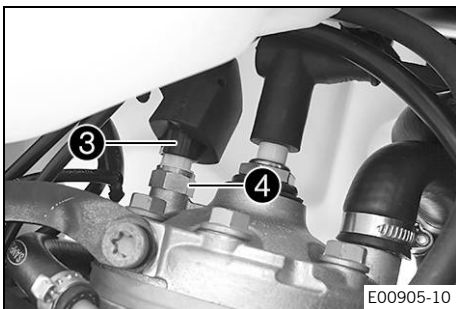
- Pour coolant in up to measurement **A** above the radiator fins.

Guideline

|                 |                 |                    |
|-----------------|-----------------|--------------------|
| 10 mm (0.39 in) |                 |                    |
| Coolant         | 1.2 l (1.3 qt.) | Coolant (📖 p. 358) |



- Push protection cap **2** upward over the thermostat.

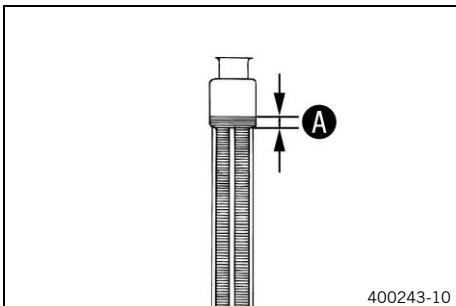


- Unplug connector **3**.
- Remove thermostat **4** with O-ring and wait until the coolant escapes without bubbles.
- Mount thermostat **4** with the O-ring and tighten.

Guideline

|   |          |                    |
|---|----------|--------------------|
| Screw, cylinder head temperature sensor | M10x1.25 | 12 Nm (8.9 lbf ft) |
|---|----------|--------------------|

- Plug in connector **3**.
- Position the protection cap **2**.



- Pour coolant in up to measurement **A** above the radiator fins.

Guideline

|                    |  |  |
|--------------------|--|--|
| 10 mm (0.39 in)    |  |  |
| Coolant (📖 p. 358) |  |  |



- Mount radiator cap **5**.



### 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 an effective exhaust extraction system when starting or running the engine in an enclosed space.

- Allow the engine to warm up and cool down again.

### Finishing work

- Check the coolant level. (📖 p. 287)



## 21.1 Checking/adjusting the exhaust control



### 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 an effective exhaust extraction system when starting or running the engine in an enclosed space.



### Warning

**Danger of burns** Some vehicle components become very hot when the vehicle is operated.

- Do not touch any parts such as the exhaust system, radiator, engine, shock absorber, or brake system before the vehicle parts have cooled down.
- Let the vehicle parts cool down before you perform any work on the vehicle.

### Condition

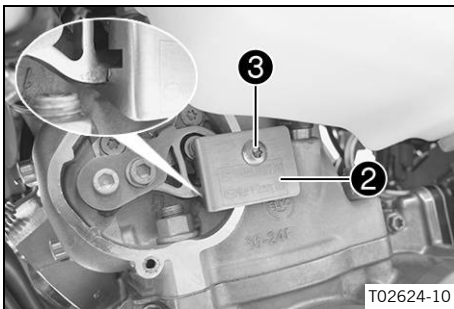
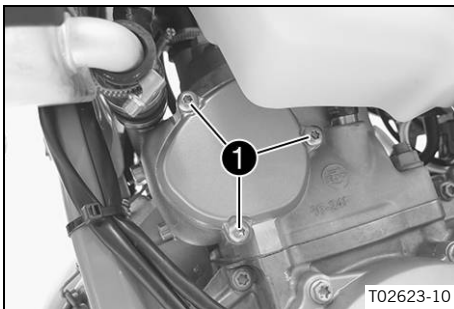
The diagnostics tool is connected and running.

### Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 12)

### Main work

- Remove screws ❶.
- Take off the cover with gasket.



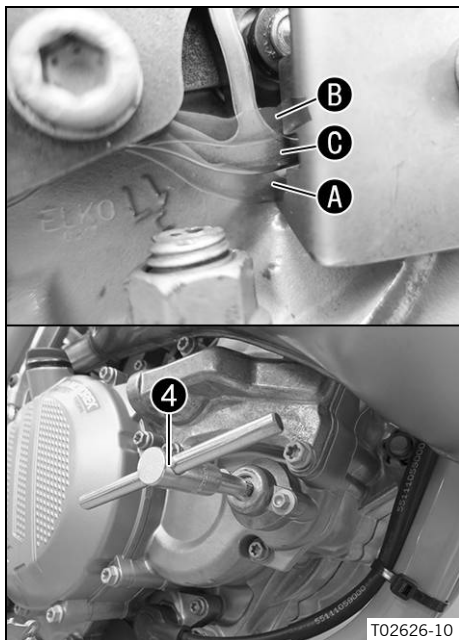
- Position special tool ❷ and mount and tighten screw ❸.

### Guideline

|                              |    |                 |
|------------------------------|----|-----------------|
| Screw, exhaust control cover | M5 | 4 Nm (3 lbf ft) |
|------------------------------|----|-----------------|

Adjusting gauge (55529022000) (📖 p. 366)

- ✓ Stop is flush with the gear segment.



- Execute "**Engine electronics**" > "**Actuator test**" > "**Exhaust control**".
- Start the motorcycle to check the function. (📖 p. 13)

**i Info**  
Let the engine warm up.

- Bring the throttle grip into the full load position.
- Check the position of the gear segment with the special tool.

Adjusting gauge (55529022000) (📖 p. 366)

- » If the gear segment is below the recess (position **A**):
  - Loosen the adjusting screw with special tool **4** until it is flush with the locking cap. Screw in the adjusting screw until the gear segment is flush with the recess (position **C**).

Socket wrench (55529021000) (📖 p. 366)

**i Info**  
The final adjustment of the adjusting screw must always be clockwise.

- » If the gear segment is above the recess (position **B**):
  - Screw in the adjusting screw until the gear segment is flush with the recess (position **C**).

Socket wrench (55529021000) (📖 p. 366)

**i Info**  
The final adjustment of the adjusting screw must always be clockwise.

- » If the gear segment is flush with the recess (position **C**):
  - The exhaust control is set correctly. No adjustment is necessary.

**(All EXC models)**

- Press and hold the kill switch ☒ while the engine is idling until the engine stops.

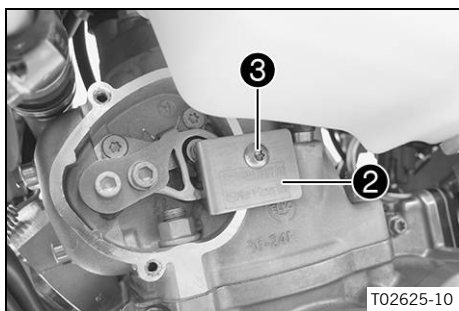
**(All XC-W models)**

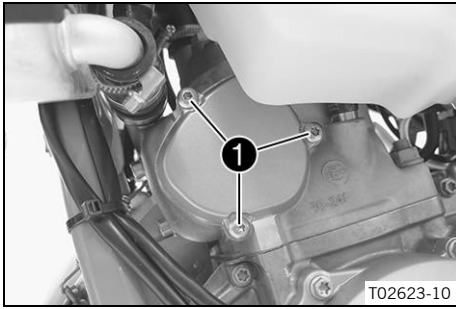
- Press and hold the kill switch ☒ while the engine is idling until the engine stops.

- Stop the "**Exhaust control**" actuator test by pressing the "**Quit**" button.

- Remove screw **3** and take off special tool **2**.

Adjusting gauge (55529022000) (📖 p. 366)





- Position the cover with the gasket.
- Mount and tighten screws ①.

Guideline

|                              |    |   |
|------------------------------|----|---|
| Screw, exhaust control cover | M5 | 4 Nm (3 lbf ft)<br><b>Loctite® 222™</b> |
|------------------------------|----|---|

### Finishing work

- Remove the motorcycle from the lift stand. (📖 p. 12)



## 22.1 Changing the gear oil



### 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

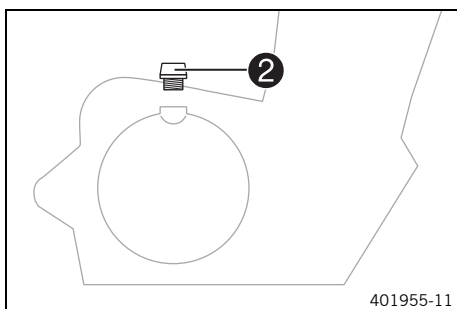
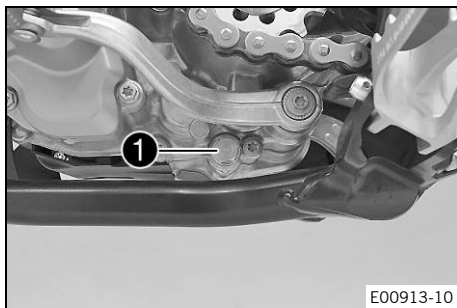
**Environmental hazard** Hazardous substances cause environmental damage.

- Dispose of oils, grease, filters, fuel, cleaning agents, brake fluid, etc., correctly and in compliance with the applicable regulations.



### Info

Drain the gear oil while the engine is at operating temperature.



### Preparatory work

#### (All Six Days models)

- Remove the engine guard. (📖 p. 74)
- Park the motorcycle on a level surface.
- Place a suitable container under the engine.

### Main work

- Remove gear oil drain plug ① with magnet.
- Let the gear oil drain fully.
- Thoroughly clean the gear oil drain plug with magnet.
- Clean the sealing surface on the engine.
- Mount and tighten gear oil drain plug ① with the magnet and a new seal ring.

#### Guideline

|                                 |         |                     |
|---------------------------------|---------|---------------------|
| Gear oil drain plug with magnet | M12x1.5 | 20 Nm (14.8 lbf ft) |
|---------------------------------|---------|---------------------|

- Remove filler plug ② with the O-ring, and fill up with gear oil.

|          |                      |                                      |
|----------|----------------------|--------------------------------------|
| Gear oil | 0.80 l<br>(0.85 qt.) | Engine oil<br>(15W/50)<br>(📖 p. 358) |
|----------|----------------------|--------------------------------------|

- Mount and tighten the filler plug together 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 an effective exhaust extraction system when starting or running the engine in an enclosed space.

- Start the engine and check for tightness.

### Finishing work

- Check the gear oil level. (📖 p. 295)

(All Six Days models)

- Install the engine guard. (📖 p. 74)

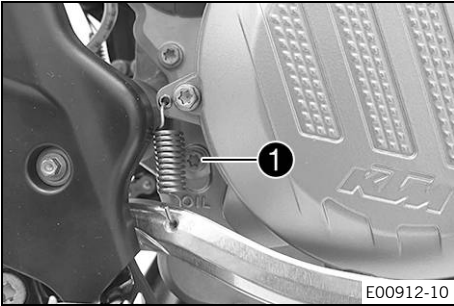


**22.2 Checking the gear oil level**



**Info**

The gear oil level must be checked when the engine is cold.



**Preparatory work**

- Stand the motorcycle upright on a horizontal surface.

**Main work**

- Detach the foot brake lever spring.
- Remove screw for checking gear oil level **1**.
- Check the gear oil level.

A small quantity of gear oil must run out of the drilled hole.

- » If no gear oil runs out:
  - Add gear oil. (📖 p. 295)
- Mount and tighten the gear oil monitoring screw.

**Guideline**

|                             |    |                    |
|-----------------------------|----|--------------------|
| Screw, gear oil level check | M6 | 10 Nm (7.4 lbf ft) |
|-----------------------------|----|--------------------|

- Attach the foot brake lever spring.

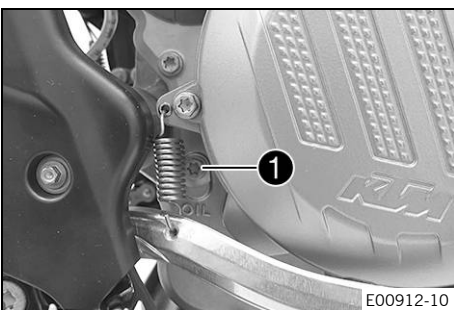


**22.3 Adding gear oil**



**Info**

Too little gear oil or poor-quality gear oil results in premature wear to the transmission. Gear oil must only be topped up when the engine is cold.

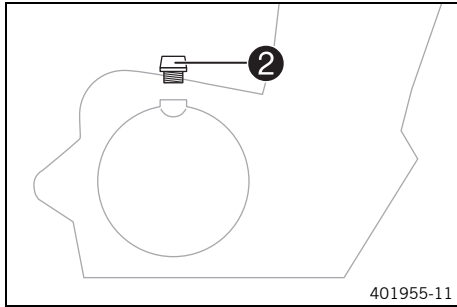


**Preparatory work**

- Park the motorcycle on a level surface.

**Main work**

- Detach the foot brake lever spring.
- Remove screw for checking gear oil level **1**.



- Remove filler plug ② with the O-ring.
- Add gear oil until it emerges from the drill hole of the gear oil monitoring screw.

Engine oil (15W/50) (📖 p. 358)

- Mount and tighten the gear oil monitoring screw.

Guideline

|                             |    |                    |
|-----------------------------|----|--------------------|
| Screw, gear oil level check | M6 | 10 Nm (7.4 lbf ft) |
|-----------------------------|----|--------------------|

- Mount and tighten filler plug ② with the O-ring.
- Attach the foot brake lever spring.



**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 an effective exhaust extraction system when starting or running the engine in an enclosed space.

- Start the engine and check for tightness.

**Finishing work**

- Check the gear oil level. (📖 p. 295)

## 22.4 Checking 2-stroke oil level

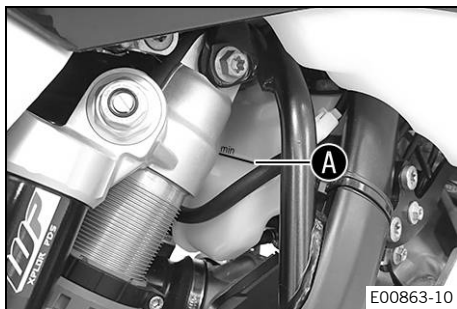


**Warning**

**Engine failure** The engine will not be lubricated unless there is 2-stroke oil in the oil tank.

If the oil level warning light lights up, the 2-stroke oil is sufficient for the remaining tank of fuel.

- As soon as the oil level warning light lights up, ride for no longer than until the remaining fuel in the tank is depleted.
- At the next opportunity add 2-stroke oil before you refuel.
- Time the oil pump if the 2-stroke oil hose has been removed or the 2-stroke oil tank has been fully depleted in error.



**Preparatory work**

- Stand the motorcycle upright on a horizontal surface.

**Main work**

- Check the 2-stroke oil level in the oil tank.



**Info**

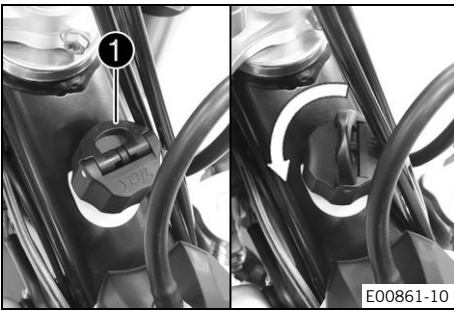
For one tank of fuel, the 2-stroke oil tank must be filled up to at least the **MIN** marking **A**.

The 2-stroke oil tank must be completely if possible.

- » If the 2-stroke oil level is too low:
  - Add 2-stroke oil. (📖 p. 297)



**22.5 Opening 2-stroke oil tank cap**



- Fold loop **1** upward.
- Turn the 2-stroke oil tank cap counterclockwise and pull it up.

**22.6 Adding 2-stroke oil**

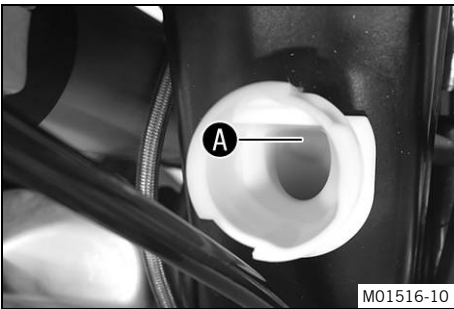


**Warning**

**Engine failure** The engine will not be lubricated unless there is 2-stroke oil in the oil tank.

If the oil level warning light lights up, the 2-stroke oil is sufficient for the remaining tank of fuel.

- As soon as the oil level warning light lights up, ride for no longer than until the remaining fuel in the tank is depleted.
- At the next opportunity add 2-stroke oil before you refuel.
- Time the oil pump if the 2-stroke oil hose has been removed or the 2-stroke oil tank has been fully depleted in error.

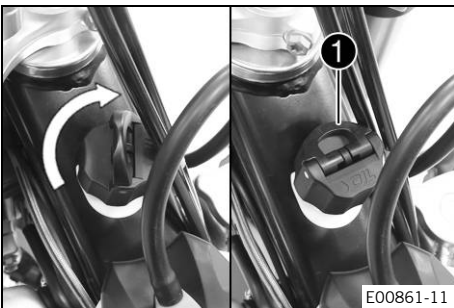


- Open 2-stroke oil tank cap. (📖 p. 297)
- Fill the 2-stroke oil tank up to the lower edge **A** of the filler neck.

|                                   |                 |                                 |
|-----------------------------------|-----------------|---------------------------------|
| 2-stroke oil tank content approx. | 0.7 l (0.7 qt.) | Engine oil, 2-stroke (📖 p. 358) |
|-----------------------------------|-----------------|---------------------------------|

- Close 2-stroke oil tank cap. (📖 p. 297)

**22.7 Closing 2-stroke oil tank cap**



- Put the 2-stroke oil tank cap on and turn it clockwise.
- Fold loop **1** down.
- ✓ The 2-stroke oil tank cap engages.

## 22.8 Priming the oil pump



### Warning

**Engine failure** The engine will not be lubricated unless there is 2-stroke oil in the oil tank.

If the oil level warning light lights up, the 2-stroke oil is sufficient for the remaining tank of fuel.

- As soon as the oil level warning light lights up, ride for no longer than until the remaining fuel in the tank is depleted.
- At the next opportunity add 2-stroke oil before you refuel.
- Time the oil pump if the 2-stroke oil hose has been removed or the 2-stroke oil tank has been fully depleted in error.

### Condition

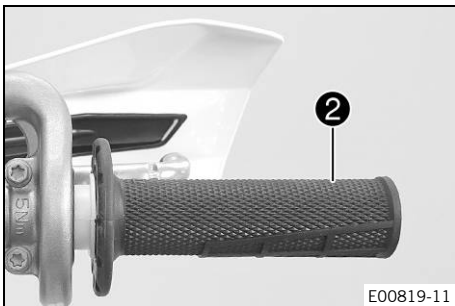
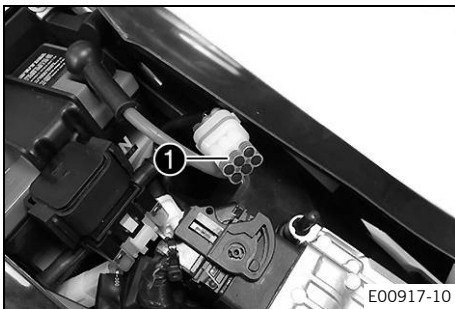
The engine is off.

### Preparatory work

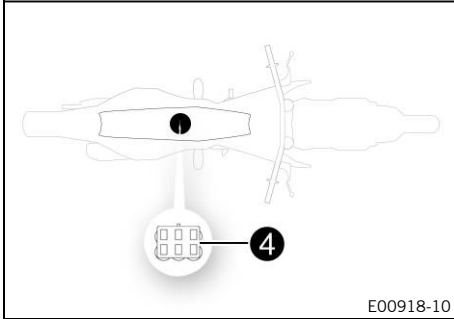
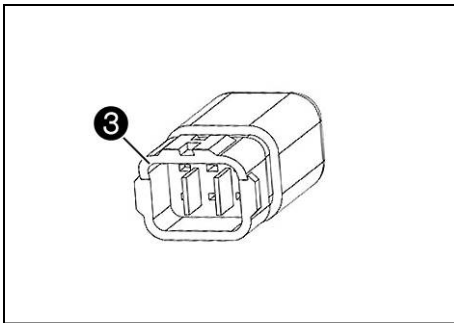
- Remove the seat. (📖 p. 121)
- Stand the motorcycle upright on a horizontal surface.
- Check 2-stroke oil level. (📖 p. 296)

### Main work

- Remove protection cap **1** of the diagnostics connector.



- Put throttle grip **2** into full throttle position and secure.



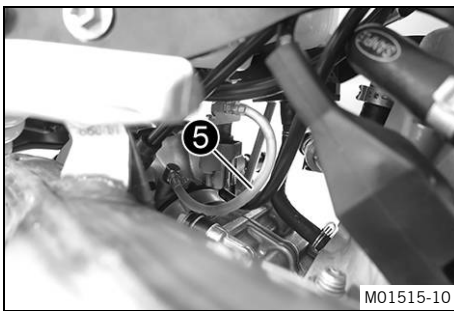
- Plug in wake-up connector ③ for priming the oil pump to the diagnostics connector ④.
- ✓ The combination instrument lighting is activated.

**i Info**  
The connector is included as part of the motorcycle's separate enclosure.

- Wait for at least five seconds.
- Release the fixing means from the throttle grip.
- ✓ The oil pump is timed.

**i Info**  
The oil pump is actuated at various speeds. The procedure is clearly audible.

- Wait until you can no longer hear the oil pump working.
- Disconnect the wake-up connector from the diagnostics connector.



- Check whether air bubbles are visible in the hose ⑤.
  - » If air bubbles are visible:
    - Repeat the entire procedure until air bubbles are no longer visible.
- Mount protection cap on the diagnostics connector.

### Finishing work

- Mount the seat. (📖 p. 121)

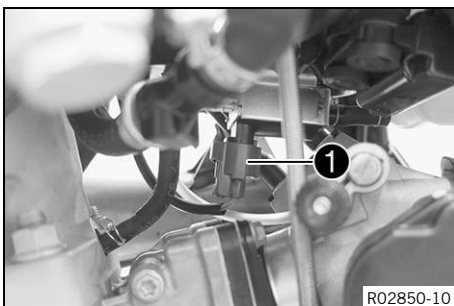
## 22.9 Replacing the oil pump

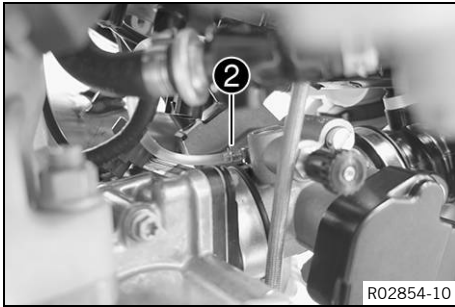
### Condition

Oil tank is empty.

### Main work

- Unplug connector ①.



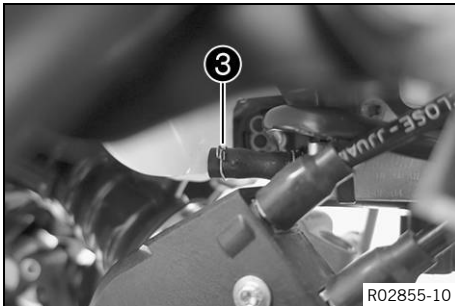


- Push back hose clamp ②.
- Pull off the tube from the throttle valve body.

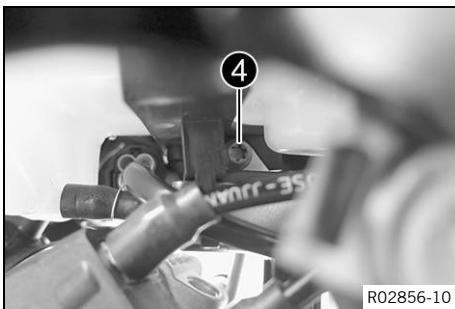


**Info**

Residual oil may escape from the tube.



- Push back hose clamp ③.



- Remove screw ④.
- Pull off the hose from the oil tank.



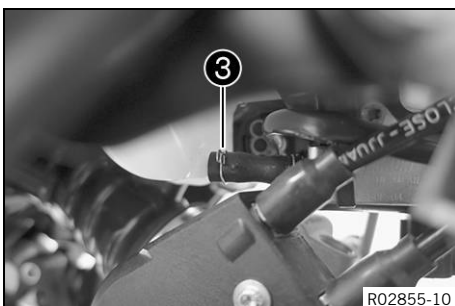
**Info**

Residual oil may escape from the oil tank.

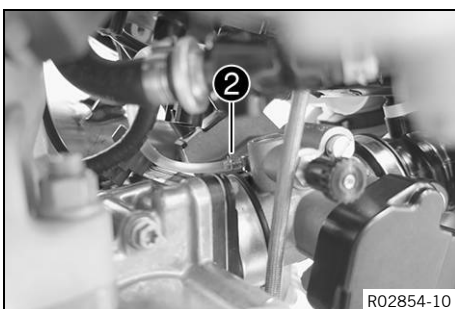
- Remove the oil pump with hoses.
- Position new oil pump with hoses.
- Mount hose on the oil tank.
- Mount and tighten screw ④.

Guideline

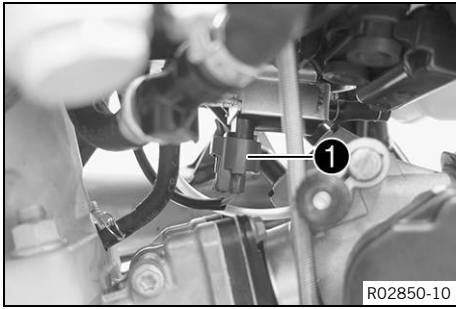
|                 |    |                   |
|-----------------|----|-------------------|
| Screw, oil pump | M6 | 7 Nm (5.2 lbf ft) |
|-----------------|----|-------------------|



- Position hose clamp ③.



- Mount hose on the throttle valve body.
- Position hose clamp ②.



- Plug in connector ①.

**Finishing work**

- Check 2-stroke oil level. (📖 p. 296)
- Prime the oil pump. (📖 p. 298)
- Mount the seat. (📖 p. 121)



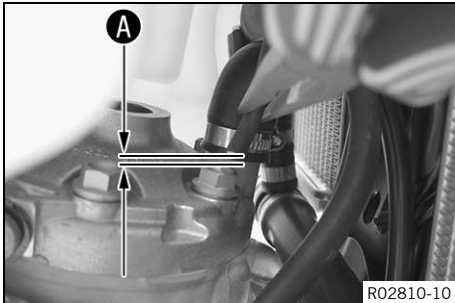
## 23.1 Checking the ignition system



### Warning

**Risk of injury** The ignition system is under high voltage.

- To avoid the danger of an electric shock, do not touch metal parts and the ends of the connection cable during and immediately after measuring.



- Shift gear to neutral.
- Unplug the spark plug connector and remove it from the ignition wire.
- Remove the spark plug.
- Hold the free end of the ignition wire at a distance **A** from ground.

Guideline

|                   |               |
|-------------------|---------------|
| Distance <b>A</b> | 5 mm (0.2 in) |
|-------------------|---------------|

- Press the kick starter robustly through its full range.



### Info

Do not open the throttle.

- Check the ignition spark.
  - » If no ignition spark is visible:
    - Check the emergency OFF switch.
    - Check the wiring harness to the emergency OFF switch.
    - Check the kill switch.
    - Check the ground connection of the EFI control unit and ignition coil.
    - Check the cable from the EFI control unit to the ignition coil.



### Info

The EFI control unit cannot be tested using simple methods but only using an ignition test bench.

- Ignition coil - check the primary winding. (📖 p. 303)
- Check the crankshaft position sensor. (📖 p. 305)
- Check the stator winding of the alternator. (📖 p. 304)

- Fit spark the plug connector on the ignition wire again. Mount the spark plug in the spark plug connector. Hold the spark plug to ground.
- Press the kick starter robustly through its full range.



### Info

Do not open the throttle.

- Check the ignition spark.
  - » If no ignition spark is visible:
    - Check the spark plug connector. (📖 p. 304)
    - Change the spark plug. (📖 p. 306)



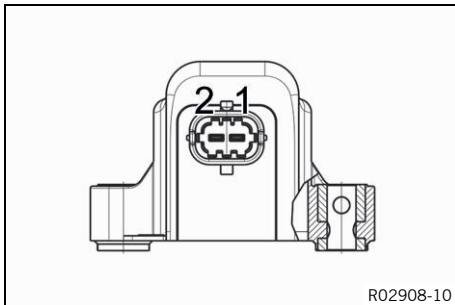
## 23.2 Ignition coil - checking the primary winding



### Warning

**Risk of injury** The ignition system is under high voltage.


- To avoid the danger of an electric shock, do not touch metal parts and the ends of the connection cable during and immediately after measuring.



### Condition

Ignition coil cylinder 1 is disconnected.

#### Ignition coil cylinder 1 - check the primary winding resistance.

-  Measure the resistance between the specified points.  
Ignition coil pin **1 (-)** – Ignition coil pin **2 (+)**

|  |                   |
|--|-------------------|
| Ignition coil                                |                   |
| Primary winding resistance at: 20 °C (68 °F) | 0.337 ... 0.412 Ω |

- » If the displayed value does not correspond to the nominal value:
  - Change the ignition coil.

### Condition

Ignition coil cylinder 1 is connected.

- Connect the special tool to the multimeter.

|   |
|---|
| Peak voltage adapter (58429042000) (📖 p. 367) |
|---|




### Info

When using the peak voltage adapter, adjust the measuring range of the multimeter to DCV.

- Start the motorcycle to check the function. (📖 p. 13)

#### Ignition coil cylinder 1 - check the primary winding voltage.

-  Measure the voltage between the specified points.  
Ignition coil pin **1 (-)** – Ignition coil pin **2 (+)**



### Info

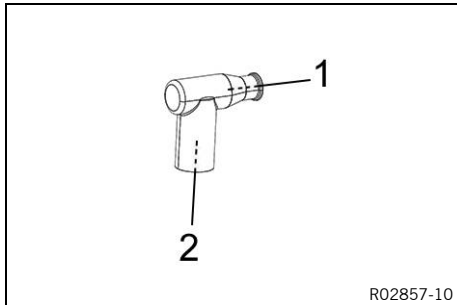
Connect the black measuring lead to pin **2** and the red measuring lead to pin **1** of the ignition coil.

|                          |               |
|--------------------------|---------------|
| Ignition coil            |               |
| Voltage, primary winding | 200 ... 250 V |

- » If the displayed value does not correspond to the nominal value:
  - Change the ignition coil.



## 23.3 Checking the spark plug connector



### Condition

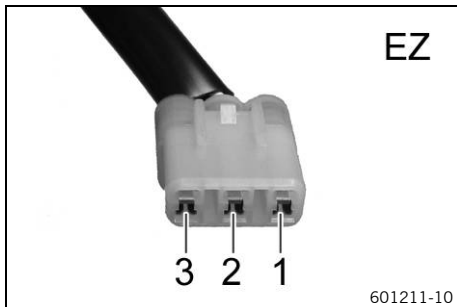
Spark plug connector cylinder 1 has been removed.

- $\Omega$  Measure the resistance between the specified points.  
Measuring point 1 – Measuring point 2

|                                 |                        |
|---------------------------------|------------------------|
| Spark plug connector            |                        |
| Resistance at: 20 °C<br>(68 °F) | 4.3 ... 5.7 k $\Omega$ |

- » If the specification is not reached:
  - Change the spark plug connector.

## 23.4 Alternator – checking the stator winding



### Condition

The stator is disconnected.

### Preparatory work

- Remove the seat. (🗨️ p. 121)

### Main work

#### Stator winding measurement I - check the resistance.

- $\Omega$  Measure the resistance between the specified points.  
Stator, connector **EZ** pin 1 – Stator, connector **EZ** pin 2

|  |                          |
|--|--------------------------|
| Alternator                                     |                          |
| Stator winding resistance<br>at: 20 °C (68 °F) | 0.368 ... 0.552 $\Omega$ |

- » If the indicated value does not correspond to the setpoint value:
  - Change the stator.

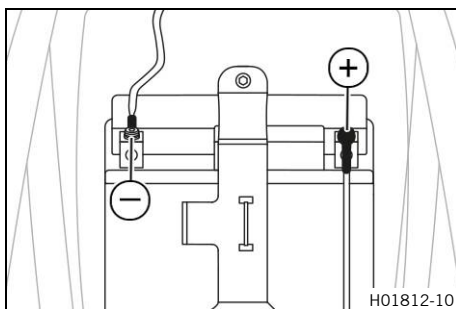
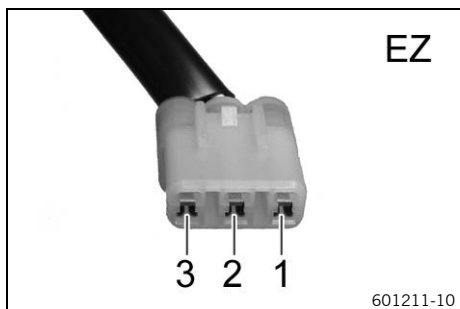
#### Stator winding measurement II - check the resistance.

- $\Omega$  Measure the resistance between the specified points.  
Stator, connector **EZ** pin 1 – Stator, connector **EZ** pin 3

|  |                          |
|--|--------------------------|
| Alternator                                     |                          |
| Stator winding resistance<br>at: 20 °C (68 °F) | 0.368 ... 0.552 $\Omega$ |

- » If the indicated value does not correspond to the setpoint value:
  - Change the stator.





**Stator winding - checking the short circuit to ground (terminal 31).**

- Measure the resistance between the specified points.  
Stator, connector **EZ** pin 1 – Measuring point **Ground (-)**

|            |                 |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

- » If the indicated value does not correspond to the setpoint value:
  - Change the stator.

**Finishing work**

- Mount the seat. (🔧 p. 121)



**23.5 Checking the crankshaft position sensor**

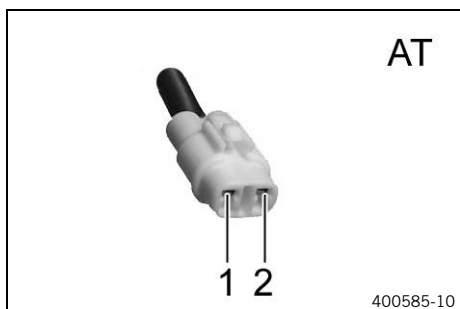
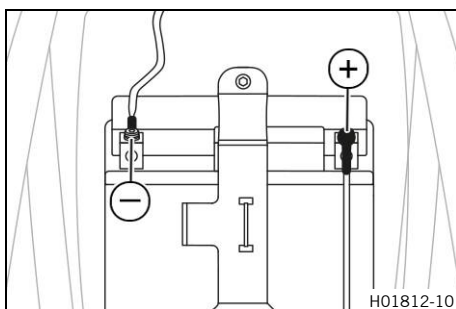
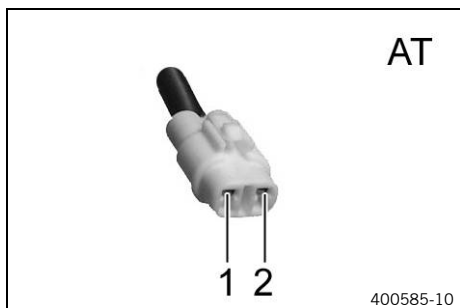
**Condition**

Crankshaft speed sensor is disconnected.

- Measure the resistance between the specified points.  
Crankshaft position sensor, connector **AT** pin 1 –  
Crankshaft position sensor, connector **AT** pin 2

|                                 |              |
|---------------------------------|--------------|
| Crankshaft speed sensor         |              |
| Resistance at: 20 °C<br>(68 °F) | 80 ... 120 Ω |

- » If the specification is not reached:
  - Change the crankshaft position sensor.



- Measure the resistance between the specified points.  
Crankshaft position sensor, connector **AT** pin 1 – Measuring point **Ground (-)**

|            |                 |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

- » If the specification is not reached:
  - Change the crankshaft position sensor.

- Connect the special tool to the multimeter.

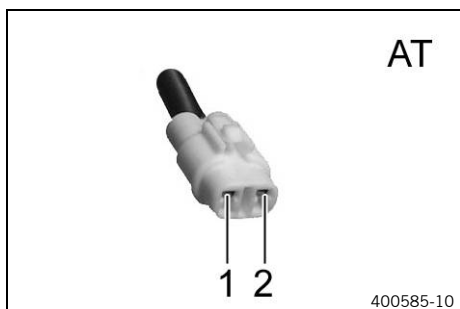
|   |
|---|
| Peak voltage adapter (58429042000) (🔧 p. 367) |
|---|



### Info

When using the peak voltage adapter, adjust the measuring range of the multimeter to DCV.

- Start the motorcycle to check the function. (🔊 p. 13)



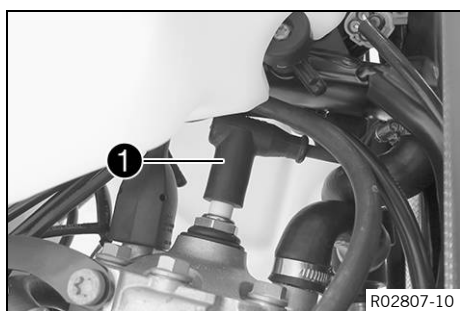
### Check the crankshaft position sensor voltage.

- **V** Measure the voltage between the specified points.
  - Crankshaft position sensor, connector **AT** pin 1
  - Crankshaft position sensor, connector **AT** pin 2

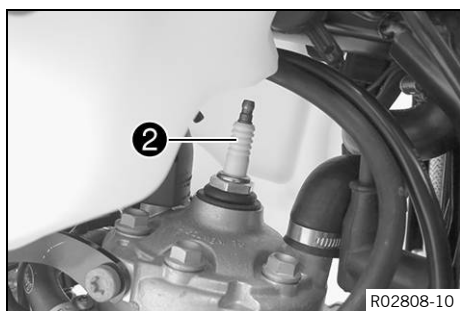
|                                  |           |
|----------------------------------|-----------|
| Crankshaft speed sensor          |           |
| Voltage at starting engine speed | 2 ... 4 V |

- » If the specification is not reached:
  - Change the crankshaft position sensor.

## 23.6 Changing the spark plug



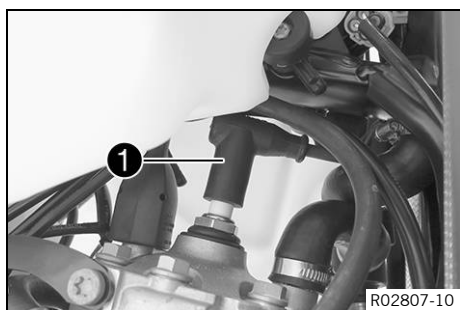
- Disconnect spark plug connector **1**.



- Remove spark plug **2** using a suitable tool.
- Mount and tighten the new spark plug using a suitable tool.

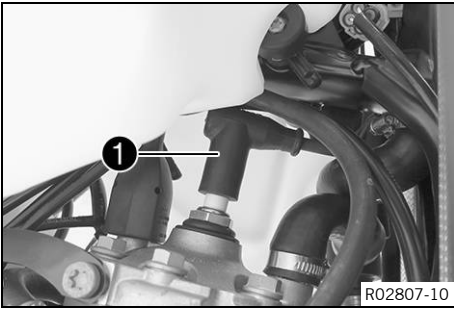
### Guideline

|            |          |                     |
|------------|----------|---------------------|
| Spark plug | M14x1.25 | 25 Nm (18.4 lbf ft) |
|------------|----------|---------------------|

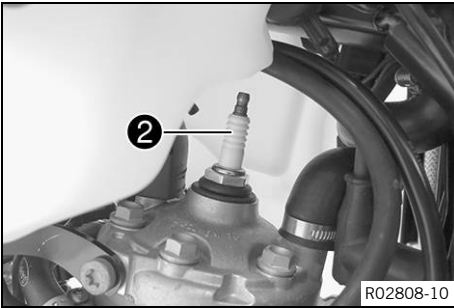


- Plug in spark plug connector **1**.

**23.7 Changing the spark plug and spark plug connector**



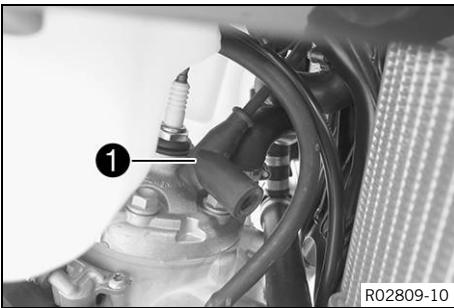
- Disconnect spark plug connector ①.



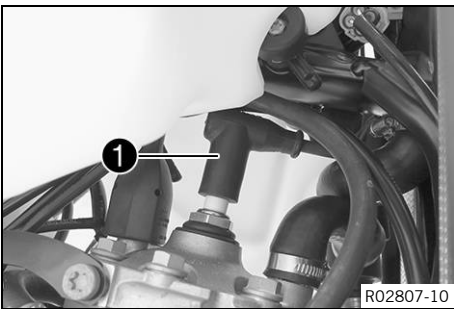
- Remove spark plug ② using a suitable tool.
- Mount and tighten the new spark plug using a suitable tool.

Guideline

|            |          |                     |
|------------|----------|---------------------|
| Spark plug | M14x1.25 | 25 Nm (18.4 lbf ft) |
|------------|----------|---------------------|



- Remove spark plug connector ①.
- Mount new spark plug connector ①.

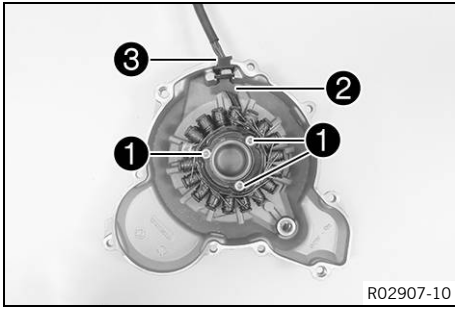


- Plug in spark plug connector ①.

**23.8 Removing the stator**

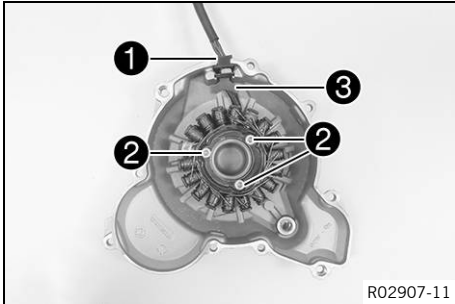
**Condition**

The alternator cover has been removed.



- Remove screws ①.
- Remove retaining bracket ②.
- Remove cable sleeve ③ from the alternator cover.
- Remove the stator from the alternator cover.

## 23.9 Installing the stator



- Position the stator in the alternator cover.
- Position cable sleeve ① in the alternator cover.
- Mount and tighten screws ②.

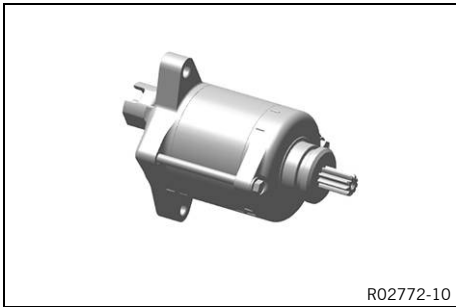
Guideline

|               |    |  |
|---------------|----|--|
| Screw, stator | M5 | 6 Nm (4.4 lbf ft)<br><b>Loctite®243™</b> |
|---------------|----|--|

- Mount retaining bracket ③.

**24.1 Checking the starter motor****Condition**

The starter motor has been removed.



- Clamp 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 to the connection of the starter motor.
  - » If the starter motor does not turn over when the circuit is closed:
    - Change the starter motor.



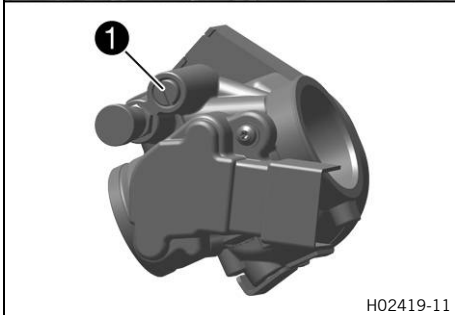
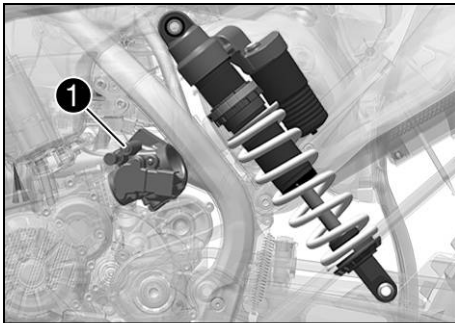
## 25.1 Adjusting the idle speed



### Warning

**Danger of accidents** The engine may go out spontaneously if the idle speed is set too low.

- Set the idle speed to the specified value.



- Run the engine until warm.

- ✓ The cold start button is deactivated – A further ¼ turn returns the cold start button back to the basic position. (📖 p. 311)



### 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 an effective exhaust extraction system when starting or running the engine in an enclosed space.

- Adjust the idle speed by turning idle speed adjusting screw ①.

Guideline

|            |                     |
|------------|---------------------|
| Idle speed | 1,400 ... 1,500 rpm |
|------------|---------------------|

|                                     |
|-------------------------------------|
| Tachometer (45129075000) (📖 p. 363) |
|-------------------------------------|



### Info

Turn clockwise to decrease the idle speed.  
Turn counterclockwise to increase the idle speed.  
Make the setting in small steps.  
An incorrect idle speed can have a negative impact on overall engine running.

## 25.2 Programming ambient pressure



### Danger

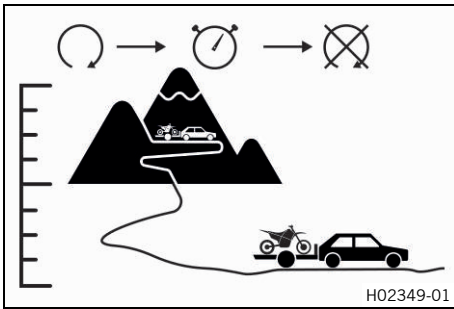
**Danger of poisoning** Exhaust gases are toxic and inhaling them may result in unconsciousness and death.

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



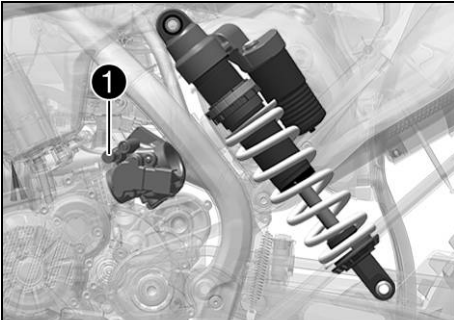
### Info

If the vehicle is ridden with the engine running at various heights above sea level, the ambient pressure is programmed on an ongoing basis.  
If the vehicle is transported over great differences in height, the ambient pressure must be reprogrammed.



- Start the vehicle at the new height above sea level and switch off the engine again.
- Wait for at least five seconds.
- Start the vehicle again and check the response of the vehicle.
  - » If the response has not improved:
    - Repeat procedure.

## 25.3 Cold start button

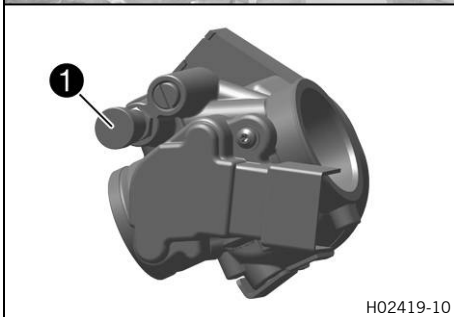


The cold start button **1** is fitted on the side of the throttle valve body.

The injection system extends the injection time if the engine is cold and the outside temperature is low. To help the engine burn the increased amount of fuel, it must be supplied with additional oxygen by pulling the cold start button.

### **i** Info

If the engine is warm, the cold start button must be deactivated.



### Possible states

- The cold start button is activated – The cold start button is pulled out all the way and turned by a  $\frac{1}{4}$  turn.
- The cold start button is deactivated – A further  $\frac{1}{4}$  turn returns the cold start button back to the basic position.

## 26.1 Engine

### 26.1.1 All 250 models

|   |   |
|---|---|
| Design  | 1-cylinder 2-stroke engine, water-cooled, with reed intake, exhaust control and transfer duct injection |
| Displacement  | 249 cm <sup>3</sup> (15.19 cu in)   |
| Stroke  | 72 mm (2.83 in)   |
| Hole  | 66.4 mm (2.614 in)  |
| Idle speed  | 1,400 ... 1,500 rpm   |
| Exhaust valve, beginning of adjustment                      | 5,500 rpm   |
| Crankshaft bearing  | 1 grooved ball bearing/1 roller bearing   |
| Conrod bearing  | Needle bearing  |
| Piston pin bearing  | Needle bearing  |
| Piston  | Cast aluminum   |
| Piston rings  | 2 half keystone rings   |
| Engine lubrication  | Separate lubrication  |
| X distance (upper edge of piston to upper edge of cylinder) | 0 ... 0.10 mm (0 ... 0.0039 in)   |
| Z distance (height of control flap)                         | 49.0 mm (1.929 in)  |
| Primary transmission  | 26:73   |
| Clutch  | Multidisc clutch in oil bath/hydraulically activated  |
| Transmission  | 6-gear, claw shifted  |
| Transmission ratio  |   |
| First gear  | 14:32   |
| Second gear   | 16:26   |
| Third gear  | 20:25   |
| Fourth gear   | 22:23   |
| Fifth gear  | 25:22   |
| Sixth gear  | 26:20   |
| Alternator  | 12 V, 196 W   |
| Ignition system   | Contactless controlled, fully electronic ignition with digital ignition adjustment, type Continental    |
| Spark plug  | NGK ZGR 7 G1  |
| Spark plug electrode gap                                    | 1.3 mm (0.051 in)   |
| Cooling   | Water cooling, permanent circulation of coolant by water pump   |
| Starting aid  | Kick starter and electric starter   |

### 26.1.2 All 300 models

|  |   |
|--|---|
| Design                                 | 1-cylinder 2-stroke engine, water-cooled, with reed intake, exhaust control and transfer duct injection |
| Displacement                           | 293.2 cm <sup>3</sup> (17.892 cu in)  |
| Stroke                                 | 72 mm (2.83 in)   |
| Hole                                   | 72 mm (2.83 in)   |
| Idle speed                             | 1,400 ... 1,500 rpm   |
| Exhaust valve, beginning of adjustment | 5,500 rpm   |



|   |  |
|---|--|
| Crankshaft bearing  | 1 grooved ball bearing/1 roller bearing  |
| Conrod bearing  | Needle bearing   |
| Piston pin bearing  | Needle bearing   |
| Piston  | Cast aluminum  |
| Piston rings  | 2 rectangular rings  |
| Engine lubrication  | Separate lubrication   |
| X distance (upper edge of piston to upper edge of cylinder) | 0 ... 0.10 mm (0 ... 0.0039 in)  |
| Z distance (height of control flap)                         | 49.5 mm (1.949 in)   |
| Primary transmission  | 26:73  |
| Clutch  | Multidisc clutch in oil bath/hydraulically activated   |
| Transmission  | 6-gear, claw shifted   |
| Transmission ratio  |  |
| First gear  | 14:32  |
| Second gear   | 16:26  |
| Third gear  | 20:25  |
| Fourth gear   | 22:23  |
| Fifth gear  | 25:22  |
| Sixth gear  | 26:20  |
| Alternator  | 12 V, 196 W  |
| Ignition system   | Contactless controlled, fully electronic ignition with digital ignition adjustment, type Continental |
| Spark plug  | NGK ZGR 7 G1   |
| Spark plug electrode gap                                    | 1.3 mm (0.051 in)  |
| Cooling   | Water cooling, permanent circulation of coolant by water pump  |
| Starting aid  | Kick starter and electric starter  |

## 26.2 Tolerance, engine wear limits

|   |   |
|---|---|
| Piston - diameter (All 250 models)                    |   |
| Size I  | 66.340 ... 66.350 mm (2.61181 ... 2.6122 in)  |
| Size II   | 66.351 ... 66.360 mm (2.61224 ... 2.61259 in) |
| Piston - diameter (All 300 models)                    |   |
| Size I  | 71.940 ... 71.950 mm (2.83228 ... 2.83267 in) |
| Size II   | 71.951 ... 71.960 mm (2.83271 ... 2.83307 in) |
| Cylinder - drill hole diameter (All 250 models)       |   |
| Size I  | 66.400 ... 66.412 mm (2.61417 ... 2.61464 in) |
| Size II   | 66.412 ... 66.425 mm (2.61464 ... 2.61515 in) |
| Cylinder - drill hole diameter (All 300 models)       |   |
| Size I  | 72.000 ... 72.012 mm (2.83464 ... 2.83511 in) |
| Size II   | 72.012 ... 72.025 mm (2.83511 ... 2.83562 in) |
| Piston/cylinder - mounting clearance (All 250 models) |   |
| New condition   | 0.050 ... 0.074 mm (0.00197 ... 0.00291 in)   |
| Wear limit  | 0.10 mm (0.0039 in)                           |
| Piston/cylinder - mounting clearance (All 300 models) |   |

|  |   |
|--|---|
| New condition  | 0.050 ... 0.085 mm (0.00197 ... 0.00335 in) |
| Wear limit   | 0.10 mm (0.0039 in)                         |
| Piston ring - end gap                                  |   |
| Ring 1   | ≤ 0.40 mm (≤ 0.0157 in)                     |
| Ring 2   | ≤ 0.40 mm (≤ 0.0157 in)                     |
| Cylinder/cylinder head - distortion of sealing surface | ≤ 0.10 mm (≤ 0.0039 in)                     |
| Connecting rod - axial play of lower conrod bearing    | 0.60 ... 0.70 mm (0.0236 ... 0.0276 in)     |
| Crankshaft - run-out at bearing pin                    | ≤ 0.03 mm (≤ 0.0012 in)                     |
| Clutch facing disc - thickness                         | ≥ 1.9 mm (≥ 0.075 in)                       |
| Thrust surface, clutch facing discs in clutch basket   | ≤ 0.5 mm (≤ 0.02 in)                        |
| Shift shaft - sliding plate/shift quadrant play        | 0.40 ... 0.80 mm (0.0157 ... 0.0315 in)     |

## 26.3 Engine tightening torques

|   |                            |                    |                      |
|---|----------------------------|--------------------|----------------------|
| Screw, inner membrane sheets                | <b>EJOTDELTA PT®</b> 35x25 | 1 Nm (0.7 lbf ft)  |                      |
| Screw, membrane support plate               | <b>EJOTDELTA PT®</b> 30x12 | 1 Nm (0.7 lbf ft)  |                      |
| Screw, outer membrane sheets                | <b>EJOTDELTA PT®</b> 30x6  | 1 Nm (0.7 lbf ft)  |                      |
| Screw, angle lever, exhaust control         | M5                         | 6 Nm (4.4 lbf ft)  | <b>Loctite®243™</b>  |
| Screw, bearing retainer                     | M5                         | 7 Nm (5.2 lbf ft)  | <b>Loctite®243™</b>  |
| Screw, clutch spring retainer               | M5                         | 6 Nm (4.4 lbf ft)  |                      |
| Screw, crankshaft position sensor           | M5                         | 6 Nm (4.4 lbf ft)  | <b>Loctite®243™</b>  |
| Screw, exhaust control bearing support      | M5                         | 6 Nm (4.4 lbf ft)  | <b>Loctite®243™</b>  |
| Screw, exhaust control cap                  | M5                         | 5 Nm (3.7 lbf ft)  |                      |
| Screw, exhaust control cover                | M5                         | 4 Nm (3 lbf ft)    | <b>Loctite® 222™</b> |
| Screw, injection valve holder               | M5                         | 5 Nm (3.7 lbf ft)  | <b>Loctite®243™</b>  |
| Screw, locking lever                        | M5                         | 6 Nm (4.4 lbf ft)  | <b>Loctite®243™</b>  |
| Screw, retaining bracket of exhaust control | M5                         | 7 Nm (5.2 lbf ft)  | <b>Loctite®2701™</b> |
| Screw, stator                               | M5                         | 6 Nm (4.4 lbf ft)  | <b>Loctite®243™</b>  |
| Cap nut, water pump impeller                | M6                         | 6 Nm (4.4 lbf ft)  | <b>Loctite®243™</b>  |
| Screw, alternator cover                     | M6                         | 8 Nm (5.9 lbf ft)  |                      |
| Screw, clutch slave cylinder                | M6                         | 10 Nm (7.4 lbf ft) |                      |
| Screw, control flap, exhaust control        | M6                         | 10 Nm (7.4 lbf ft) | <b>Loctite®243™</b>  |
| Screw, engine case                          | M6                         | 10 Nm (7.4 lbf ft) |                      |
| Screw, exhaust flange                       | M6                         | 8 Nm (5.9 lbf ft)  |                      |
| Screw, gear oil level check                 | M6                         | 10 Nm (7.4 lbf ft) |                      |
| Screw, intake flange/reed valve housing     | M6                         | 6 Nm (4.4 lbf ft)  |                      |

|   |           |   |
|---|-----------|---|
| Screw, intermediate clutch cover        | M6        | 10 Nm (7.4 lbf ft)                            |
| Screw, kick starter stop plate          | M6        | 10 Nm (7.4 lbf ft)<br><b>Loctite®243™</b>     |
| Screw, outer clutch cover               | M6        | 8 Nm (5.9 lbf ft)                             |
| Screw, shift drum locating              | M6        | 10 Nm (7.4 lbf ft)<br><b>Loctite®243™</b>     |
| Screw, shift lever                      | M6        | 14 Nm (10.3 lbf ft)<br><b>Loctite®243™</b>    |
| Screw, starter motor                    | M6        | 10 Nm (7.4 lbf ft)                            |
| Screw, starter motor bearing bush       | M6        | 10 Nm (7.4 lbf ft)<br><b>Loctite®243™</b>     |
| Screw, starter motor protection cap     | M6        | 8 Nm (5.9 lbf ft)                             |
| Screw, vacuum connections               | M6        | 8 Nm (5.9 lbf ft)<br><b>Loctite®2701™</b>     |
| Screw, water pump cover                 | M6        | 10 Nm (7.4 lbf ft)                            |
| Screw, balancer shaft                   | M8        | 30 Nm (22.1 lbf ft)<br><b>Loctite®243™</b>    |
| Screw, cylinder head                    | M8        | 27 Nm (19.9 lbf ft)                           |
| Screw, kick starter                     | M8        | 25 Nm (18.4 lbf ft)<br><b>Loctite®2701™</b>   |
| Nut, cylinder base                      | M10       | 35 Nm (25.8 lbf ft)                           |
| Screw, drive chain engine sprocket      | M10       | 60 Nm (44.3 lbf ft)<br><b>Loctite®2701™</b>   |
| Stud, cylinder base                     | M10       | 25 Nm (18.4 lbf ft)<br><b>Loctite®243™</b>    |
| Screw, cylinder head temperature sensor | M10x1.25  | 12 Nm (8.9 lbf ft)                            |
| Nut, rotor                              | M12x1     | 60 Nm (44.3 lbf ft)                           |
| Gear oil drain plug with magnet         | M12x1.5   | 20 Nm (14.8 lbf ft)                           |
| Spark plug                              | M14x1.25  | 25 Nm (18.4 lbf ft)                           |
| Nut, inner clutch hub                   | M18x1.5   | 100 Nm (73.8 lbf ft)<br><b>Loctite® 648™</b>  |
| Nut, primary gear                       | M18LHx1.5 | 150 Nm (110.6 lbf ft)<br><b>Loctite® 648™</b> |

## 26.4 Capacities

### 26.4.1 Gear oil

|          |                   |                                |
|----------|-------------------|--------------------------------|
| Gear oil | 0.80 l (0.85 qt.) | Engine oil (15W/50) (📖 p. 358) |
|----------|-------------------|--------------------------------|

### 26.4.2 Engine oil

|                                   |                 |                                 |
|-----------------------------------|-----------------|---------------------------------|
| 2-stroke oil tank content approx. | 0.7 l (0.7 qt.) | Engine oil, 2-stroke (📖 p. 358) |
|-----------------------------------|-----------------|---------------------------------|

### 26.4.3 Coolant

|         |                 |                    |
|---------|-----------------|--------------------|
| Coolant | 1.2 l (1.3 qt.) | Coolant (📖 p. 358) |
|---------|-----------------|--------------------|

## 26.4.4 Fuel

|                                   |                  |  |
|-----------------------------------|------------------|--|
| Total fuel tank capacity, approx. | 9 l (2.4 US gal) | Super unleaded (ROZ 95/RON 95/PON 91) (📖 p. 359) |
| Fuel reserve, approx.             | 1.5 l (1.6 qt.)  |  |

## 26.5 Chassis

|   |   |  |
|---|---|--|
| Frame   | Central tube frame made of chrome molybdenum steel tubing |  |
| Fork (All standard EXC/XC-W models)                         | <b>WP SuspensionXplor 48</b>                              |  |
| Fork (All Six Days models)                                  | <b>WP SuspensionXplor 48 PA</b>                           |  |
| Suspension travel   |   |  |
| front   | 300 mm (11.81 in)   |  |
| Suspension travel   |   |  |
| rear  | 310 mm (12.2 in)  |  |
| Fork offset   | 22 mm (0.87 in)   |  |
| Shock absorber  | <b>WP Suspension 5018 PDS DCC</b>                         |  |
| Brake system  | Disc brakes, brake calipers on floating bearings          |  |
| Brake discs - diameter                                      |   |  |
| front   | 260 mm (10.24 in)   |  |
| rear  | 220 mm (8.66 in)  |  |
| Brake discs - wear limit (All standard EXC/XC-W models)     |   |  |
| front   | 2.5 mm (0.098 in)   |  |
| rear  | 3.5 mm (0.138 in)   |  |
| Brake discs - wear limit (All Six Days models)              |   |  |
| front   | 2.5 mm (0.098 in)   |  |
| rear  | 3.7 mm (0.146 in)   |  |
| Tire air pressure, road (All EXC models)                    |   |  |
| front   | 1.5 bar (22 psi)  |  |
| rear  | 1.5 bar (22 psi)  |  |
| Tire air pressure off road                                  |   |  |
| front   | 1.0 bar (15 psi)  |  |
| rear  | 1.0 bar (15 psi)  |  |
| Secondary ratio   | 14:50 (13:50)   |  |
| Chain   | 5/8 x 1/4"  |  |
| Rear sprockets available                                    | 38, 40, 42, 45, 48, 49, 50, 51, 52                        |  |
| Steering head angle   | 63.5°   |  |
| Wheelbase   | 1,482 ± 10 mm (58.35 ± 0.39 in)                           |  |
| Seat height unloaded  | 960 mm (37.8 in)  |  |
| Ground clearance unloaded                                   | 370 mm (14.57 in)   |  |
| Weight without fuel, approx. (All standard EXC/XC-W models) | 103 kg (227 lb.)  |  |
| Weight without fuel, approx. (All Six Days models)          | 103.5 kg (228.2 lb.)                                      |  |
| Maximum permissible front axle load (All 250 models)        | 148 kg (326 lb.)  |  |
| Maximum permissible front axle load (All 300 models)        | 147 kg (324 lb.)  |  |
| Maximum permissible rear axle load                          | 190 kg (419 lb.)  |  |

|                                    |                  |
|------------------------------------|------------------|
| Maximum permissible overall weight | 335 kg (739 lb.) |
|------------------------------------|------------------|

## 26.6 Electrical system

|                                     |                        |  |
|-------------------------------------|------------------------|--|
| Battery                             | HJTZ5S-FP              | Lithium-ion battery<br>Battery voltage: 12 V<br>Nominal capacity: 2.0 Ah<br>maintenance-free |
| Combination instrument battery      | CR 2430                | Battery voltage: 3 V   |
| Fuse                                | 75011088005            | 5 A  |
| Fuse                                | 75011088010            | 10 A   |
| Fuse                                | 58011109120            | 20 A   |
| Headlight                           | HS1/socket BX43t       | 12 V<br>35/35 W  |
| Position light                      | W5W / socket W2.1x9.5d | 12 V<br>5 W  |
| Indicator lamps                     | W2.3W / socket W2x4.6d | 12 V<br>2.3 W  |
| Turn signal (All EXC models)        | R10W / socket BA15s    | 12 V<br>10 W   |
| Brake/tail light                    | LED                    |  |
| License plate lamp (All EXC models) | LED                    |  |

## 26.7 Tires

| Validity                  | Front tire  | Rear tire  |
|---------------------------|---|--|
| (All standard EXC models) | <b>80/100 - 21 M/C 51M TT</b><br>MAXXIS Maxx EnduPro            | <b>140/80 - 18 M/C 70R M+S TT</b><br>MAXXIS Maxx EnduPro         |
| (All EXC Six Days models) | <b>90/90 - 21 M/C 54M M+S TT</b><br>Metzeler MCE 6 DAYS EXTREME | <b>140/80 - 18 M/C 70M M+S TT</b><br>Metzeler MCE 6 DAYS EXTREME |
| (All XC-W models)         | <b>90/90 - 21 54M TT</b><br>Dunlop GEOMAX AT 81 F               | <b>110/100 - 18 64M TT</b><br>Dunlop GEOMAX AT 81                |

The tires specified represent one of the possible series production tires. Additional information is available in the Service section under:  
<http://www.ktm.com>

## 26.8 Fork

### 26.8.1 All standard EXC/XC-W models

|                     |                              |
|---------------------|------------------------------|
| Fork article number | 14.18.8S.63                  |
| Fork                | <b>WP SuspensionXplor 48</b> |
| Compression damping |                              |
| Comfort             | 18 clicks                    |
| Standard            | 15 clicks                    |
| Sport               | 12 clicks                    |
| Rebound damping     |                              |
| Comfort             | 18 clicks                    |
| Standard            | 15 clicks                    |

|   |                                    |  |
|---|------------------------------------|--|
| Sport   | 12 clicks                          |  |
| Spring length with preload spacer(s)            | 474 mm (18.66 in)                  |  |
| Spring rate                                     |                                    |  |
| Weight of rider: 65 ... 75 kg (143 ... 165 lb.) | 4.0 N/mm (22.8 lb/in)              |  |
| Weight of rider: 75 ... 85 kg (165 ... 187 lb.) | 4.2 N/mm (24 lb/in)                |  |
| Weight of rider: 85 ... 95 kg (187 ... 209 lb.) | 4.4 N/mm (25.1 lb/in)              |  |
| Fork length                                     | 928 mm (36.54 in)                  |  |
| Fork oil per fork leg                           | 642 ± 10 ml (21.71 ± 0.34 fl. oz.) | Fork oil (SAE 4) (48601166S1) (📖 p. 359) |

## 26.8.2 All Six Days models

|   |                                    |  |
|---|------------------------------------|--|
| Fork article number                             | 14.15.8S.63                        |  |
| Fork  | <b>WP SuspensionXplor 48 PA</b>    |  |
| Compression damping                             |                                    |  |
| Comfort   | 18 clicks                          |  |
| Standard  | 15 clicks                          |  |
| Sport   | 12 clicks                          |  |
| Rebound damping                                 |                                    |  |
| Comfort   | 18 clicks                          |  |
| Standard  | 15 clicks                          |  |
| Sport   | 12 clicks                          |  |
| Spring preload - <b>Preload Adjuster</b>        |                                    |  |
| Comfort   | <b>+0</b>                          |  |
| Standard  | <b>+0</b>                          |  |
| Sport   | <b>+3</b>                          |  |
| Spring length with preload spacer(s)            | 474 mm (18.66 in)                  |  |
| Spring rate                                     |                                    |  |
| Weight of rider: 65 ... 75 kg (143 ... 165 lb.) | 4.0 N/mm (22.8 lb/in)              |  |
| Weight of rider: 75 ... 85 kg (165 ... 187 lb.) | 4.2 N/mm (24 lb/in)                |  |
| Weight of rider: 85 ... 95 kg (187 ... 209 lb.) | 4.4 N/mm (25.1 lb/in)              |  |
| Fork length                                     | 928 mm (36.54 in)                  |  |
| Fork oil per fork leg                           | 635 ± 10 ml (21.47 ± 0.34 fl. oz.) | Fork oil (SAE 4) (48601166S1) (📖 p. 359) |

## 26.9 Shock absorber

|                                 |                                   |  |
|---------------------------------|-----------------------------------|--|
| Shock absorber article number   | 12.18.7S.63                       |  |
| Shock absorber                  | <b>WP Suspension 5018 PDS DCC</b> |  |
| Compression damping, low-speed  |                                   |  |
| Comfort                         | 18 clicks                         |  |
| Standard                        | 15 clicks                         |  |
| Sport                           | 12 clicks                         |  |
| Compression damping, high-speed |                                   |  |
| Comfort                         | 2.5 turns                         |  |
| Standard                        | 2 turns                           |  |

|   |                                    |
|---|------------------------------------|
| Sport   | 1 turn                             |
| Rebound damping                                 |                                    |
| Comfort   | 18 clicks                          |
| Standard  | 15 clicks                          |
| Sport   | 12 clicks                          |
| Spring preload                                  | 8 mm (0.31 in)                     |
| Spring rate                                     |                                    |
| Weight of rider: 65 ... 75 kg (143 ... 165 lb.) | 57 ... 63 N/mm (325 ... 360 lb/in) |
| Weight of rider: 75 ... 85 kg (165 ... 187 lb.) | 60 ... 66 N/mm (343 ... 377 lb/in) |
| Weight of rider: 85 ... 95 kg (187 ... 209 lb.) | 63 ... 69 N/mm (360 ... 394 lb/in) |
| Spring length                                   | 225 mm (8.86 in)                   |
| Gas pressure                                    | 10 bar (145 psi)                   |
| Static sag                                      | 35 mm (1.38 in)                    |
| Riding sag                                      | 110 mm (4.33 in)                   |
| Fitted length                                   | 415 mm (16.34 in)                  |
| Shock absorber fluid (📖 p. 359)                 | SAE 2.5                            |

### 26.10 Chassis tightening torques

|  |                                  |                      |
|--|----------------------------------|----------------------|
| Remaining screws, chassis                            | <b>EJOT PT®</b> K60x25-Z         | 2 Nm (1.5 lbf ft)    |
| Screw, fuel pump                                     | <b>EJOT PT®</b>                  | 2.3 Nm (1.7 lbf ft)  |
| Screw, intake air temperature sensor                 | <b>EJOTDELTA PT®</b> 45x12-Z     | 0.7 Nm (0.52 lbf ft) |
| Screw, oil fill level sensor                         | <b>G 3/4 "</b>                   | 7 Nm (5.2 lbf ft)    |
| Screw, pressure regulator                            | <b>EJOT PT®</b> K60x25-Z         | 2.3 Nm (1.7 lbf ft)  |
| Screw, seat fixing                                   | <b>EJOTEJOFORM PT®</b> K60x23/18 | 2.5 Nm (1.84 lbf ft) |
| Screw, emergency OFF switch (All EXC models)         | M4                               | 0.7 Nm (0.52 lbf ft) |
| Screw, fixed grip                                    | M4                               | 5 Nm (3.7 lbf ft)    |
|  |                                  | <b>Loctite®243™</b>  |
| Spoke nipple, front wheel                            | M4.5                             | 6 Nm (4.4 lbf ft)    |
| Spoke nipple, rear wheel                             | M4.5                             | 6 Nm (4.4 lbf ft)    |
| Remaining nuts, chassis                              | M5                               | 5 Nm (3.7 lbf ft)    |
| Remaining screws, chassis                            | M5                               | 5 Nm (3.7 lbf ft)    |
| Screw, battery terminal                              | M5                               | 2.5 Nm (1.84 lbf ft) |
| Screw, light switch (All EXC models)                 | M5                               | 1 Nm (0.7 lbf ft)    |
| Screw, shock absorber adjusting ring                 | M5                               | 5 Nm (3.7 lbf ft)    |
| Screw, turn signal switch (All EXC models)           | M5                               | 1 Nm (0.7 lbf ft)    |
| Nut, cable on starter motor                          | M6                               | 4 Nm (3 lbf ft)      |
| Remaining nuts, chassis                              | M6                               | 10 Nm (7.4 lbf ft)   |
| Remaining screws, chassis                            | M6                               | 10 Nm (7.4 lbf ft)   |
| Screw, ball joint of push rod on foot brake cylinder | M6                               | 10 Nm (7.4 lbf ft)   |
|  |                                  | <b>Loctite®243™</b>  |

|   |     |   |
|---|-----|---|
| Screw, chain sliding guard                                | M6  | 6 Nm (4.4 lbf ft)<br><b>Loctite®243™</b>    |
| Screw, front brake disc                                   | M6  | 14 Nm (10.3 lbf ft)<br><b>Loctite®243™</b>  |
| Screw, manifold on silent block                           | M6  | 6 Nm (4.4 lbf ft)                           |
| Screw, oil pump   | M6  | 7 Nm (5.2 lbf ft)                           |
| Screw, oil pump holder on oil tank                        | M6  | 6 Nm (4.4 lbf ft)                           |
| Screw, rear brake disc                                    | M6  | 14 Nm (10.3 lbf ft)<br><b>Loctite®243™</b>  |
| Screw, silent block on frame                              | M6  | 6 Nm (4.4 lbf ft)                           |
| Screw, throttle grip                                      | M6  | 5 Nm (3.7 lbf ft)                           |
| Nut, foot brake lever                                     | M8  | 15 Nm (11.1 lbf ft)                         |
| Nut, foot brake lever stop                                | M8  | 20 Nm (14.8 lbf ft)                         |
| Nut, pull switch (All XC-W models)                        | M8  | 0.4 Nm (0.3 lbf ft)                         |
| Nut, rear sprocket screw                                  | M8  | 35 Nm (25.8 lbf ft)<br><b>Loctite®2701™</b> |
| Nut, rim lock   | M8  | 12 Nm (8.9 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 (All standard EXC/XC-W models) | M8  | 15 Nm (11.1 lbf ft)                         |
| Screw, bottom triple clamp (All Six Days models)          | M8  | 15 Nm (11.1 lbf ft)                         |
| Screw, chain sliding piece                                | M8  | 15 Nm (11.1 lbf ft)                         |
| Screw, engine brace                                       | M8  | 25 Nm (18.4 lbf ft)<br><b>Loctite®2701™</b> |
| Screw, engine sprocket cover                              | M8  | 20 Nm (14.8 lbf ft)                         |
| Screw, fork stub  | M8  | 15 Nm (11.1 lbf ft)                         |
| Screw, front brake caliper                                | M8  | 25 Nm (18.4 lbf ft)<br><b>Loctite®243™</b>  |
| Screw, handlebar clamp                                    | M8  | 20 Nm (14.8 lbf ft)                         |
| Screw, side stand attachment                              | M8  | 35 Nm (25.8 lbf ft)<br><b>Loctite®2701™</b> |
| Screw, subframe   | M8  | 35 Nm (25.8 lbf ft)<br><b>Loctite®2701™</b> |
| Screw, top steering stem (All standard EXC/XC-W models)   | M8  | 20 Nm (14.8 lbf ft)                         |
| Screw, top steering stem (All Six Days models)            | M8  | 17 Nm (12.5 lbf ft)<br><b>Loctite®243™</b>  |
| Screw, top triple clamp (All standard EXC/XC-W models)    | M8  | 20 Nm (14.8 lbf ft)                         |
| Screw, top triple clamp (All Six Days models)             | M8  | 17 Nm (12.5 lbf ft)                         |
| Engine bracket screw                                      | M10 | 60 Nm (44.3 lbf ft)                         |
| Remaining nuts, chassis                                   | M10 | 45 Nm (33.2 lbf ft)                         |
| Remaining screws, chassis                                 | M10 | 45 Nm (33.2 lbf ft)                         |
| Screw, handlebar support                                  | M10 | 40 Nm (29.5 lbf ft)<br><b>Loctite®243™</b>  |
| Nut, fuel pump  | M12 | 15 Nm (11.1 lbf ft)                         |



|                                  |         |   |
|----------------------------------|---------|---|
| Screw, bottom shock absorber     | M12     | 80 Nm (59 lbf ft)<br><b>Loctite®2701™</b> |
| Screw, top shock absorber        | M12     | 80 Nm (59 lbf ft)<br><b>Loctite®2701™</b> |
| Nut, swingarm pivot              | M16x1.5 | 100 Nm (73.8 lbf ft)                      |
| Nut, rear wheel spindle          | M20x1.5 | 80 Nm (59 lbf ft)                         |
| Screw, front wheel spindle       | M20x1.5 | 35 Nm (25.8 lbf ft)                       |
| Screw, top steering head         | M20x1.5 | 12 Nm (8.9 lbf ft)                        |
| Screw-in nozzles, cooling system | M20x1.5 | 12 Nm (8.9 lbf ft)<br><b>Loctite®243™</b> |

## 27.1 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

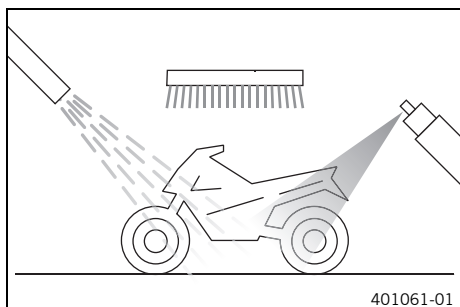
**Environmental hazard** Hazardous substances cause environmental damage.

- 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 coarse dirt particles with a gentle water jet.
- Spray heavily soiled parts with a normal commercial motorcycle cleaner and then brush off with a soft brush.

Motorcycle cleaner (📖 p. 361)



### 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.

- 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 off, lubricate all moving parts and bearings.
- Clean the chain. (📖 p. 149)

- Treat bare metal (except for brake discs and the exhaust system) with a corrosion inhibitor.

Preserving materials for paints, metal and rubber (📖 p. 361)

- Treat all 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. 361)

**(All EXC models)**

- Oil the steering lock.

Universal oil spray (📖 p. 361)

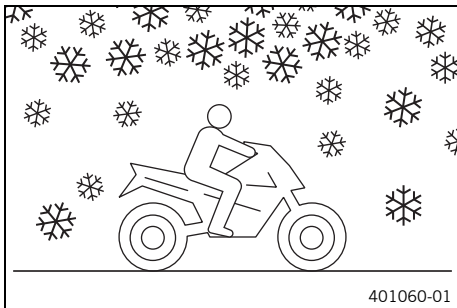


**27.2 Checks and maintenance steps for winter operation**

**i Info**

If you use the motorcycle in winter, salt can be expected on the roads. You should therefore take precautions against aggressive road salt.

If the vehicle has been used on salted roads, use cold water for cleaning after riding. Warm water enhances the corrosive effects of salt.



- Clean the motorcycle. (📖 p. 322)
- Clean the brakes.

**i Info**

After **EVERY** trip on salted roads, thoroughly wash the cool and installed brake calipers and brake linings with cold water and dry carefully.

After riding on salted roads, thoroughly wash the vehicle with cold water and dry it well.

- Treat the engine, the swingarm, and all other bare or galvanized parts (except brake discs) with a wax-based corrosion inhibitor.

**i Info**

Corrosion inhibitor is not permitted to come in contact with the brake discs as this would greatly reduce the braking force.

- Clean the chain. (📖 p. 149)



## 28.1 Storage



### Warning

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

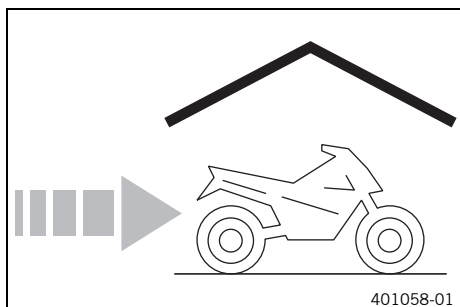
- Avoid skin, eye and clothing contact with fuel.
- Immediately consult a doctor if you swallow fuel.
- Do not inhale fuel vapors.
- In case of skin contact, rinse the affected area with plenty of water.
- Rinse the eyes thoroughly with water, and consult a doctor in case of fuel contact with the eyes.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



### 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.



- Clean the motorcycle. (📖 p. 322)
- Change the gear oil. (📖 p. 294)
- Check the antifreeze and coolant level. (📖 p. 286)
- When refueling for the last time before taking the motorcycle out of service, add fuel additive.

|                          |
|--------------------------|
| Fuel additive (📖 p. 360) |
|--------------------------|

- Refuel.
- Add 2-stroke oil. (📖 p. 297)
- Check the tire air pressure. (📖 p. 137)
- Remove the battery. (📖 p. 161)
- Recharge the battery.

#### Guideline

|   |                             |
|---|-----------------------------|
| Ideal charging and storage temperature of the lithium-ion battery | 10 ... 20 °C (50 ... 68 °F) |
|---|-----------------------------|

- Store the vehicle in a dry location that is not subject to large fluctuations in temperature.



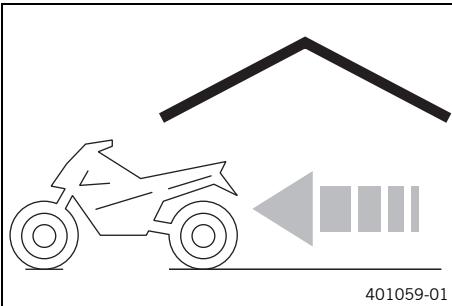
### Info

KTM recommends jacking up the motorcycle.

- Raise the motorcycle with a lift stand. (📖 p. 12)
- Cover the vehicle with a tarp or similar cover that is permeable to air.

**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. Because the engine will not warm up sufficiently, the water vapor produced during combustion will condense, causing engine parts and the exhaust system to rust.

**28.2 Preparing for use after storage**

401059-01

- Remove the motorcycle from the lift stand. (📖 p. 12)
- Install the battery. (📖 p. 162)
- Perform checks and maintenance measures when preparing for use.
- Make a test ride.



## 29.1 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.

## 29.2 Required work

|   | Every 10 operating hours when used for motorsports |   |   |   |
|---|--|---|---|---|
|   | Every 40 operating hours                           |   |   |   |
|   | Every 20 operating hours                           |   |   |   |
|   | Once after 5 operating hours                       |   |   |   |
|   | Once after 1 operating hour                        |   |   |   |
| Read out the fault memory using the KTM diagnostics tool.   | ○  | ○ | ● | ● |
| Check that the electrical system is functioning properly.   | ○  |   | ● | ● |
| Check and charge the battery.   |  |   | ● | ● |
| Check the front brake linings. (📖 p. 167)   |  |   | ● | ● |
| Check the brake linings of the rear brake. (📖 p. 174)   |  |   | ● | ● |
| Check the brake discs. (📖 p. 139)   |  |   | ● | ● |
| Check the brake lines for damage and leakage.   |  |   | ● | ● |
| Check the rear brake fluid level. (📖 p. 178)  |  |   | ● | ● |
| Check the free travel of the foot brake lever. (📖 p. 176)   |  |   | ● | ● |
| Check the frame. (📖 p. 74)  |  |   | ● | ● |
| Check the swingarm. (📖 p. 101)  |  |   | ● | ● |
| Check the swingarm bearing for backlash. (📖 p. 105)   |  |   | ● | ● |
| Check the heim joint for play. (📖 p. 101)   |  |   | ● | ● |
| Check the tire condition. (📖 p. 137)  | ○  |   | ● | ● |
| Check the tire air pressure. (📖 p. 137)   | ○  |   | ● | ● |
| Check the wheel bearing for play. (📖 p. 138)  |  |   | ● | ● |
| Check the wheel hubs.   |  |   | ● | ● |
| Check the rim run-out. (📖 p. 139)   | ○  |   | ● | ● |
| Check the spoke tension. (📖 p. 140)   | ○  |   | ● | ● |
| Check the chain, rear sprocket, engine sprocket, and chain guide. (📖 p. 151)  |  |   | ● | ● |
| Check the chain tension. (📖 p. 150)   | ○  |   | ● | ● |
| Grease all moving parts (e.g. side stand, hand lever, chain, etc.) and check for smooth operation.                    |  |   | ● | ● |
| Check/correct the fluid level of the hydraulic clutch. (📖 p. 275)   |  |   | ● | ● |
| Check the front brake fluid level. (📖 p. 170)   |  |   | ● | ● |
| Check the free travel of the hand brake lever. (📖 p. 169)   |  |   | ● | ● |
| Check the play of the steering head bearing. (📖 p. 65)  | ○  |   | ● | ● |
| Change the spark plug and spark plug connector. (📖 p. 307)  |  |   |   | ● |
| Check the reed valve housing, reed valve, and intake flange. (📖 p. 235)   |  |   | ● | ● |
| Change the gear oil. (📖 p. 294)   |  | ○ |   | ● |
| Check all hoses (e.g. fuel, cooling, bleeder, drainage, etc.) and sleeves for cracking, leaks, and incorrect routing. | ○  |   | ● | ● |

|  | Every 10 operating hours when used for motorsports | Every 40 operating hours | Every 20 operating hours | Once after 5 operating hours | Once after 1 operating hour |
|--|--|--------------------------|--------------------------|------------------------------|-----------------------------|
| Check the antifreeze and coolant level. (🔧 p. 286)   | ○  | ●                        | ●                        | ●                            | ●                           |
| Check the cables for damage and for routing without kinks.                                   |  | ●                        | ●                        | ●                            |                             |
| Check that the throttle cables are undamaged, routed without sharp bends, and set correctly. | ○  | ●                        | ●                        | ●                            |                             |
| Clean the air filter and air filter box. (🔧 p. 118)  |  | ●                        | ●                        | ●                            |                             |
| Change glass fiber yarn filling in the main silencer. (🔧 p. 114)                             |  | ●                        | ●                        |                              |                             |
| Service the fork. (🔧 p. 20)  |  |                          |                          | ●                            |                             |
| Service the shock absorber. (🔧 p. 83)  |  |                          |                          | ●                            |                             |
| Check the screws and nuts for tightness.   | ○  | ●                        | ●                        | ●                            |                             |
| Change the fuel screen. (🔧 p. 125)   | ○  | ●                        | ●                        | ●                            |                             |
| Check the fuel pressure. (🔧 p. 132)  |  | ●                        | ●                        | ●                            |                             |
| Check the headlight setting. (🔧 p. 183)  | ○  | ●                        | ●                        | ●                            |                             |
| Check idle.  |  | ●                        | ●                        | ●                            |                             |
| Final check: Check the vehicle for operating safety and take a test ride.                    | ○  | ○                        | ●                        | ●                            | ●                           |
| Read out the error memory after the test ride using the KTM diagnostics tool.                | ○  | ○                        | ●                        | ●                            | ●                           |
| Make the service entry in the <b>KTM Dealer.net</b> and in the Service and Warranty Booklet. | ○  | ○                        | ●                        | ●                            | ●                           |

- One-time interval
- Periodic interval

### 29.3 Recommended work

|   | Every 40 operating hours when used for motorsports | Every 10 operating hours when used for motorsports | Annually | Every 80 operating hours | Every 40 operating hours | Once after 20 operating hours | Once after 10 operating hours |
|---|--|--|----------|--------------------------|--------------------------|-------------------------------|-------------------------------|
| Change the front brake fluid. (🔧 p. 172)  |  |  | ●        |                          |                          |                               |                               |
| Change the rear brake fluid. (🔧 p. 179)   |  |  | ●        |                          |                          |                               |                               |
| Change the hydraulic clutch fluid. (🔧 p. 276)   |  |  | ●        |                          |                          |                               |                               |
| Lubricate the steering head bearing. (🔧 p. 61)  |  |  | ●        |                          |                          |                               |                               |
| Clean the pressure sensor hose. (🔧 p. 190)  |  |  | ●        | ●                        | ●                        |                               |                               |
| Service the fork. (🔧 p. 20)   | ○  |  |          |                          |                          |                               |                               |
| Service the shock absorber. (🔧 p. 83)   |  | ○  |          |                          |                          |                               |                               |
| Check the electric starter drive. (🔧 p. 249)  |  |  | ●        |                          |                          |                               | ●                             |
| Change the fuel filter. (🔧 p. 126)  |  |  | ●        |                          |                          |                               | ●                             |
| Change the piston and check the cylinder.   |  |  | ●        |                          |                          |                               | ●                             |
| Replace the oil pump. (🔧 p. 299)  |  |  | ●        |                          |                          |                               |                               |
| Perform minor engine service. (Check the exhaust control for functioning and smooth operation. Check the clutch.) |  |  | ●        | ●                        |                          | ●                             | ●                             |

## 29 SERVICE SCHEDULE

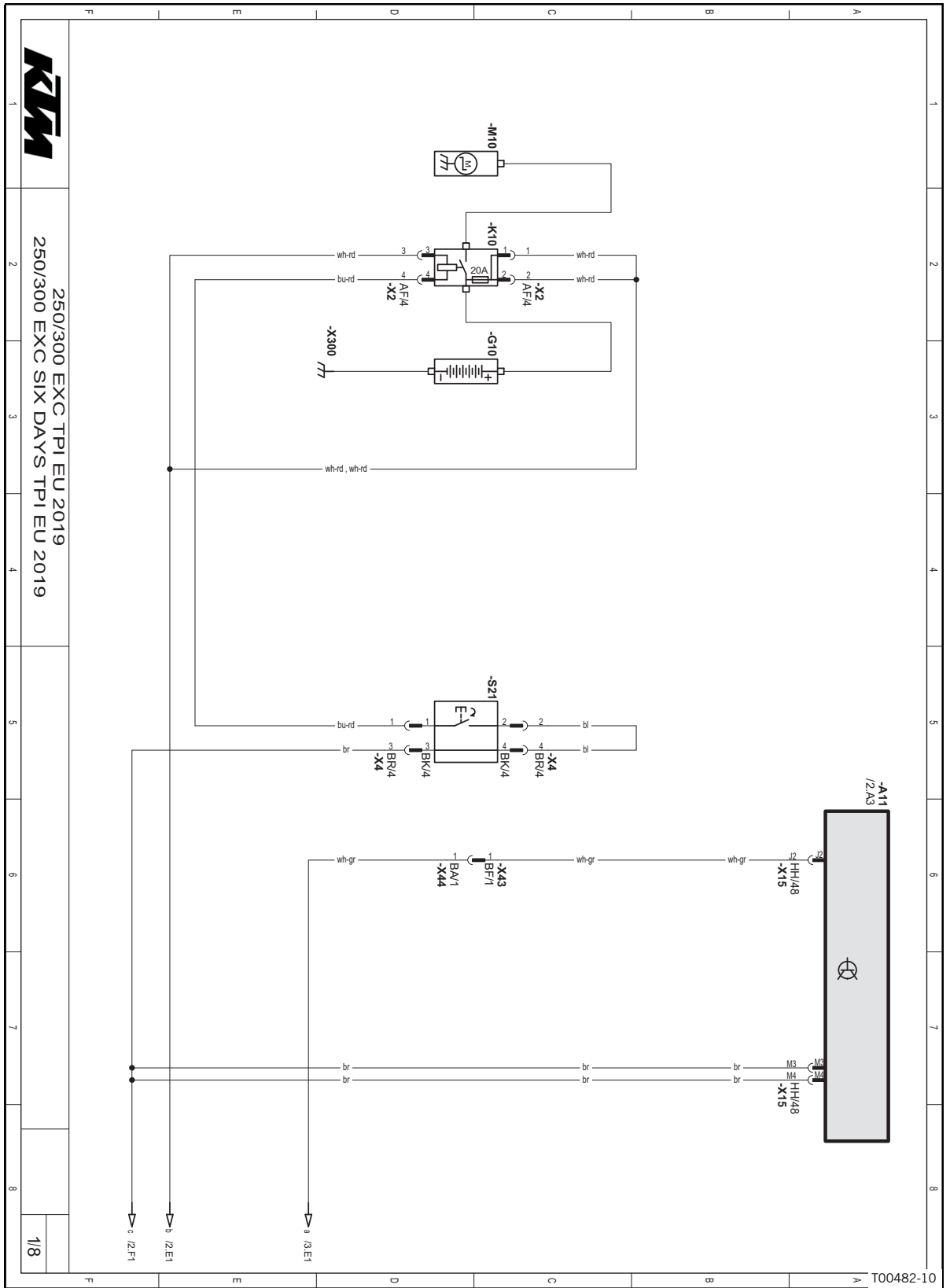
|   | Every 40 operating hours when used for motorsports | Every 10 operating hours when used for motorsports | Annually | Every 80 operating hours | Every 40 operating hours | Once after 20 operating hours | Once after 10 operating hours |
|---|--|--|----------|--------------------------|--------------------------|-------------------------------|-------------------------------|
| Perform major engine service including removing and installing engine.<br>(Change the connecting rod, conrod bearing, and crank pin. Clean the pressure sensor cylinder connection. Check the transmission and shift mechanism.<br>Change all engine bearings.) |  |  |          |                          |                          | •                             | •                             |

- One-time interval
- Periodic interval





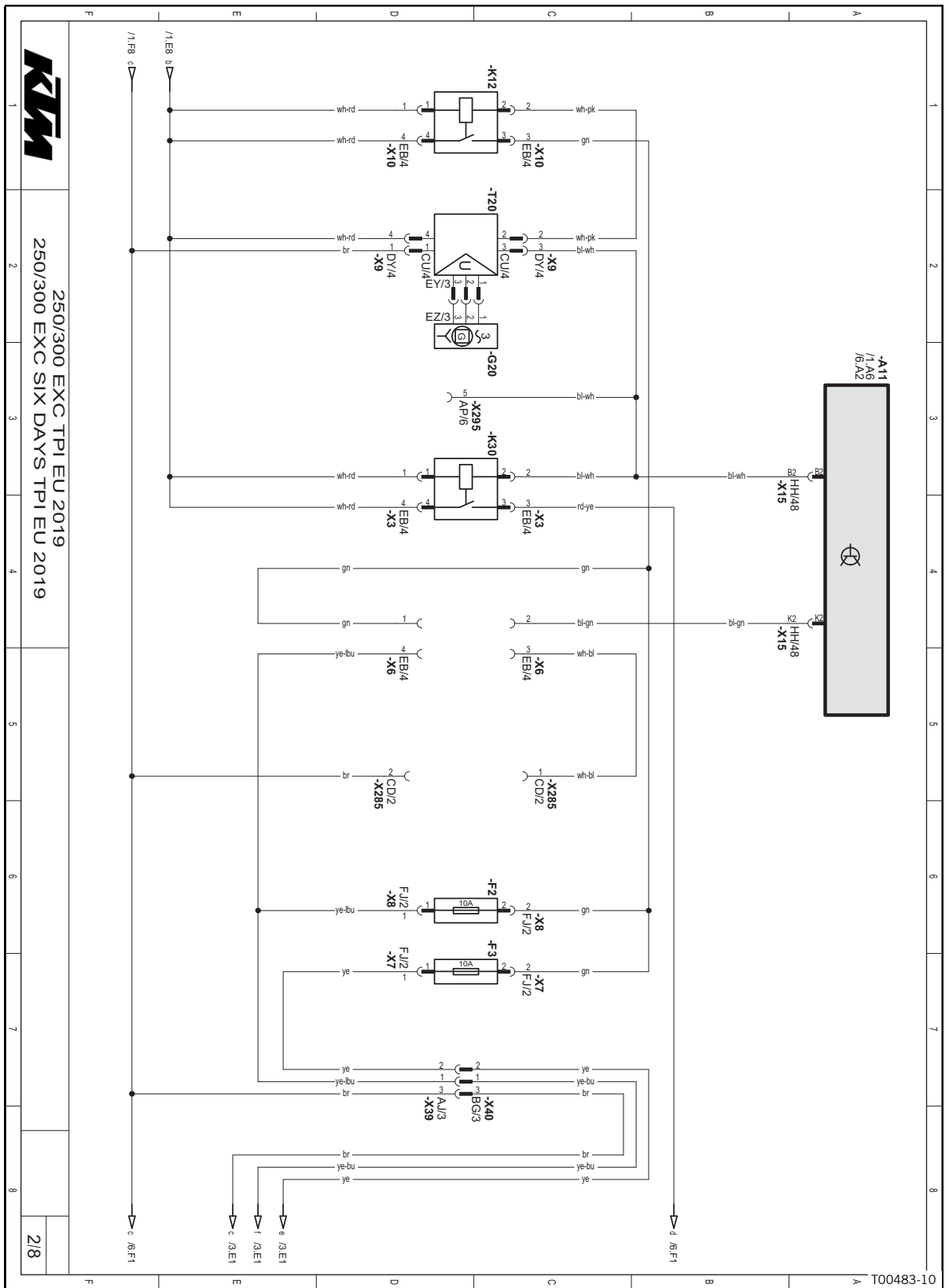
30.1 Page 1 of 8 (All EXC models)



**Components:**

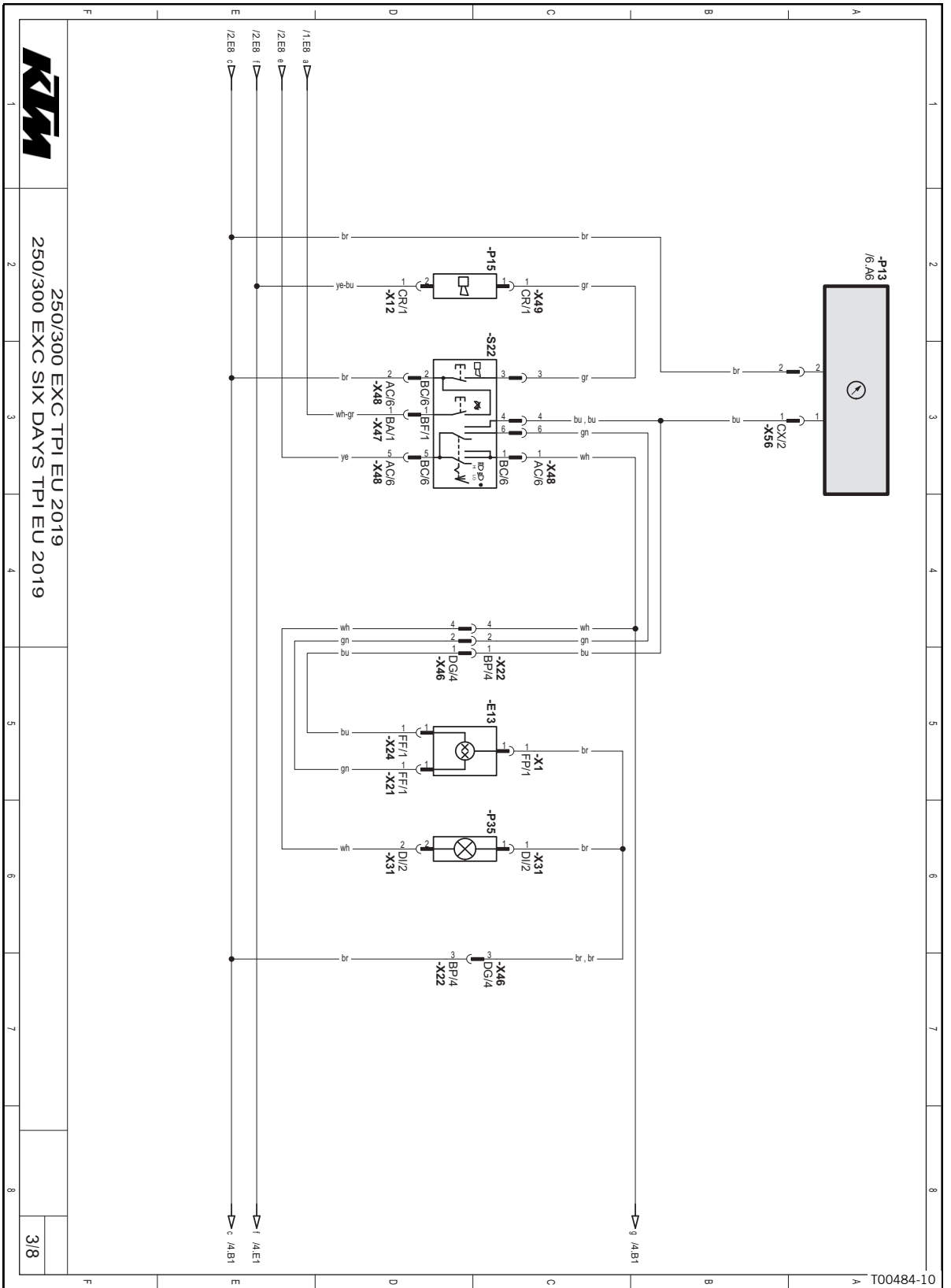
|     |                              |
|-----|------------------------------|
| A11 | EFI control unit             |
| G10 | Battery                      |
| K10 | Starter relay with main fuse |
| M10 | Electric starter system      |
| S21 | E-tip switch                 |

## 30.2 Page 2 of 8 (All EXC models)



**Components:**

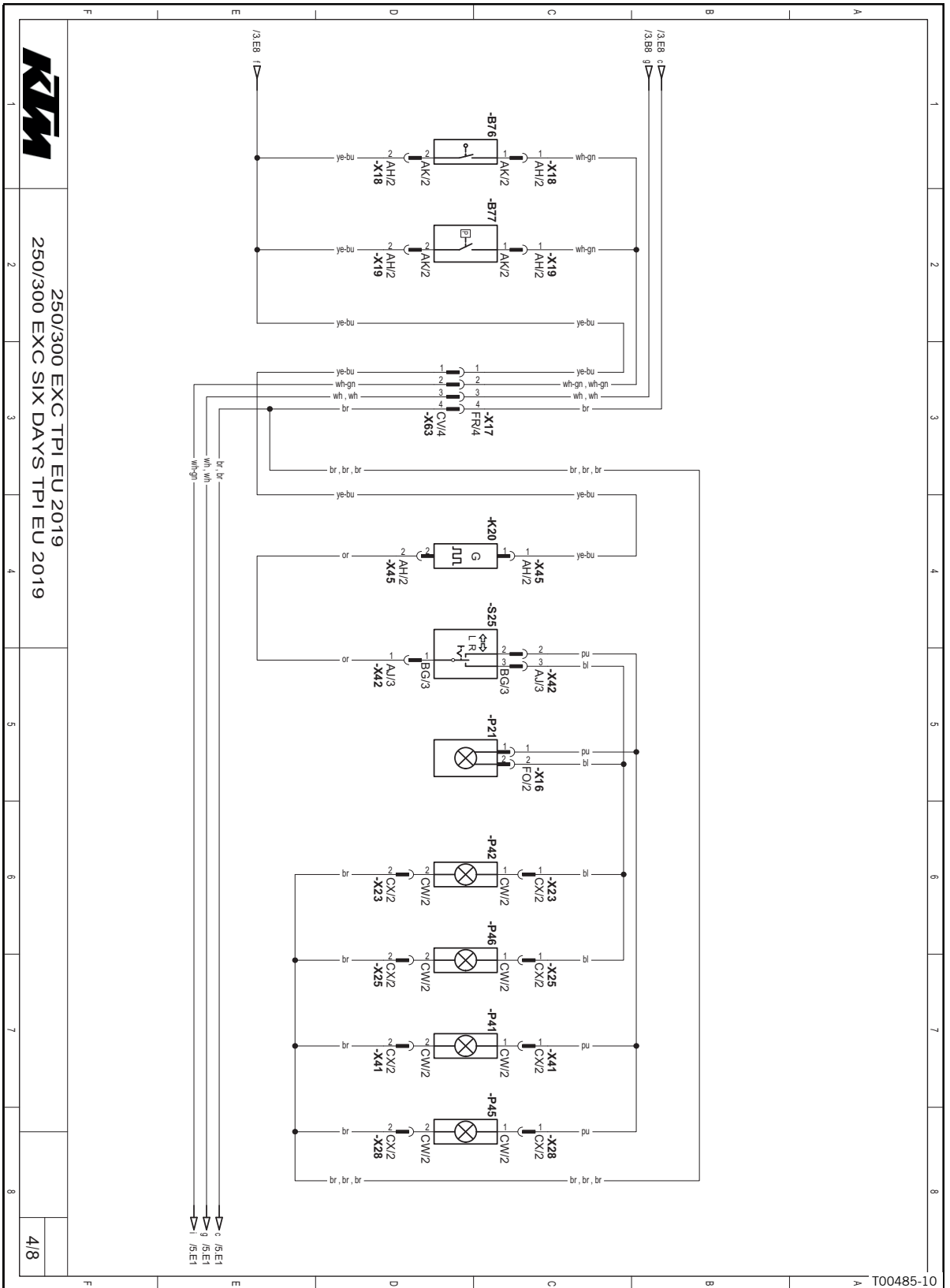
|      |                        |
|------|------------------------|
| A11  | EFI control unit       |
| F2   | Fuse                   |
| F3   | Fuse                   |
| G20  | Alternator             |
| K12  | Light relay            |
| K30  | Power relay            |
| T20  | Voltage regulator      |
| X285 | Radiator fan connector |
| X295 | Diagnostics connector  |



**Components:**

|     |  |
|-----|--|
| E13 | Low beam, high beam                    |
| P13 | Speedometer                            |
| P15 | Horn                                   |
| P35 | Parking light                          |
| S22 | Light switch, horn button, kill switch |

## 30.4 Page 4 of 8 (All EXC models)

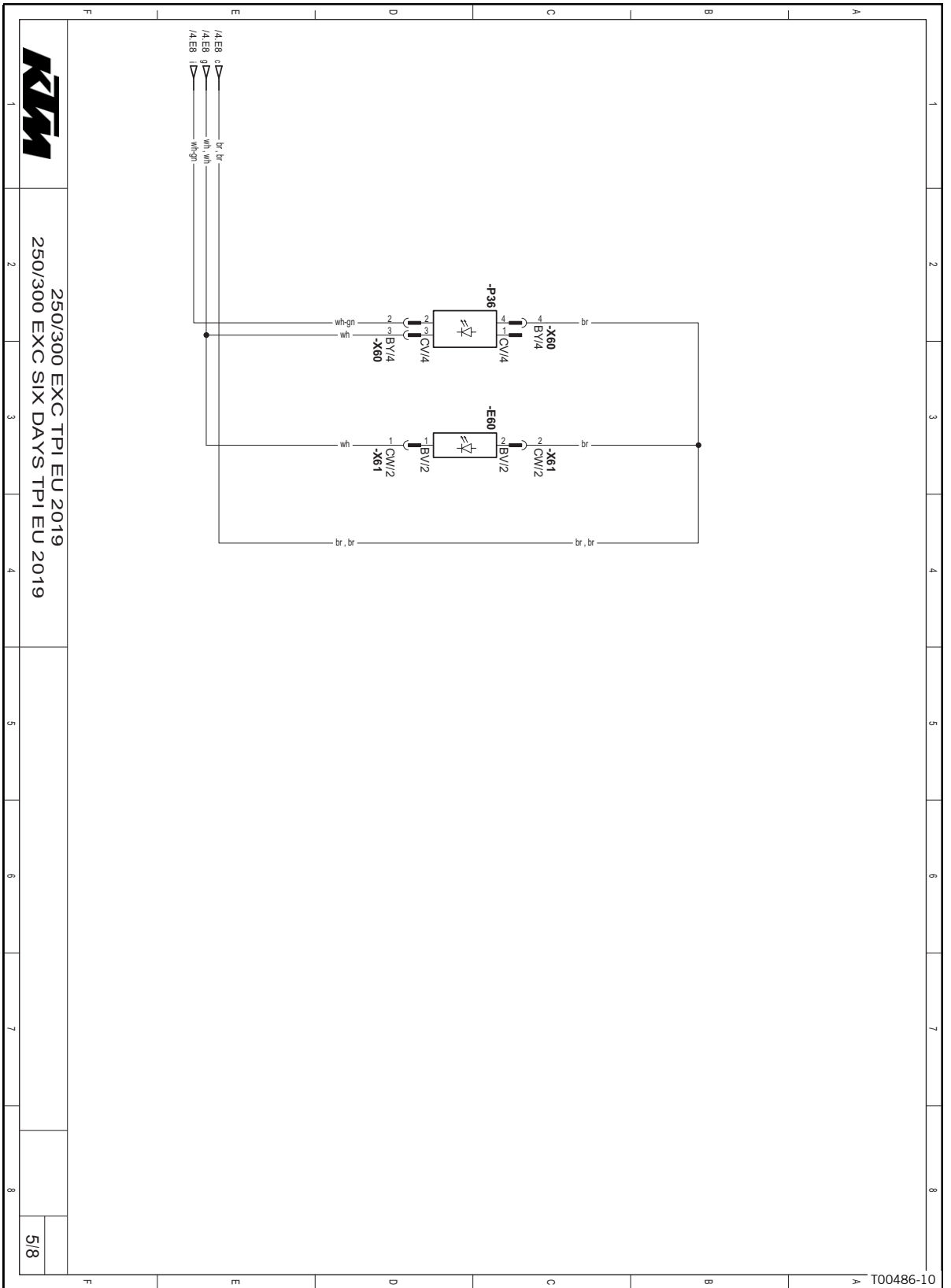




**Components:**

|     |                            |
|-----|----------------------------|
| B76 | Front brake light switch   |
| B77 | Rear brake light switch    |
| K20 | Turn signal relay          |
| P21 | Turn signal indicator lamp |
| P41 | Turn signal, front left    |
| P42 | Turn signal, front right   |
| P45 | Turn signal, rear left     |
| P46 | Turn signal, rear right    |
| S25 | Turn signal switch         |

## 30.5 Page 5 of 8 (All EXC models)

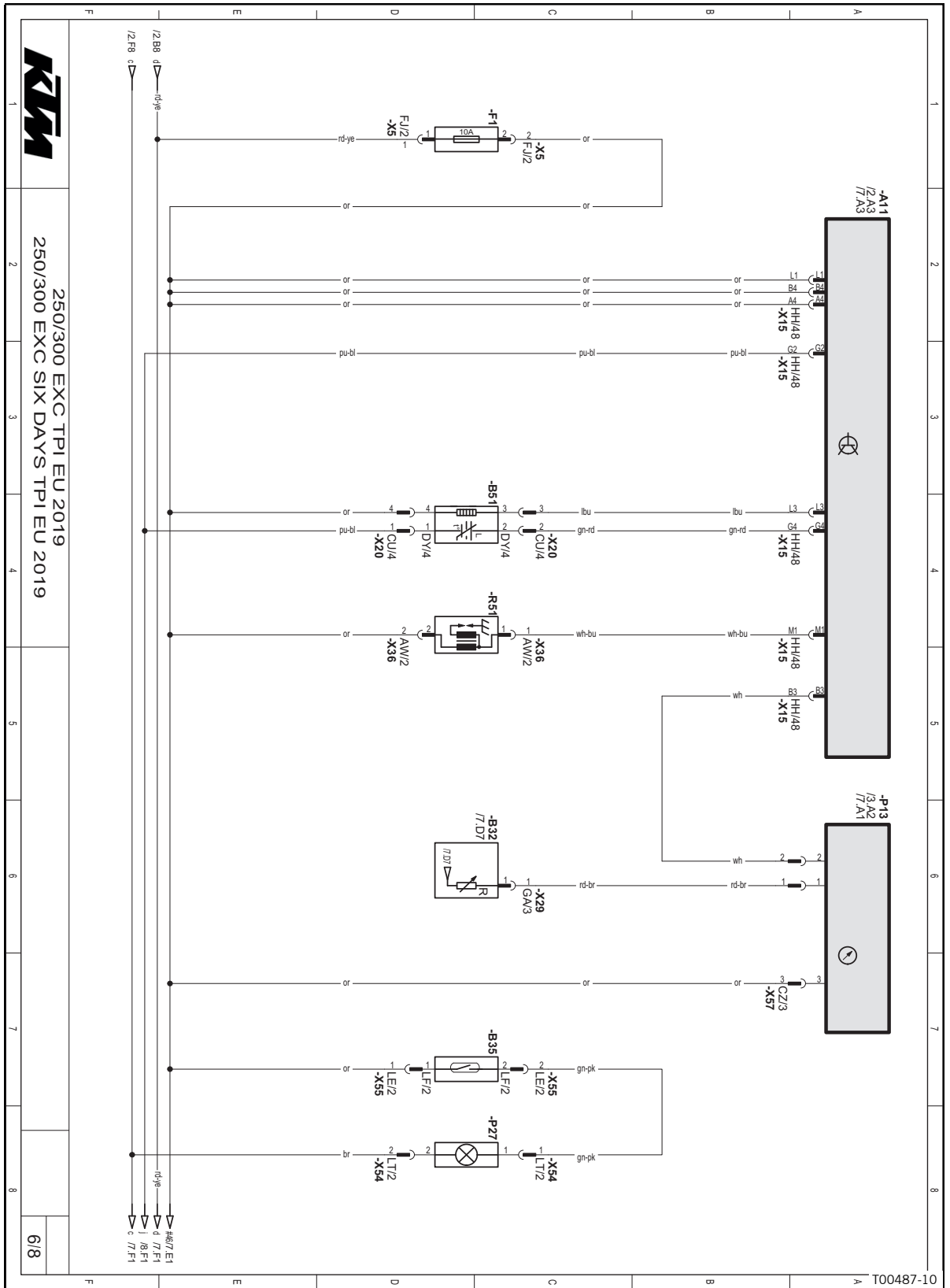


T00486-10

**Components:**

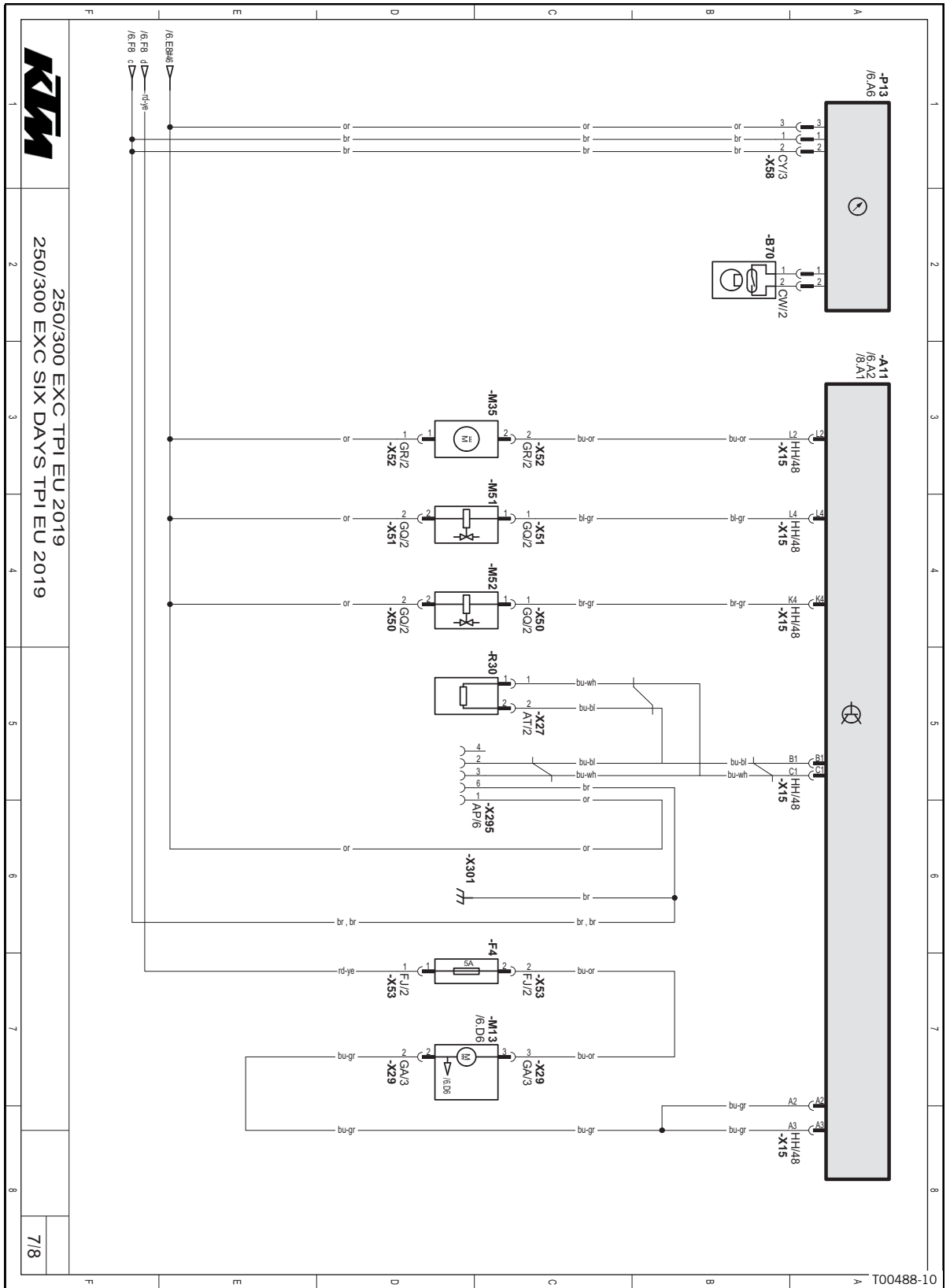
E60 License plate lamp

P36 Brake/tail light



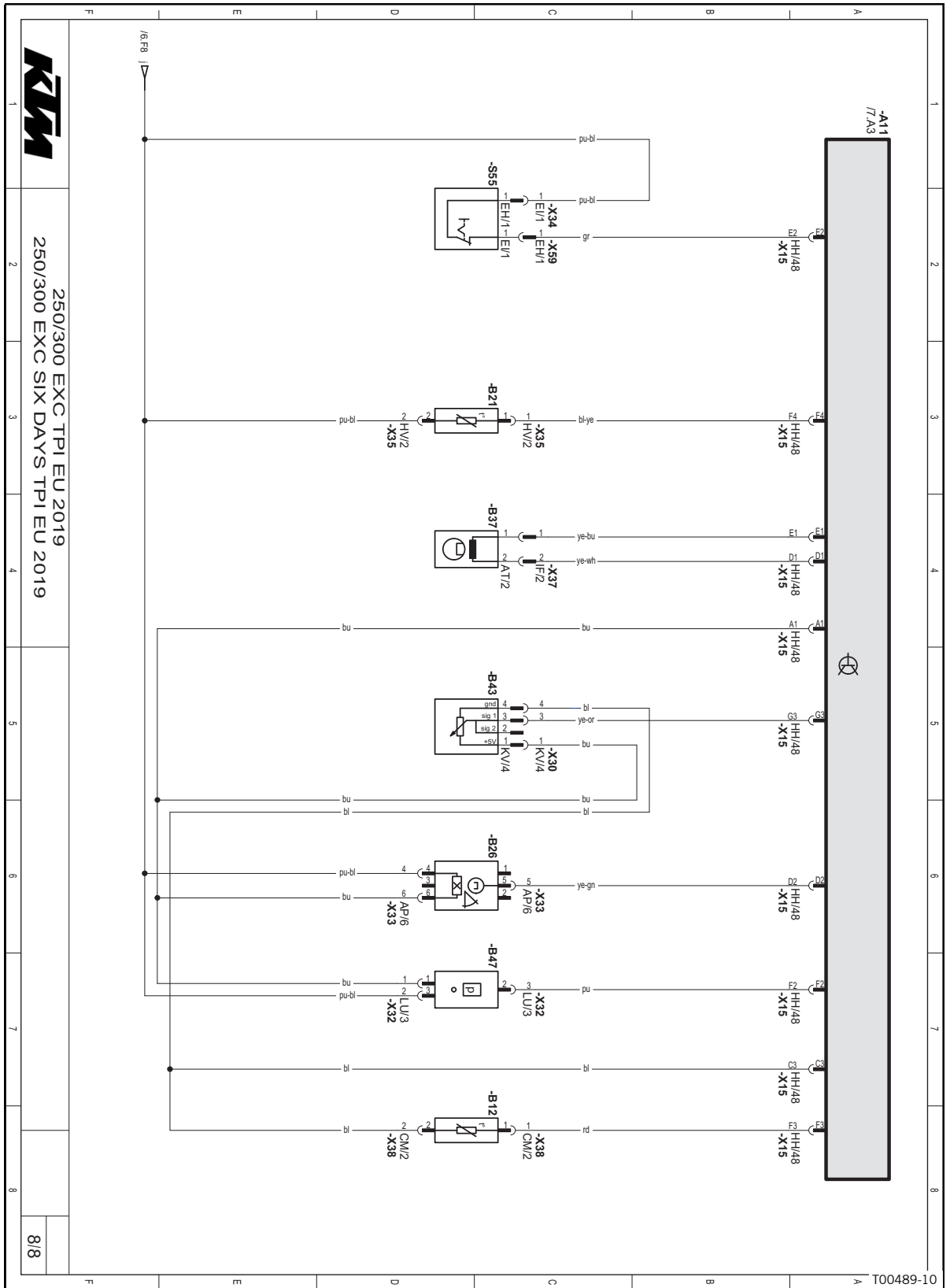
**Components:**

|     |                        |
|-----|------------------------|
| A11 | EFI control unit       |
| B32 | Fuel level sensor      |
| B35 | Oil level sensor       |
| B51 | Lambda sensor          |
| F1  | Fuse                   |
| P13 | Speedometer            |
| P27 | Oil level warning lamp |
| R51 | Ignition coil          |



**Components:**

|      |                                |
|------|--------------------------------|
| A11  | EFI control unit               |
| B70  | Front wheel speed sensor       |
| F4   | Fuse                           |
| M13  | Fuel pump                      |
| M35  | Oil pump                       |
| M51  | Injection valve 0              |
| M52  | Injection valve 1              |
| P13  | Speedometer                    |
| R30  | CAN-bus terminating resistor 1 |
| X295 | Diagnostics connector          |



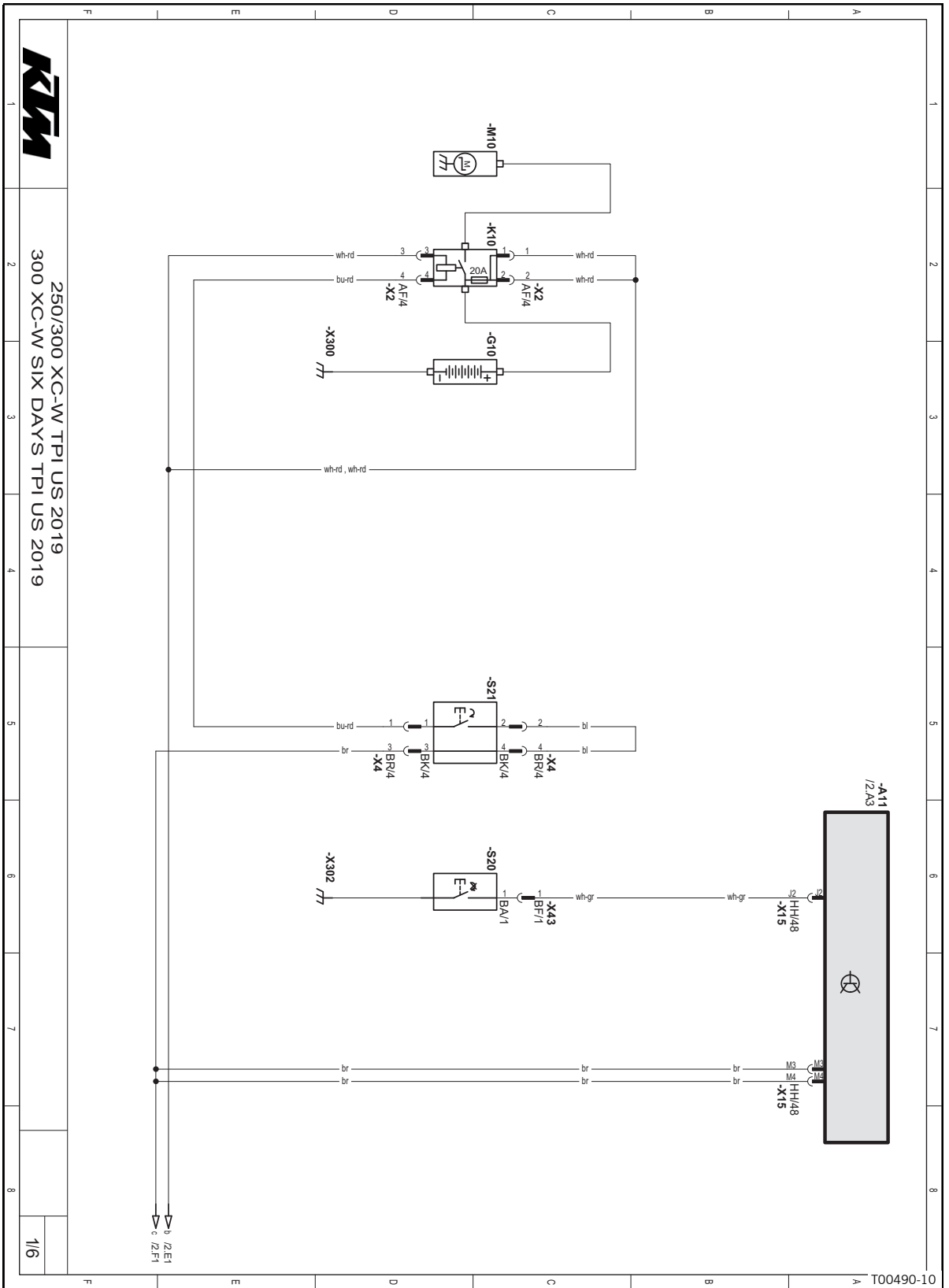


**Components:**

|     |                                     |
|-----|-------------------------------------|
| A11 | EFI control unit                    |
| B12 | Intake air temperature sensor       |
| B21 | Engine coolant temperature sensor   |
| B26 | Rollover sensor                     |
| B37 | Crankshaft speed sensor             |
| B43 | Throttle valve position sensor      |
| B47 | Crankcase pressure sensor           |
| S55 | <b>Map-Select</b> switch (optional) |

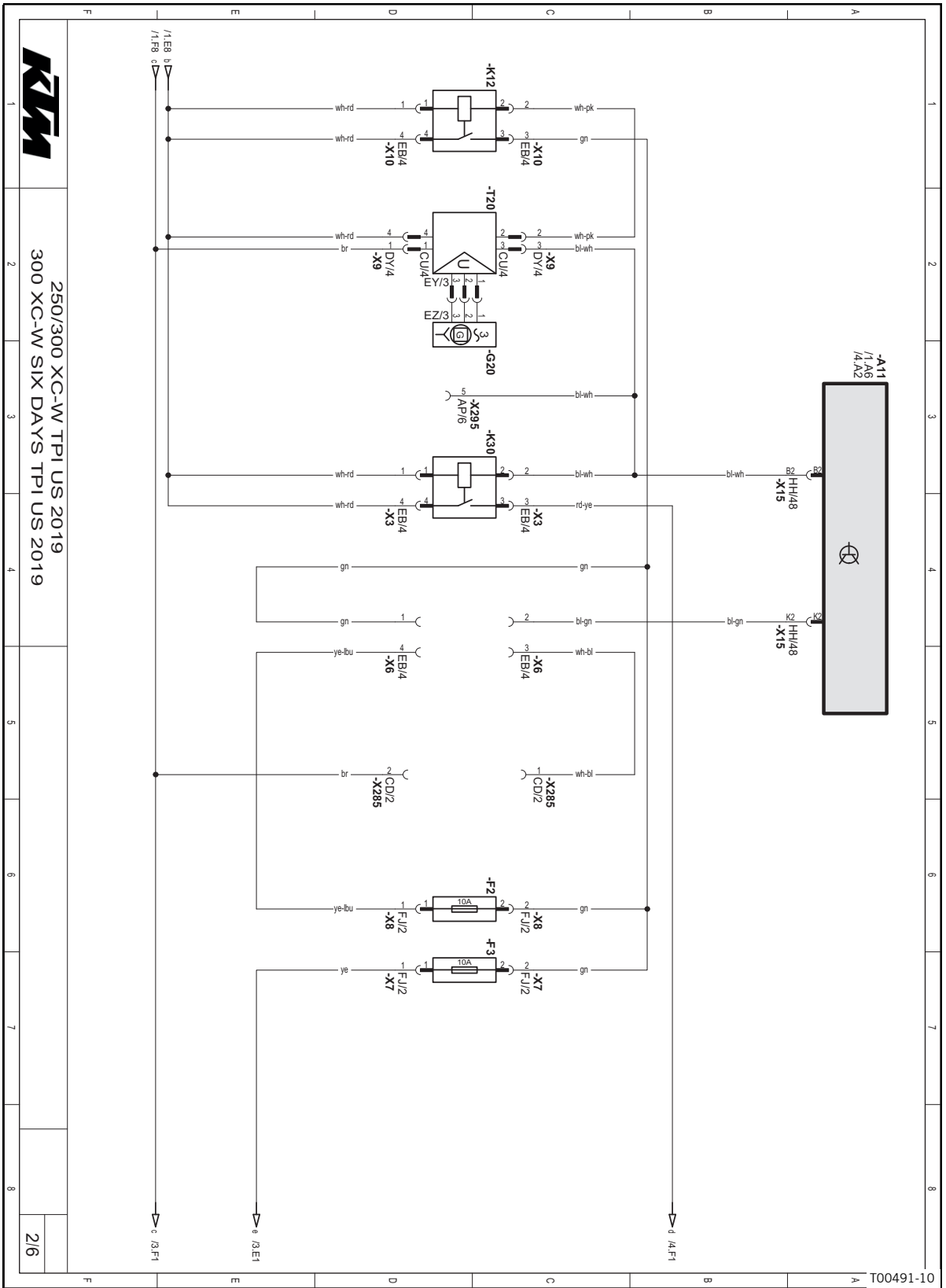
**Cable colors:**

|     |            |
|-----|------------|
| 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     |



**Components:**

|     |                              |
|-----|------------------------------|
| A11 | EFI control unit             |
| G10 | Battery                      |
| K10 | Starter relay with main fuse |
| M10 | Electric starter system      |
| S21 | E-tip switch                 |
| S20 | Kill switch                  |



**Components:**

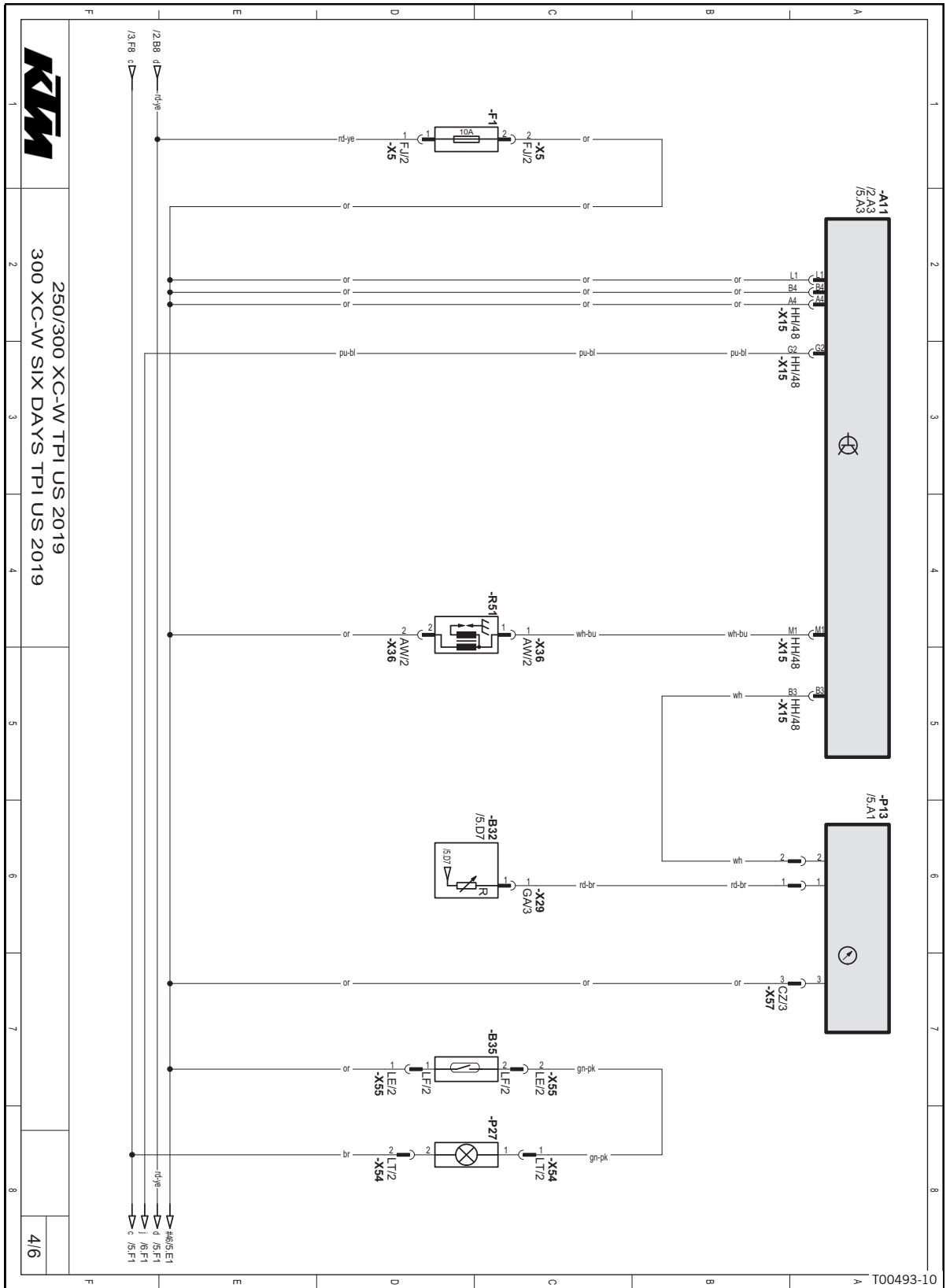
|      |                        |
|------|------------------------|
| A11  | EFI control unit       |
| F2   | Fuse                   |
| F3   | Fuse                   |
| G20  | Alternator             |
| K12  | Light relay            |
| K30  | Power relay            |
| T20  | Voltage regulator      |
| X285 | Radiator fan connector |
| X295 | Diagnostics connector  |



**Components:**

|     |                     |
|-----|---------------------|
| E13 | Low beam, high beam |
| P35 | Parking light       |
| P36 | Brake/tail light    |
| S30 | Light switch        |

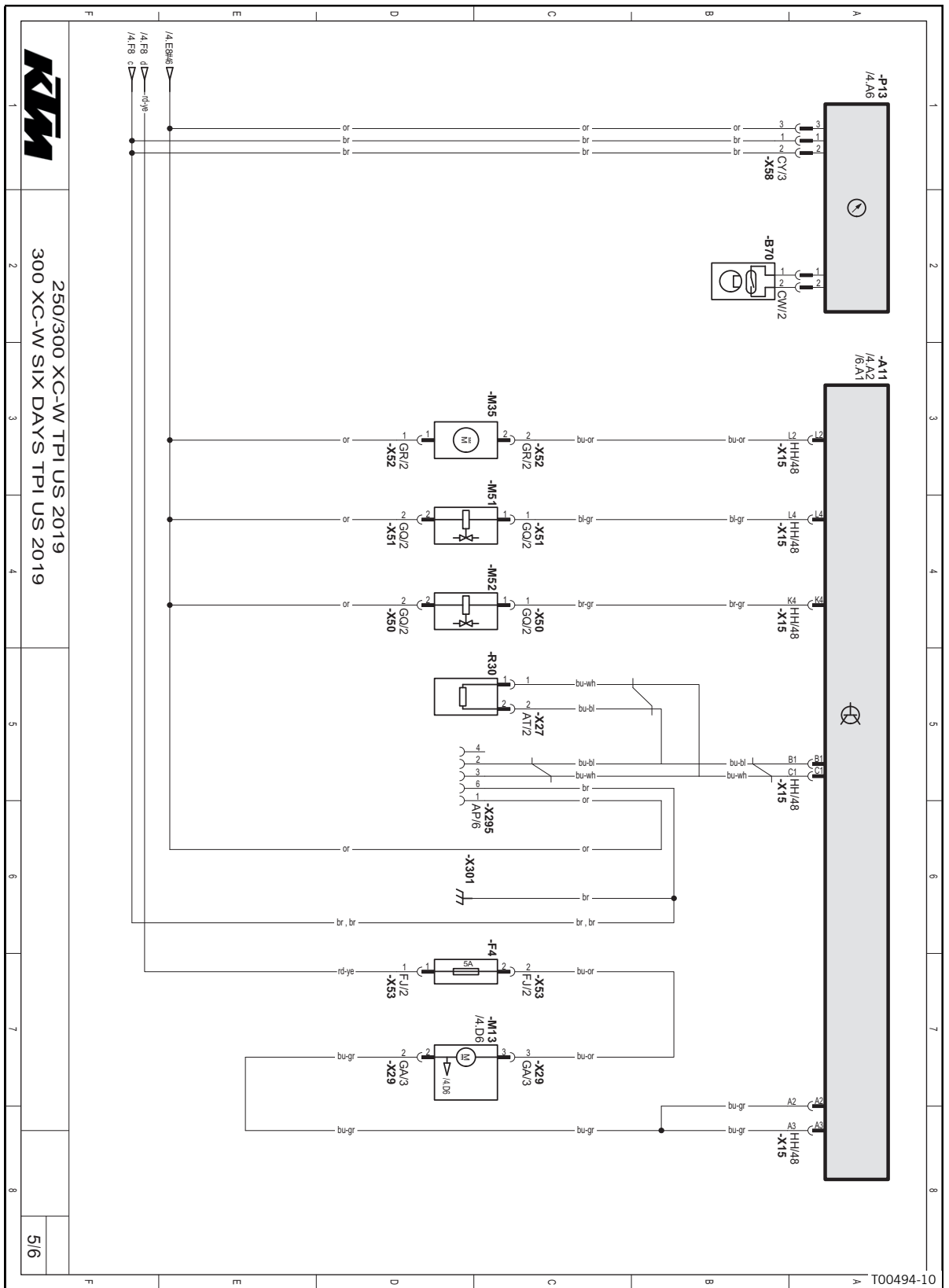
## 30.12 Page 4 of 6 (All XC-W models)





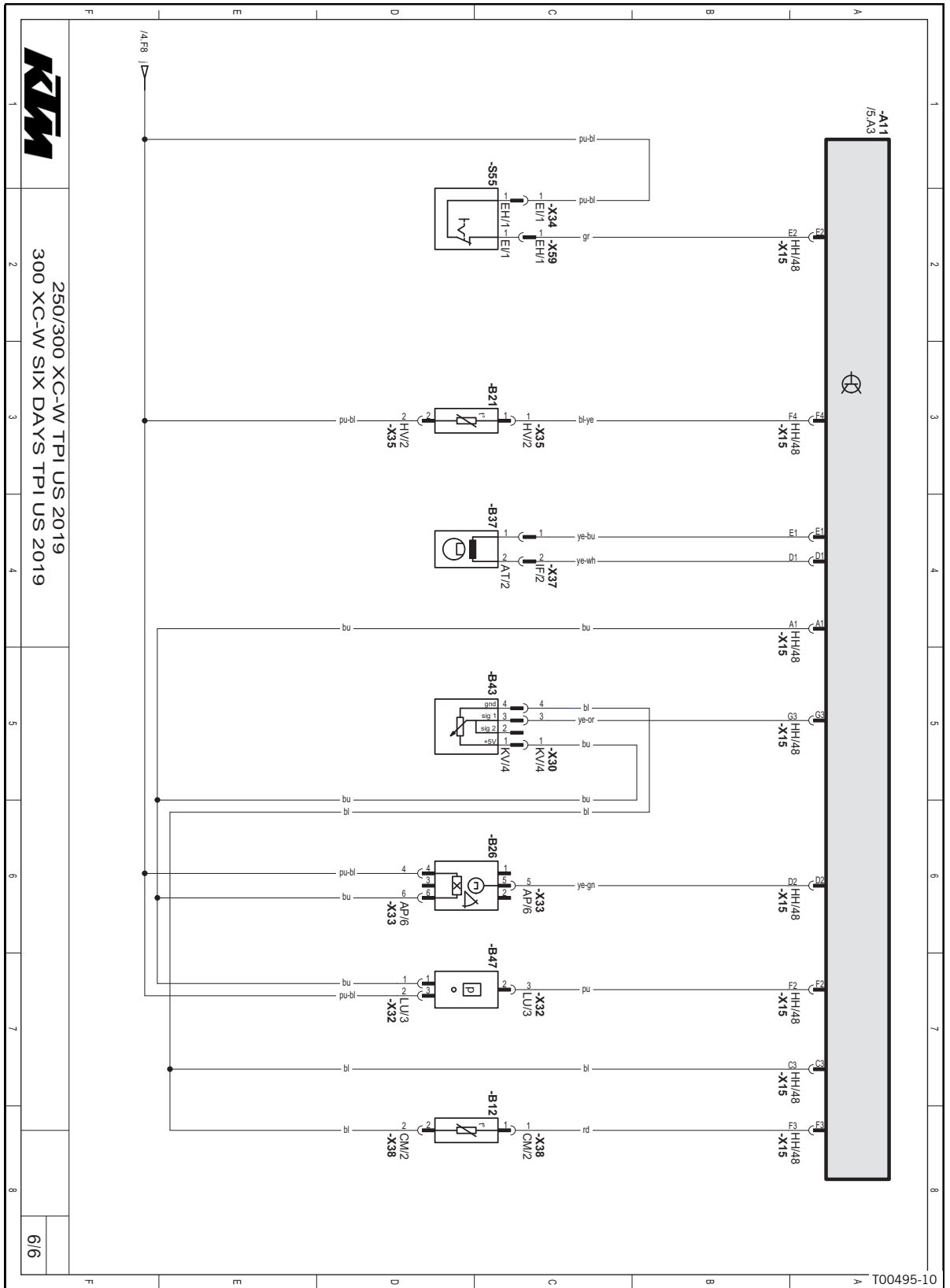
**Components:**

|     |                        |
|-----|------------------------|
| A11 | EFI control unit       |
| B32 | Fuel level sensor      |
| B35 | Oil level sensor       |
| F1  | Fuse                   |
| P13 | Speedometer            |
| P27 | Oil level warning lamp |
| R51 | Ignition coil          |



**Components:**

|      |                                |
|------|--------------------------------|
| A11  | EFI control unit               |
| B70  | Front wheel speed sensor       |
| F4   | Fuse                           |
| M13  | Fuel pump                      |
| M35  | Oil pump                       |
| M51  | Injection valve 0              |
| M52  | Injection valve 1              |
| P13  | Speedometer                    |
| R30  | CAN-bus terminating resistor 1 |
| X295 | Diagnostics connector          |



**Components:**

|     |                                     |
|-----|-------------------------------------|
| A11 | EFI control unit                    |
| B12 | Intake air temperature sensor       |
| B21 | Engine coolant temperature sensor   |
| B26 | Rollover sensor                     |
| B37 | Crankshaft speed sensor             |
| B43 | Throttle valve position sensor      |
| B47 | Crankcase pressure sensor           |
| S55 | <b>Map-Select</b> switch (optional) |

**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 (15W/50)

### Standard/classification

- JASO T903 MA2 (📖 p. 377)
- SAE (📖 p. 377) (15W/50)

### Guideline

- Use only engine oils that comply with the specified standards (see specifications on the container) and that possess the corresponding properties.

### Recommended supplier

#### Motorex®

- Top Speed 4T

## Engine oil, 2-stroke

### Standard/classification

- JASO FD (📖 p. 377)

### Guideline

- Only use high grade 2-stroke engine oil of a reputable brand.

|                 |
|-----------------|
| Fully synthetic |
|-----------------|

**Recommended supplier**

Motorex®

- Cross Power 2T

**Fork oil (SAE 4) (48601166S1)****Standard/classification**

- SAE (📖 p. 377) (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. 377) (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).

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### Air filter cleaner

Recommended supplier

Motorex®

- Racing Bio Dirt Remover

### 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 (T625)

Recommended supplier

Molykote®

- 33 Medium

### Lubricant (T159)

Recommended supplier

Bel-Ray®

- MC-11®



**Motorcycle cleaner**

Recommended supplier

Motorex®

- Moto Clean

**Multi-purpose grease (00062010051)**

Recommended supplier

Klüber Lubrication®

- CENTOPLEX 2 EP

**Off-road chain spray**

Recommended supplier

Motorex®

- Chainlube Offroad

**Oil for foam air filter**

Recommended supplier

Motorex®

- Racing Bio Liquid Power

**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

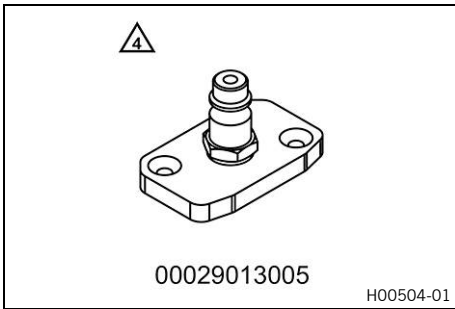
**Universal oil spray**

Recommended supplier

Motorex®

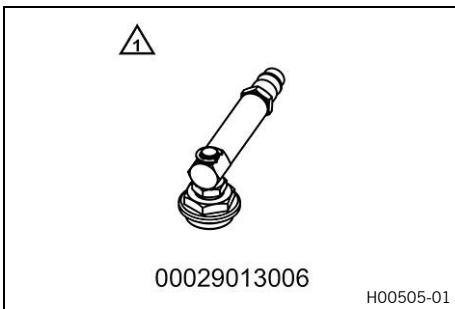
- Joker 440 Synthetic

## Bleeder cover



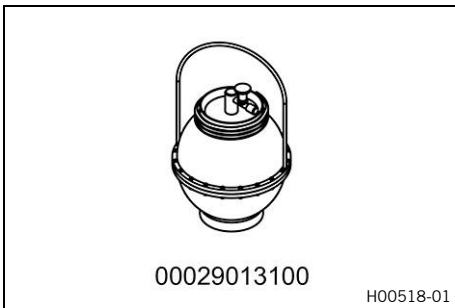
Art. no.: 00029013005

## Bleeder cover



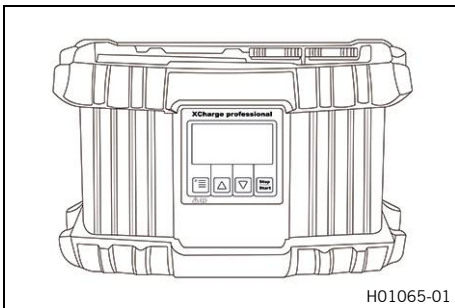
Art. no.: 00029013006

## Bleeding device



Art. no.: 00029013100

## EU battery charger XCharge-professional

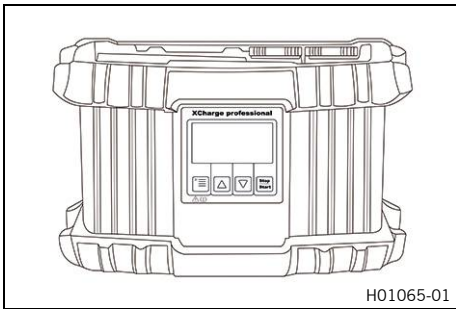


Art. no.: 00029095050

### 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**

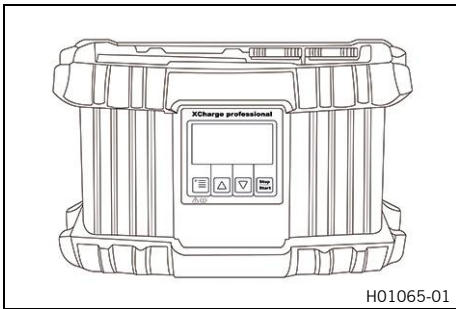


Art. no.: 00029095051

**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**

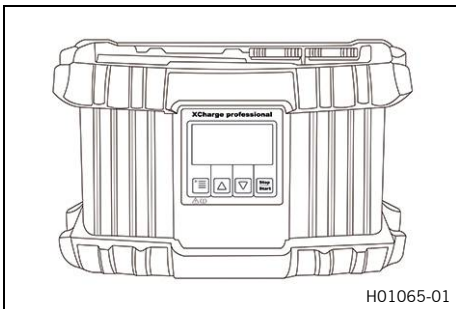


Art. no.: 00029095052

**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**

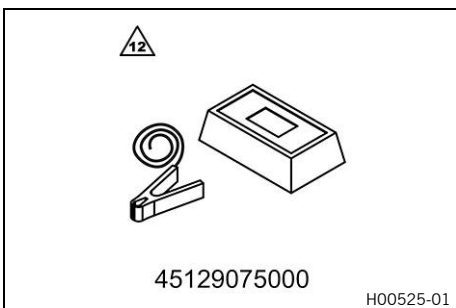


Art. no.: 00029095053

**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) |

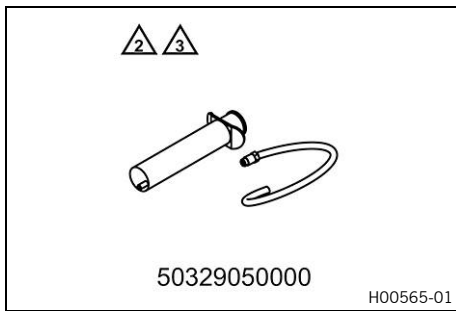
**Tachometer**



Art. no.: 45129075000

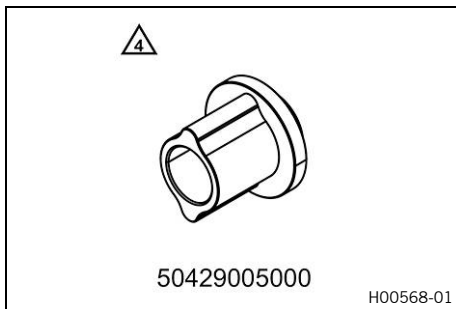
## Syringe

Art. no.: 50329050000



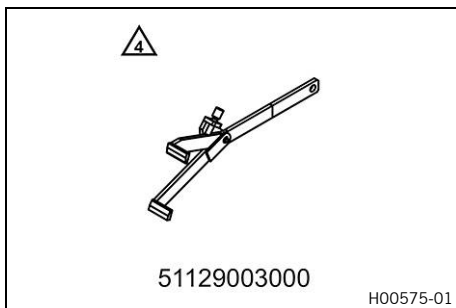
## Pressing tool

Art. no.: 50429005000



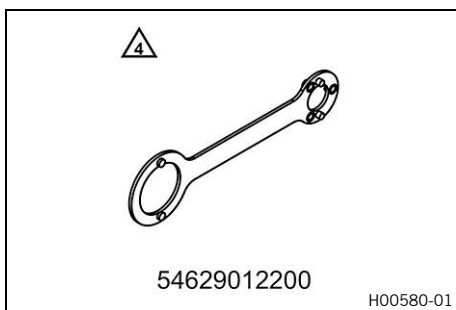
## Holding wrench

Art. no.: 51129003000

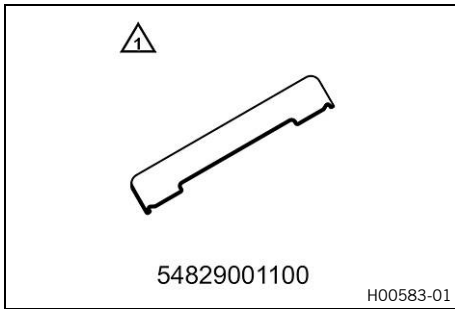


## Holding wrench

Art. no.: 54629012200

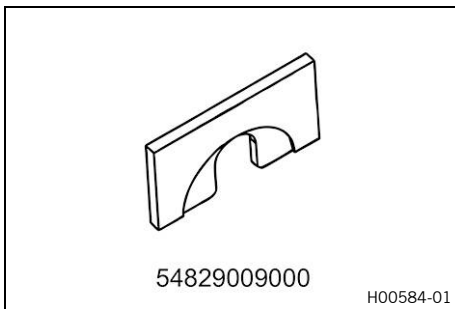


**Setting gauge**



Art. no.: 54829001100

**Separator plate**



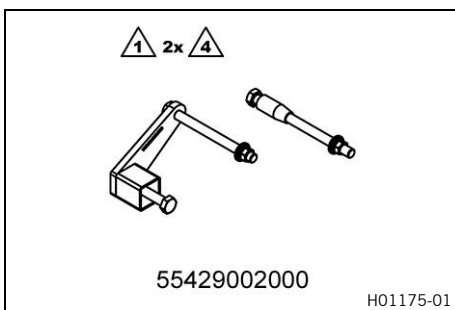
Art. no.: 54829009000

**Crankshaft pressing tool insert**



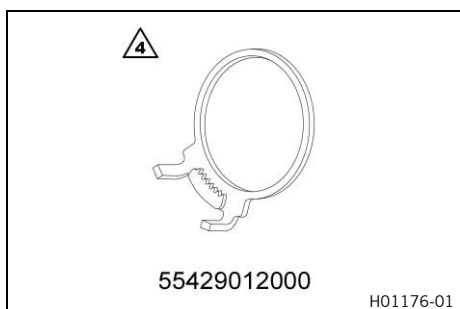
Art. no.: 54829108000

**Holder and fitting for work stand**



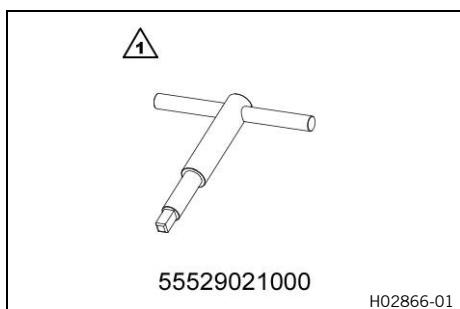
Art. no.: 55429002000

## Holding wrench



Art. no.: 55429012000

## Socket wrench

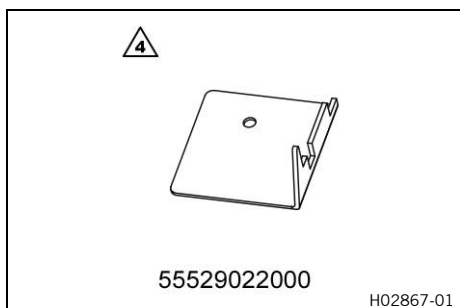


Art. no.: 55529021000

### Feature

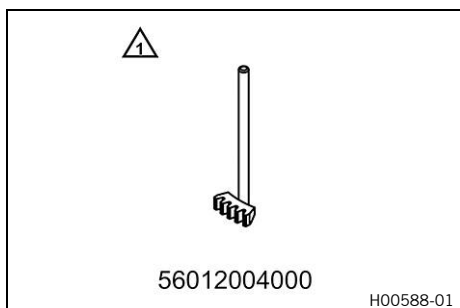
|        |               |
|--------|---------------|
| Square | 5 mm (0.2 in) |
|--------|---------------|

## Adjusting gauge



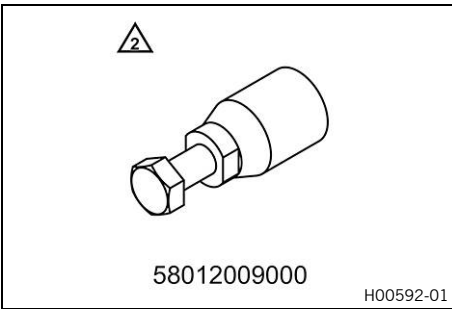
Art. no.: 55529022000

## Gear segment



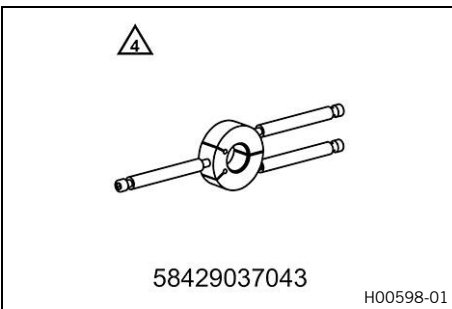
Art. no.: 56012004000

**Puller**



Art. no.: 58012009000

**Puller**

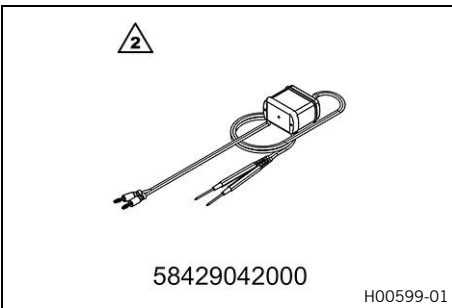


Art. no.: 58429037043

**Feature**

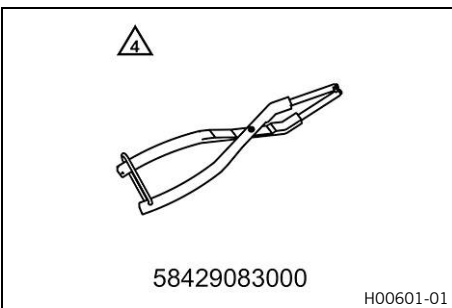
|                 |                    |
|-----------------|--------------------|
| Inside diameter | 43.9 mm (1.728 in) |
|-----------------|--------------------|

**Peak voltage adapter**



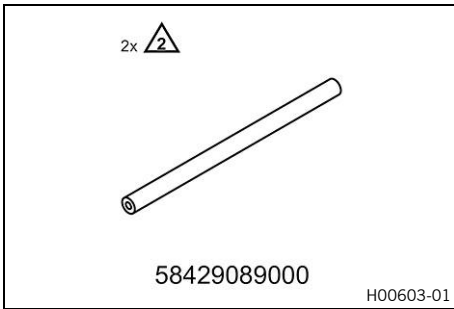
Art. no.: 58429042000

**Footrest spring plier**



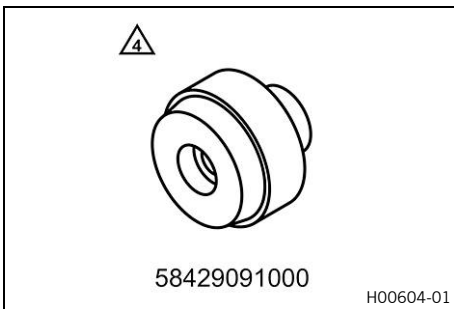
Art. no.: 58429083000

## Tool bracket



Art. no.: 58429089000

## Pressing tool



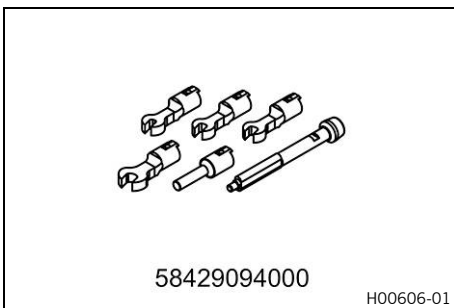
Art. no.: 58429091000

## Pressing tool



Art. no.: 58429092000

## Torque wrench kit



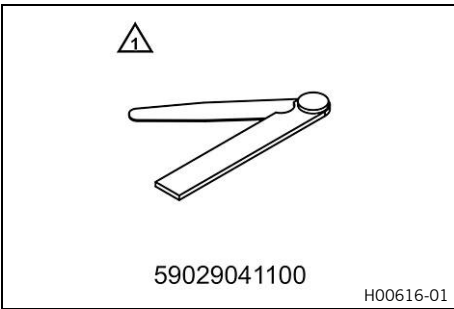
Art. no.: 58429094000

### Feature

|                |                                   |
|----------------|-----------------------------------|
| Torque         | 3 ... 15 Nm (2.2 ... 11.1 lbf ft) |
| Open ended bit | 3.9 mm (0.154 in)                 |
| Open ended bit | 4.9 mm (0.193 in)                 |
| Open ended bit | 5.5 mm (0.217 in)                 |
| Open ended bit | 6.8 mm (0.268 in)                 |
| Bit diameter   | 5.9 mm (0.232 in)                 |



**Feeler gauge**

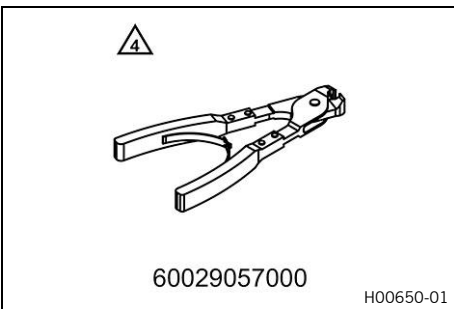


Art. no.: 59029041100

**Feature**

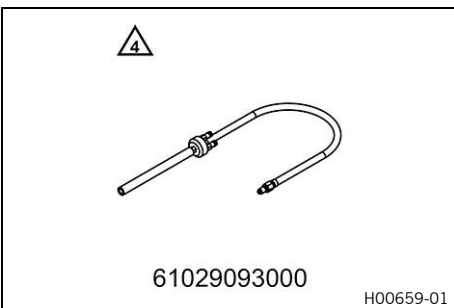
|         |  |
|---------|--|
| 5 piece | 0.10 ... 0.25 mm (0.0039 ...<br>0.0098 in) |
|---------|--|

**Hose clamp plier**



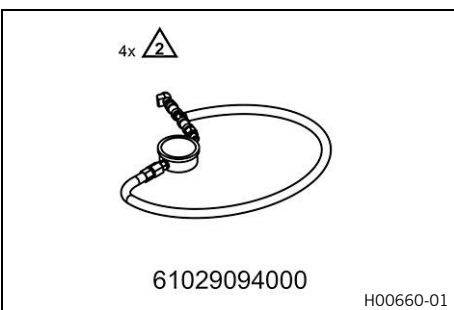
Art. no.: 60029057000

**Testing hose**



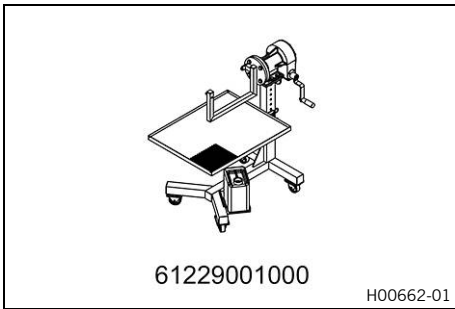
Art. no.: 61029093000

**Pressure testing tool**



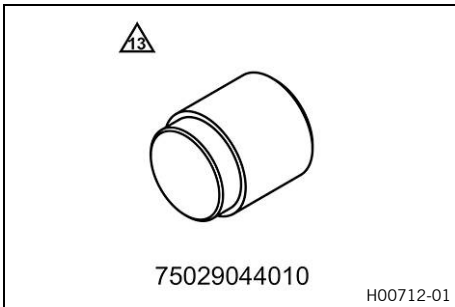
Art. no.: 61029094000

## Engine work stand



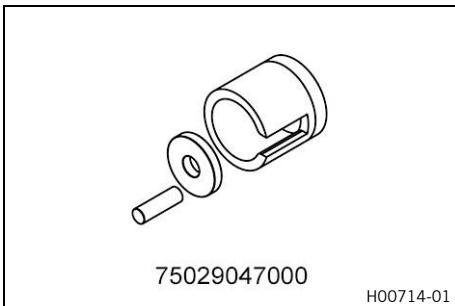
Art. no.: 61229001000

## Pressing tool



Art. no.: 75029044010

## Crankshaft pressing tool



Art. no.: 75029047000

## Lift stand

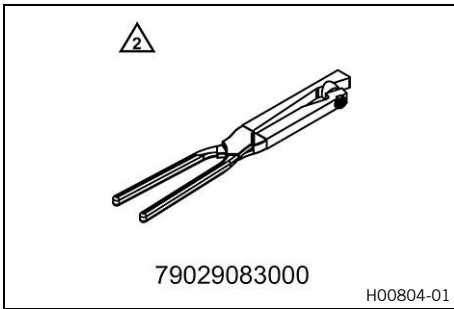


Art. no.: 78129955100

### Feature

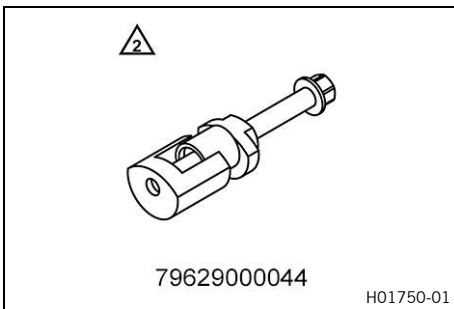
|        |                                    |
|--------|------------------------------------|
| Height | 315 ... 425 mm (12.4 ... 16.73 in) |
| Load   | ≤ 150 kg (≤ 331 lb.)               |

**Footrest spring plier**



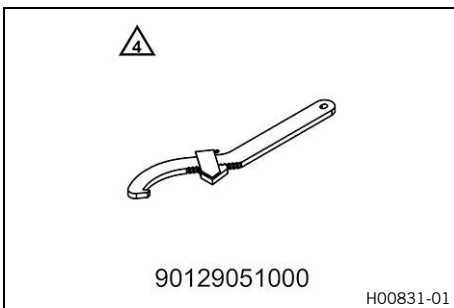
Art. no.: 79029083000

**Pressing tool**



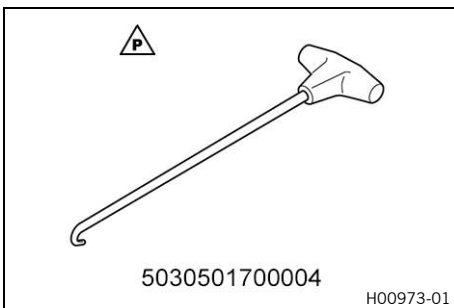
Art. no.: 79629000044

**Holding wrench**



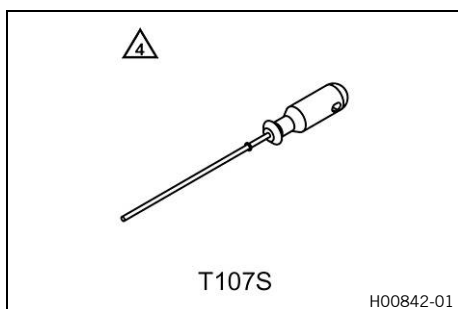
Art. no.: 90129051000

**Spring hook**



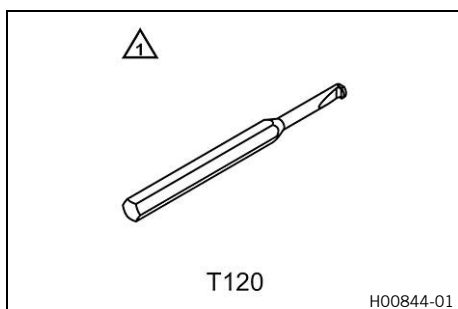
Art. no.: 5030501700004

## Depth micrometer



Art. no.: T107S

## Drift

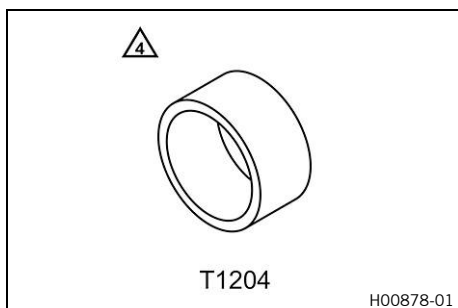


Art. no.: T120

### Feature

|          |                |
|----------|----------------|
| Diameter | 8 mm (0.31 in) |
|----------|----------------|

## Mounting sleeve

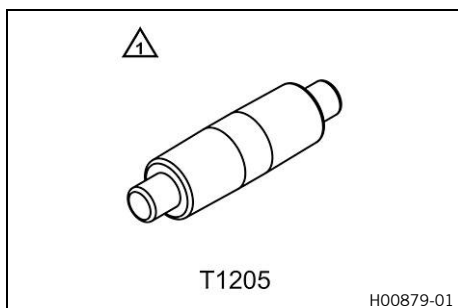


Art. no.: T1204

### Feature

|          |                                       |
|----------|---------------------------------------|
| Diameter | 25.5 ... 30.5 mm (1.004 ... 1.201 in) |
|----------|---------------------------------------|

## Calibrating unit

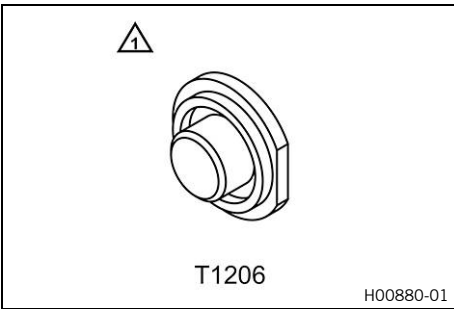


Art. no.: T1205

### Feature

|          |                 |
|----------|-----------------|
| Diameter | 18 mm (0.71 in) |
|----------|-----------------|

**Pressing tool**

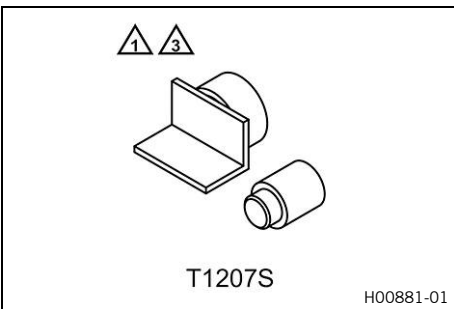


Art. no.: T1206

**Feature**

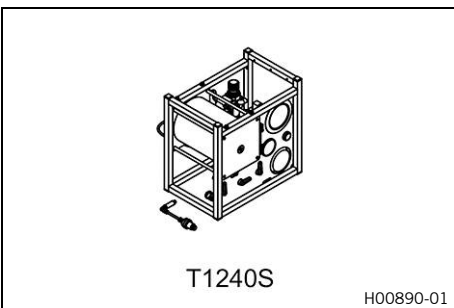
|          |                                 |
|----------|---------------------------------|
| Diameter | 15 ... 30 mm (0.59 ... 1.18 in) |
|----------|---------------------------------|

**Pressing tool**



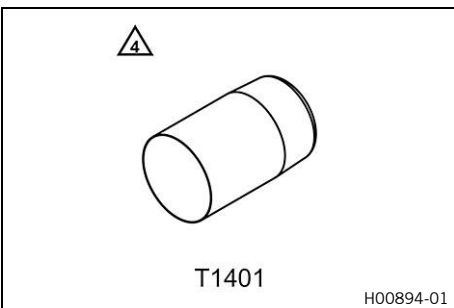
Art. no.: T1207S

**Vacuum pump**



Art. no.: T1240S

**Protecting sleeve**

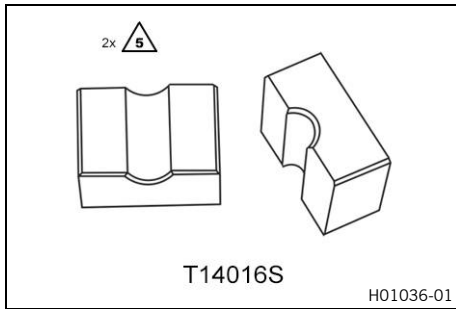


Art. no.: T1401

**Feature**

|          |                 |
|----------|-----------------|
| Diameter | 48 mm (1.89 in) |
|----------|-----------------|

## Clamping stand

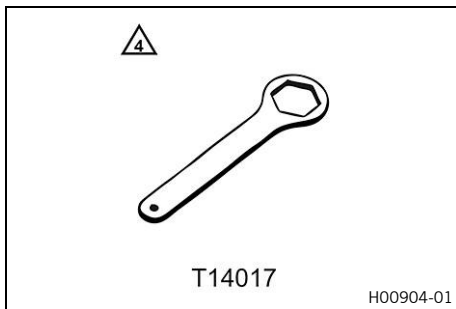


Art. no.: T14016S

### Feature

|          |                 |
|----------|-----------------|
| Diameter | 12 mm (0.47 in) |
|----------|-----------------|

## Ring wrench

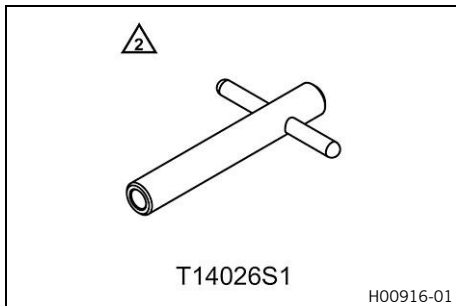


Art. no.: T14017

### Feature

|                |                 |
|----------------|-----------------|
| Hexagonal part | 50 mm (1.97 in) |
|----------------|-----------------|

## Support tool

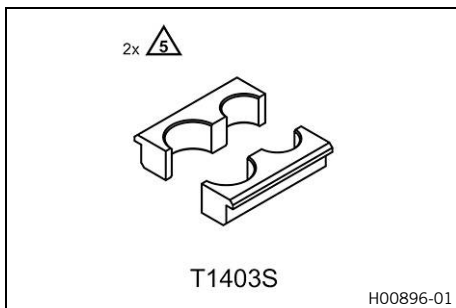


Art. no.: T14026S1

### Feature

|          |                 |
|----------|-----------------|
| M12      |                 |
| Diameter | 17 mm (0.67 in) |

## Clamping stand

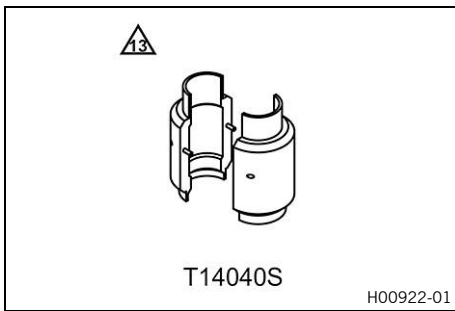


Art. no.: T1403S

### Feature

|          |                 |
|----------|-----------------|
| Diameter | 48 mm (1.89 in) |
| Diameter | 60 mm (2.36 in) |

**Mounting tool**

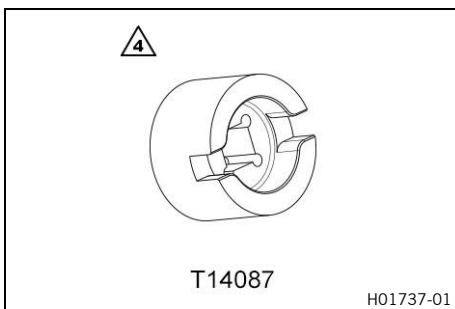


Art. no.: T14040S

**Feature**

|          |                 |
|----------|-----------------|
| Diameter | 48 mm (1.89 in) |
|----------|-----------------|

**Special socket**

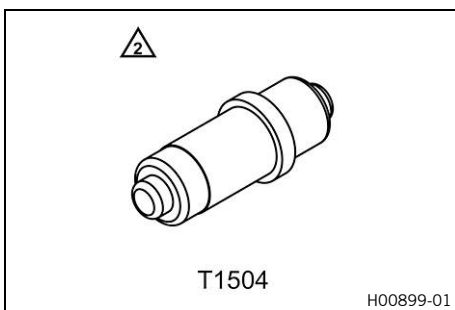


Art. no.: T14087

**Feature**

|                   |                    |
|-------------------|--------------------|
| Drive             | 1/2 in             |
| External diameter | 44 mm (1.73 in)    |
| Internal diameter | 29.5 mm (1.161 in) |

**Pressing tool**

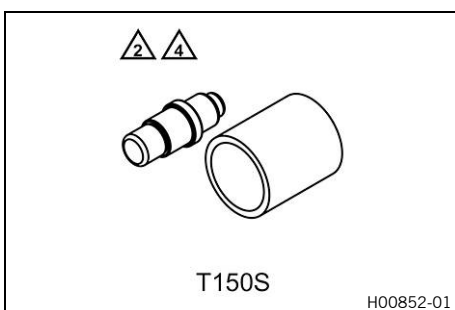


Art. no.: T1504

**Feature**

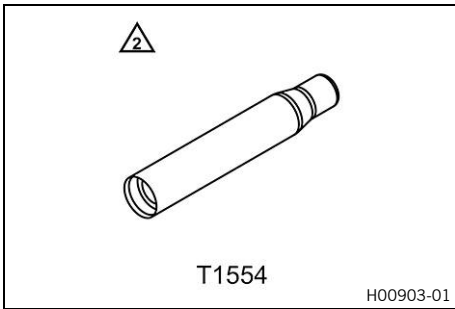
|          |                 |
|----------|-----------------|
| Diameter | 18 mm (0.71 in) |
|----------|-----------------|

**Mounting tool**



Art. no.: T150S

## Mounting sleeve

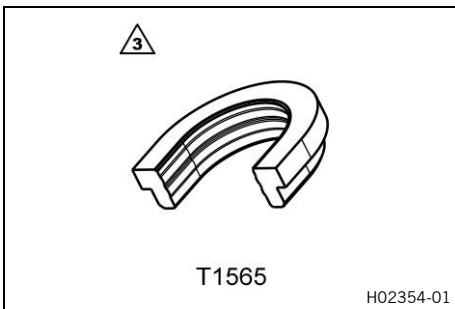


Art. no.: T1554

### Feature

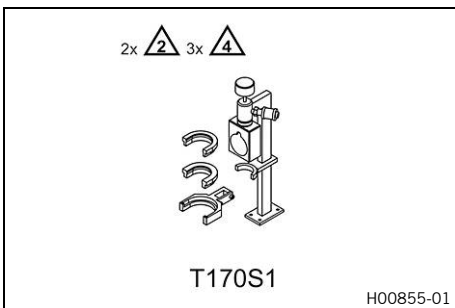
|          |                 |
|----------|-----------------|
| Diameter | 18 mm (0.71 in) |
|----------|-----------------|

## 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.

### JASO FD

JASO FD is a classification for a 2-stroke engine oil that was specifically developed for the extreme demands of racing. Thanks to first rate synthetic esters and specially designed additives, superb combustion is achieved even under extreme operating conditions.

|     |   |   |
|-----|---|---|
| TPI | Injection into transfer ducts (Transfer Port Injection) | Electronic fuel injection in which two injection valves in the transfer ducts of the cylinders are used |
| PA  | Preload adjuster  | Device on the spring elements which enables adjustment of the spring preload                            |

|          |                |
|----------|----------------|
| Art. no. | Article number |
| ca.      | circa          |
| cf.      | compare        |
| e.g.     | for example    |
| etc.     | et cetera      |
| i.a.     | inter alia     |
| no.      | number         |
| poss.    | possibly       |

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