



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 EXC TPI ERZBERGRODEO
300 XC-W TPI ERZBERGRODEO

ITEM NO. 3206472EN

Read this repair manual carefully and thoroughly before beginning work.

The vehicle will only be able to meet the demands placed on it in the long run 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 (F7303V7)
250 EXC SIX DAYS TPI EU (F7303V2)
250 XC-W TPI US (F7375V4)
300 EXC TPI EU (F7403V7)
300 EXC SIX DAYS TPI EU (F7403V2)
300 EXC SIX DAYS TPI CN (F7487V2)
300 EXC SIX DAYS TPI ASEAN (F7488V2)
300 XC-W TPI US (F7475V3)
300 EXC TPI ERZBERGRODEO EU (F7403V3)
300 XC-W TPI ERZBERGRODEO US (F7475V6)



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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.

Proprietary name	Indicates a proprietary name.
Name®	Indicates a protected name.
Brand™	Indicates a brand available on the open market.
<u>Underlined terms</u>	Refer to technical details of the vehicle or indicate technical terms, which are explained in the glossary.

2.1 Repair Manual

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

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

2.2 Safety advice

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



Info

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

2.3 Degrees of risk and symbols



Danger

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



Warning

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



Caution

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

Note

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



Note

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

2.4 Work rules

Unless specified otherwise, the ignition must be turned off during all work (models with ignition lock, models with remote key) or the engine must be at a standstill (models without ignition lock or remote key).

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, expansion screws, seals, sealing rings, O-rings, pins, and lock washers).

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

If thread locker (e.g., **Precote®**) has already been applied to a new part, do not apply any additional thread locker. 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 warranty, implied warranty

The work prescribed in the service schedule must only be carried out in an authorized KTM workshop and confirmed in the **KTM Dealer.net**, as otherwise all warranty claims will be void. Damage or secondary damage caused by tampering with and/or conversions on the vehicle are not covered by the manufacturer warranty.

3.2 Fuel, auxiliary substances



Note

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

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

Use fuels and auxiliary substances in accordance with the Owner's Manual and specification.

3.3 Spare parts, technical 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 latest news **KTM PowerParts** on your vehicle can be found on the KTM website.
International KTM Website: KTM.COM

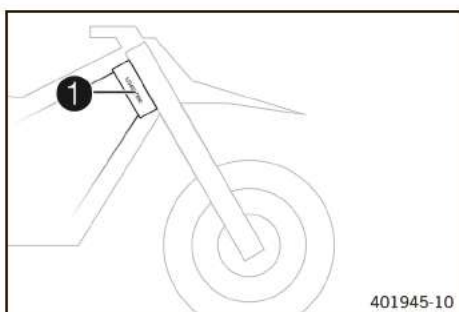
3.4 Figures

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.

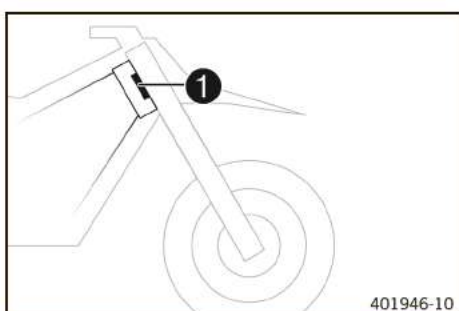
4 SERIAL NUMBERS

4.1 Vehicle identification number



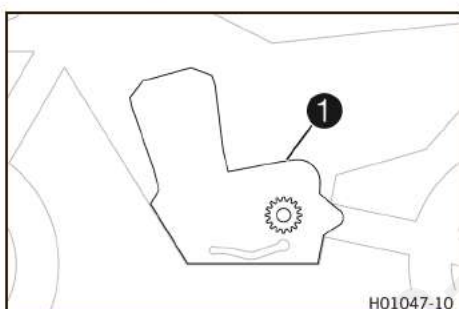
The vehicle identification number ❶ is stamped on the right side of the steering head.

4.2 Type label



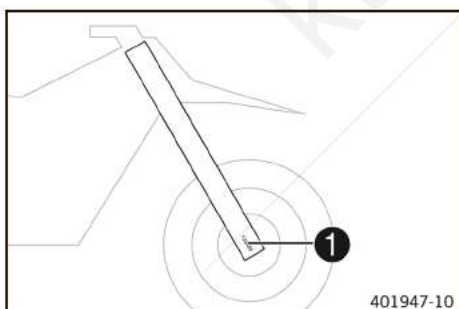
Type label ❶ is fixed to the front of the steering head.

4.3 Engine number



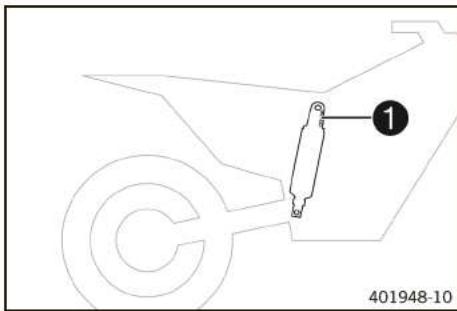
The engine number ❶ is located on the left side of the engine over the engine sprocket.

4.4 Fork part number



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

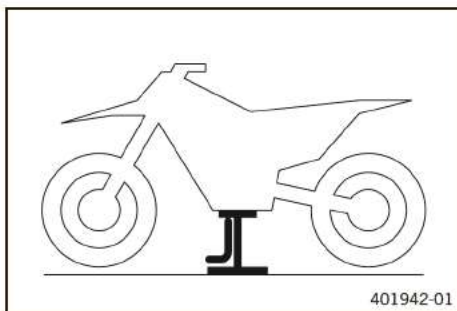
4.5 Shock absorber article number



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

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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. 382)

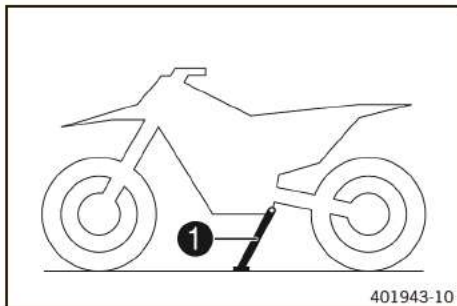
- ✓ Neither wheel is in contact with the ground.
- Secure the motorcycle against falling over.

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 strap.

5.3 Starting the vehicle



Danger

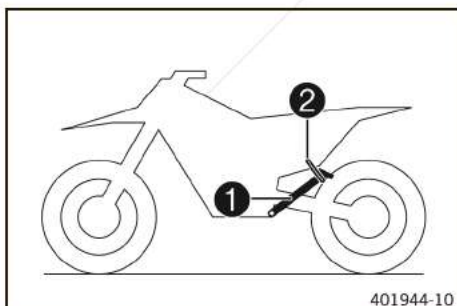
Danger of poisoning Exhaust gases are toxic and inhaling them may result in unconsciousness and death.

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

Note

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

- Always run the engine warm at a low speed.



- Take the motorcycle off side stand ① and secure the side stand with rubber strap ②.
- Shift the transmission to neutral position.

Condition

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

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



Info

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

- Press the start button.



Info

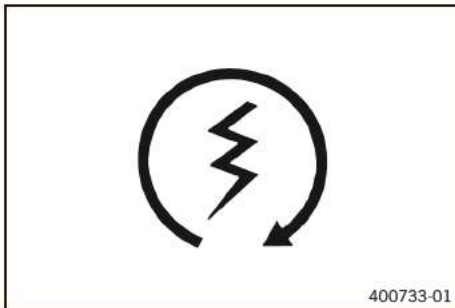
Do not open the throttle.

Press the start 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 effective exhaust extraction when starting or running the engine in an enclosed space.

- Shift the transmission to neutral position.
- Press the start button.



Info

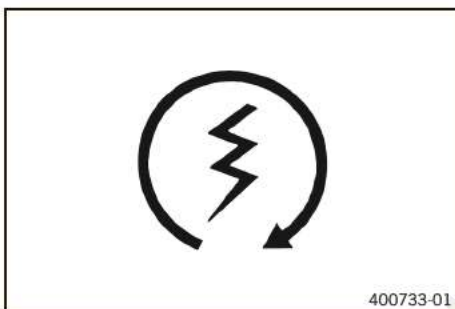
Press the start button for a maximum of 5 seconds.

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.

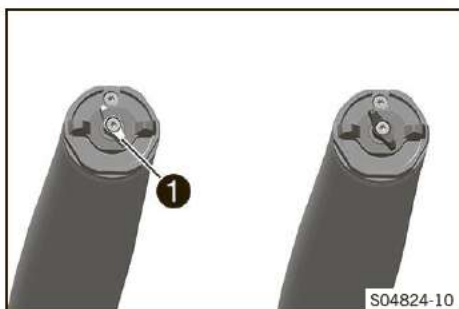
Do not open the throttle.



6.1 Adjusting the compression damping of the fork

i Info

The hydraulic compression damping determines the fork suspension behavior.



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

i Info

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

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

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

Guideline

Compression damping	
Comfort	18 clicks
Standard	15 clicks
Sport	12 clicks

i Info

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

6.2 Adjusting the rebound damping of the fork

i Info

The hydraulic rebound damping determines the fork suspension behavior.



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

i Info

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

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

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

Guideline

Rebound damping	
Comfort	18 clicks
Standard	15 clicks
Sport	12 clicks

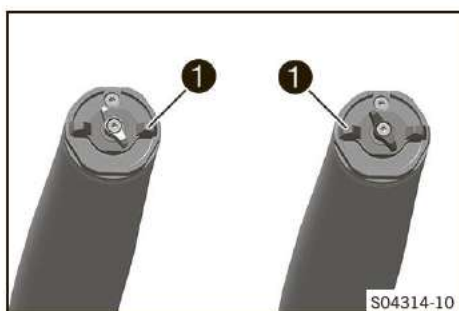


Info

Turn clockwise to increase the damping; turn counterclockwise to reduce damping when the shock absorber rebounds.



6.3 Adjusting the spring preload of the fork



Preparatory work

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

Main work

- Turn T-grips ① counterclockwise all the way.
- ✓ Marking **+0** aligns with the right T-grip 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 T-grip clockwise.

Guideline

Spring preload – preload adjuster	
Comfort	+0
Standard	+0
Sport	+3

- ✓ The T-grip engages 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

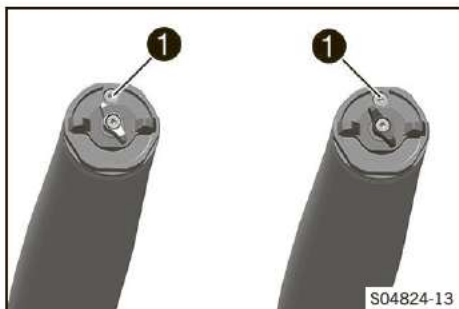
- Remove the motorcycle from the lift stand. (📖 p. 12)



6.4 Bleeding the fork legs

Preparatory work

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



Main work

- Release bleeder screws **1**.
- ✓ 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. 18)

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. 373)

- 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)

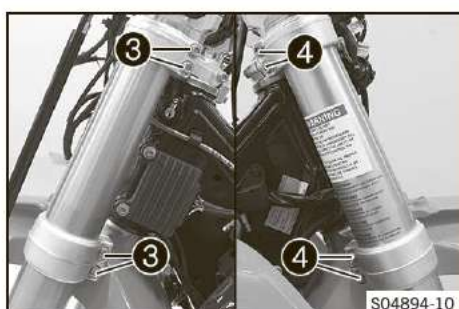
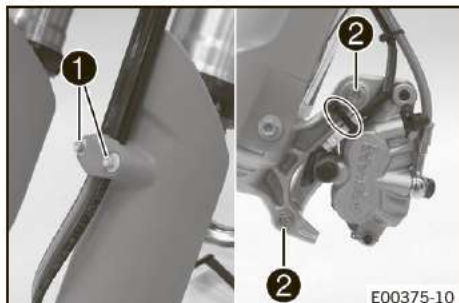
6.6 Removing the fork legs

Preparatory work

- Raise the motorcycle with a lift stand. (p. 12)
- Remove the front wheel. (p. 122)
- Remove the headlight mask with the headlight. (p. 116)

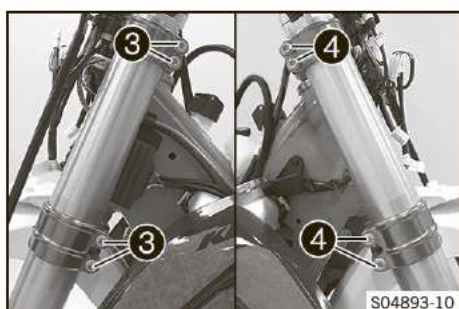
Main work

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



(All standard models)

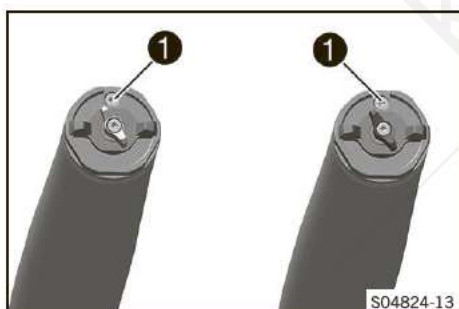
- Loosen screws ③. Remove the left fork leg.
- Loosen screws ④. Remove the right fork leg.



(All special 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 adjuster). The compression damping is located in left fork leg **COMP** (white adjuster). 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 upper edge of the upper triple clamp.

6 FORK, TRIPLE CLAMP



(All standard models)

- Tighten screws ②.

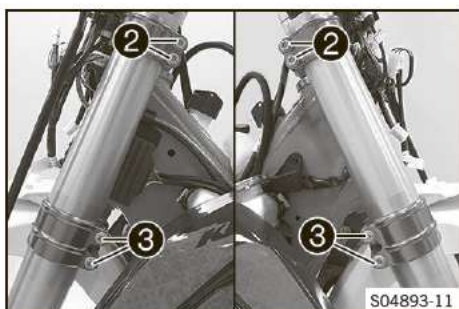
Guideline

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

- Tighten screws ③.

Guideline

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



(All special models)

- Tighten screws ②.

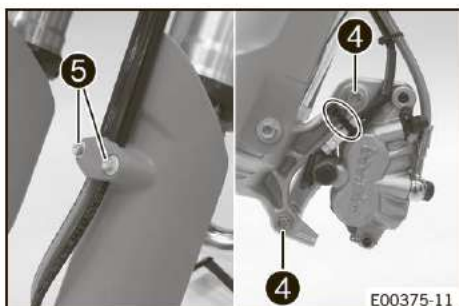
Guideline

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

- Tighten screws ③.

Guideline

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



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

Guideline

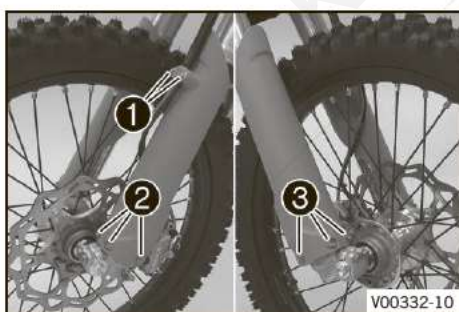
Screw, front brake caliper	M8	25 Nm (18.4 lbf ft) Loctite®243™
----------------------------	----	--

- Mount the cable ties.
- Position the brake line, the wiring harness, and the clamp. Mount and tighten screws ⑤.

Finishing work

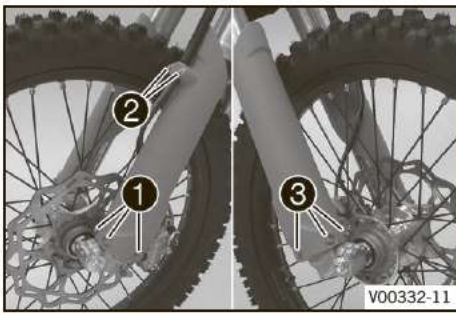
- Install the front wheel. (📖 p. 123)
- Install the headlight mask with the headlight. (📖 p. 116)
- Check the headlight setting. (📖 p. 166)

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

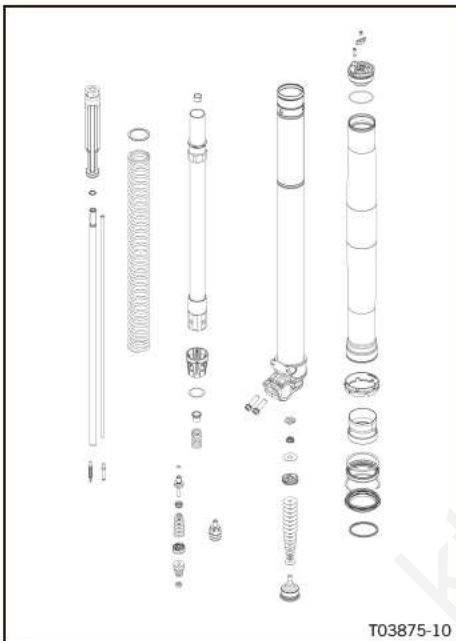
Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
---------------------------	----	--------------------

- 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 Servicing the fork



Condition

The fork legs have been removed.

- Disassemble the fork legs. (p. 19)
- Disassemble the cartridge. (p. 22)
- Disassemble the tap compression. (p. 25)
- Check the fork legs. (p. 26)
- Assemble the tap compression. (p. 28)
- Assemble the cartridge. (p. 28)
- Assemble the fork legs. (p. 32)

6.11 Disassembling the fork legs



Info

The operations are the same on both fork legs.

Condition

The fork legs have been removed.

6 FORK, TRIPLE CLAMP



- 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. 390)

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



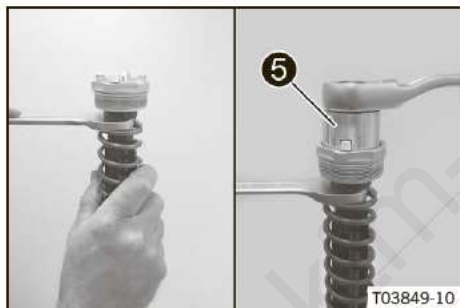
- Loosen screw cap **4**.

Ring wrench (T14017) (p. 390)



Info

The screw cap cannot be removed yet.

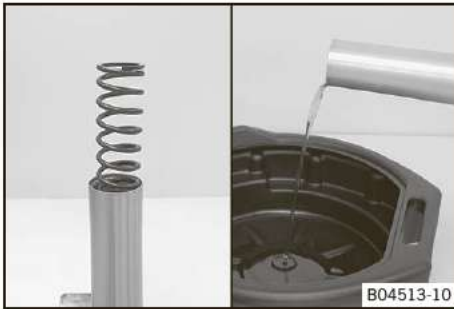


- Unclamp the fork leg and push the outside fork tube downward.
- Pull the spring downward and push the open end wrench onto the hexagonal part.
- Hold the hexagonal part and loosen the Preload Adjuster with special tool **5**, but do not take it off yet.

Special socket (T14087) (p. 391)



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

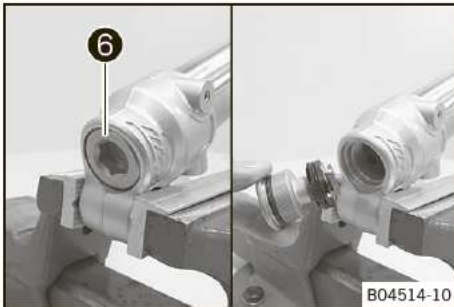


- Remove the spring.
- Drain the fork oil.



Info

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



- Clamp the fork leg with the axle clamp.

Guideline

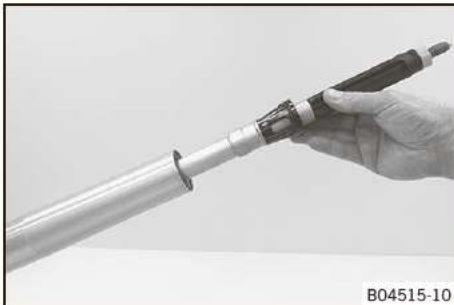
Use soft jaws.

- Unscrew and remove compression holder 6.

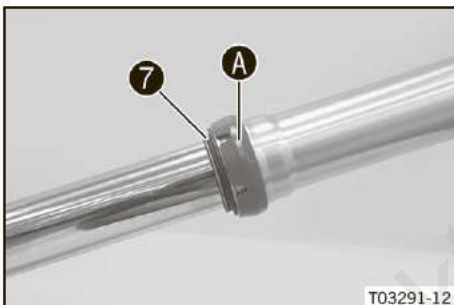


Info

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



- Remove the cartridge.



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



Info

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



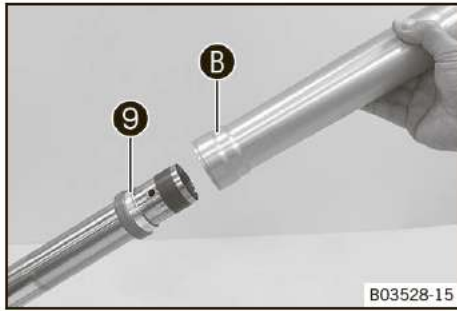
- Remove lock ring 8.



Info

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

6 FORK, TRIPLE CLAMP



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

Guideline

50 °C (122 °F)

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



Info

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



- Remove upper sliding bushing **10**.



Info

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

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

6.12 Disassembling the cartridge

Preparatory work

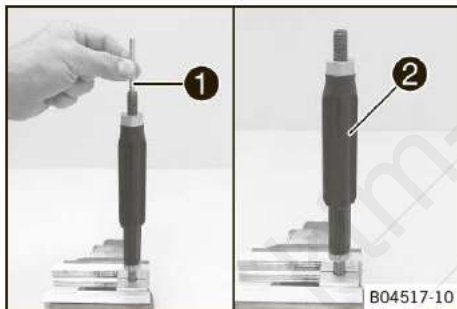
- Disassemble the fork legs. (p. 19)

Right cartridge

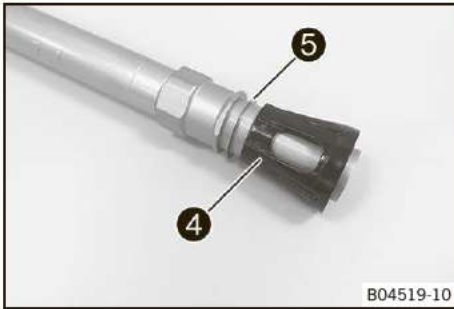
- Clamp the piston rod using the special tool.

Clamping stand (T14016S) (p. 390)

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



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

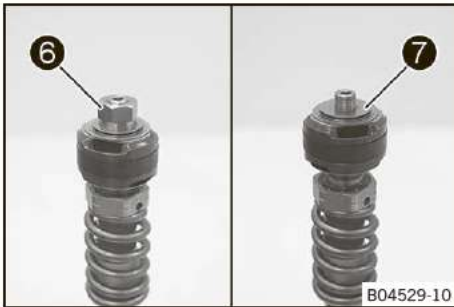


- Take spring seat **4** and washer **5** off the cartridge.



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

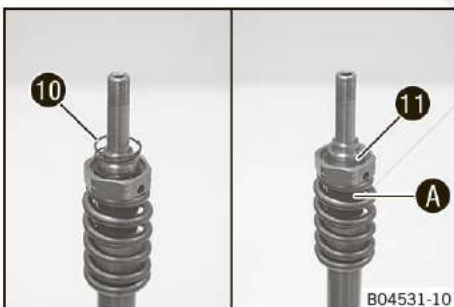
Clamping stand (T14016S) (p. 390)



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

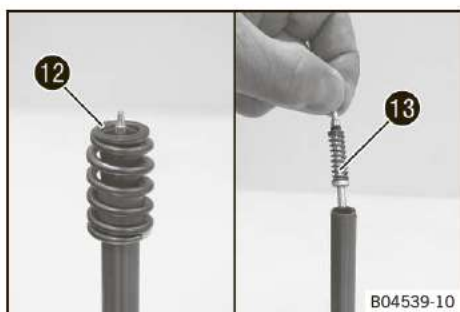


- Remove piston **8**.
- Completely remove shim stack **9**.

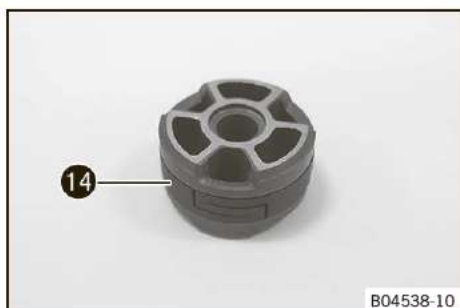


- Remove spring **10**.
 - Warm up the piston rod in area **A**.
- Guideline
- 50 °C (122 °F)
- Remove tap rebound **11**.

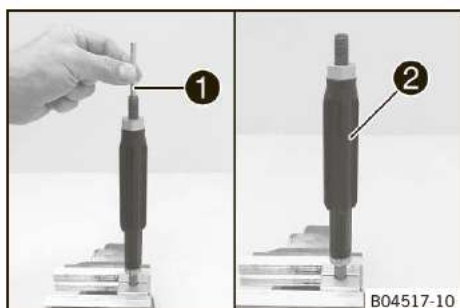
6 FORK, TRIPLE CLAMP



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



- Remove piston ring **14**.



Left cartridge

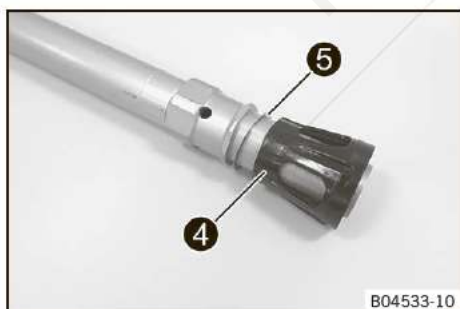
- Clamp the piston rod using the special tool.

Clamping stand (T14016S) (p. 390)

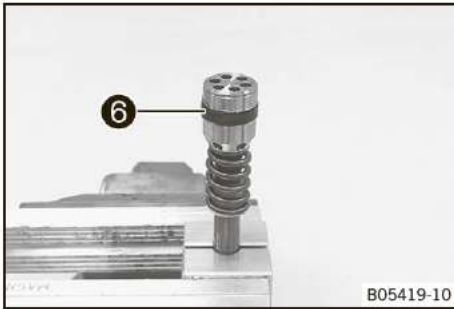
- Remove adjusting tube **1**.
- Remove fluid barrier **2** from the piston rod.



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



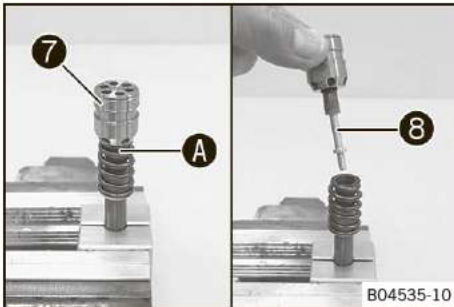
- Take spring seat **4** and washer **5** off the cartridge.



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

Clamping stand (T14016S) (p. 390)

- Remove piston ring 6.

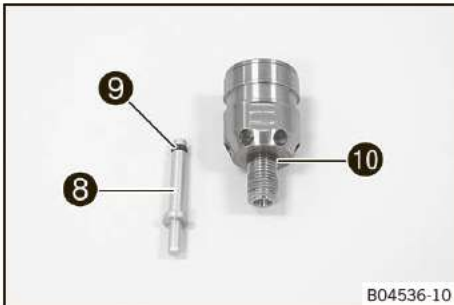


- Warm up the piston rod in area A.

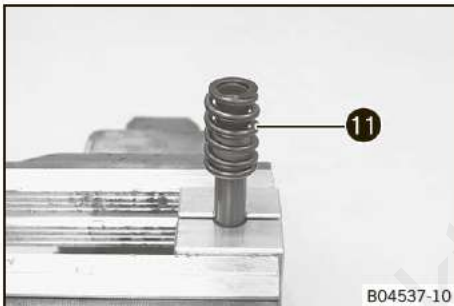
Guideline

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.

6.13 Disassembling the tap compression



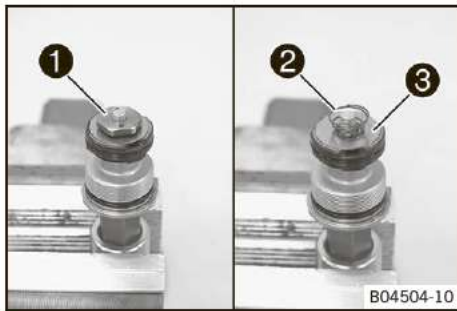
Info

The procedures are the same on both fork legs.

Preparatory work

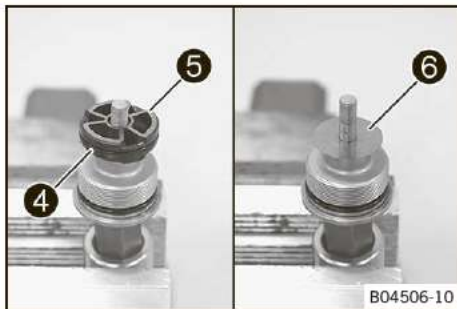
- Disassemble the fork legs. (p. 19)

6 FORK, TRIPLE CLAMP

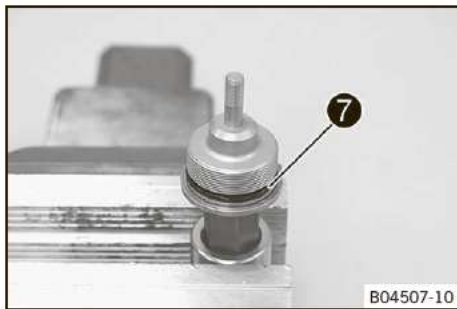


Main work

- 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.

6.14 Checking the fork legs

Condition

The fork legs have been disassembled.



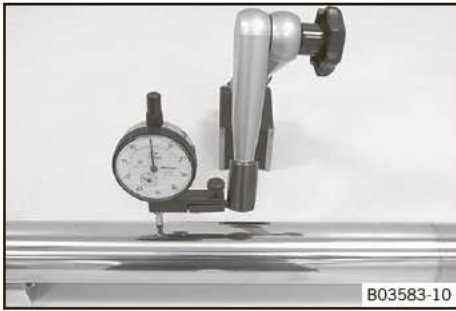
- Check the inside fork tube and the axle clamp for damage.
 - » If damage is found:
 - Change the inside fork tube.



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

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

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



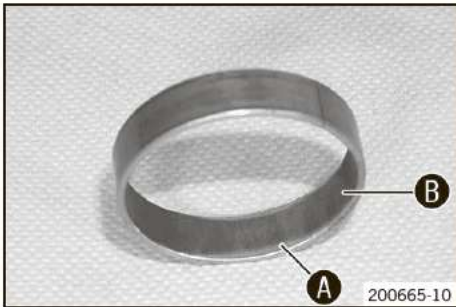
- Measure the run-out of the inside fork tube.

Run-out of the inside fork tube	$\leq 0.20 \text{ mm } (\leq 0.0079 \text{ in})$
---------------------------------	--

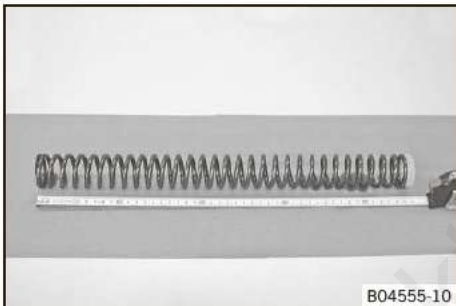
- » If the measured value is greater than the specified value:
 - Change the inside fork tube.



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



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



- 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.



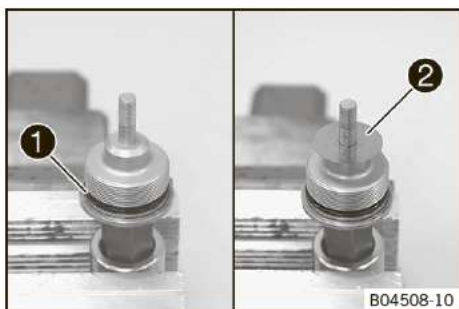
Info

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

6.15 Assembling the tap compression

i Info

The operations 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 the O-ring.

Lubricant (T158) (p. 372)

- Mount shim stack **2**.

i Info

Mount the smaller shims at the bottom.



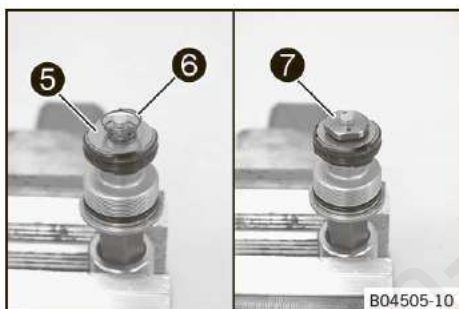
- Mount piston **3**.

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. 371)



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

Guideline

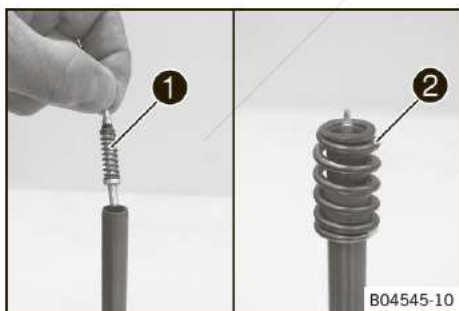
Nut, tap compression	M6x0.5	5 Nm (3.7 lbf ft)
----------------------	--------	-------------------

i Info

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

- Extract the tap compression.

6.16 Assembling the cartridge



Right cartridge

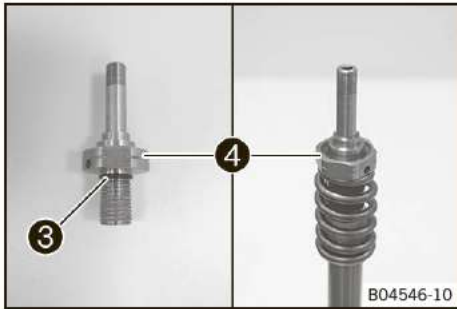
- Clamp in the piston rod.

Clamping stand (T14016S) (p. 390)

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

Lubricant (T158) (p. 372)

- Mount spring **2**.



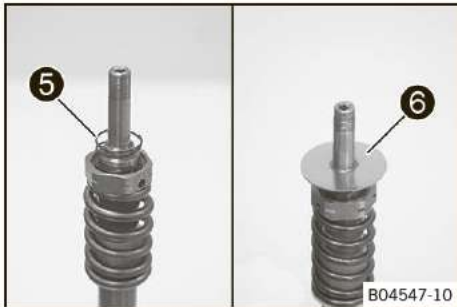
- Mount and grease O-ring **3** in tap rebound **4**.

Lubricant (T158) (p. 372)

- Mount and tighten the tap rebound.

Guideline

Tap rebound	M9x1	18 Nm (13.3 lbf ft) Loctite®2701™
-------------	------	---



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



Info

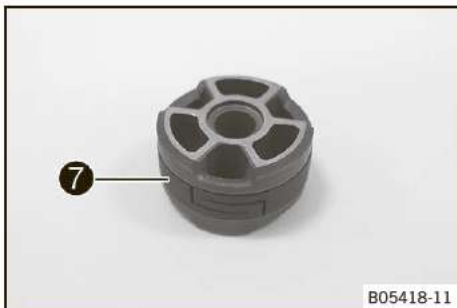
Mount the smaller shims at the bottom.

- 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**.

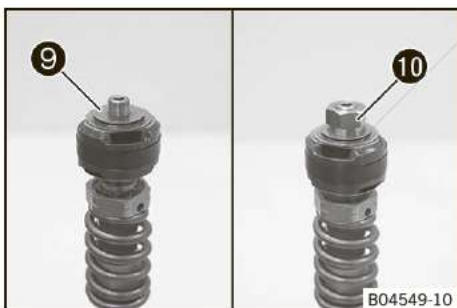
Fork oil (SAE 4) (48601166S1) (p. 371)



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

Guideline

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



- Mount shim stack **9**.



Info

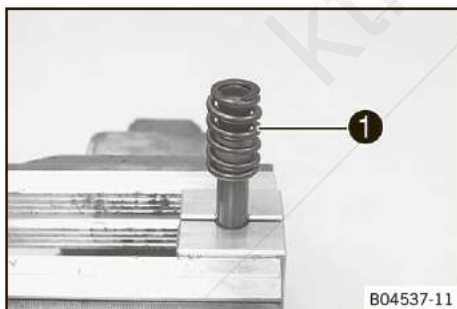
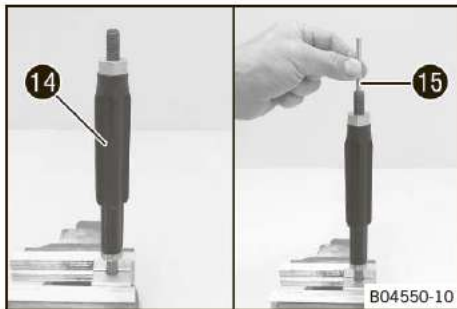
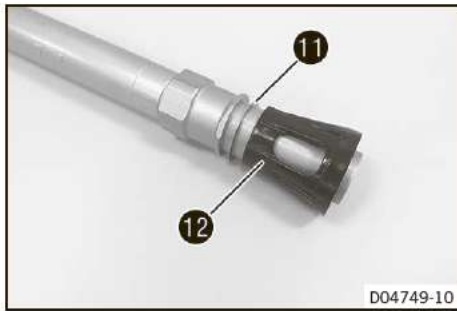
Align the triangular plate exactly with the piston opening.

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

Guideline

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

6 FORK, TRIPLE CLAMP



- ✓ 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.

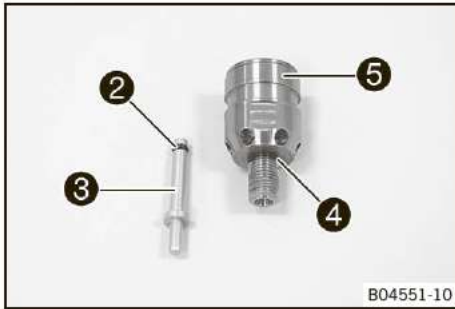
- Mount adjusting tube 15 for the rebound damping in the cartridge.
- ✓ The adjusting tube protrudes approx. 5 mm (0.197 in) out of the cartridge and can be pressed in against the spring force.
- ✗ The adjusting tube protrudes more than 7 mm (0.275 in) from the cartridge and cannot be pressed in against the spring force.

Left cartridge

- Clamp in the piston rod.

Clamping stand (T14016S) (p. 390)

- Mount spring 1.

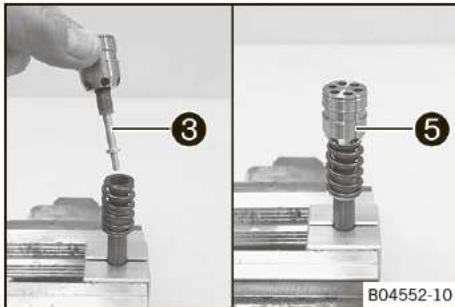


- Mount and lubricate O-ring ② for setting needle ③.

Lubricant (T158) (p. 372)

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

Lubricant (T158) (p. 372)



- Insert setting needle ③ in the piston.

- Mount and tighten piston ⑤.

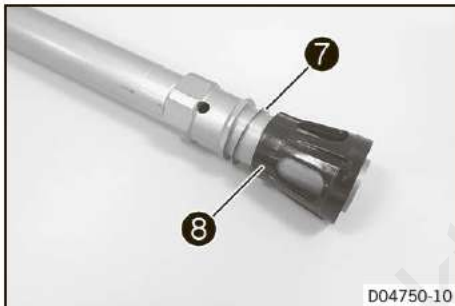
Guideline

Compression piston	M9x1	18 Nm (13.3 lbf ft) Loctite®2701™
--------------------	------	---



- Mount and lubricate piston ring ⑥.

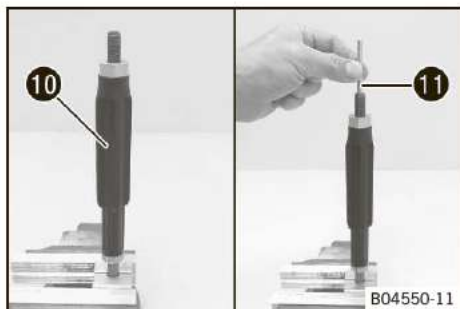
Fork oil (SAE 4) (48601166S1) (p. 371)



- 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.

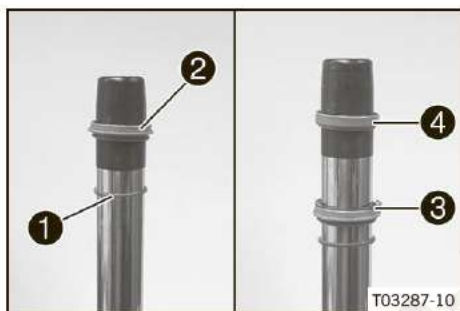
- Mount adjusting tube **11** for the rebound damping in the cartridge.
 - ✓ The adjusting tube protrudes approx. 3 mm (0.118 in) out of the cartridge and can be pressed in against the spring force.
 - ✗ The adjusting tube protrudes more than 5 mm (0.197 in) from the cartridge and cannot be pressed in against the spring force.

6.17 Assembling the fork legs



Info

The operations are the same on both fork legs.



Preparatory work

- Check the fork legs. (p. 26)
- Assemble the tap compression. (p. 28)
- Assemble the cartridge. (p. 28)

Main work

- Clamp the inside fork tube using an axle clamp.

Guideline

Use soft jaws.

- Mount the special tool.

Protecting sleeve (T1401) (p. 389)

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

Lubricant (T14034) (p. 372)



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 **3**.
- Grease and push on seal ring **4**.

Lubricant (T14034) (p. 372)



Info

Sealing lip downward, open side upward.

- Remove the special tool.

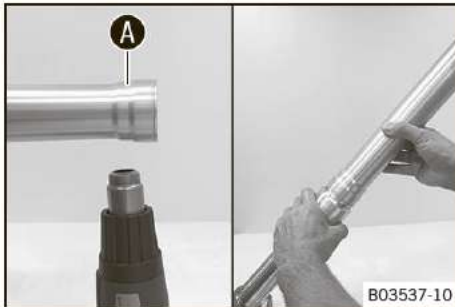


- Push on support ring **5**.
- Push on lower sliding bushing **6**.
- Mount upper sliding bushing **7**.



Info

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



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

Guideline

50 °C (122 °F)

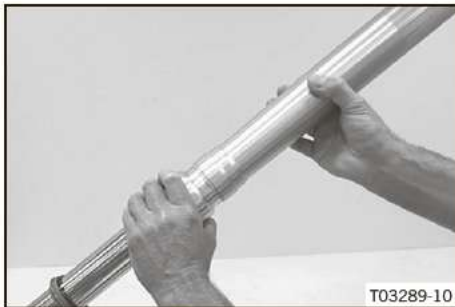
- Slide on the outside fork tube.
- Hold the lower sliding bushing with the longer side of the special tool.

Mounting tool (T14040S) (p. 391)

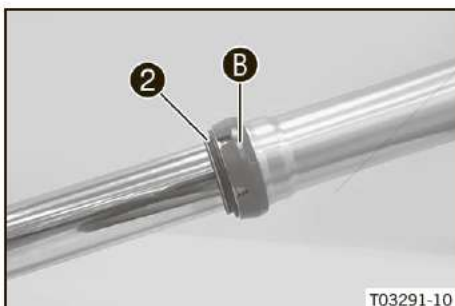
- Press the outside fork tube all the way in.
- Position the support ring.
- Hold the seal ring with shorter side of the special tool.

Mounting tool (T14040S) (p. 391)

- Press the outside fork tube all the way in.



- Mount lock ring **3**.
- ✓ The lock ring engages audibly.



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

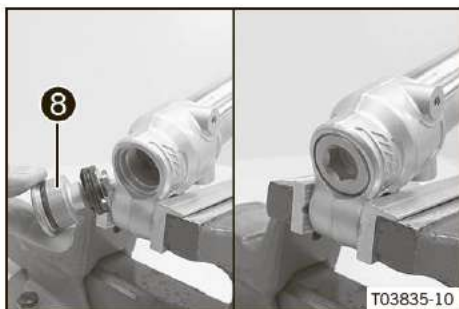
6 FORK, TRIPLE CLAMP



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

i Info

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



- Mount and tighten tap compression **8**.

Guideline

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

i Info

When assembling, ensure that the tap compressions are not mixed up.
The red tap compression is installed on the right.



- Mount special tool **9** on the piston rod.

Support tool (T14026S1) (p. 390)

i Info

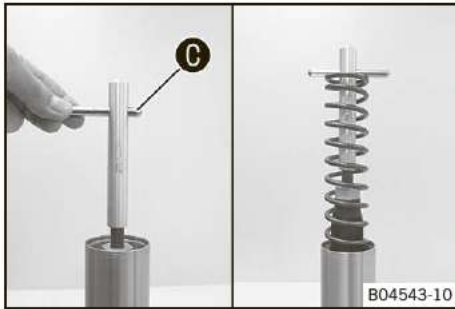
The special tool must be used to prevent the adjusting tube from being lifted and thus to prevent oil from reaching the piston rod.

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

Fork oil per fork leg	636 ± 10 ml (21.5 ± 0.34 fl. oz.)	Fork oil (SAE 4) (48601166S1) (p. 371)
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i Info

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

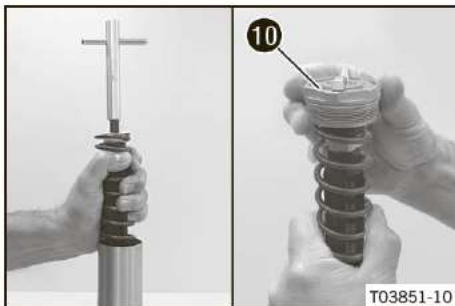


- Remove pin **C** of the special tool.

Support tool (T14026S1) (p. 390)

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

Spring rate	
Weight of rider: 65 ... 75 kg (143 ... 165 lb.)	4.2 N/mm (24 lb/in)
Weight of rider: 75 ... 85 kg (165 ... 187 lb.)	4.4 N/mm (25.1 lb/in)
Weight of rider: 85 ... 95 kg (187 ... 209 lb.)	4.6 N/mm (26.3 lb/in)



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

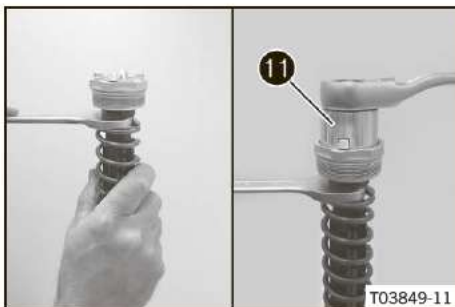
Support tool (T14026S1) (p. 390)

- Mount screw cap **10**.



Info

When assembling, ensure that the screw caps are mounted correctly.
Rebound damping side – right fork leg, screw cap with marking **REB**, red adjuster.
Compression damping side – left fork leg, screw cap with marking **COMP**, white adjuster.



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

Guideline

Preload adjuster on piston rod	M12x1	25 Nm (18.4 lbf ft)
--------------------------------	-------	---------------------

Special socket (T14087) (p. 391)



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

Clamping stand (T1403S) (p. 390)

- Grease the O-ring of the screw cap.

Lubricant (T158) (p. 372)

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

Guideline

Screw cap on the outside fork tube	M51x1.5	40 Nm (29.5 lbf ft)
------------------------------------	---------	---------------------

Ring wrench (T14017) (p. 390)

6 FORK, TRIPLE CLAMP



- Mount the adjuster.
- Mount and tighten screw 12.

Guideline

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



Alternative 1

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

Guideline

Rebound damping	
Comfort	18 clicks
Standard	15 clicks
Sport	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 – preload adjuster	
Comfort	+0
Standard	+0
Sport	+3

Alternative 2



Warning

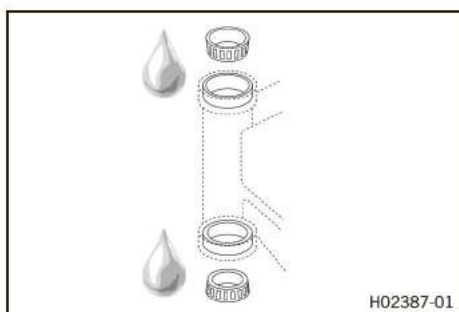
Danger of accident Modifications to the suspension setting may seriously alter the handling characteristic.

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.

6.18 Lubricating the steering head bearing



(All standard models)

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

(All special models)

- Remove the lower triple clamp. (p. 40)
- Install the lower triple clamp. (p. 41)

6.19 Removing the lower triple clamp (All standard models)

Preparatory work

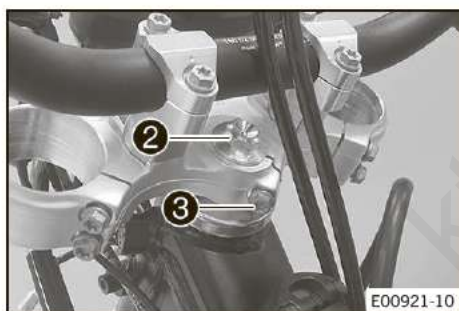
- Raise the motorcycle with a lift stand. (p. 12)
- Remove the front wheel. (p. 122)
- Remove the headlight mask with the headlight. (p. 116)
- Remove the fork legs. (p. 17)
- Remove front fender. (p. 115)
- Remove the handlebar cushion.

Main work

- Remove screws ① and hang the combination instrument holder to the side.



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



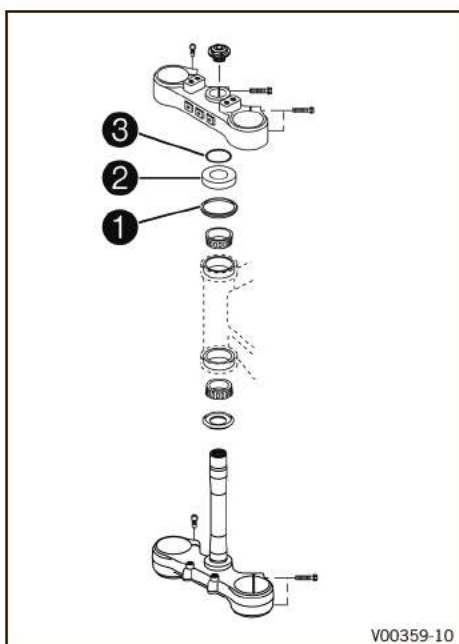
Info

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.



6.20 Installing the lower triple clamp (All standard models)

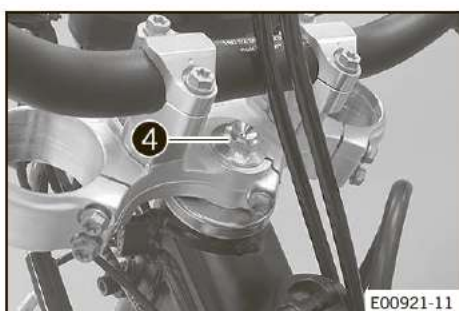


Main work

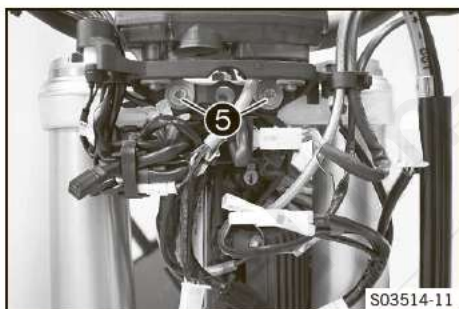
- Clean the bearing and sealing elements, check for damage, and grease.

High viscosity grease (p. 372)

- Insert the lower triple clamp with the steering stem. Mount upper steering head bearing.
- Check whether upper steering head seal **1** is correctly positioned.
- Mount protective ring **2** and O-ring **3**.



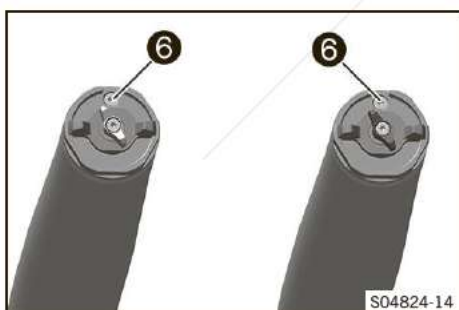
- Position the upper triple clamp with the handlebar.
- Position the clutch line and the wiring harness.
- Mount screw **4**, but do not tighten yet.



- Position the combination instrument holder, and mount and tighten screws **5**.

Guideline

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



- 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 adjuster). The compression damping is located in left fork leg **COMP** (white adjuster). 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 upper 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

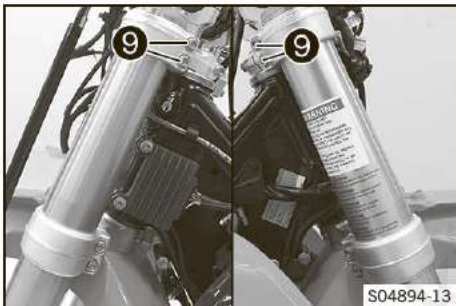
Screw, top steering head	M20x1.5	12 Nm (8.9 lbf ft)
--------------------------	---------	--------------------



- Tighten screw 8.

Guideline

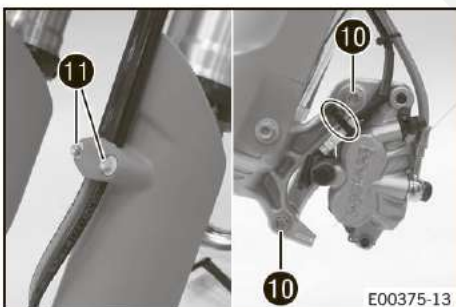
Screw, top steering stem	M8	20 Nm (14.8 lbf ft)
--------------------------	----	---------------------



- 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) Loctite®243™
----------------------------	----	--

- Mount the cable ties.
- Position the brake line, the wiring harness, and the clamp. Mount and tighten screws 11.

Finishing work

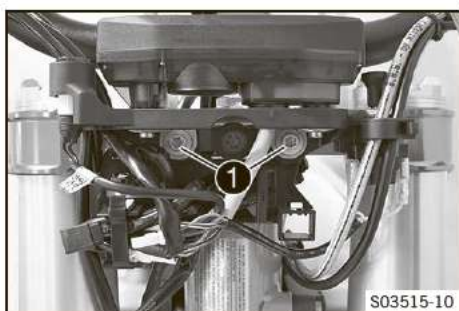
- Mount the handlebar cushion.
- Install front fender. (p. 115)
- Install the front wheel. (p. 123)
- Install the headlight mask with the headlight. (p. 116)

- Check that the wiring harness, throttle cables, and brake and clutch lines can move freely and are routed correctly.
- Check the steering head bearing for play. (p. 43)
- Remove the motorcycle from the lift stand. (p. 12)
- Check the headlight setting. (p. 166)

6.21 Removing the lower triple clamp (All special models)

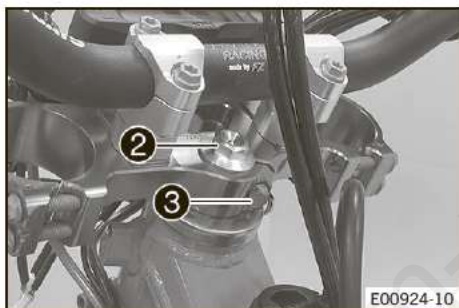
Preparatory work

- Raise the motorcycle with a lift stand. (p. 12)
- Remove the front wheel. (p. 122)
- Remove the headlight mask with the headlight. (p. 116)
- Remove the fork legs. (p. 17)
- Remove front fender. (p. 115)
- Remove the handlebar cushion.



Main work

- Remove screws ① and hang the combination instrument holder to the side.



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



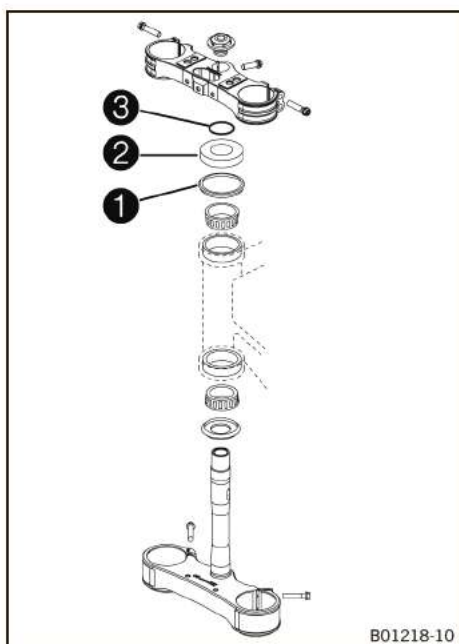
Info

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.

6.22 Installing the lower triple clamp (All special models)



B01218-10

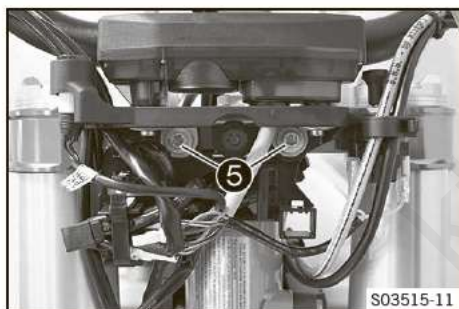
Main work

- Clean the bearing and sealing elements, check for damage, and grease.
- High viscosity grease (p. 372)
- Insert the lower triple clamp with the steering stem. Mount upper steering head bearing.
 - Check whether upper steering head seal ① is correctly positioned.
 - Mount protective ring ② and O-ring ③.



E00927-10

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

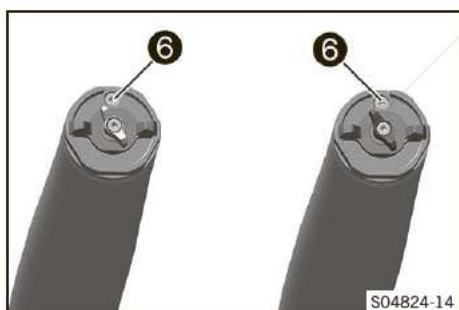


S03515-11

- Position the combination instrument holder, and mount and tighten screws ⑤.

Guideline

Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
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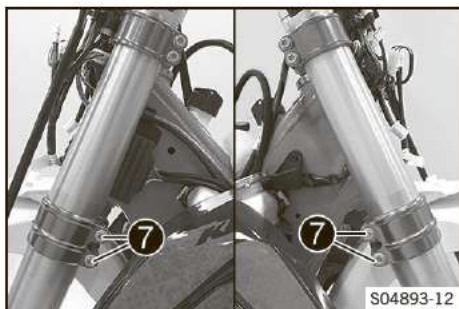
S04824-14

- 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 adjuster). The compression damping is located in left fork leg **COMP** (white adjuster). 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 upper edge of the upper triple clamp.

6 FORK, TRIPLE CLAMP



- Tighten screws 7.

Guideline

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



- Tighten screw 4.

Guideline

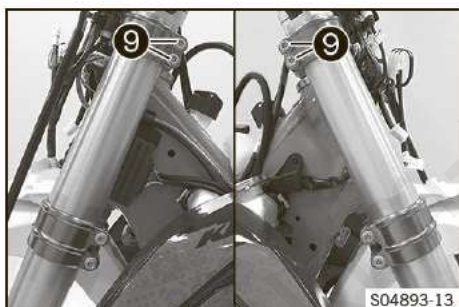
Screw, top steering head	M20x1.5	12 Nm (8.9 lbf ft)
--------------------------	---------	--------------------



- Mount and tighten screw 8.

Guideline

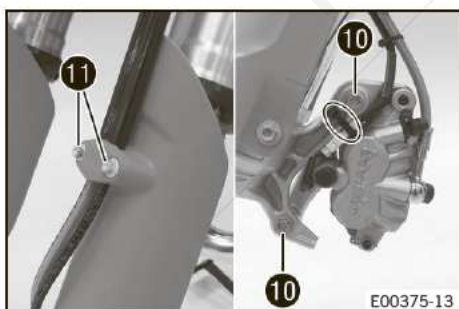
Screw, top steering stem	M8	17 Nm (12.5 lbf ft) Loctite®243™
--------------------------	----	--



- 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) Loctite®243™
----------------------------	----	--

- Mount the cable ties.
- Position the brake line, the wiring harness, and the clamp. Mount and tighten screws 11.

Finishing work

- Mount the handlebar cushion.
- Install front fender. (p. 115)
- Install the front wheel. (p. 123)
- Install the headlight mask with the headlight. (p. 116)

- Check that the wiring harness, throttle cables, and brake and clutch lines can move freely and are routed correctly.
- Check the steering head bearing for play. (📖 p. 43)
- Remove the motorcycle from the lift stand. (📖 p. 12)
- Check the headlight setting. (📖 p. 166)

6.23 Checking the steering head bearing play



Warning

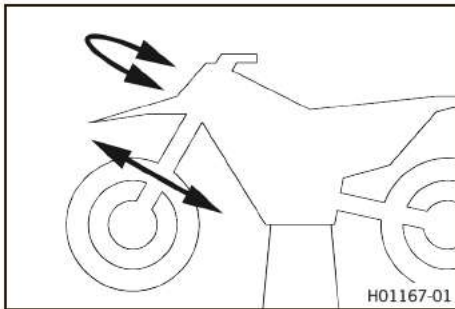
Danger of accidents Incorrect steering head bearing play impairs the handling characteristic and damages components.

- Correct incorrect steering head bearing play immediately.



Info

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



Preparatory work

- 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. 44)

- 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:

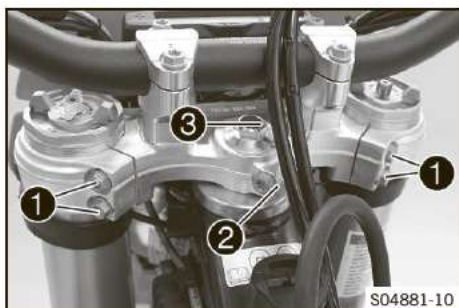
- Adjust the steering head bearing play. (📖 p. 44)
- Check the steering head bearing and change if necessary.

- Check the steering stop bolts for correct adjustment and locking.

Finishing work

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

6.24 Adjusting the steering head bearing play



Preparatory work

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

Main work

(All standard models)

- Loosen screws ❶ and 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.

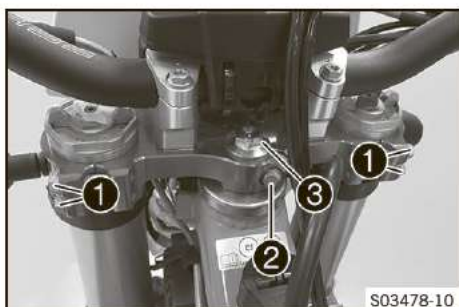
Guideline

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

- Tighten screw ❷.

Guideline

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



(All special models)

- 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) Loctite®243™
--------------------------	----	--

Finishing work

- Check the steering head bearing for play. (🔧 p. 43)
- Remove the motorcycle from the lift stand. (🔧 p. 12)

6.25 Changing the steering head bearing (All standard models)

Preparatory work

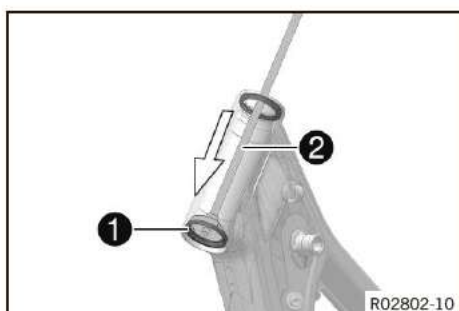
- Raise the motorcycle with a lift stand. (p. 12)
- Remove the front wheel. (p. 122)
- Remove the headlight mask with the headlight. (p. 116)
- Remove the fork legs. (p. 17)
- Remove front fender. (p. 115)
- Remove the handlebar cushion.
- Remove the lower triple clamp. (p. 37)

Main work

- Remove lower bearing ring ① with special tool ②.

Tool bracket (58429089000) (p. 380)

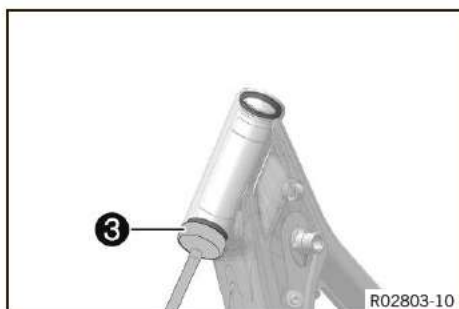
Pressing tool (58429092000) (p. 380)



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

Tool bracket (58429089000) (p. 380)

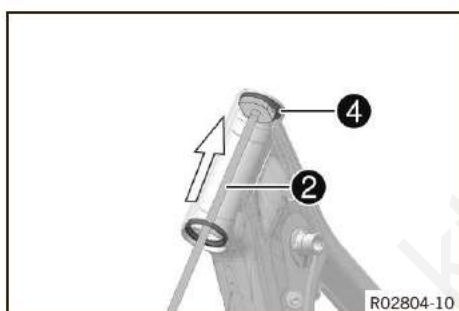
Pressing tool (58429091000) (p. 380)



- Remove upper bearing ring ④ with special tool ②.

Tool bracket (58429089000) (p. 380)

Pressing tool (58429092000) (p. 380)



- 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. 115)

- Install the front wheel. (📖 p. 123)
- Install the headlight mask with the headlight. (📖 p. 116)
- Check that the wiring harness, throttle cables, and brake and clutch lines can move freely and are routed correctly.
- Check the steering head bearing for play. (📖 p. 43)
- Remove the motorcycle from the lift stand. (📖 p. 12)
- Check the headlight setting. (📖 p. 166)

6.26 Changing the steering head bearing (All special models)

Preparatory work

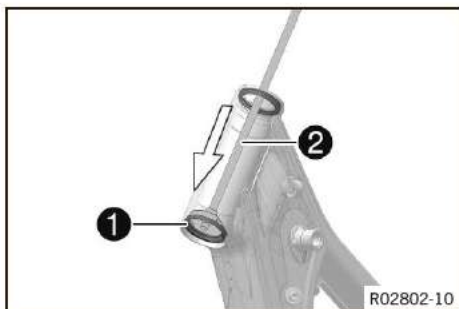
- Raise the motorcycle with a lift stand. (📖 p. 12)
- Remove the front wheel. (📖 p. 122)
- Remove the headlight mask with the headlight. (📖 p. 116)
- Remove the fork legs. (📖 p. 17)
- Remove front fender. (📖 p. 115)
- Remove the handlebar cushion.
- Remove the lower triple clamp. (📖 p. 40)

Main work

- Remove lower bearing ring ❶ with special tool ❷.

Tool bracket (58429089000) (📖 p. 380)

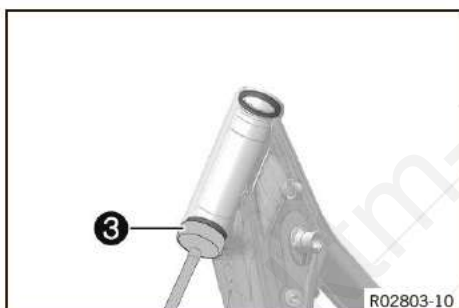
Pressing tool (58429092000) (📖 p. 380)
--



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

Tool bracket (58429089000) (📖 p. 380)

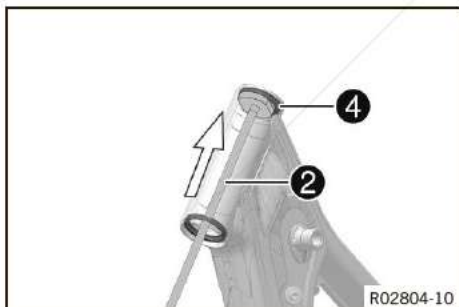
Pressing tool (58429091000) (📖 p. 380)
--

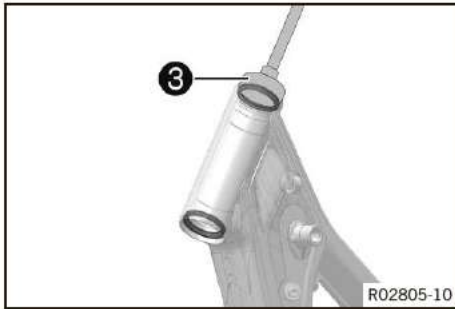


- Remove upper bearing ring ❹ with special tool ❷.

Tool bracket (58429089000) (📖 p. 380)

Pressing tool (58429092000) (📖 p. 380)
--

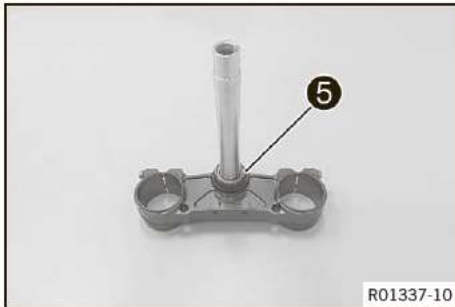




- Press the new bearing ring up to the stop with special tool **3**.

Tool bracket (58429089000) (p. 380)

Pressing tool (58429091000) (p. 380)



- 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.



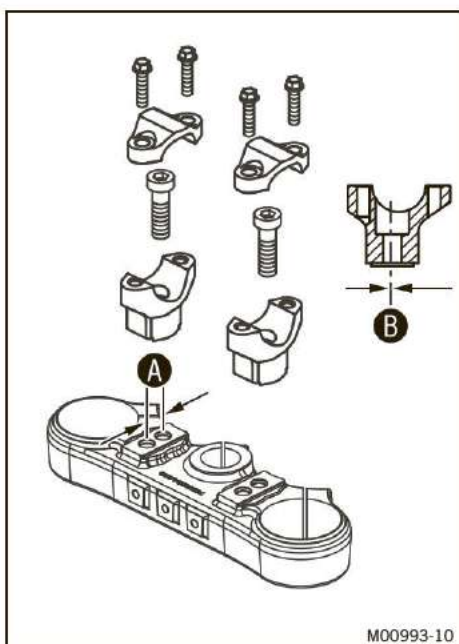
Info

Only press the bearing in via the inner ring.

Finishing work

- Install the lower triple clamp. (p. 41)
- Mount the handlebar cushion.
- Install front fender. (p. 115)
- Install the front wheel. (p. 123)
- Install the headlight mask with the headlight. (p. 116)
- Check that the wiring harness, throttle cables, and brake and clutch lines can move freely and are routed correctly.
- Check the steering head bearing for play. (p. 43)
- Remove the motorcycle from the lift stand. (p. 12)
- Check the headlight setting. (p. 166)

7.1 Handlebar position



(All standard models)

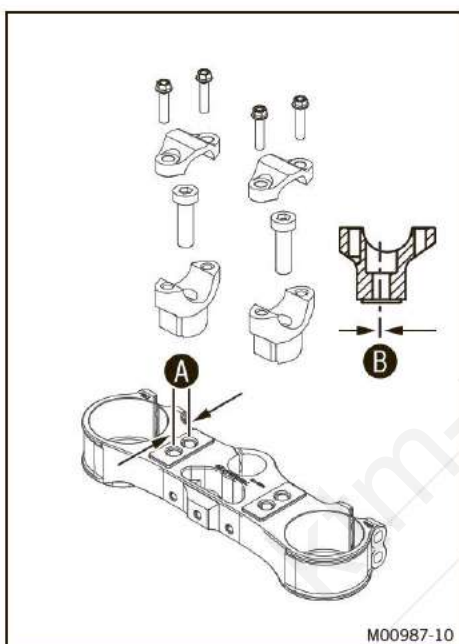
On the upper triple clamp, there are 2 holes at a distance of **A** to each other.

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 special 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

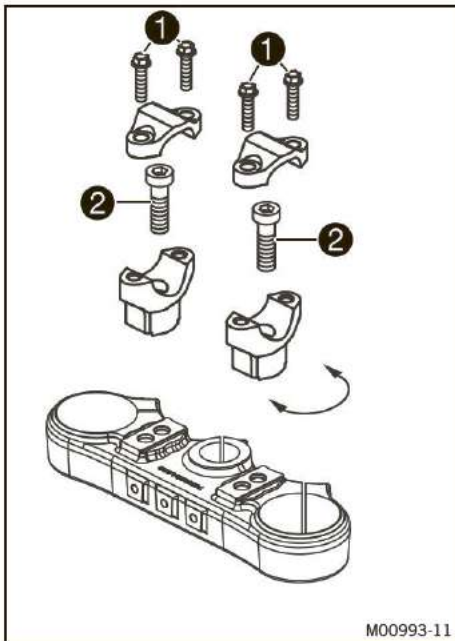


Warning

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.

**(All standard 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) Loctite®243™
--------------------------	-----	--

**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.

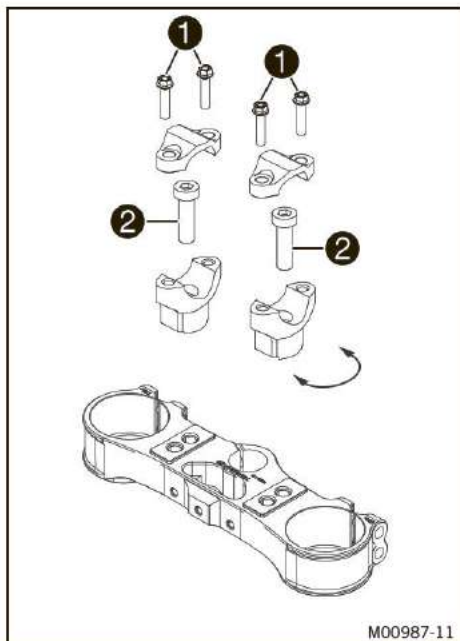
Guideline

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

**Info**

Make sure the gap widths are even.

7 HANDLEBAR, CONTROLS



(All special 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) Loctite®243™
--------------------------	-----	--



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

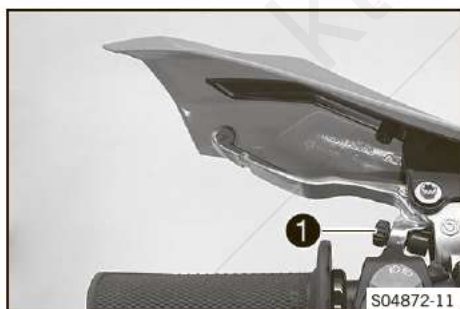
Screw, handlebar clamp	M8	20 Nm (14.8 lbf ft)
------------------------	----	------------------------



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

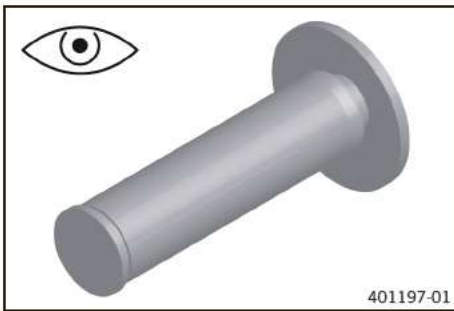
Turn the adjusting screw counterclockwise to decrease the distance between the clutch lever and the handlebar.

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.

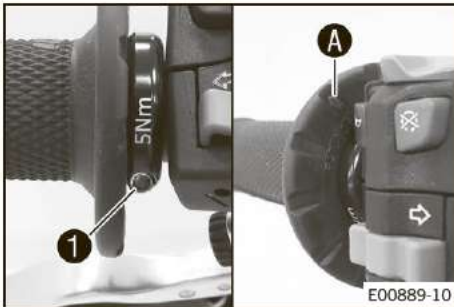
- » If a rubber grip is damaged or worn:
 - Change the rubber grip.

- Check that screw ① is firmly seated.

Guideline

Screw, fixed grip	M4	5 Nm (3.7 lbf ft) Loctite®243™
-------------------	----	--

Diamond ② must be positioned visibly as shown in the figure.



7.5 Checking the throttle cable routing

Preparatory work

- Remove the seat. (📖 p. 101)
- Remove the fuel tank. (📖 p. 102)

Main work

- Check the 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 rubber strap of the fuel tank support.

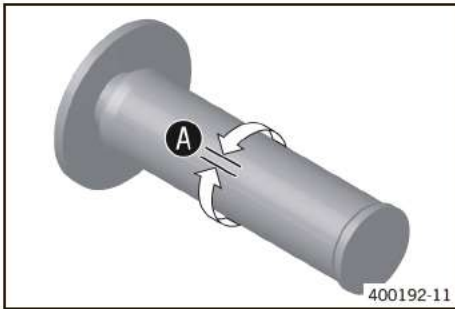
- » If the throttle cable is not routed as specified:
 - Correct the throttle cable routing.



Finishing work

- Install the fuel tank. (📖 p. 103)
- Mount the seat. (📖 p. 101)

7.6 Checking the play in the throttle cable



- Check the throttle grip for smooth operation.
- Turn 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. 52)



Danger

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

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

bar 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. 52)

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. 101)
- Remove the fuel tank. (p. 102)
- Check the throttle cable routing. (p. 51)

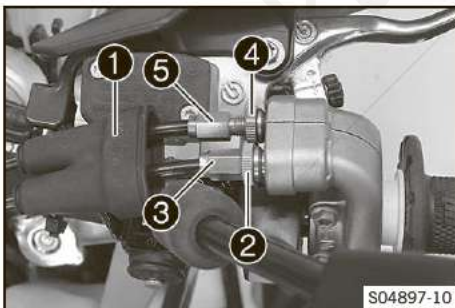
Main work

- 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 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. 52)

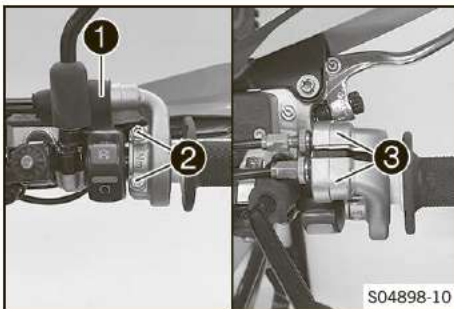
7.8 Setting the characteristic map of the throttle response



Info

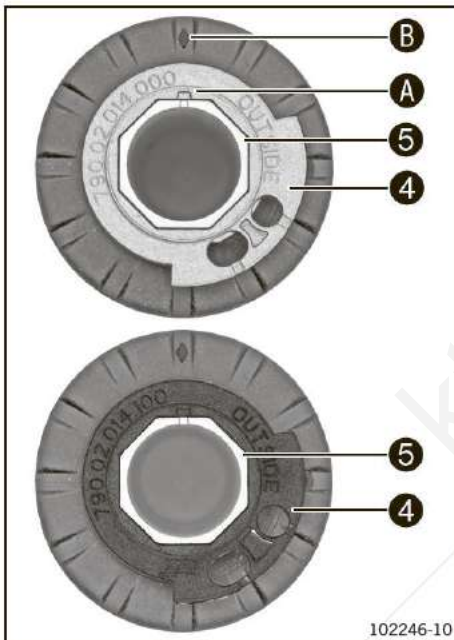
On the throttle grip, the characteristic map of the throttle response is changed by changing the guide plate.

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)



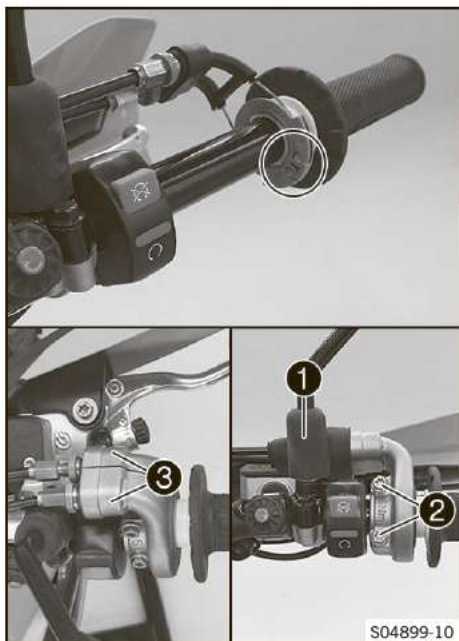
Info

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.

7 HANDLEBAR, CONTROLS



- 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. 52)

8.1 Checking the frame



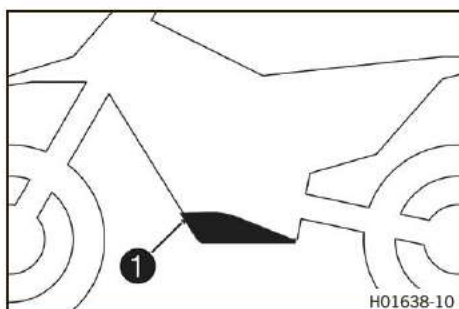
- Check the frame for damage, cracks, and deformation.
 - » If the frame shows signs of damage, cracks, or deformation:

- Change the frame.

Guideline

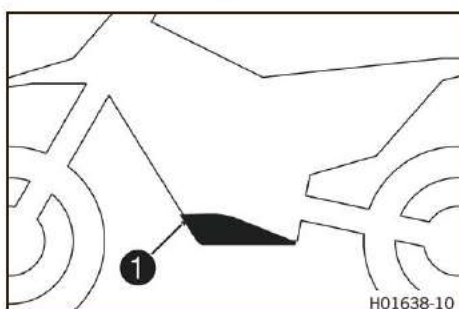
Repairs on the frame are not permitted.

8.2 Removing the engine guard (All special models)



- Remove screws ❶ and engine guard.

8.3 Installing the engine guard (All special 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)
---------------------------	----	--------------------

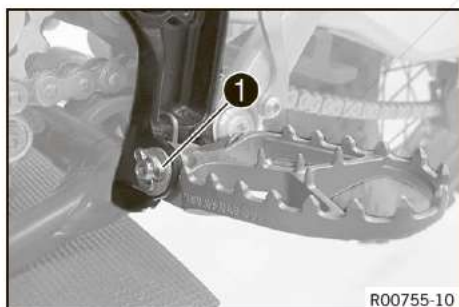
8.4 Changing the footrests

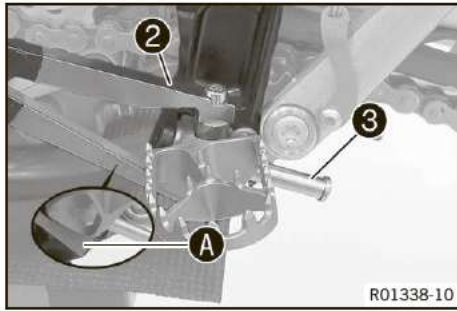
Condition

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

Left footrest

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

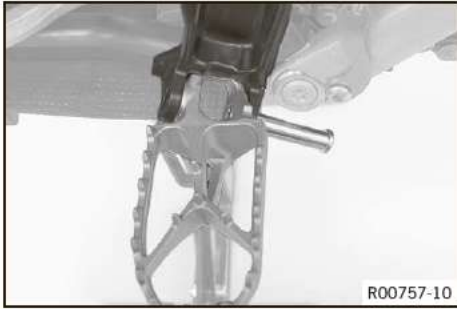




- Press the spring with special tool ②.

Footrest spring plier (79029083000) (p. 383)

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



- Position the new footrest and pin.



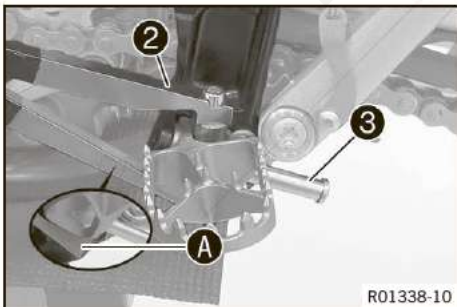
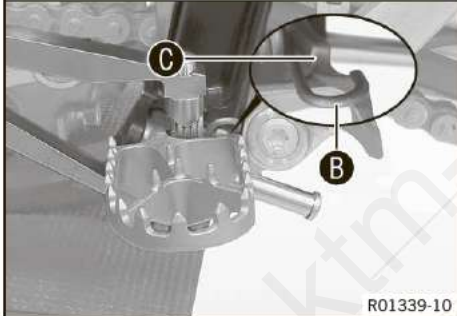
Info

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



- Position spring as shown.

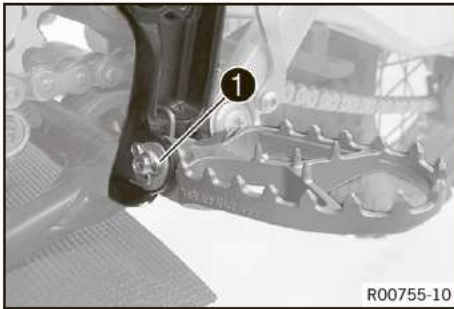
- ✓ Spring B engages in area C.



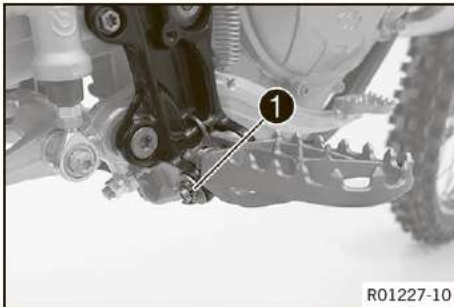
- Press the spring with special tool ②.

Footrest spring plier (79029083000) (p. 383)

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

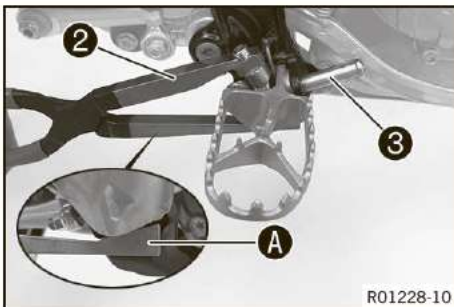


- Mount the washer and splint **1**.
- Remove the motorcycle from the lift stand. (p. 12)



Right footrest

- Remove pin **1** and take off the washer.



- Press the spring with special tool **2**.

Footrest spring plier (79029083000) (p. 383)

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

- Remove pin **3**.

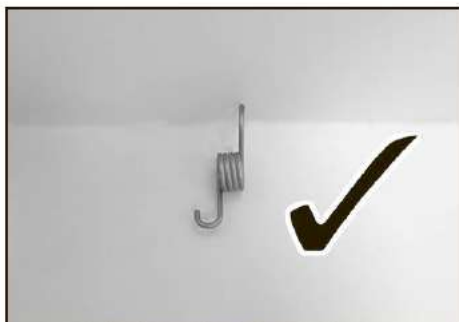


- Position the new footrest and pin.

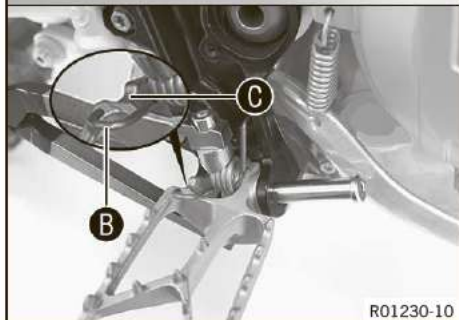


Info

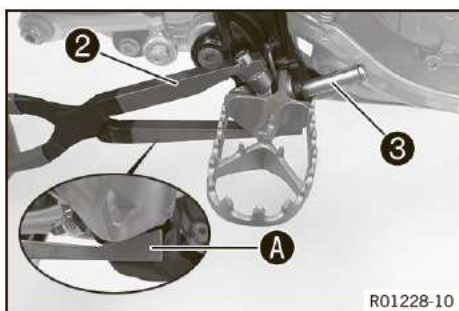
Only insert the pin to the extent that the spring can still be mounted.



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

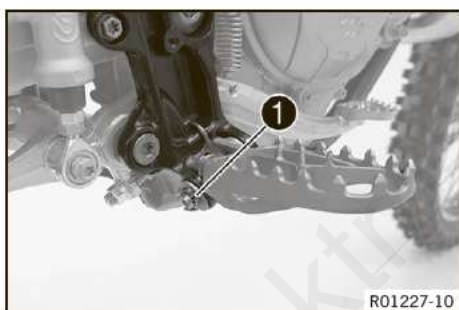


R01230-10



R01228-10

- Press the spring with special tool **2**.
- Footrest spring plier (79029083000) (p. 383)
- ✓ The special tool is applied to area **A** on the footrest.
 - Mount pin **3**.



R01227-10

- Mount the washer and splint **1**.

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



Caution

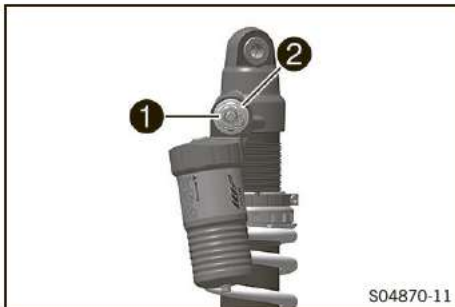
Risk of injury Parts of the shock absorber will move around if the shock absorber is detached incorrectly. The shock absorber is filled with highly compressed nitrogen.

- Please follow the description provided.



Info

The effect of the high speed compression adjuster can be seen in the 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

High-speed compression damping	
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

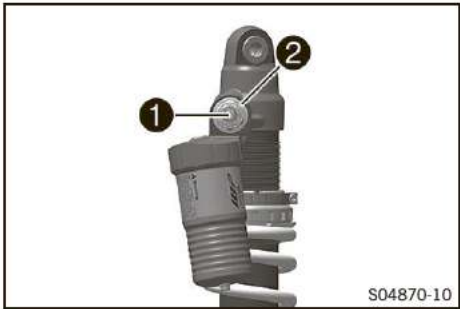
Risk of injury Parts of the shock absorber will move around if the shock absorber is detached incorrectly. The shock absorber is filled with highly compressed nitrogen.

- Please follow the description provided.



Info

The effect of the low-speed compression adjuster 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.

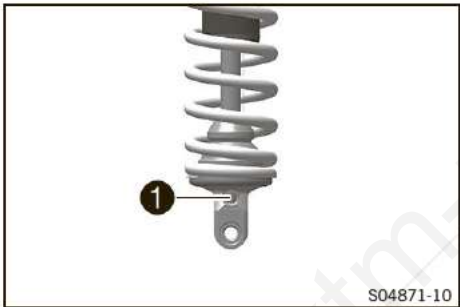
Guideline

Low-speed compression damping	
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.



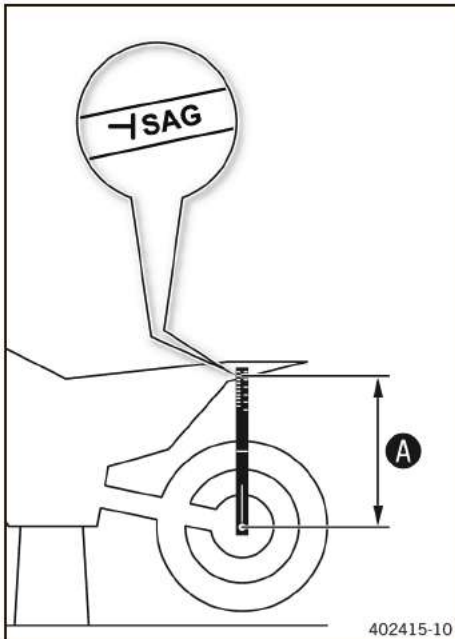
- Turn adjusting screw ❶ clockwise up to the last perceptible click.
- Turn counterclockwise by the number of clicks corresponding to the shock absorber type.

Guideline

Rebound damping	
Comfort	18 clicks
Standard	15 clicks
Sport	12 clicks

i Info
Turn clockwise to increase the damping; turn counterclockwise to reduce damping when the shock absorber rebounds.

9.4 Measuring the dimension of the rear wheel unloaded



Preparatory work

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

Main work

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

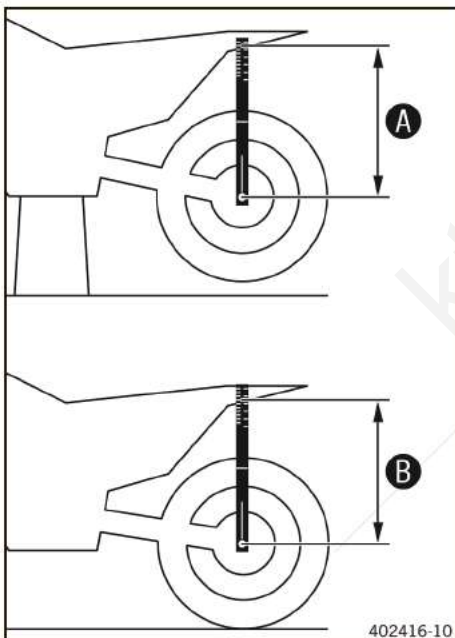
Sag gauge (00029090100)
Pin, sag scale (00029990010)

- Note 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. 61)
- Hold the motorcycle upright with aid of an assistant.
- Measure the distance again between the rear axle and marking **SAG** on the rear fender using the sag gage.
- Note the value as dimension **B**.



Info

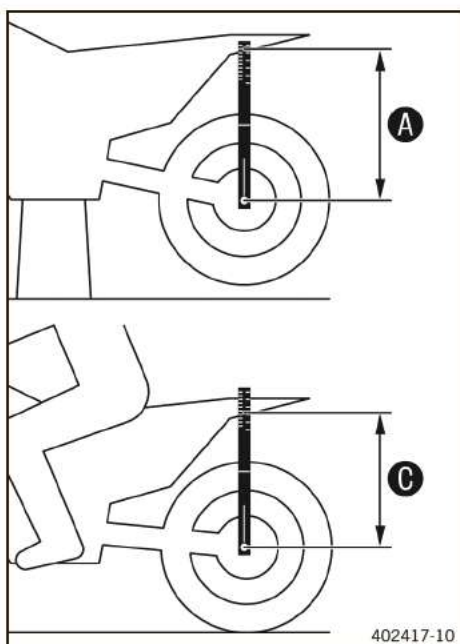
The static sag is the difference between measurements **A** and **B**.

- Check the static sag.

Static sag	37 mm (1.46 in)
------------	-----------------

- » If the static sag is less or more than the specified value:
 - Adjust the spring preload of the shock absorber. (p. 62)

9.6 Checking the riding sag of the shock absorber



- Measure dimension **A** of rear wheel unloaded. (📖 p. 61)
- 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 gage.
- Note the value as dimension **C**.



Info

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

- Check riding sag.

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

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.

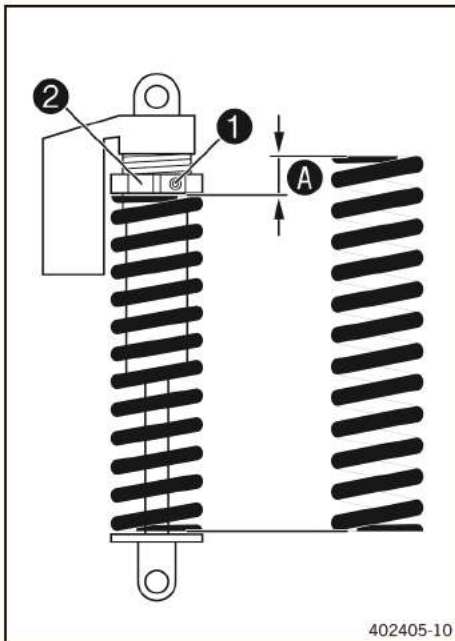


Info

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. 64)
- 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.

Hook wrench (90129051000) (p. 383)

**Info**

If the spring cannot be fully released, the spring must be removed to accurately measure the spring length.

- Measure the total spring length while the spring is not under tension.
- Tension the spring by turning adjusting ring ② to specified dimension A.

Guideline

Spring preload	9 mm (0.35 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. 64)
- Remove the motorcycle from the lift stand. (p. 12)

9.8 Adjusting the riding sag

Preparatory work

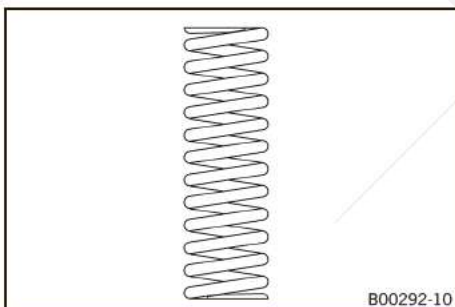
- Raise the motorcycle with a lift stand. (p. 12)
- Remove the shock absorber. (p. 64)
- After removing the shock absorber, clean it thoroughly.

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)





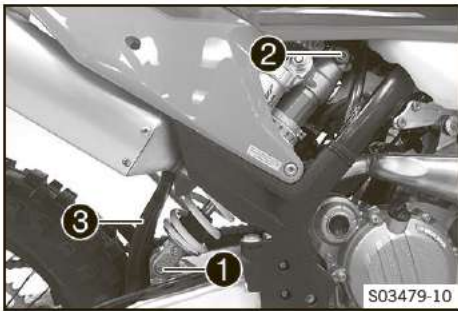
Info

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

- Finishing work**
- Install the shock absorber. (📖 p. 64)
 - Remove the motorcycle from the lift stand. (📖 p. 12)
 - Check the static sag of the shock absorber. (📖 p. 61)
 - Check the riding sag of the shock absorber. (📖 p. 62)
 - Adjust the rebound damping of the shock absorber. (📖 p. 60)

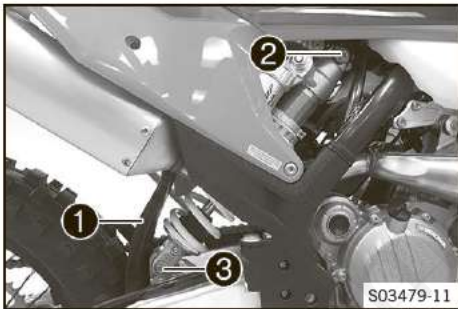
9.9 Removing the shock absorber

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



- Main work**
- Remove screw ① and lower the rear wheel with the link fork as far as possible without blocking the rear wheel. Secure the rear wheel in this position.
 - Remove screw ②, push splash protector ③ to the side, and remove the shock absorber.

9.10 Installing the shock absorber



- Main work**
- Push splash protector ① to the side and position the shock absorber. Mount and tighten screw ②.

Guideline

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

- Mount and tighten screw ③.

Guideline

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



Info

The heim joint for the shock absorber on the link fork is Teflon coated. It must not be lubricated with grease, nor with any 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

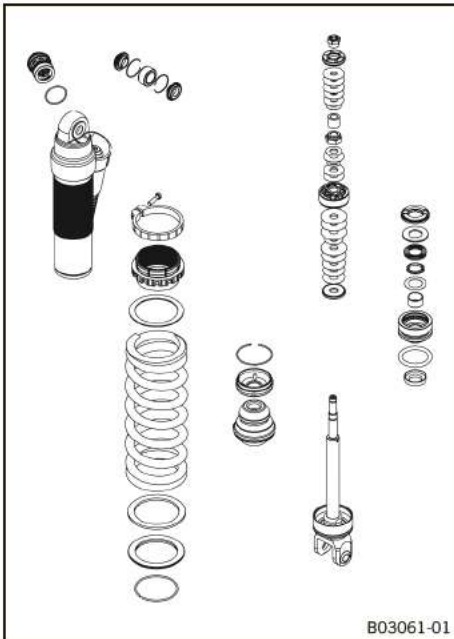
**Caution**

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.



- Remove the spring. (p. 65)
- Disassemble the damper. (p. 66)
- Disassemble the piston rod. (p. 68)
- Disassemble the seal ring retainer. (p. 67)
- Check the damper. (p. 71)
- Change the heim joint. (p. 72)
- Assemble the seal ring retainer. (p. 73)
- Assemble the piston rod. (p. 74)
- Assemble the damper. (p. 75)
- Install the spring. (p. 82)

9.12 Removing the spring

Condition

The shock absorber has been removed.



- Clamp the shock absorber into the vise.

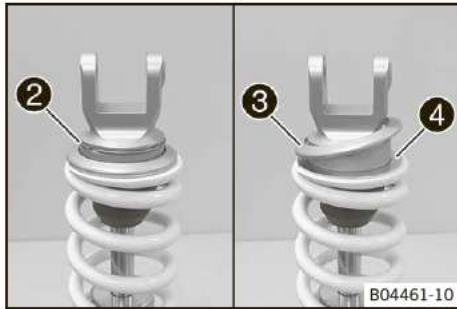
Guideline

Use soft jaws.

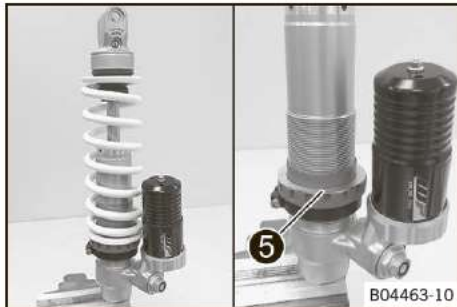
- Measure and note the spring length while the spring is under tension.
- Loosen screw ①.
- Turn the adjusting ring until the spring is completely without tension.

Hook wrench (90129051000) (p. 383)

9 SHOCK ABSORBER, LINK FORK



- 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. 65)

Main work

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



- 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**

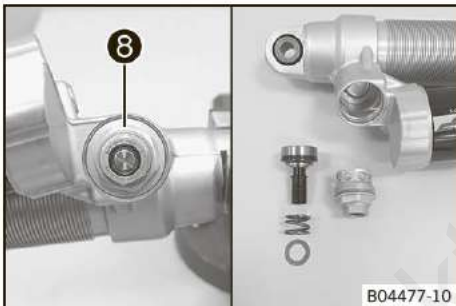
Check inner surface; do not scratch. If necessary, remove any burrs with sandpaper.



- Remove the piston rod.



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



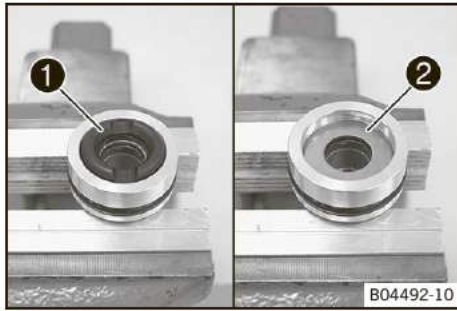
- Remove compression adjuster **8**. Remove the washer, spring, and piston.

9.14 Disassembling the seal ring retainer

Preparatory work

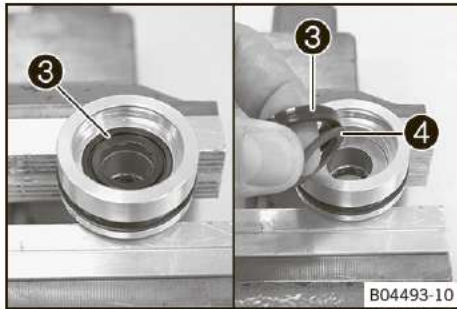
- Remove the spring. (p. 65)
- Disassemble the damper. (p. 66)
- Disassemble the piston rod. (p. 68)

9 SHOCK ABSORBER, LINK FORK

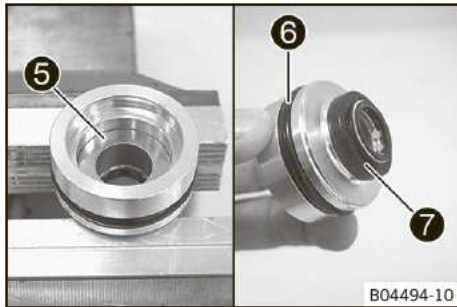


Main work

- 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. 65)
- Disassemble the damper. (p. 66)

Main work

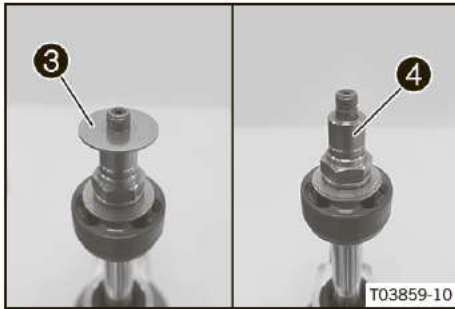
- Clamp the piston rod with the fork in the bench vise.

Guideline

Use soft jaws.



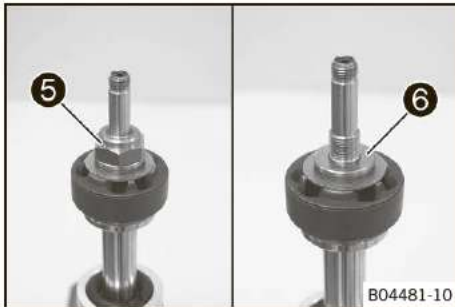
- Remove nut ①.
- Remove piston ②.



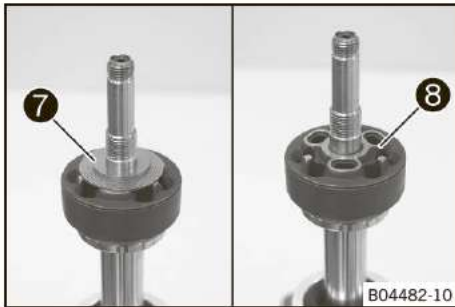
- Remove compression shim stack ③.

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

- Remove bushing ④.



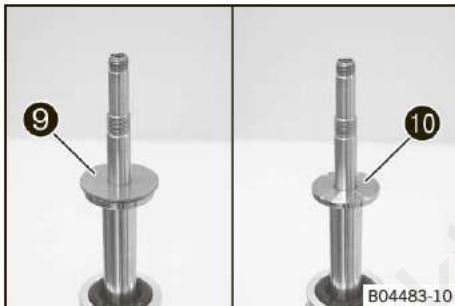
- Remove nut ⑤.
- Remove washer ⑥.



- Remove rebound shim stack ⑦.

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

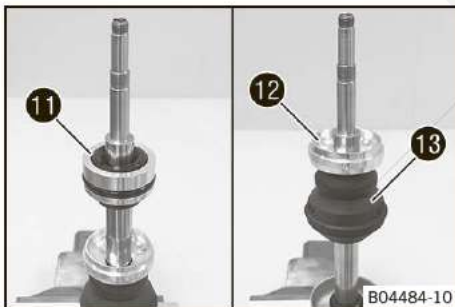
- Remove piston ⑧.



- Remove compression shim stack ⑨.

i 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

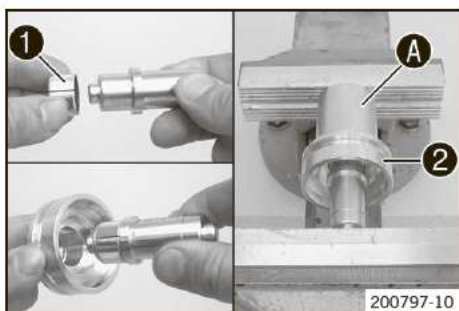
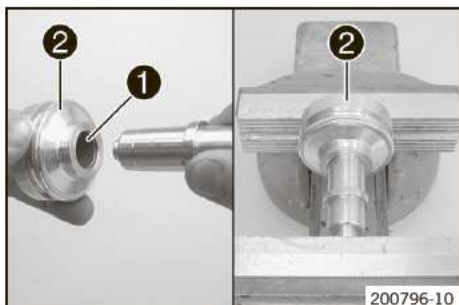
Preparatory work

- Remove the spring. (p. 65)
- Disassemble the damper. (p. 66)
- Disassemble the piston rod. (p. 68)
- Disassemble the seal ring retainer. (p. 67)

Main work

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

Pressing tool (T1504) (p. 391)



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

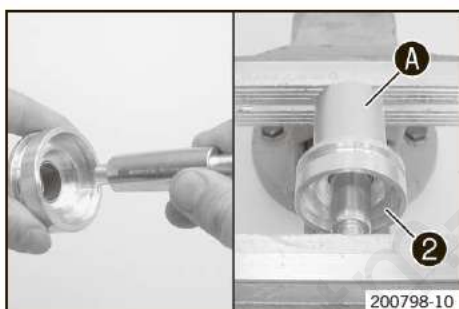
Pressing tool (T1504) (p. 391)

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

Pressing tool (T1504) (p. 391)

- 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. 391)



- Lubricate the special tool.

Shock absorber fluid (SAE 2.5) (50180751S1) (p. 371)

Calibrating unit (T1205) (p. 388)

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

Mounting tool (T150S) (p. 391)

- Press the special tool through the new pilot bushing.

Calibrating unit (T1205) (p. 388)

✓ The pilot bushing is to be calibrated.

Finishing work

- Assemble the seal ring retainer. (p. 73)

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	$\leq 46.10 \text{ mm } (\leq 1.815 \text{ in})$

- » 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.



- Measure the diameter of the piston rod.

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

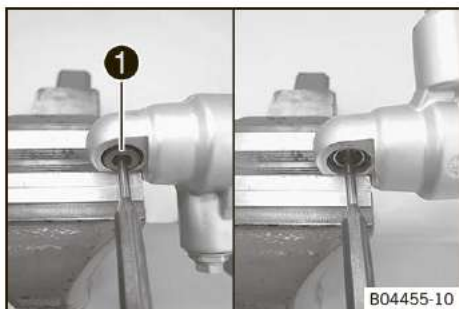
- » If the measured value is smaller than the specified value:
 - Replace the piston rod.
- Measure the run-out of the piston rod.

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 Changing the heim joint



- Clamp the shock absorber into the vise.

Guideline

Use soft jaws.

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

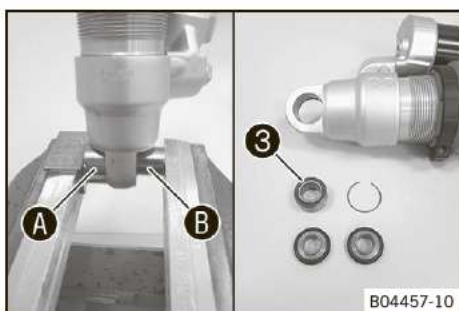
Drift (T120) (p. 388)



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

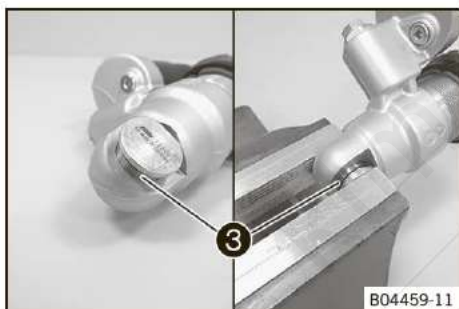
Pressing tool (T1207S) (p. 389)

- Remove second lock ring **2**.



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

Pressing tool (T1207S) (p. 389)



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

Guideline

Use soft jaws.

Pressing tool (T1206) (p. 389)

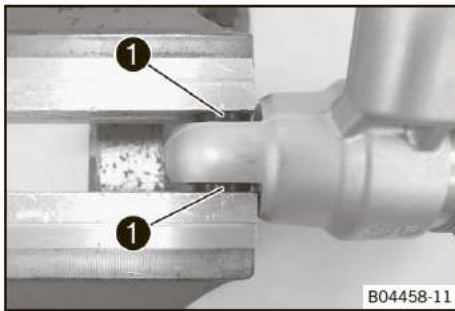
- Press the heim joint all the way in.



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

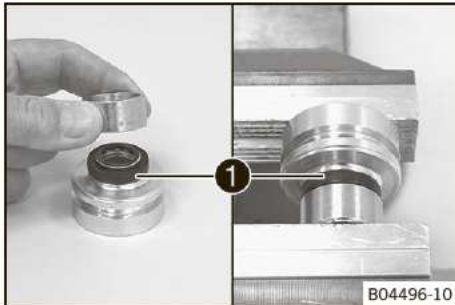
Pressing tool (T1207S) (p. 389)

- Mount second lock ring **2**.



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

9.19 Assembling seal ring retainer

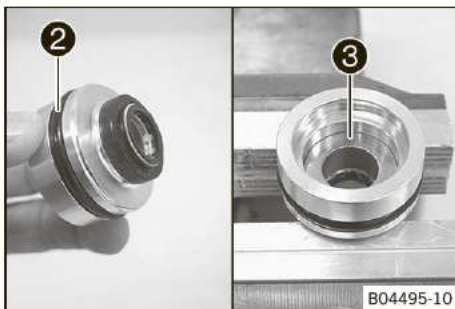


- Mount dust boot **1** with the special tool.

Mounting sleeve (T1204) (p. 388)

- Grease the sealing lip of the dust boot.

Lubricant (T625) (p. 372)

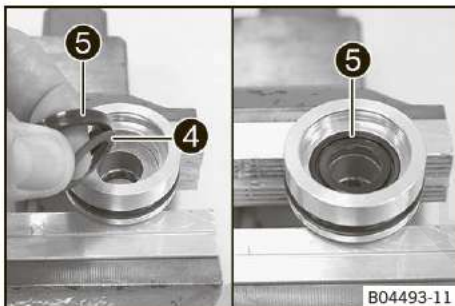


- Grease the O-ring groove.

Lubricant (T158) (p. 372)

- Mount O-ring **2**.

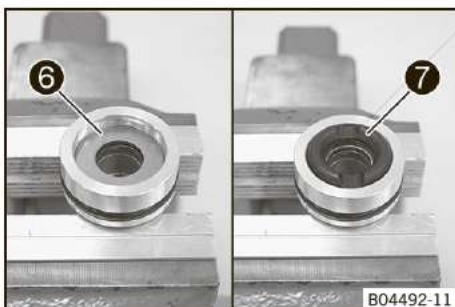
- Mount washer **3**.



- Position washer **4** on seal ring **5**.

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

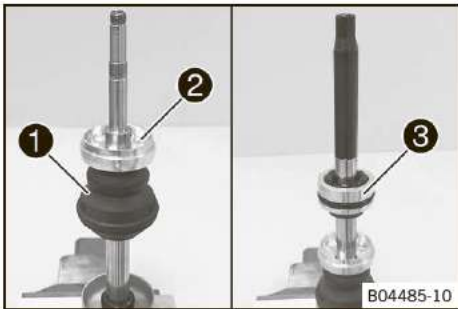
Lubricant (T14034) (p. 372)



- Mount washer **6**.

- Mount rebound rubber **7**.

9.20 Assembling the piston rod



Preparatory work

- Assemble the seal ring retainer. (p. 73)

Main work

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

Guideline

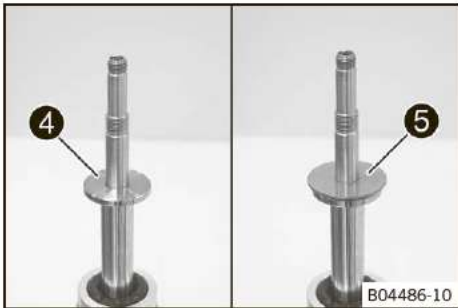
Use soft jaws.

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

Mounting sleeve (T1554) (p. 392)

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

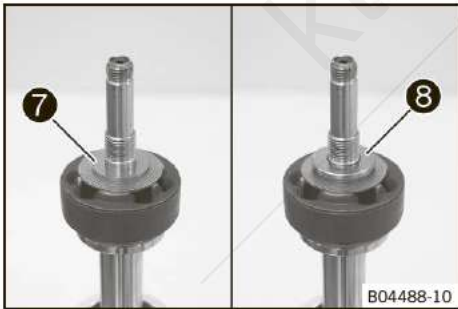
Lubricant (T625) (p. 372)



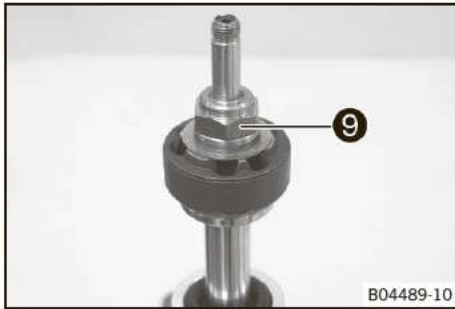
- Clean piston 6.
- Mount the piston.

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 with the groove facing downward.
- 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

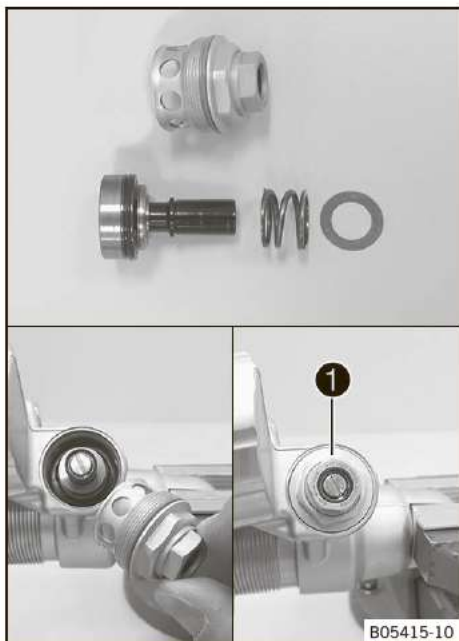
Nut, piston rod	M10x1	30 Nm (22.1 lbf ft) Loctite®2701™
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9.21 Assembling the damper

Preparatory work

- Assemble the seal ring retainer. (p. 73)
- Assemble the piston rod. (p. 74)

9 SHOCK ABSORBER, LINK FORK



Main work

- Lubricate the O-rings of the compression adjuster.

Lubricant (T158) (p. 372)

- Lubricate the thread.

Lubricant (T159) (p. 372)

- 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.



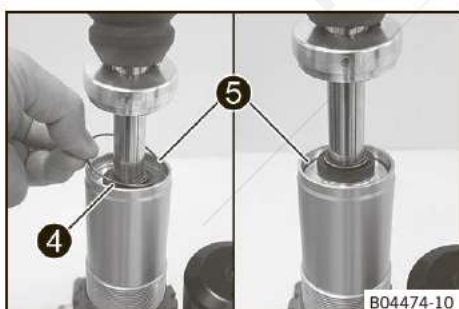
- Fill the damper cartridge about half full.

Shock absorber fluid (SAE 2.5) (50180751S1) (p. 371)

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

Lubricant (T158) (p. 372)

- Mount the piston rod carefully.



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

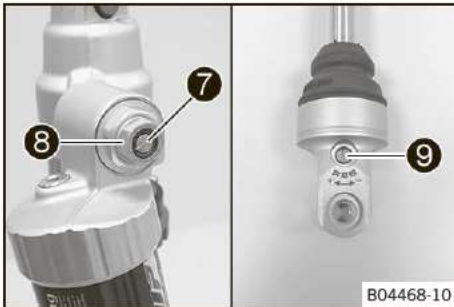
i Info

Do not scratch the inside surface.

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



- Mount locking cap ⑥ of the damper cartridge.
- Bleed and fill the damper. (p. 78)
- Fill the damper with nitrogen. (p. 81)



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

Low-speed compression damping	
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

High-speed compression damping	
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.

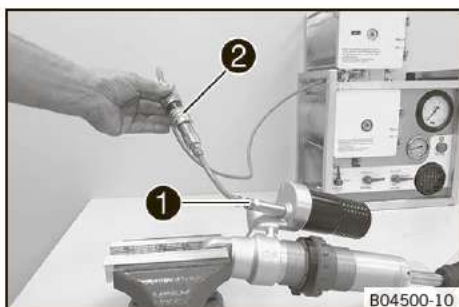
9.22 Bleeding and filling the damper



Info

Before working with the vacuum pump, it is essential that you carefully read through the Owner's Manual included for the vacuum pump.

Open the adjusters of the rebound and compression damping completely.



- Clamp the damper as shown.

Guideline

Use soft jaws.



Info

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

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

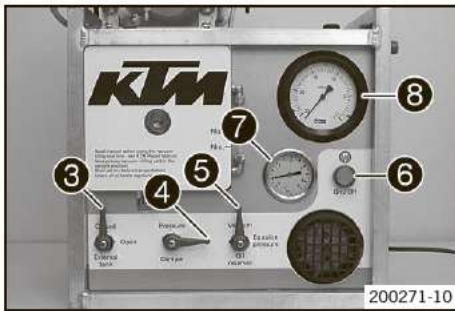


Info

Hand-tighten only without using a tool.

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

Vacuum pump (T1240S) (p. 389)



- 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

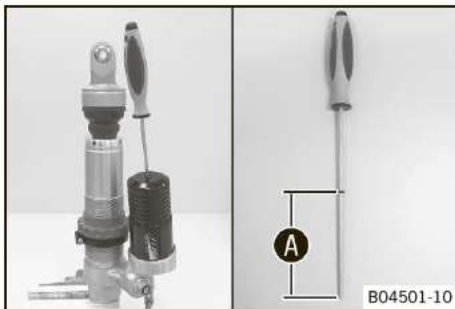
- ✓ Vacuum gauge ⑧ drops to the required value.

4 mbar

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

Depth micrometer (T107S) (p. 388)

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



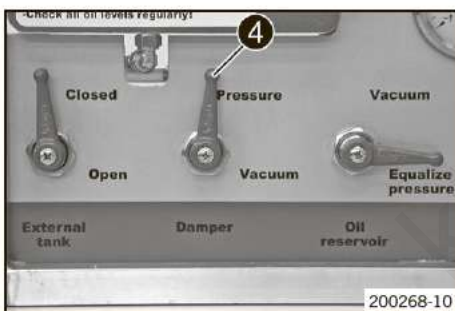
- When the vacuum gauge reaches the required value, turn control lever **Oil reservoir** ⑤ to **Equalize pressure**.

Guideline

4 mbar

- ✓ The pressure gauge rises to the specified value.

0 bar



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

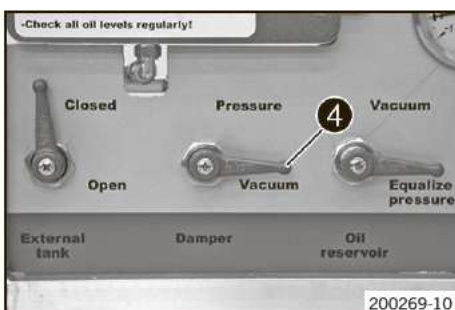
Guideline

0 bar

- ✓ Oil is pumped into the damper.

- ✓ The pressure gauge rises to the specified value.

3 bar



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

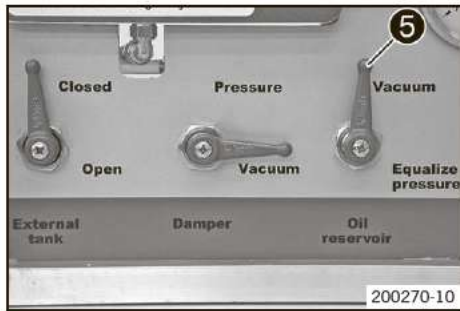
Guideline

3 bar

- ✓ The pressure gauge drops to the specified value.

0 bar

9 SHOCK ABSORBER, LINK FORK



- 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 specified value.

8 mbar



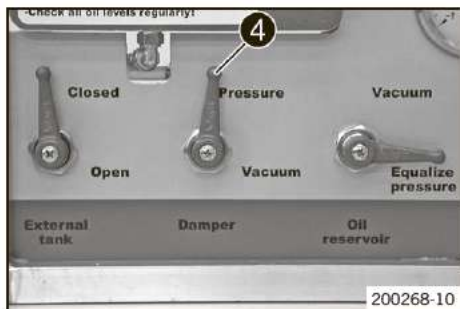
- When the vacuum gauge reaches the required value, turn control lever **Oil reservoir 5** to **Equalize Pressure**.

Guideline

8 mbar

- ✓ The pressure gauge drops to the specified value.

0 bar



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

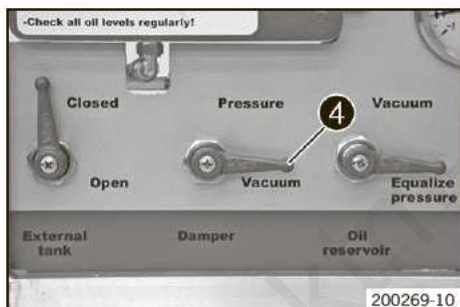
Guideline

0 bar

- ✓ Oil is pumped into the damper.

- ✓ The pressure gauge rises to the specified 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 specified value.

0 bar

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

Guideline

0 bar

- ✓ The vacuum pump is switched off.

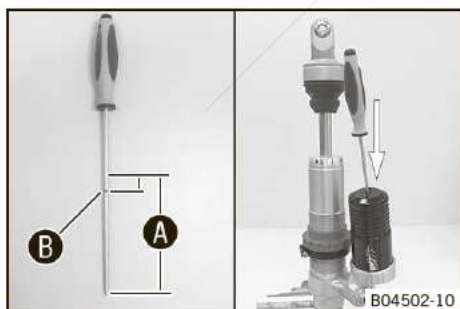
- Slide the O-ring to the end of the special tool by the specified value (distance **A** minus specified value **B**).

Guideline

5 mm

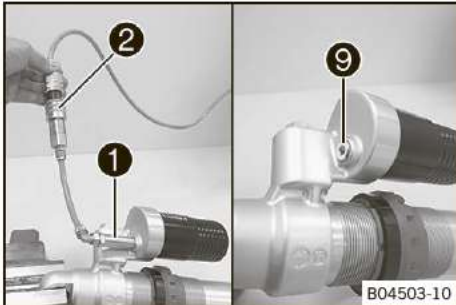
Depth micrometer (T107S) (p. 388)

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



**Info**

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



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

**Info**

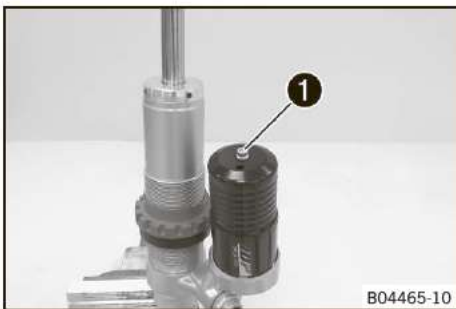
Hold the damper so that the filling port is at the highest point.

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

Guideline

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

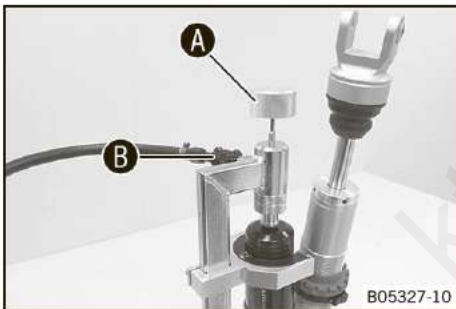
9.23 Filling damper with nitrogen



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

**Info**

The piston rod is fully extended.



- Fix the special tool in the vise.

Filling tool (T170S1) (p. 392)

Filling adapter (T1565) (p. 392)

- 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 ① engages in the hexagon socket of the filling port screw.

- Open filler tap ②.
- Fill the damper for at least 15 seconds.

Guideline

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

Info

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

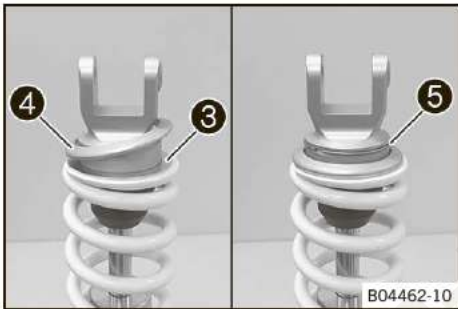
- Screw the filling port shut with tap handle **A**.
- Close spigot **B** and take the damper out of the special tool.
- Tighten the filling port screw.

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

9.24 Installing the spring



- Clamp the shock absorber into the vise.
- Guideline
- | |
|----------------|
| Use soft jaws. |
|----------------|



- 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	9 mm (0.35 in)
Hook wrench (90129051000) (📖 p. 383)	

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.

Hook wrench (90129051000) (p. 383)

- Tighten screw 6.

Guideline

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

**9.25 Checking the link fork**

- Check the link fork for damage, cracks, and deformation.
 - » If the link fork shows signs of damage, cracks, or deformation:
- Change the link fork.

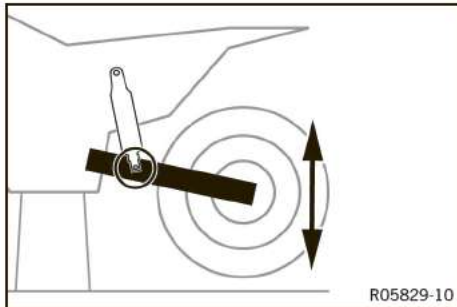
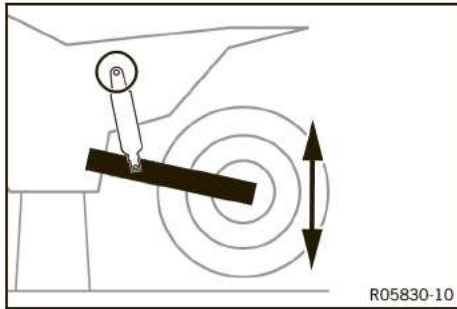
Guideline

Repairs on the link fork are not permitted.

9.26 Checking the shock absorber 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.

9 SHOCK ABSORBER, LINK FORK



Main work

- Check the upper heim joint.
- Move the link fork up and down.
 - » If there is detectable play:
 - Change the heim joint. (📖 p. 72)
- Check the lower heim joint.
- Move the link fork up and down.
 - » If there is detectable play:
 - Change the heim joint on the link fork. (📖 p. 84)

Finishing work

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

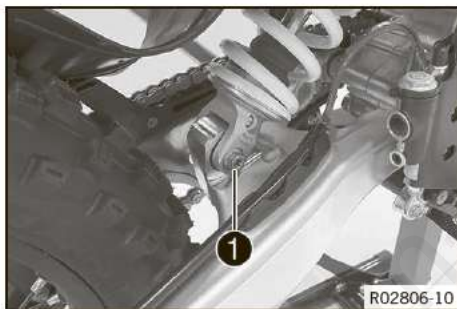
9.27 Changing the heim joint on the link fork

Preparatory work

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

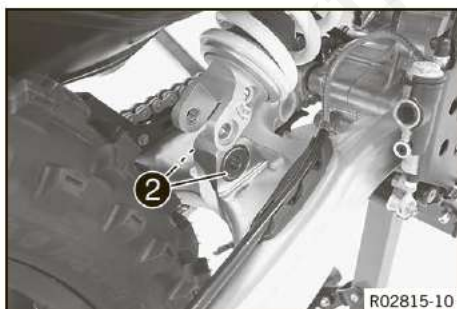
Main work

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

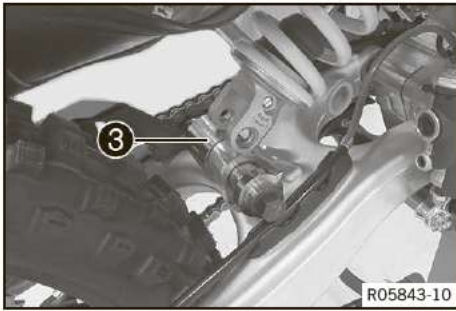


Info

Raise the link fork slightly to be able to remove the screw more easily.



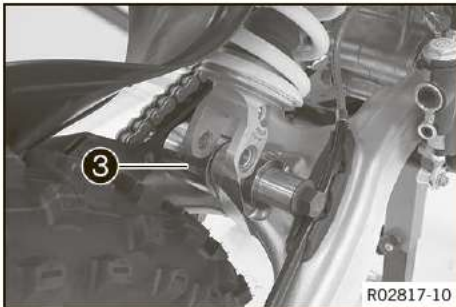
- Swing the shock absorber to the rear.
- Remove spacers ② on both sides.



- Mount special tool ③.

Pressing tool (79629000044) (p. 383)

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

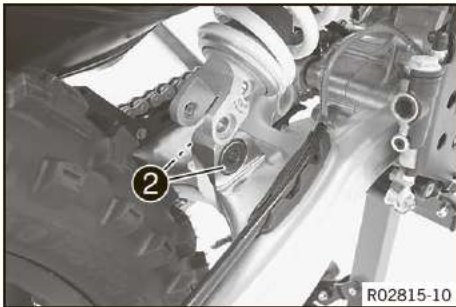


- Position the new heim joint.

- Mount special tool ③.

Pressing tool (79629000044) (p. 383)

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

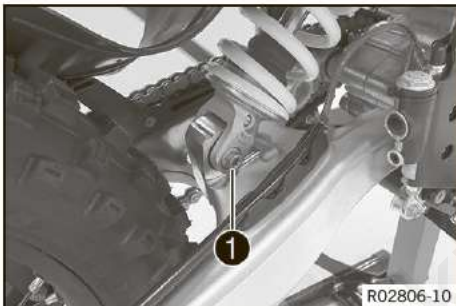


- Mount spacers ② on both sides.



Info

The heim joint for the shock absorber on the link fork is Teflon coated. It must not be lubricated with grease, nor with any 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) Loctite®2701™
------------------------------	-----	---



Info

Raise the link fork slightly to be able to mount the screw more easily.

Finishing work

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

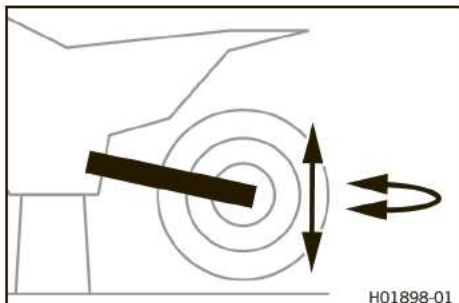
9.28 Checking the fork bearing for play

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 link fork up and down.
 - » If there is detectable play:
 - Change the link fork bearing. (📖 p. 89)
- Move the link fork from one side to the other.
 - » If there is detectable play:
 - Change the link fork bearing. (📖 p. 89)



Finishing work

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

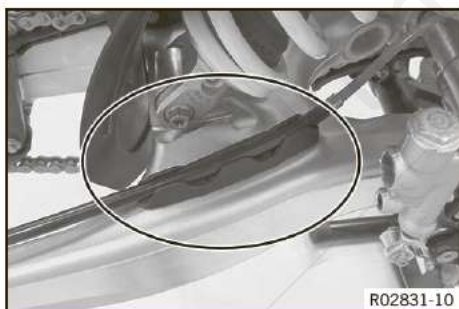
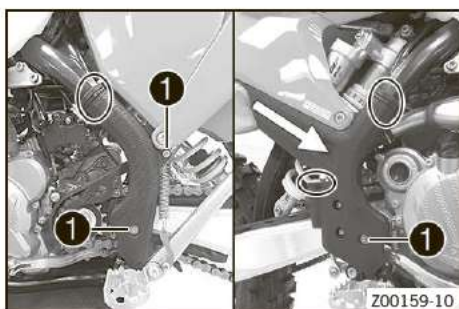
9.29 Removing the link fork

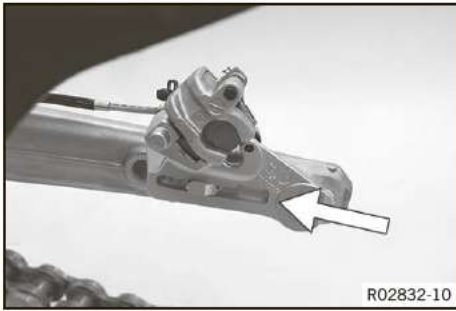
Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 12)
- Remove the rear wheel. (📖 p. 126)

Main work

- Remove screws ① with the washers.
- Remove the cable ties.
- Push the right frame protector to the front and take off at the bottom.
- Take off the left frame protector.
- Take the brake line out of the guide.



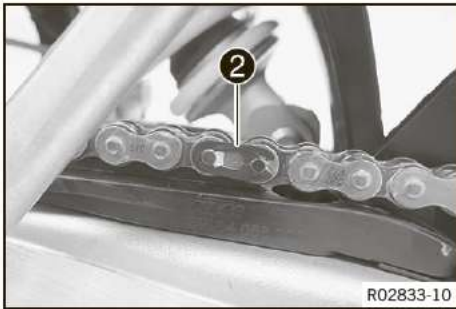


- Push the brake caliper forward, slip it out, and hang it to the side.



Info

Cover the components to protect them against damage.



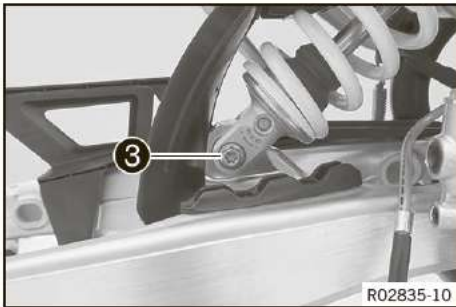
- Remove connecting link **2** of the chain.



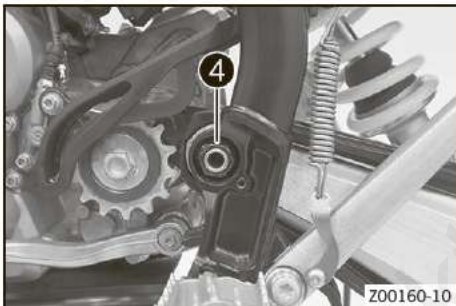
Info

Cover the components to protect them against damage.

- Take off the chain.

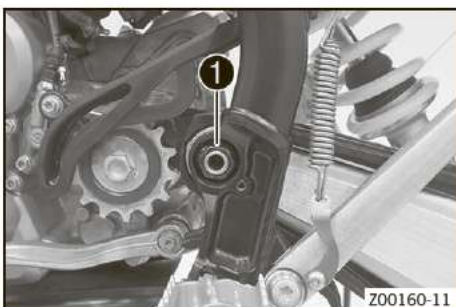


- Remove screw **3**.
- Push the link fork down and away from the shock absorber.



- Remove nut **4**.
- Remove the swingarm pivot.
- Take off the link fork.

9.30 Installing the link fork



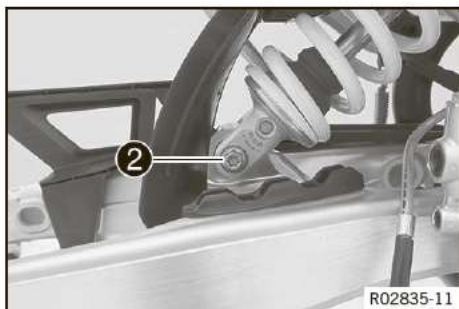
Main work

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

Guideline

Nut, fork pivot	M16x1.5	100 Nm (73.8 lbf ft)
-----------------	---------	-------------------------

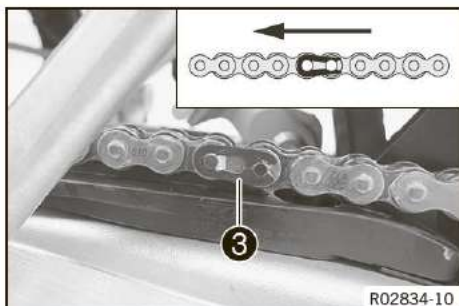
9 SHOCK ABSORBER, LINK FORK



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

Guideline

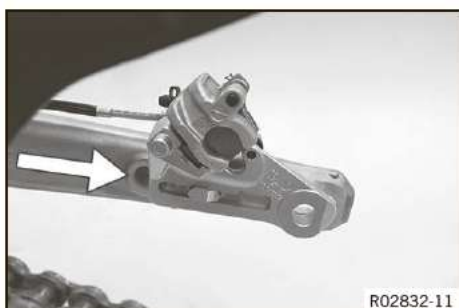
Screw, bottom shock absorber	M12	80 Nm (59 lbf ft) Loctite®2701™
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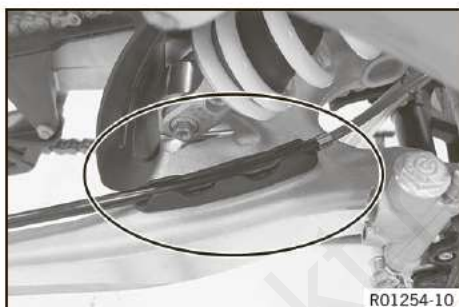
- Mount the chain.
- Connect the chain with connecting link ③.

Guideline

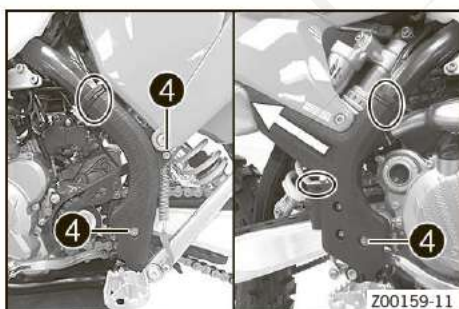
The closed side of the chain joint lock must face in the direction of travel.



- Position the brake caliper.



- Position the brake line in the guide.



- Insert the right frame protector from below and push it to the rear.
- Position the left frame protector.
- 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. 127)
- Check the chain tension. (📖 p. 132)
- Remove the motorcycle from the lift stand. (📖 p. 12)

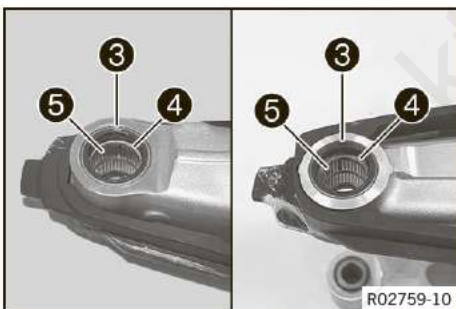
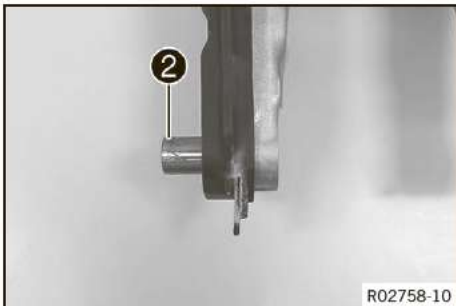
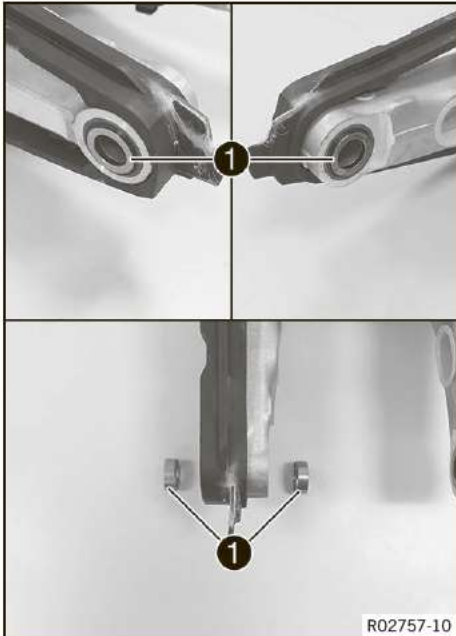
9.31 Changing the link fork bearing

Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 12)
- Remove the rear wheel. (📖 p. 126)
- Remove the link fork. (📖 p. 86)

Left fork bearing

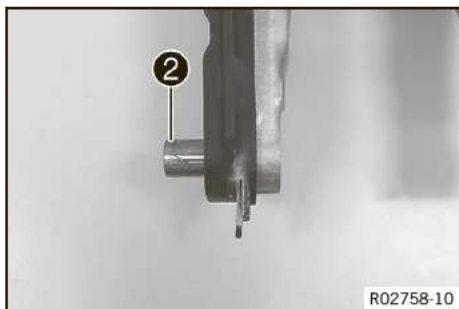
- Remove collar bushings ❶.



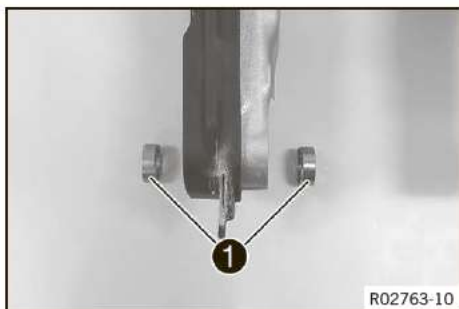
- Remove bushing ❷.

- Remove radial 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 radial shaft seal rings ❸.

9 SHOCK ABSORBER, LINK FORK



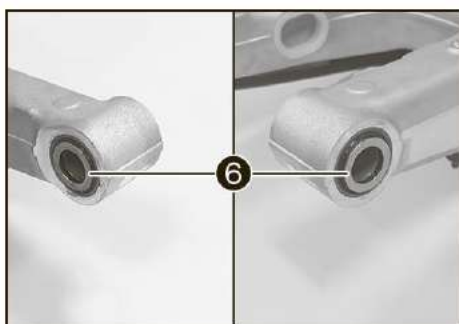
- Mount bushing ②.



- Grease the radial shaft seal rings.

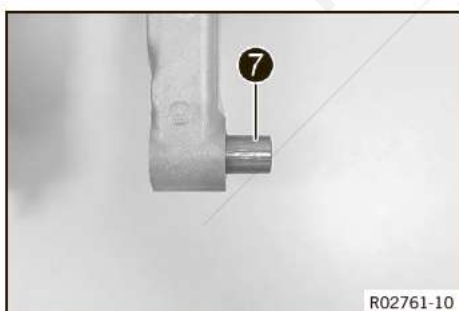
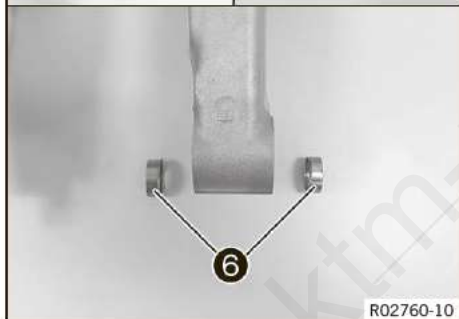
Long-life grease (R0 p. 372)

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

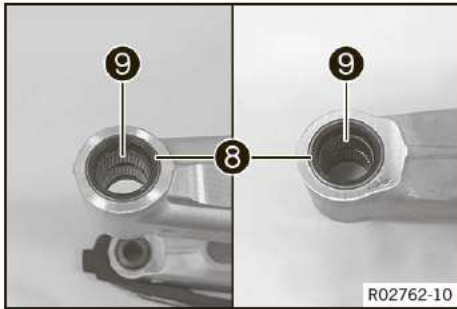


Right fork bearing

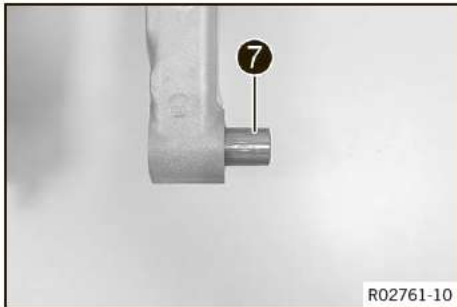
- Remove collar bushings ⑥.



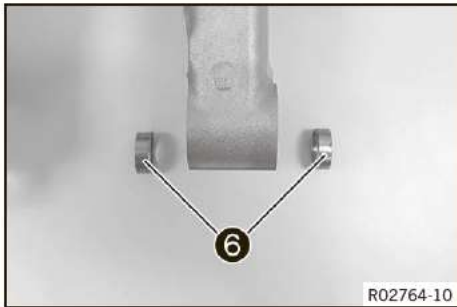
- Remove bushing ⑦.



- Remove radial 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 radial shaft seal rings ⑧.



- Mount bushing ⑦.



- Grease the radial shaft seal rings.

Long-life grease (📖 p. 372)

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

Finishing work

- Install the link fork. (📖 p. 87)
- Install the rear wheel. (📖 p. 127)
- Check the chain tension. (📖 p. 132)
- Remove the motorcycle from the lift stand. (📖 p. 12)

10.1 Removing the manifold



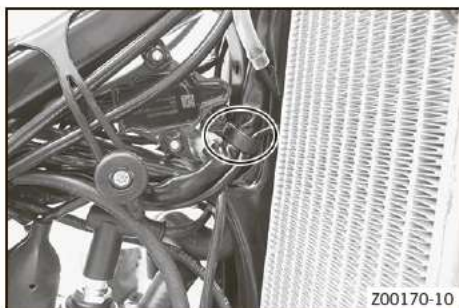
Warning

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

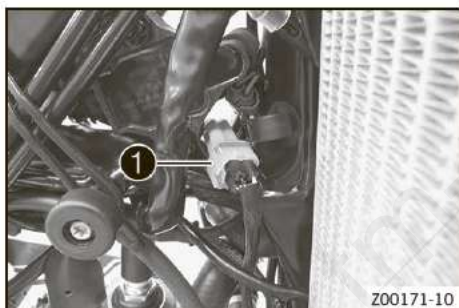
- Allow the exhaust system to cool down before performing any work on the vehicle.

(EU/CN/ASEAN)

- Remove the fuel tank. (p. 102)
- Remove the cable tie(s) and expose the cable.



- Open the cable holder.
- Expose the cable.

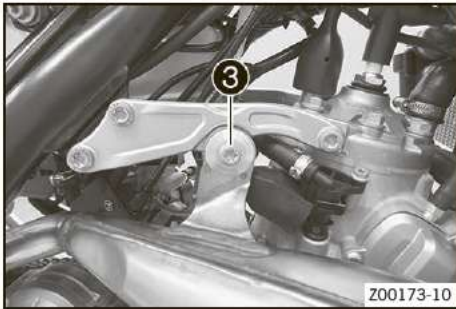


- Disconnect plug-in connector ① of the lambda sensor.
- Expose the cable.



- Remove springs ②.

Spring hook (50305017000C1) (p. 387)



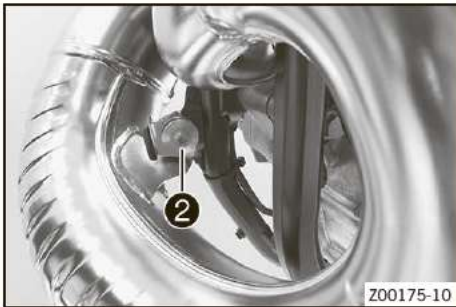
- Remove screw ③.
- Take off the manifold in a forward direction.



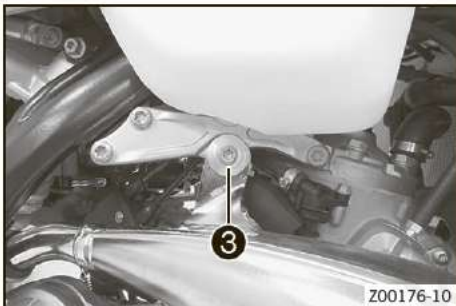
(US)

- Remove springs ①.

Spring hook (50305017000C1) (p. 387)

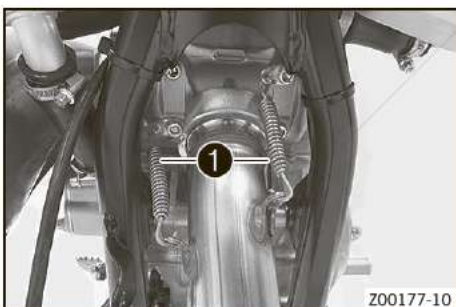


- Remove screw ②.



- Remove screw ③.
- Take off the manifold in a forward direction.

10.2 Installing the manifold



(EU/CN/ASEAN)

- Position the manifold and mount springs ①.

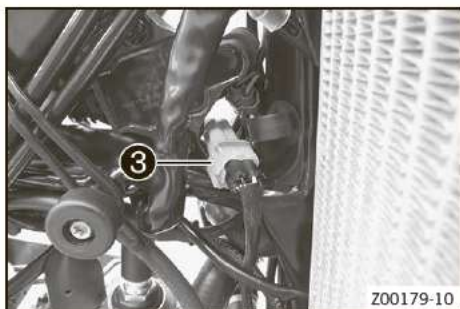
Spring hook (50305017000C1) (p. 387)



- Mount and tighten screw **2**.

Guideline

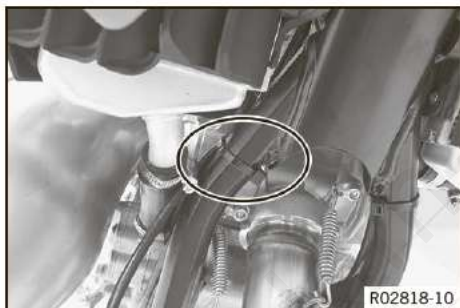
Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
---------------------------	----	--------------------



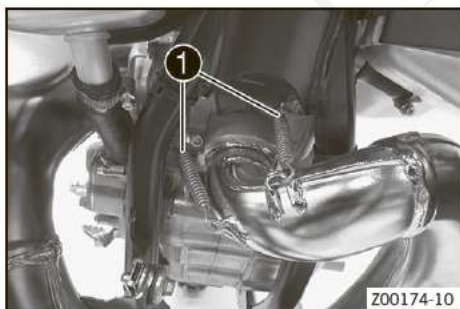
- Join plug-in connector **3** of the lambda sensor.



- Position the cables.
- Secure the cable with the cable holders.



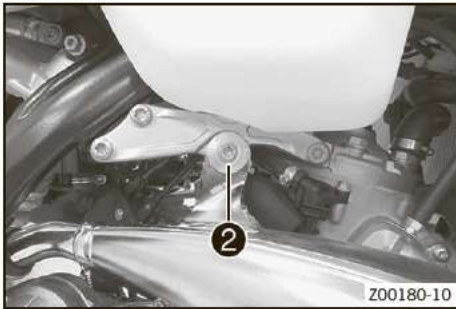
- Route the cable without tension and secure it with a cable tie.
- Install the fuel tank. (p. 103)



(US)

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

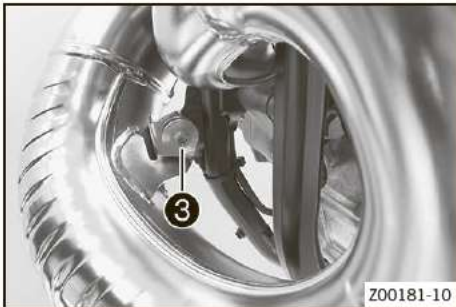
Spring hook (50305017000C1) (p. 387)



- Mount screw ②, but do not tighten yet.

Guideline

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



- Mount and tighten screw ③.

Guideline

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

- Tighten screw ②.

Guideline

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

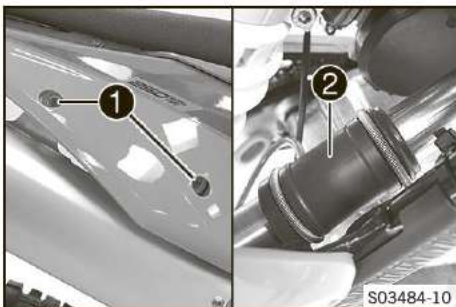
10.3 Removing the main silencer



Warning

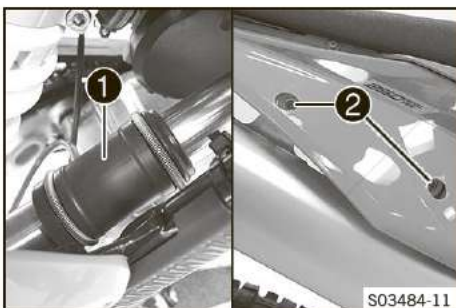
Danger of burns The exhaust system gets very hot when the vehicle is driven.

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



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

10.4 Installing the main silencer



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

Guideline

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

10.5 Changing the glass fiber yarn filling of the main silencer



Warning

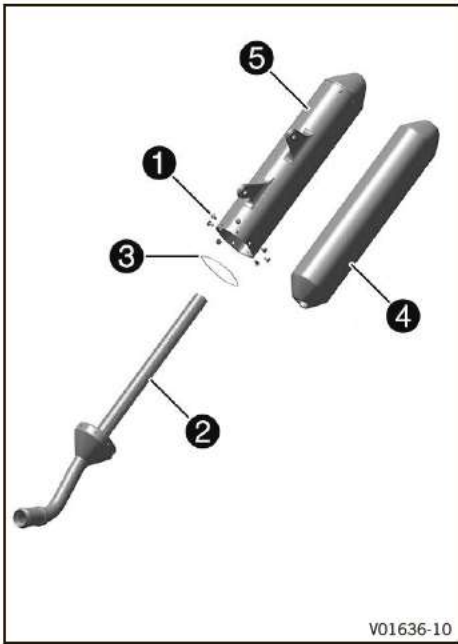
Danger of burns The exhaust system gets very hot when the vehicle is driven.

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



Info

Over time, the fibers of the glass fiber yarn filling escape and the damper "burns" out. Not only is the noise level higher, but the performance characteristics change.



- Preparatory work**
- Remove main silencer. (🔧 p. 95)
- Main work**
- Remove screws ❶. Pull out inner tube ❷ with O-ring ❸.
 - Pull glass fiber yarn filling ❹ from the inner tube.
 - Clean the parts that need to be reinstalled and check for damage.
 - Mount new glass fiber yarn filling ❹ on the inner tube.
 - Push outer tube ❺ over the inner tube with the new glass fiber yarn filling and the O-ring.
 - Mount and tighten all screws ❶.

Guideline		
Screws on main silencer	M5	7 Nm (5.2 lbf ft)

- Finishing work**
- Install the main silencer. (🔧 p. 95)

11.1 Removing the air filter box cover

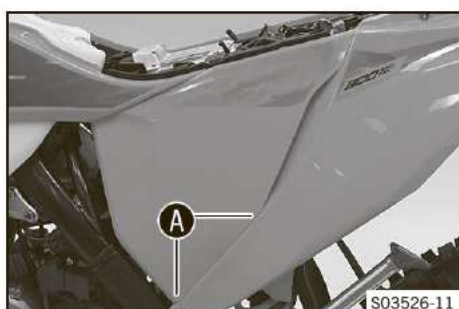
Preparatory work

- Remove the seat. (📖 p. 101)

Condition

The air filter box cover is secured.

- Remove screw ❶.

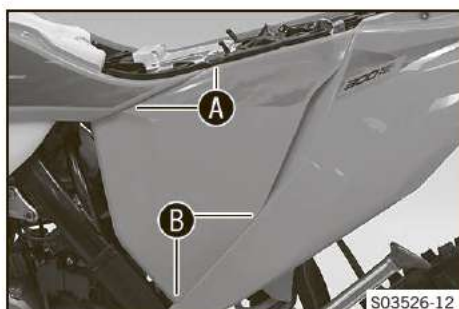


- Pull off the air filter box cover in area ❶ laterally and take it off at the front.

11.2 Installing the air filter box cover

Main work

- Insert the air filter box cover in area ❶ and clip it into area ❷.



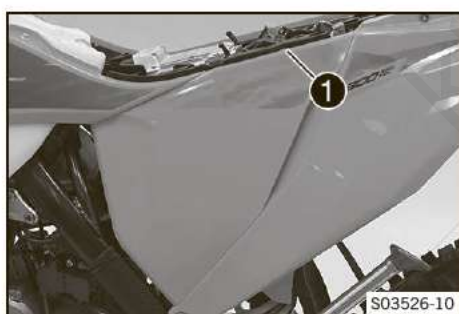
Condition

The air filter box cover is secured.

- Mount and tighten screw ❶.

Guideline

Screw, air filter box cover	EJOT PT® K60x20-Z	3 Nm (2.2 lbf ft)
-----------------------------	----------------------	-------------------



Finishing work

- Mount the seat. (📖 p. 101)

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.

- Only operate the vehicle if it is equipped with 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 seat. (📖 p. 101)
- Remove the air filter box cover. (📖 p. 97)

Main work

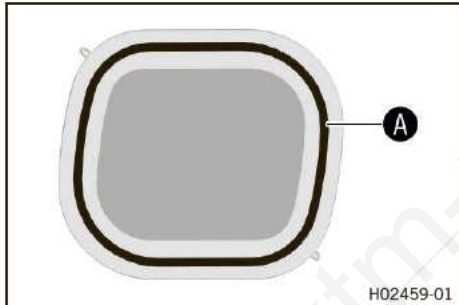


11.4 Installing the air filter

Main work

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

Long-life grease (📖 p. 372)



- 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. 97)
- Mount the seat. (📖 p. 101)

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 seat. (p. 101)
- Remove the air filter box cover. (p. 97)
- Remove the air filter. (p. 98)

Main work

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

Air filter cleaner (p. 372)



Info

Only press the air filter to dry it, never wring it out.

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

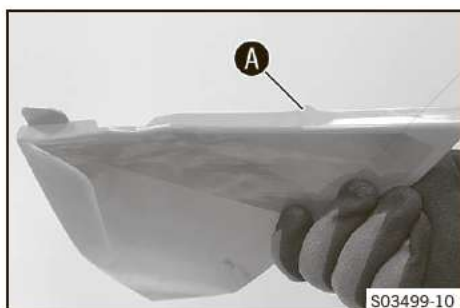
Oil for foam air filter (p. 373)

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

Finishing work

- Install the air filter. (p. 98)
- Install the air filter box cover. (p. 97)
- Mount the seat. (p. 101)

11.6 Preparing air filter box cover for securing



Preparatory work

- Remove the seat. (p. 101)
- Remove the air filter box cover. (p. 97)

Main work

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

Guideline

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

Finishing work

- Install the air filter box cover. (p. 97)
- Mount the seat. (p. 101)

12.1 Opening the fuel tank filler cap



Danger

Fire hazard Fuel is highly flammable.

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

- Do not fuel 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 fuel tank filler cap counter-clockwise, and lift it off.

12.2 Closing the fuel tank filler cap



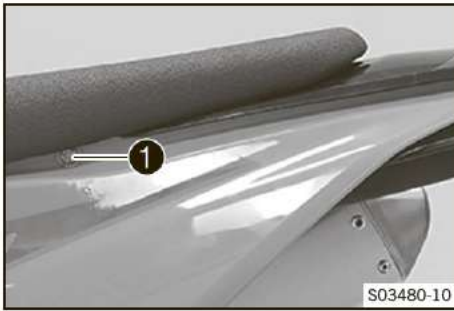
- Mount the fuel tank filler cap and turn it clockwise until release button **1** engages.



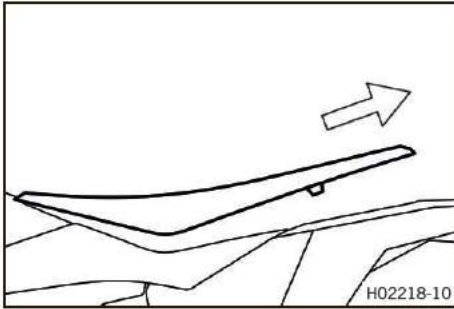
Info

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

12.3 Removing the seat

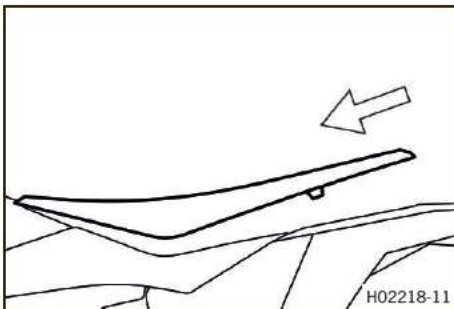


- Remove screw ① on the left side.

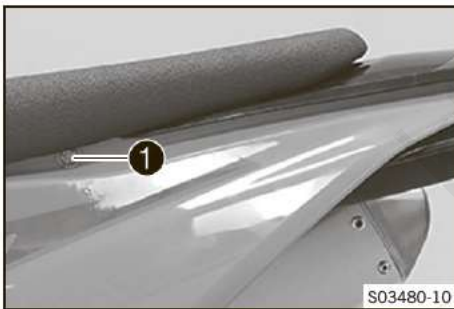


- Raise the rear of the seat, pull the seat back, and lift it off.

12.4 Mounting the seat



- Mount the front of the seat on the two collar bushings of the fuel tank, lower the seat at the rear, and push the seat forward.
- Make sure the seat is latched in place correctly.



- Mount and tighten screw ① on the left side.

Guideline

Screw, seat fixing	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 fuel 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.

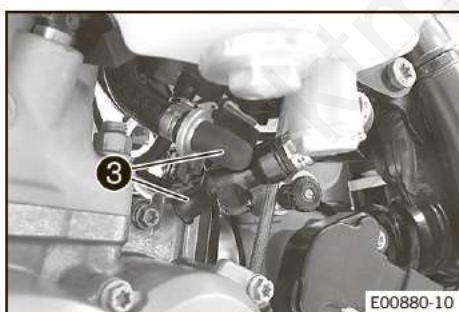
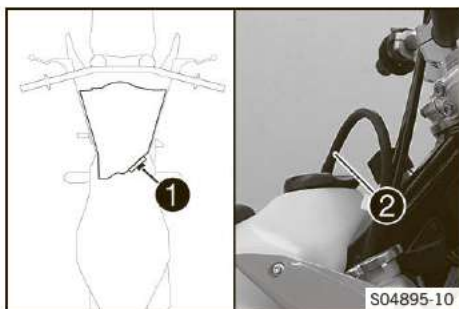
- Avoid skin, eye and clothing contact with fuel.
- Immediately consult a doctor if you swallow fuel.
- Do not inhale fuel vapors.
- In case of skin contact, rinse the affected area with plenty of water.
- Rinse the eyes thoroughly with water, and consult a doctor in case of fuel contact with the eyes.
- 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. 101)

Main work

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



- Clean the quick release coupling 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 quick release coupling.

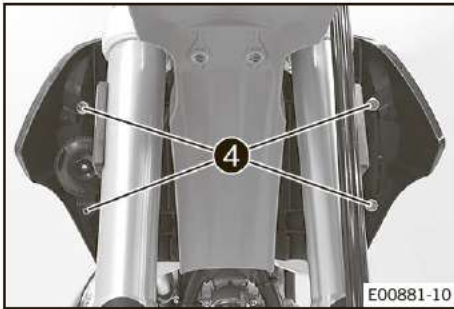


Info

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.
(EU/CN/ASEAN)
- Hang the horn and horn bracket to one side.



- Remove screw ⑤ with the rubber bushing.



- Pull both spoilers off laterally from the radiator mount 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.

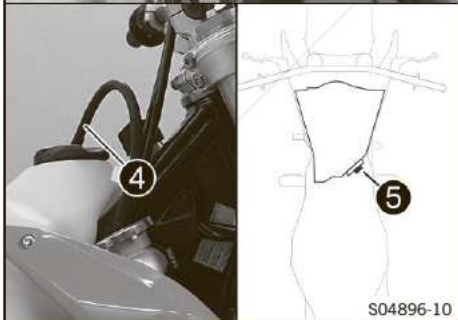
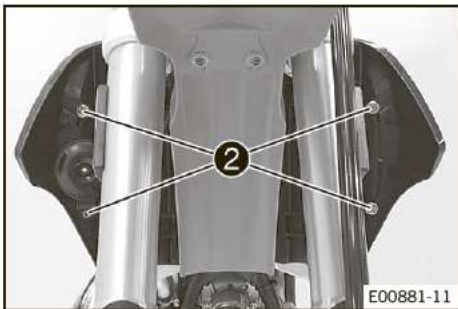
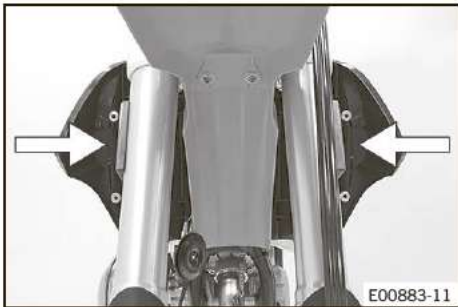
- Do not fuel the vehicle in the vicinity of open flames or lit cigarettes.
- Switch off the engine for refueling.
- Make sure that no fuel is spilled; particularly not on hot parts of the vehicle.
- If any fuel is spilled, wipe it off immediately.
- Observe the specifications for refueling.



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 the throttle cable routing. (p. 51)
- 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)
---------------------------	----	--------------------

(EU/CN/ASEAN)

- 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.
- Clean the quick release coupling thoroughly with compressed air.



Info

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

- Spray silicone spray onto a lint-free cleaning cloth and lightly lubricate the O-ring of the quick-release coupling.

Silicone spray (p. 373)

- Join quick release coupling (3).



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. 101)

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 fuel 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**

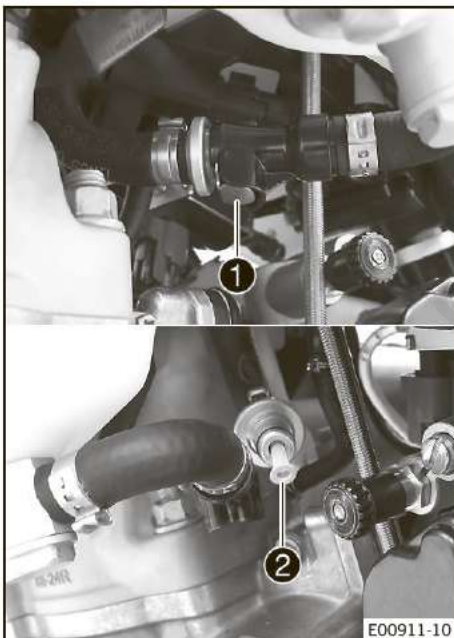
Danger of poisoning Fuel is poisonous and a health hazard.

- 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 quick release coupling ❶ 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 quick release coupling.

**Info**

Remaining fuel may flow out of the fuel hose.

- Pull fuel screen ❷ out of the connecting piece.
- Insert the new fuel screen all the way into the connecting piece.
- Spray silicone spray onto a lint-free cleaning cloth and lightly lubricate the O-ring of the quick-release coupling.

Silicone spray (📖 p. 373)

- Join the quick release coupling.



Danger

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

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

- Start the engine and check 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 fuel 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.

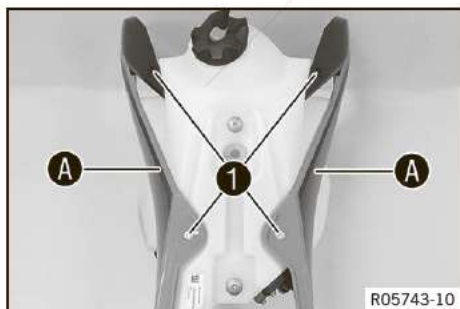
- Do not allow fuel to enter the groundwater, the soil, or the sewage system.

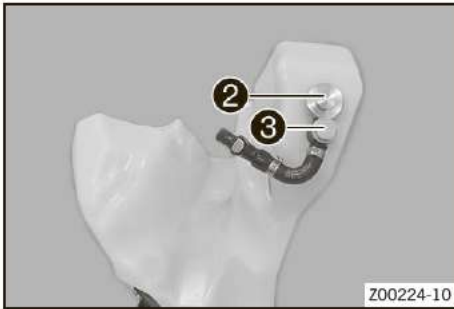
Preparatory work

- Drain the fuel from the fuel tank into a suitable container.
- Remove the seat. (📖 p. 101)
- Remove the fuel tank. (📖 p. 102)

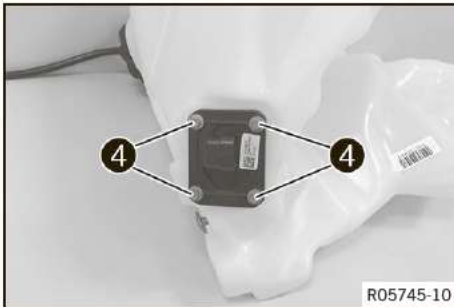
Main work

- Remove screws ①.
- Detach the front side cover in area A to the front and take it off.





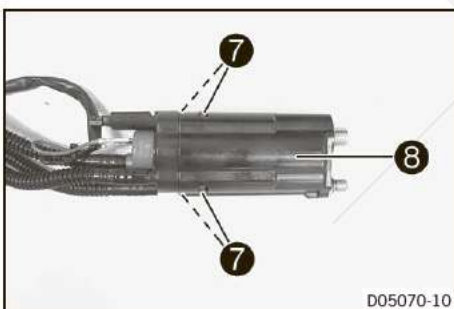
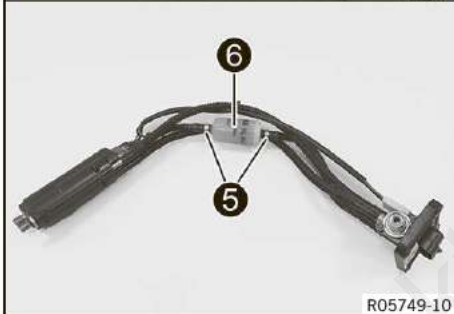
- Remove nut 2 with the gasket.
- Remove fuel connection 3 with the O-rings.



- Remove screws 4.



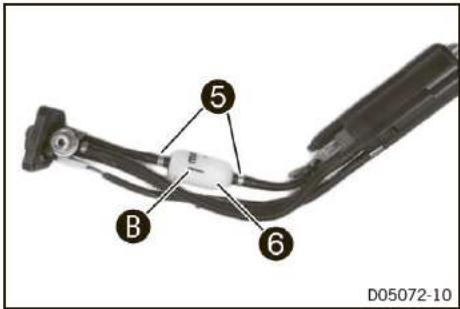
- Pull out the fuel pump.
- Remove hose clamps 5.
- Remove fuel filter 6.



- Press locking mechanism 7.
- Pull back fuel pump housing 8.

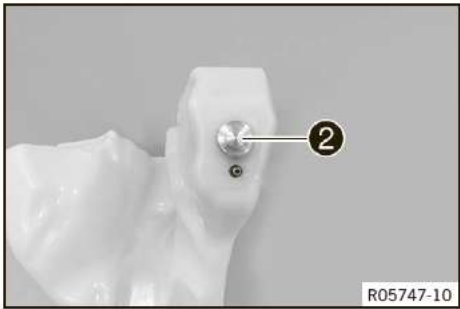


- Change fuel screen 9.
- Mount the fuel pump housing.

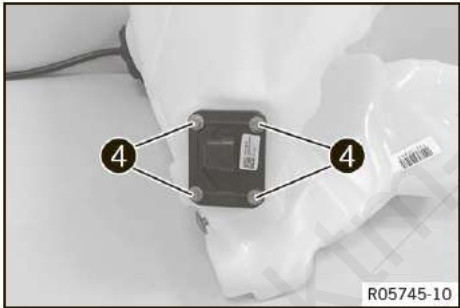


- Mount new fuel filter 6.
- ✓ Arrow B points away from the fuel pump.
- Mount hose clamps 5.

Hose clamp pliers (60029057000) (p. 381)



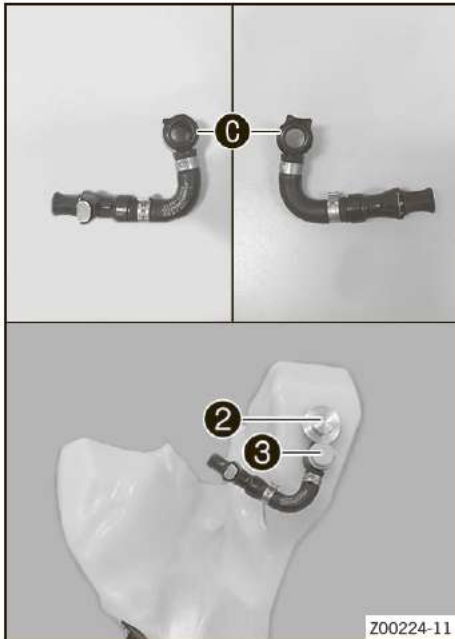
- Position the fuel pump.
- Mount nut 2 with gasket, but do not tighten yet.



- Mount and tighten screws 4.

Guideline

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



- Grease O-rings **C** lightly.

Multi-purpose grease (00062010051) (p. 373)



Info

Make sure that no grease gets into the fuel connection.

- Mount fuel connection **3** with the O-rings but do not tighten yet.
- Tighten nut **2**.

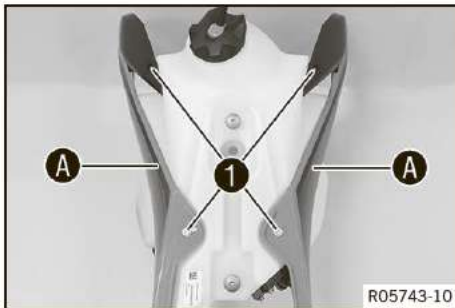
Guideline

Nut, fuel pump mounting	M12	15 Nm (11.1 lbf ft)
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- Tighten fuel connection **3**.

Guideline

Fuel connection on fuel pump	M8	15 Nm (11.1 lbf ft)
------------------------------	----	---------------------



- Attach side covers in area **A** and position.
- Mount and tighten screws **1**.

Finishing work

- Install the fuel tank. (p. 103)
- Mount the seat. (p. 101)

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 fuel 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.

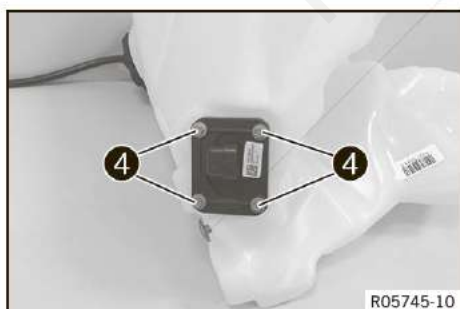
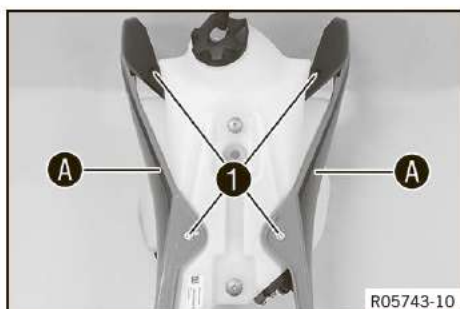
- Do not allow fuel to enter the groundwater, the soil, or the sewage system.

Preparatory work

- Drain the fuel from the fuel tank into a suitable container.
- Remove the seat. (p. 101)
- Remove the fuel tank. (p. 102)

Main work

- Remove screws ①.
- Detach the front side cover in area A to the front and take it off.



- Remove nut ② with the gasket.
- Remove fuel connection ③ with the O-rings.

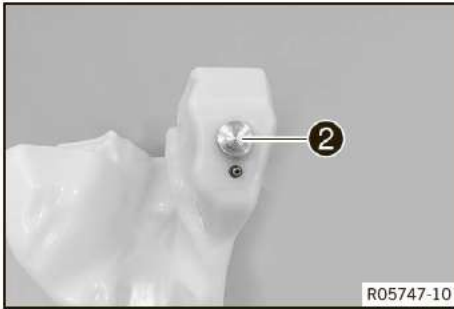
- Remove screws ④.



- Remove the fuel pump.

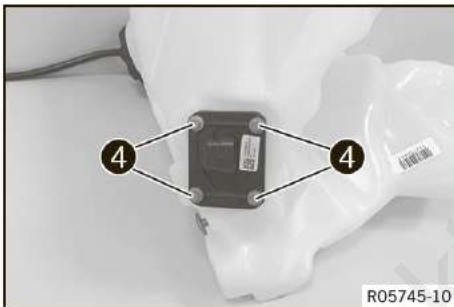


R05746-10



- Position the new fuel pump.
- Mount nut ② with gasket, but do not tighten yet.

R05747-10



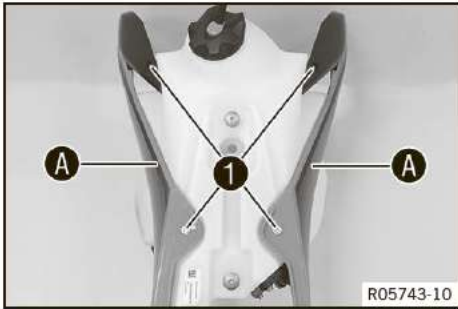
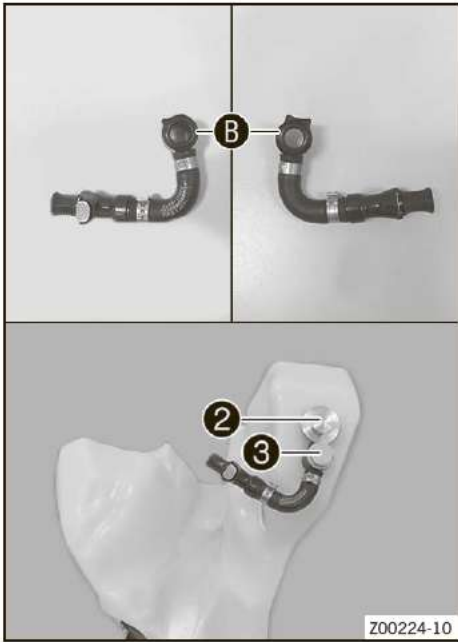
- Mount and tighten screws ④.

Guideline

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

- ✓ The connector points downwards.

R05745-10



- Grease O-rings **B** lightly.

Multi-purpose grease (00062010051) (📖 p. 373)

i Info
Make sure that no grease gets into the fuel connection.

- Mount fuel connection **3** with the O-rings but do not tighten yet.
- Tighten nut **2**.

Guideline

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

- Tighten fuel connection **3**.

Guideline

Fuel connection on fuel pump	M8	15 Nm (11.1 lbf ft)
------------------------------	----	---------------------

- Attach side covers in area **A** and position.
- Mount and tighten screws **1**.

Finishing work

- Install the fuel tank. (📖 p. 103)
- Mount the seat. (📖 p. 101)

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 fuel 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.



- Clean the quick release coupling thoroughly with compressed air.



Info

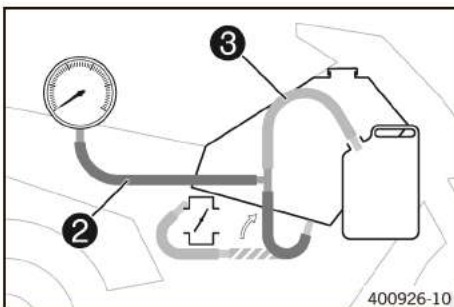
Under no circumstances should dirt enter into the fuel line. Dirt in the fuel line clogs the injection valve!

- Press on the small metal plate and disconnect quick release coupling 1.



Info

Remaining fuel may flow out of the fuel hose.



- Mount special tool 2.

Pressure testing tool (61029094000) (p. 382)

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

Testing hose (61029093000) (p. 381)

- 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
---------------------------------------	-------

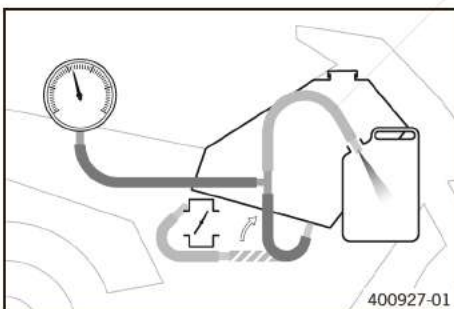
- Check the fuel pressure with the fuel tank filler cap closed.

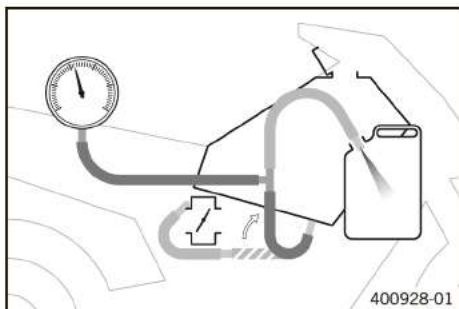
Fuel pressure

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

» If the specification is not reached:

- Open the fuel tank filler cap. (p. 100)
- Check the fuel tank breather.





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

Fuel pressure	
When the fuel pump is active	3.35 ... 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. 106)
- Change the fuel pump. (p. 109)

- Stop the "Actuator test" > "Fuel pump" by pressing the "Quit" button.
- Remove the special tools.
- Join the quick release coupling.

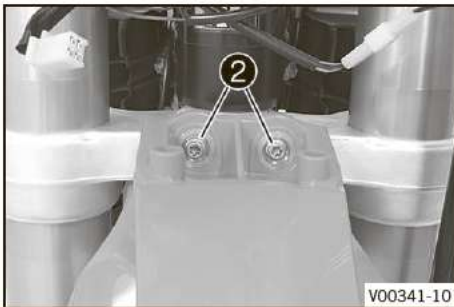
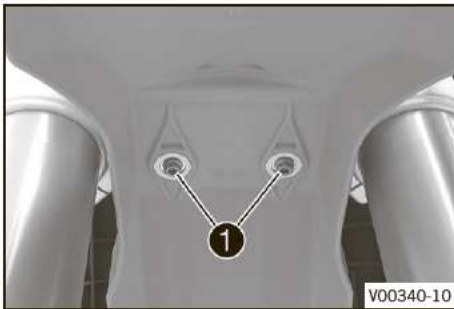
13.1 Removing front fender

Preparatory work

- Remove the headlight mask with the headlight. (📖 p. 116)

Main work

- Remove screws ❶.



- Remove screws ❷. Take off front fender.

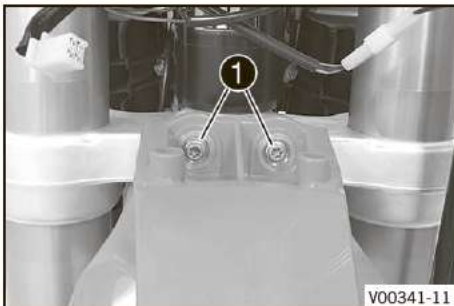
13.2 Installing front fender

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

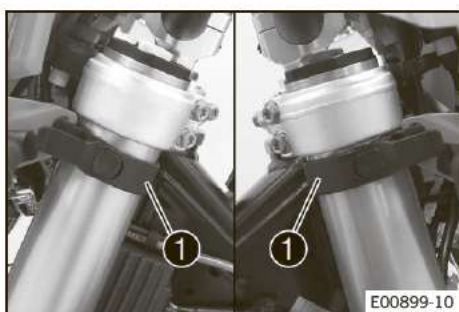
Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
------------------------------	----	--------------------



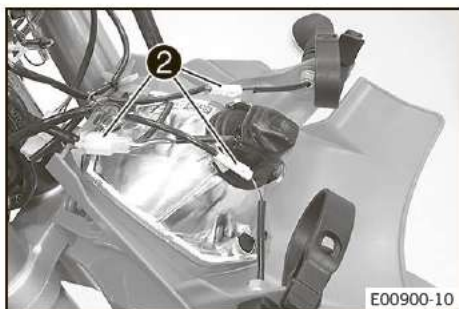
Finishing work

- Install the headlight mask with the headlight. (📖 p. 116)
- Check the headlight setting. (📖 p. 166)

13.3 Removing the headlight mask with the headlight

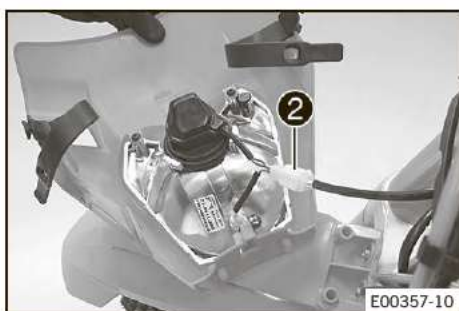


- Detach the brake line and wiring harness from the headlight mask.
- Loosen rubber strap ①. Slide the headlight mask up and swing it forward.



(EU/CN/ASEAN)

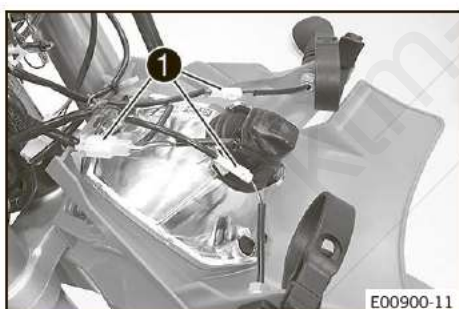
- Detach plug-in connectors ② and take off the headlight mask with the headlight.



(US)

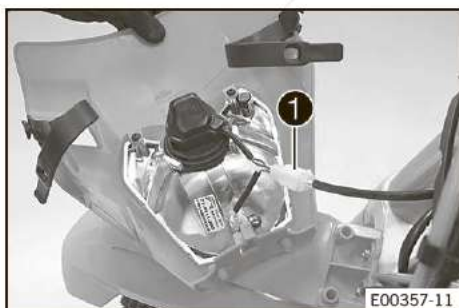
- Disconnect plug-in connector ② and take off the headlight mask together with the headlight.

13.4 Installing the headlight mask with the headlight



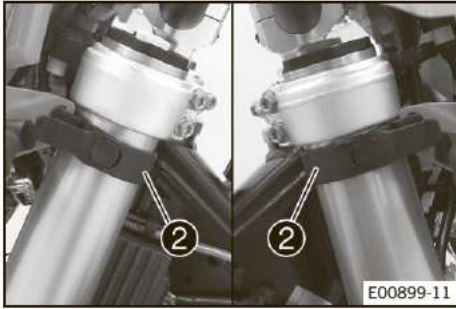
Main work
(EU/CN/ASEAN)

- Join plug-in connectors ①.



(US)

- Join plug-in connector ①.



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

Finishing work

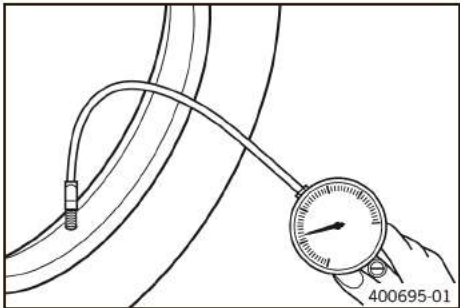
- Check the headlight setting. (📖 p. 166)



ktm-manuals.com

14.1 Checking tire pressure

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



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

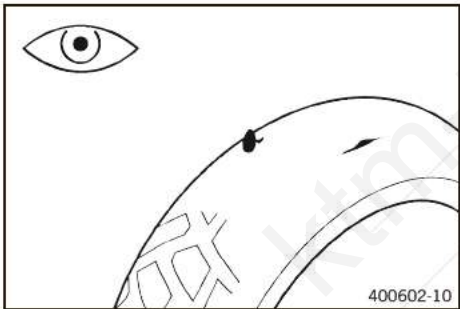
Street tire pressure (EU/CN/ASEAN)	
front	2.0 bar (29 psi)
rear	2.0 bar (29 psi)

Offroad tire pressure	
front	1.0 bar (15 psi)
rear	1.0 bar (15 psi)

- » If the tire pressure does not meet specifications:
 - Correct tire pressure.
- Mount the protection 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 pressure of the tires all have a major impact on the handling characteristic of the motorcycle.
Worn tires have a negative effect on handling characteristics, especially on wet surfaces.

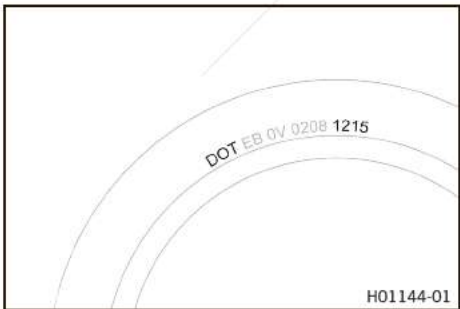


- Check the front and rear tires for cuts, embedded objects, and other damage.
 - » If the tires have cuts, run-in objects, or other damage:
 - Change the tires.
- Check the tread depth.

i Info
Adhere to the legally required minimum tread depth.

Minimum tread depth	≥ 2 mm (≥ 0.08 in)
---------------------	--------------------

- » If the tread depth is less than the minimum tread depth:
 - Change the tires.
- Check the tire age.





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.



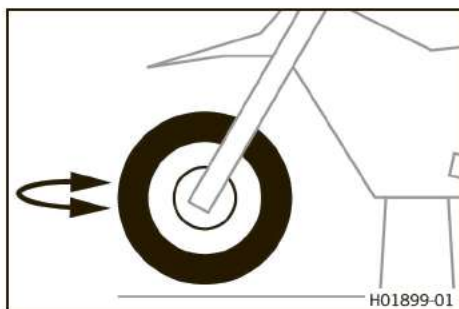
14.3 Checking the wheel bearing for play

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.

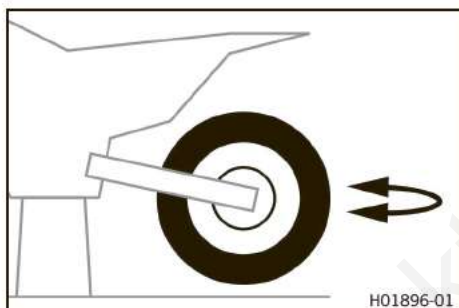


Info

Hold fork leg to check it.

- » If there is detectable play:
 - Change front wheel bearing. (📖 p. 125)

- 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.



Info

Hold the link fork to check it.

- » If there is detectable play:
 - Change the rear wheel bearing. (📖 p. 129)

Finishing work

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



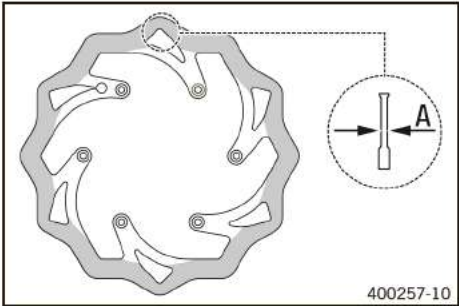
14.4 Checking the brake discs



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 models)	
front	2.5 mm (0.098 in)
rear	3.5 mm (0.138 in)
Brake discs - wear limit (All special 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. 124)
 - Change the rear brake disc. (📖 p. 128)
- 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. 124)
 - Change the rear brake disc. (📖 p. 128)

14.5 Checking the rim run-out



Warning

Danger of accidents Incorrectly tensioned spokes impair the handling characteristic and result in secondary damage.

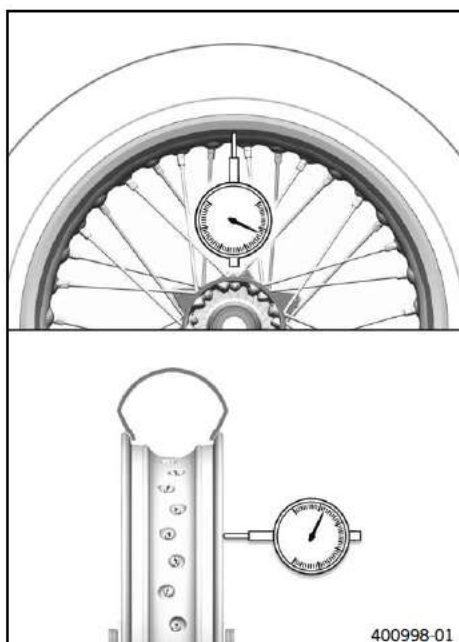
The spokes break due to being overloaded if they are too tightly tensioned. If the tension in the spokes is too low, then lateral and radial run-out will form in the wheel. Other spokes will become looser as a result.

- 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.

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

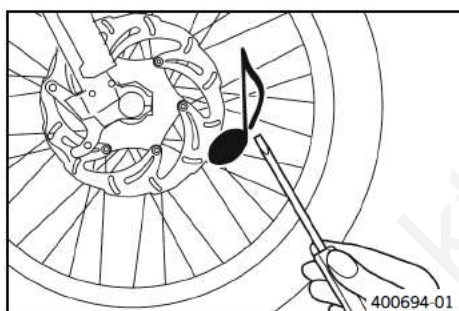


Warning

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

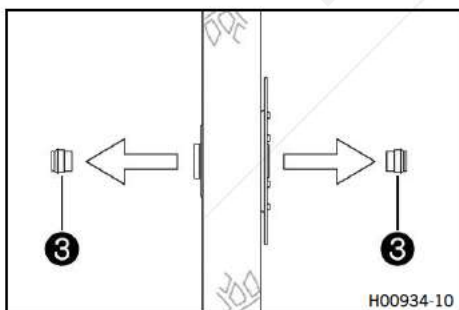
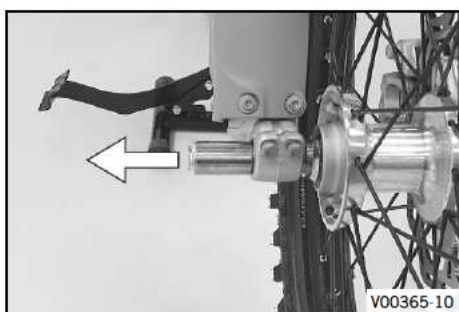
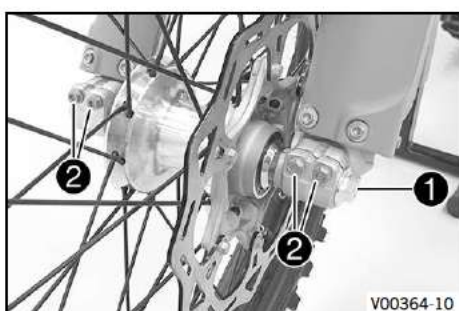
Spoke nipple, front wheel	M4.5	6 Nm (4.4 lbf ft)
Spoke nipple, rear wheel	M4.5	6 Nm (4.4 lbf ft)

Torque wrench kit (58429094000) (p. 380)



14.7 Front wheel

14.7.1 Removing the front wheel



Preparatory work

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

Main work

- Manually press the brake caliper toward the brake disc 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.

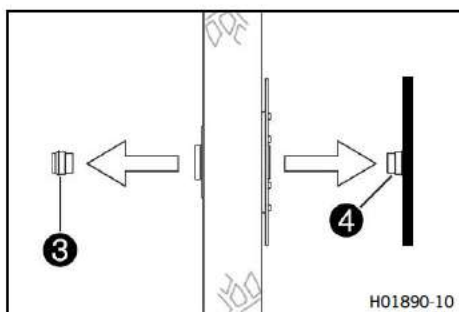


Info

Do not actuate the hand brake lever when the front wheel is removed.

(All Standard and SIX DAYS models)

- Remove spacers 3.



(All ERZBERGRODEO models)

- Remove spacer 3 and brake disc guard 4.

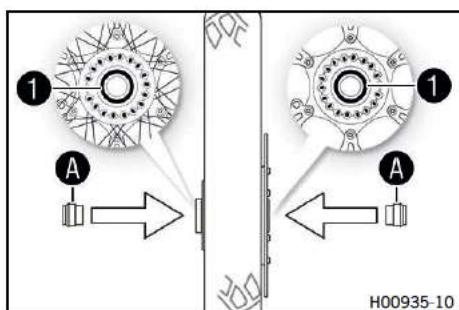
14.7.2 Installing the front wheel



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.



(All Standard and SIX DAYS models)

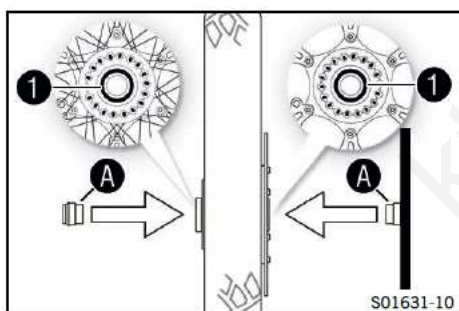
- Check the wheel bearing for damage and wear.
 - » If the wheel bearing is damaged or worn:
 - Change front wheel bearing. (p. 125)
- Clean and grease shaft seal rings 1 and contact surfaces A of the spacers.

Long-life grease (p. 372)

- Insert the spacers.
- Clean and grease the wheel spindle.

Long-life grease (p. 372)

- Jack up the front wheel into the fork, position it, and insert the wheel spindle.
 - ✓ The brake linings are correctly positioned.



(All ERZBERGRODEO models)

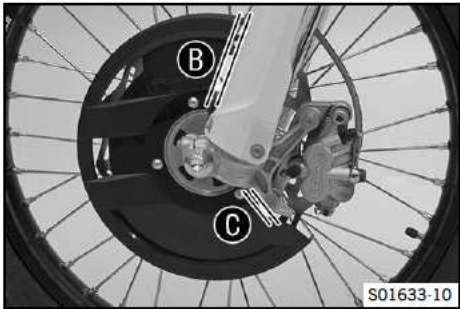
- Check the wheel bearing for damage and wear.
 - » If the wheel bearing is damaged or worn:
 - Change front wheel bearing. (p. 125)
- Clean and grease shaft seal rings 1 and contact surfaces A of the spacers.

Long-life grease (p. 372)

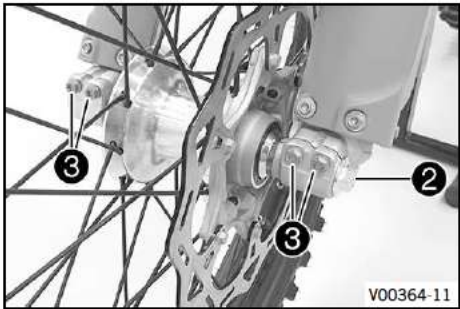
- Insert the spacer and brake disc guard.
- Clean and grease the wheel spindle.

Long-life grease (p. 372)

- Position the front wheel and insert the wheel spindle.
 - ✓ The brake linings are correctly positioned.



- Align the brake disc guard so that distance **B** and **C** are equal in size.

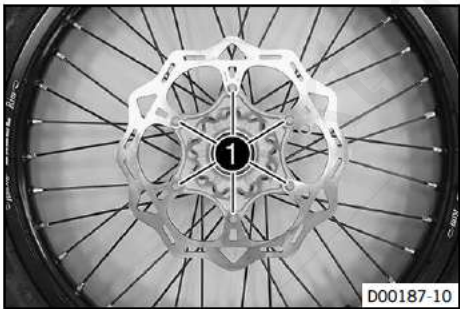


- Mount and tighten screw **2**.
Guideline
- | | | |
|----------------------------|---------|---------------------|
| Screw, front wheel spindle | M20x1.5 | 35 Nm (25.8 lbf ft) |
|----------------------------|---------|---------------------|
- Operate the hand brake lever several times until the brake 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

i 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. 122)



- Main work**
(All Standard and ERZBERGRODEO models)
- Remove screws **1**. Take off the brake disc.
 - Clean the contact surface of the brake disc.
 - Position the brake disc with the label facing outward.
 - Mount and tighten screws **1**.
Guideline
- | | | |
|-------------------------|----|--|
| Screw, front brake disc | M6 | 14 Nm (10.3 lbf ft)
Loctite®243™ |
|-------------------------|----|--|



(All SIX DAYS models)

- Remove screws 1. Take off the brake disc.
- Clean the contact surface of the brake disc.
- Position the brake disc with the label facing outward.
- Mount and tighten screws 1.

Guideline

Screw, front brake disc	M6	14 Nm (10.3 lbf ft) Loctite®243™
----------------------------	----	--

Finishing work

- Install the front wheel. (p. 123)



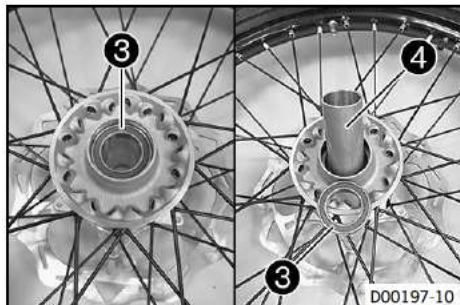
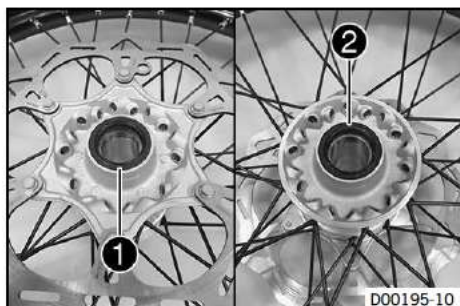
14.7.4 Changing the front wheel bearing

Preparatory work

- Raise the motorcycle with a lift stand. (p. 12)
- Remove the front wheel. (p. 122)

Main work

- Remove radial shaft seal rings 1 and 2.



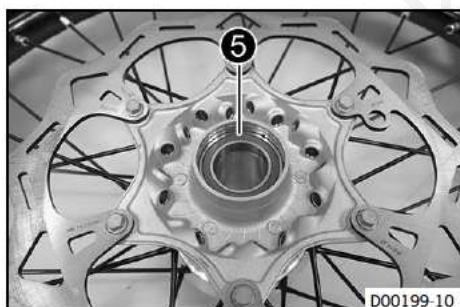
- Press out bearing 3 using a suitable tool.



Info

Spacing tube 4 can be pushed aside.

- Remove spacing tube 4.

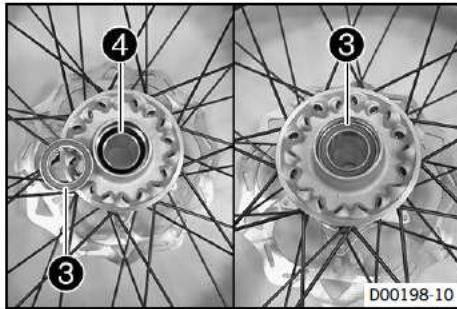


- Press out bearing 5 using a suitable tool.
- Press in new bearing 5 all the way using a suitable tool.



Info

Only press the bearing in via the outer bearing race, otherwise the bearing will be damaged when it is pressed in.



- Clean, grease, and mount spacing tube **4**.

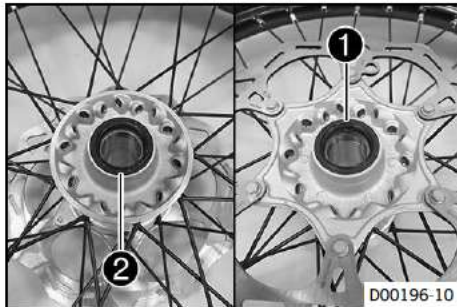
Long-life grease (p. 372)

- Press in new bearing **3** all the way using a suitable tool.



Info

Only press the bearing in via the outer bearing race, otherwise the bearing will be damaged when it is pressed in.



- Grease new radial shaft seal rings **2** and **1** and press in until they are flush.

Finishing work

- Install the front wheel. (p. 123)

14.8 Rear wheel

14.8.1 Removing the rear wheel

Preparatory work

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

Main work

- Manually press the brake caliper toward the brake disc to push back the brake piston.



Info

Make sure that you do not press the brake caliper against the spokes when pushing back the brake piston.

- Remove nut **1**.
- Take off 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.



Info

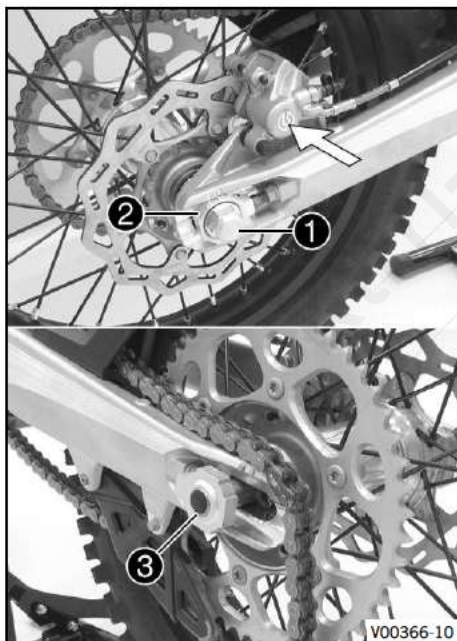
Cover the components to protect them against damage.



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.



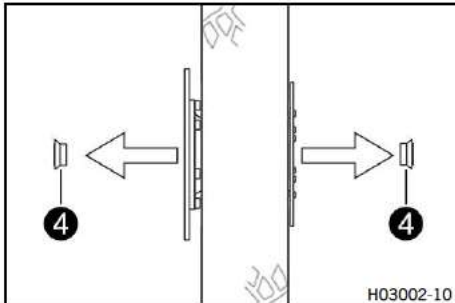
- Hold the rear wheel and remove the wheel spindle. Take the rear wheel out of the link fork.



Info

Do not operate the foot brake lever when the rear wheel is removed.

- Remove spacers ④.



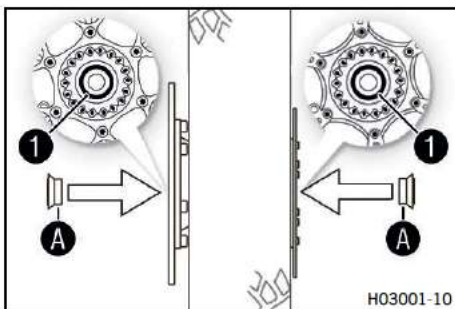
14.8.2 Installing the rear wheel



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

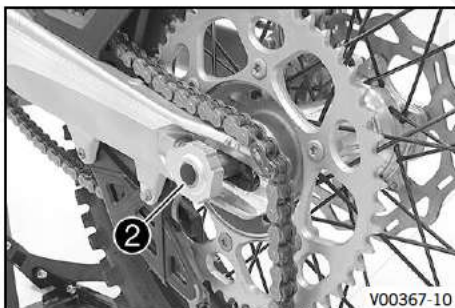
- Check the wheel bearing for damage and wear.
 - » If the wheel bearing is damaged or worn:
 - Change the rear wheel bearing. (p. 129)
- Clean and grease shaft seal rings ① and contact surfaces A of the spacers.

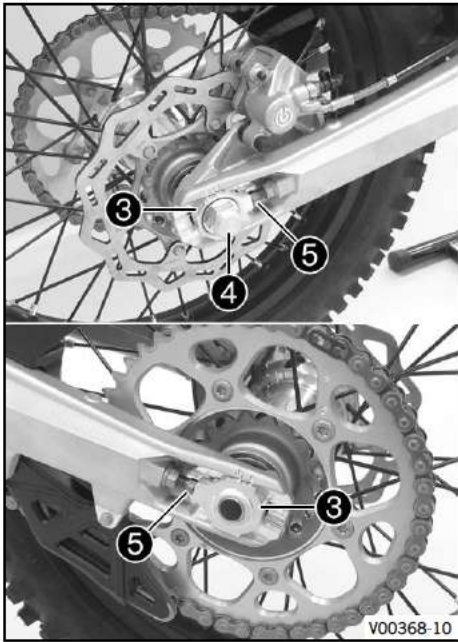
Long-life grease (p. 372)

- Insert the spacers.
- Clean and grease the wheel spindle.

Long-life grease (p. 372)

- Position 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. 132)
- Tighten nut 4.

Guideline

Nut, rear wheel spindle	M20x1.5	80 Nm (59 lbf ft)
-------------------------	---------	-------------------

i Info

The wide adjustment range of the chain adjusters (32 mm (1.26 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

i Info

If the brake discs are changed, the brake linings must also be changed.

Preparatory work

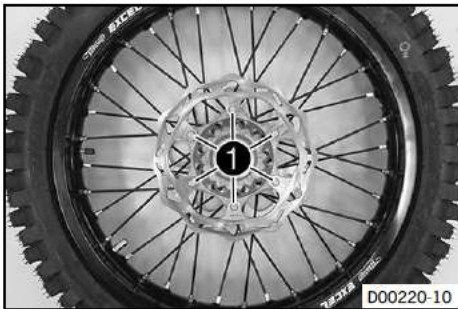
- Raise the motorcycle with a lift stand. (p. 12)
- Remove the rear wheel. (p. 126)

Main work
(All standard models)

- Remove screws 1. Take off the brake disc.
- Clean the contact surface of the brake disc.
- Position the brake disc with the label facing outward.
- Mount and tighten screws 1.

Guideline

Screw, rear brake disc	M6	14 Nm (10.3 lbf ft) Loctite®243™
------------------------	----	--



(All special models)

- Remove screws 1. Take off the brake disc.
- Clean the contact surface of the brake disc.
- Position the brake disc with the label facing outward.
- Mount and tighten screws 1.

Guideline

Screw, rear brake disc	M6	14 Nm (10.3 lbf ft) Loctite®243™
------------------------	----	--



Finishing work

- Install the rear wheel. (p. 127)
- Remove the motorcycle from the lift stand. (p. 12)



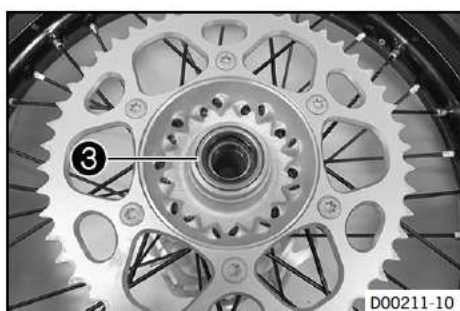
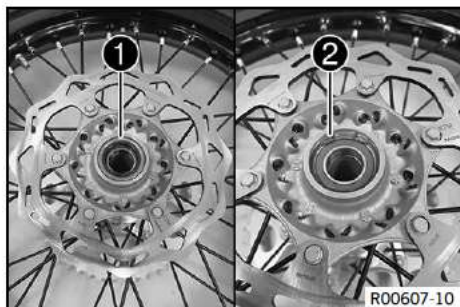
14.8.4 Changing the rear wheel bearing

Preparatory work

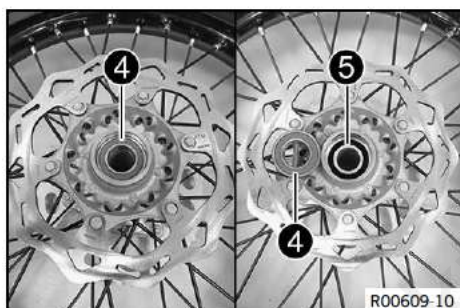
- Raise the motorcycle with a lift stand. (p. 12)
- Remove the rear wheel. (p. 126)

Main work

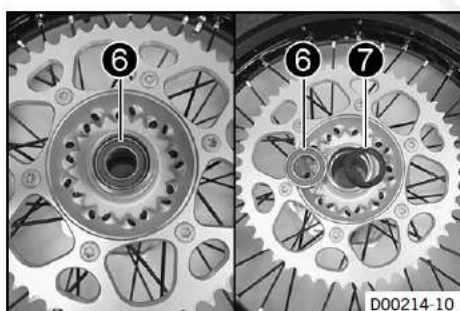
- Remove radial shaft seal ring 1.
- Remove lock ring 2.



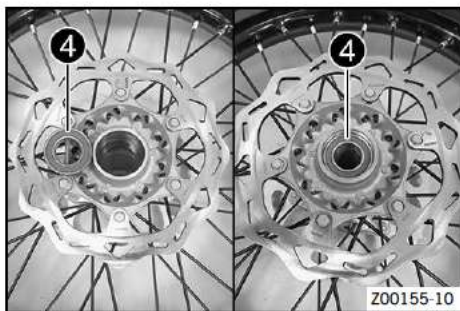
- Remove radial shaft seal ring 3.



- 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.

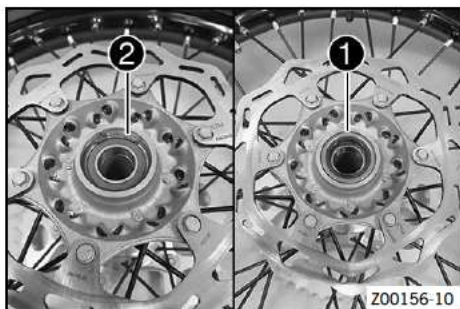


- Press new bearing **4** all the way in from the outside to the inside.

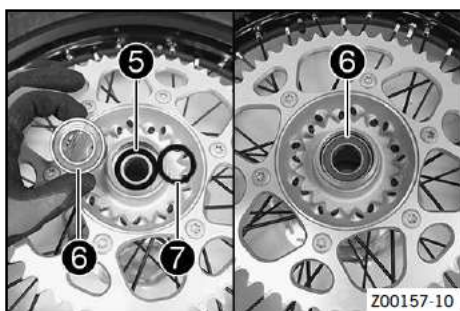


Info

Only press the bearing in via the outer bearing race, otherwise the bearing will be damaged when it is pressed in.



- Mount lock ring **2**.
✓ The lock ring engages audibly.
- Grease new radial shaft seal ring **1** and press it in until it is flush.



- Clean, grease, and mount spacing tube **5**.

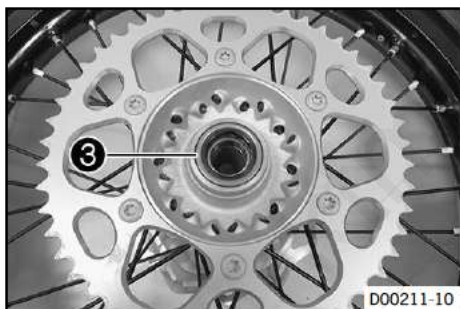
Long-life grease (p. 372)

- Position spacer washer **7**.
- Press new bearing **6** all the way in from the outside to the inside.



Info

Only press the bearing in via the outer bearing race, otherwise the bearing will be damaged when it is pressed in.

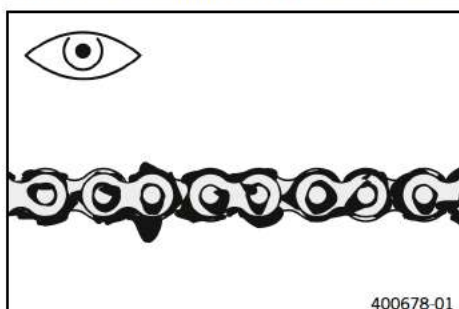


- Grease new radial shaft seal ring **3** and press it in until it is flush.

Finishing work

- Install the rear wheel. (p. 127)
- 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. 131)

14.8.6 Cleaning the chain



Warning

Danger of accidents Lubricants on the tires reduces the road grip.

- Remove lubricants from the tires using a suitable cleaning agent.



Warning

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

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



Note

Environmental hazard Hazardous substances cause environmental damage.

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



Info

The service life of the chain depends largely on its maintenance.

Preparatory work

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

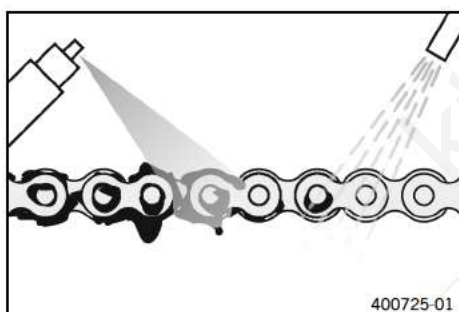
Main work

- Rinse off loose dirt with a soft jet of water.
- Remove old grease residue with chain cleaner.

Chain cleaner (p. 372)

- After drying, apply chain spray.

Off-road chain spray (p. 373)



Finishing work

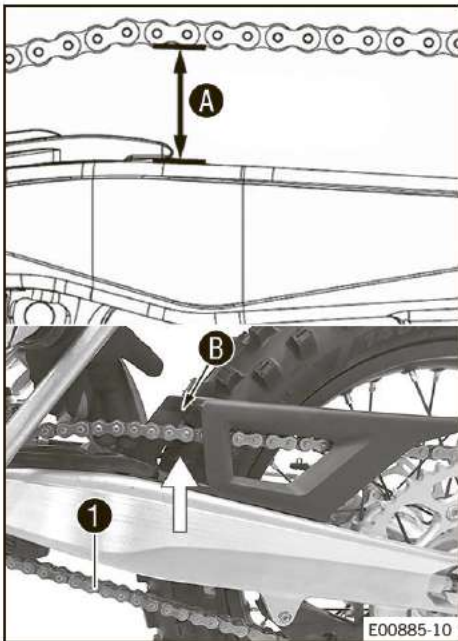
- Remove the motorcycle from the lift stand. (p. 12)

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**.

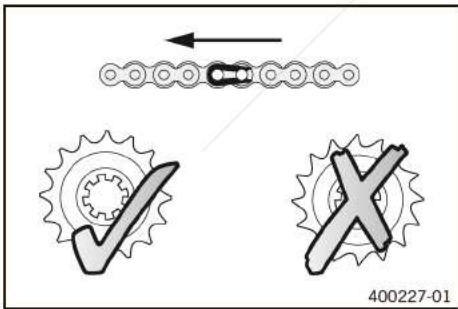


Chain tension	55 ... 58 mm (2.17 ... 2.28 in)
---------------	---------------------------------

» If the chain tension does not meet the specification:
- Adjust the chain tension. (p. 135)

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

14.8.8 Checking the chain, rear sprocket, engine sprocket, and chain guide

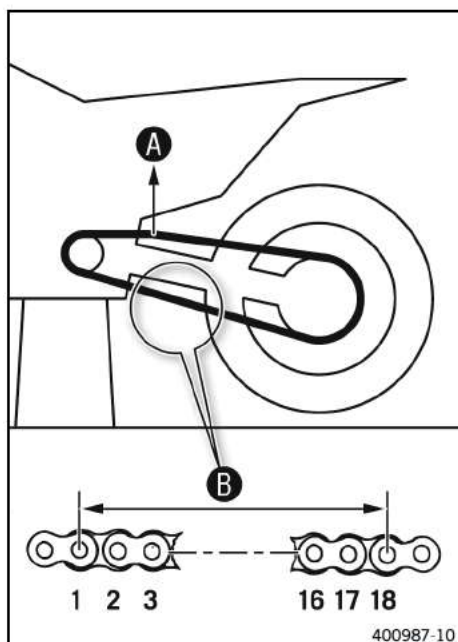


Preparatory work
- Raise the motorcycle with a lift stand. (p. 12)

Main work
- Shift the transmission into neutral.
- 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. 135)



Info
The engine sprocket, rear sprocket, and chain should always be replaced together.



- Pull on the top section 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.



Info

Chain wear is not always even, so you should repeat this measurement at different chain positions.

Maximum distance 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. 135)



Info

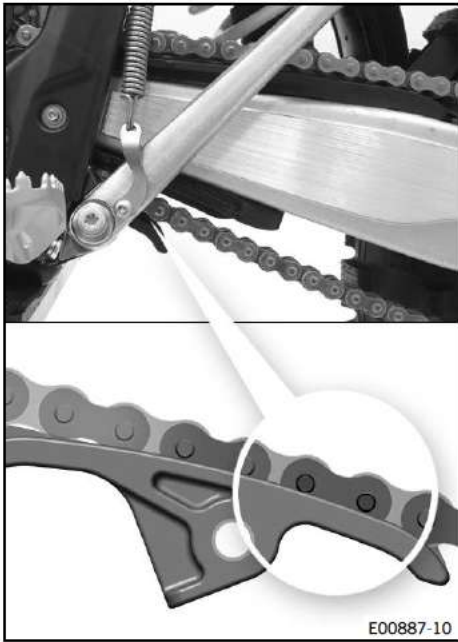
When a new chain is mounted, the rear sprocket and engine sprocket should also be changed. New chains wear out faster on old, worn sprockets.



- 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 screws on the chain sliding guard.

Guideline

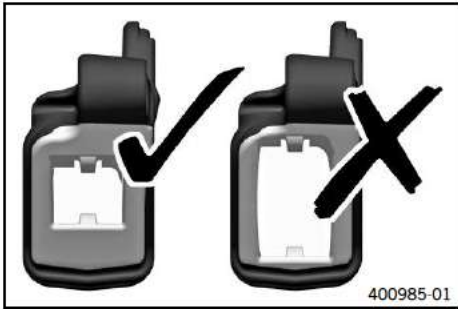
Screw, chain sliding guard	M6	10 Nm (7.4 lbf ft) Loctite®243™
----------------------------	----	---



- Check 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 screw on the chain sliding piece.

Guideline

Screw, chain sliding piece	M8	15 Nm (11.1 lbf ft)
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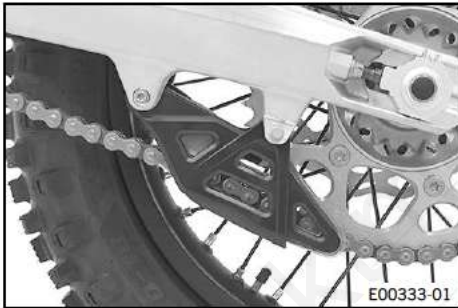


- Check the chain guide for wear.



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



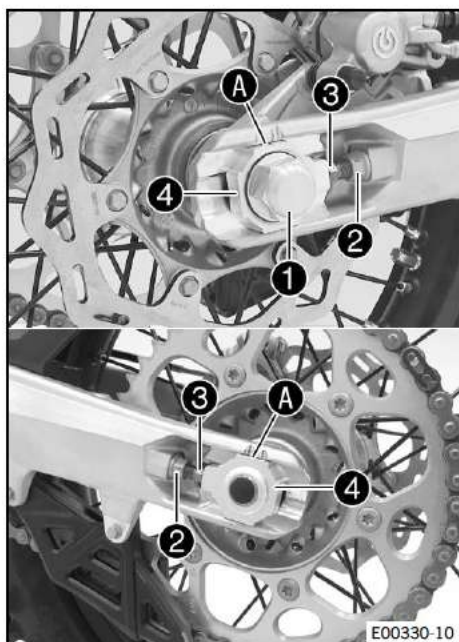
Warning

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. 132)

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)
-------------------------	---------	-------------------



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 ④ can be turned by 180°.

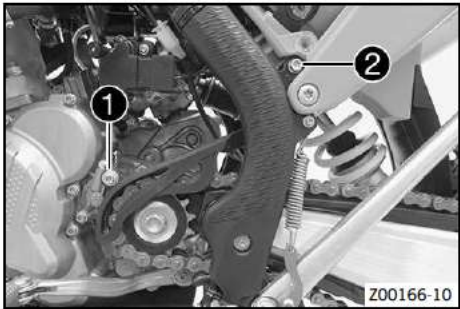
Finishing work

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

14.8.10 Changing the drivetrain kit

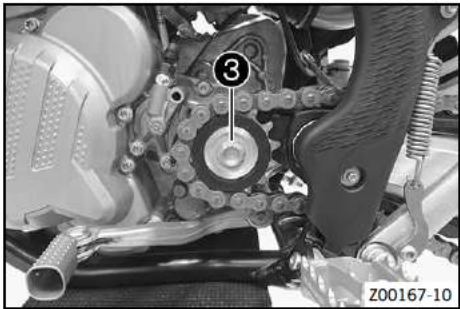
Preparatory work

- Raise the motorcycle with a lift stand. (p. 12)
- Remove the seat. (p. 101)
- Remove the air filter box cover. (p. 97)

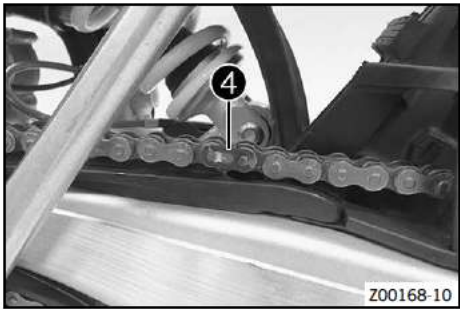


Main work

- Remove screw 1.
- Remove screw 2.
- Take the engine sprocket cover off to the front.



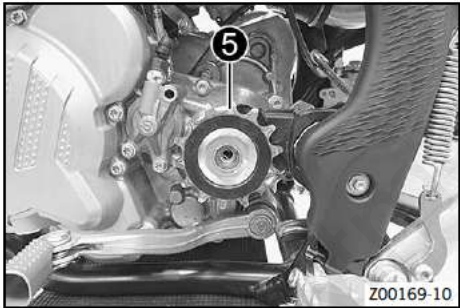
- Have an assistant operate the rear brake.
- Remove screw 3 with washer.



- 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. 126)



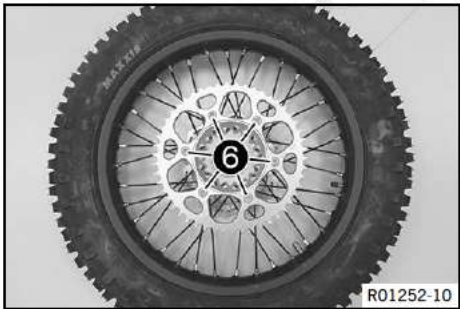
- Remove engine sprocket 5.

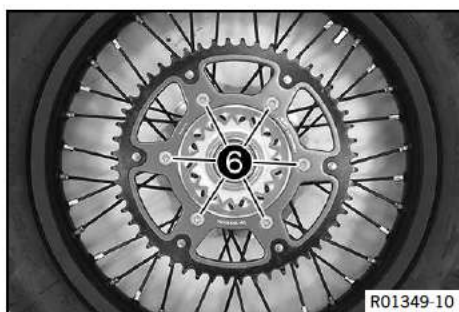
(All standard models)

- 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) Loctite®2701™
--------------------------	----	---



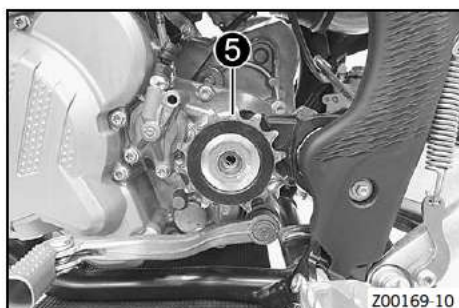


(All special models)

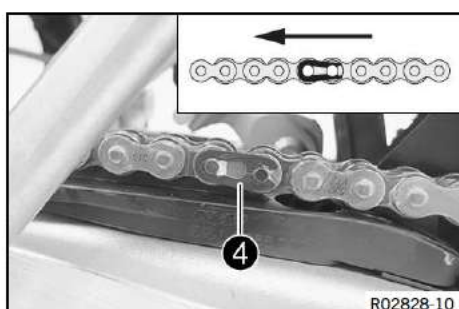
- Remove fittings **6**. Take off the rear sprocket.
- Position the new rear sprocket. Mount and tighten the fittings.

Guideline

Nut, rear sprocket screw	M8	35 Nm (25.8 lbf ft) Loctite®2701™
--------------------------	----	---



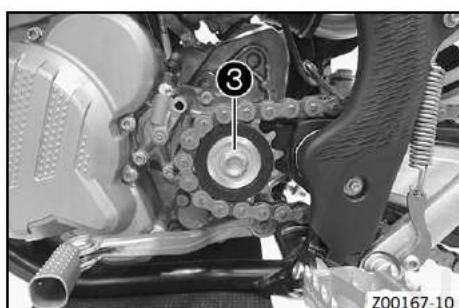
- Slide new engine sprocket **5** onto the countershaft.
- Install the rear wheel. (p. 127)



- Mount the new chain.
- Connect the chain with connecting link **4**.

Guideline

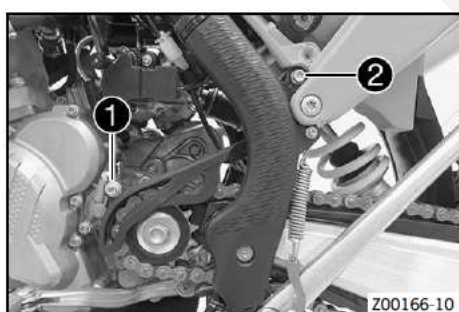
The closed side of the chain joint lock must face in the direction of travel.



- 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) Loctite®2701™
------------------------------------	-----	---



- 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	15 Nm (11.1 lbf ft)
------------------------------	----	---------------------

Finishing work

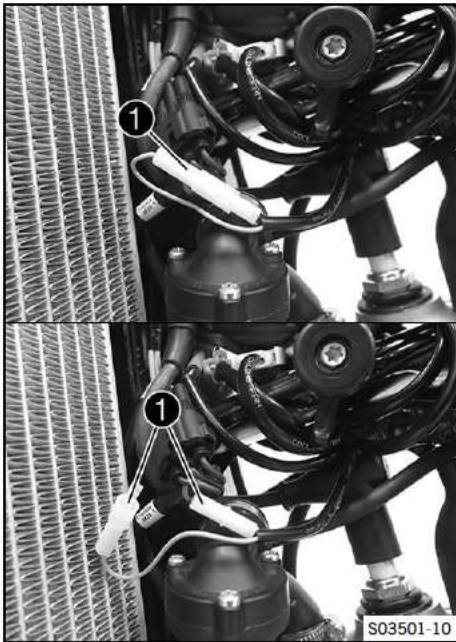
- Install the air filter box cover. (p. 97)
- Mount the seat. (p. 101)
- Check the chain tension. (p. 132)

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



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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.



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 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

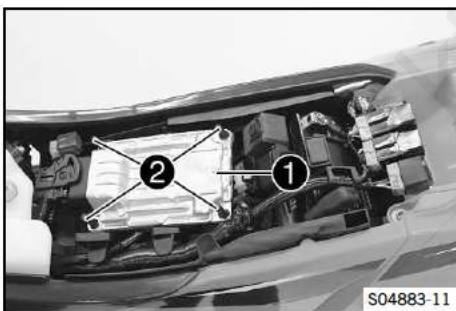
The main fuse protects all electrical power consumers of the vehicle.

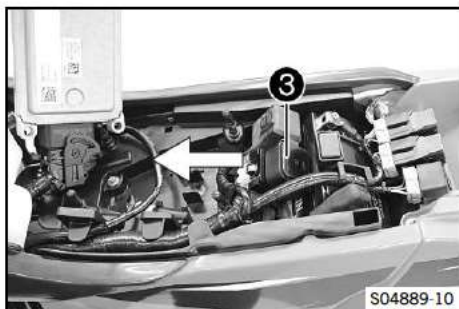
Preparatory work

- Remove the seat. (p. 101)

Main work

- Pull EFI control unit **1** upward off the rubber lugs **2** and hang to the side.





- Pull starter relay ③ from the holder.



- Take off protection caps ④.
- Remove faulty main fuse ⑤.



Info

A faulty fuse has a burned-out fuse wire **A**.
A spare fuse ⑥ is located in the starter relay.

- Insert a new main fuse.

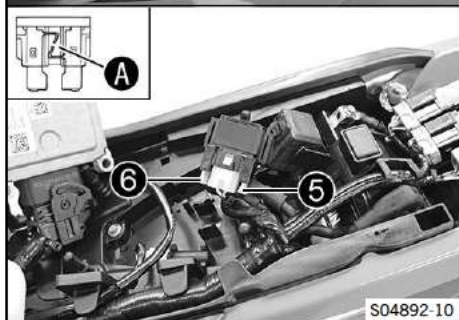
Fuse (58011109120) (p. 313)

- Check that the electrical system is functioning properly.

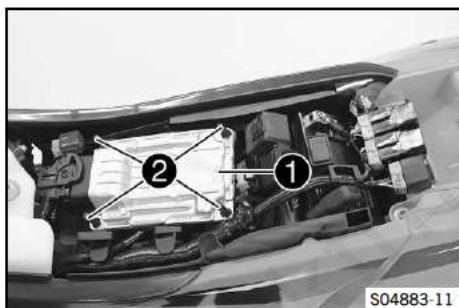


Tip

Insert a spare fuse so that it is available if needed.



- Attach the protection caps ④.
- Mount starter relay ③ onto the holder and route the cable.



- Mount the EFI control unit ① on the rubber lugs ②.

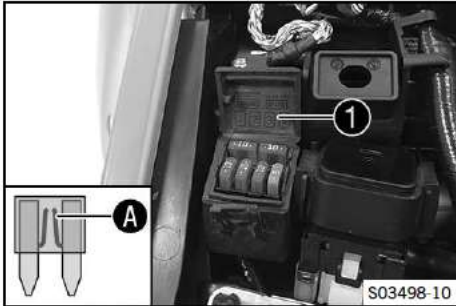
Finishing work

- Mount the seat. (p. 101)

15.3 Changing the fuses of individual electrical power consumers

Info

The fuse box containing the fuses of individual electrical power consumers is located under the seat.



Preparatory work

- Remove the seat. (p. 101)

Main work

- Open fuse box cover ①.
- Remove the faulty fuse.

Guideline

(EU/CN/ASEAN)

Fuse 1 - 10 A - EFI control unit, lambda sensor, oil pump, combination instrument, electronic fuel injection, diagnostics connector

Fuse 2 - 10 A - horn, brake light, radiator fan (optional), turn signal (optional)

Fuse 3 - 10 A - high beam, low beam, position light, tail light, license plate lamp

Fuse 4 - 5 A - fuel pump

(US)

Fuse 1 - 10 A - EFI control unit, oil pump, combination instrument, electronic fuel injection, diagnostics connector

Fuse 2 - 10 A - radiator fan (optional)

Fuse 3 - 10 A - low beam, position light, tail light

Fuse 4 - 5 A - fuel pump

Fuses res - 10 A - spare fuse

Info

A faulty fuse has a burned-out fuse wire ①.



Warning

Fire hazard Incorrect fuses overload the electrical system.

- Only use fuses with the required ampere value.
- Do not bypass or repair fuses.

- Insert the spare fuse with the correct rating.

Fuse (75011088010) (p. 313)

Fuse (75011088005) (p. 313)



Tip

Put a spare fuse in the fuse box so that it is available if needed.

- Check the function of the electrical power consumer.
- Close the fuse box cover ①.

Finishing work

- Mount the seat. (📖 p. 101)

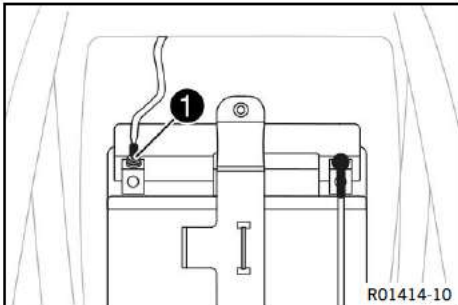
15.4 Disconnecting the negative cable of the 12-V battery

Preparatory work

- Remove the seat. (📖 p. 101)

Main work

- Disconnect negative cable ❶ of the 12-V battery.



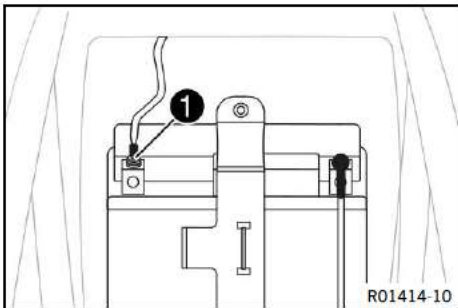
15.5 Connecting the negative cable of the 12-V battery

Main work

- Connect negative cable ❶ of the 12-V battery.

Guideline

Screw, battery terminal	M5	2.5 Nm (1.84 lbf ft)
-------------------------	----	-------------------------



Finishing work

- Mount the seat. (📖 p. 101)

15.6 Removing the 12-V battery



Note

Environmental hazard 12 V batteries contain environmentally hazardous materials.

- Do not dispose of 12 V batteries as household waste.
- Dispose of 12 V batteries at a collection point for used batteries.



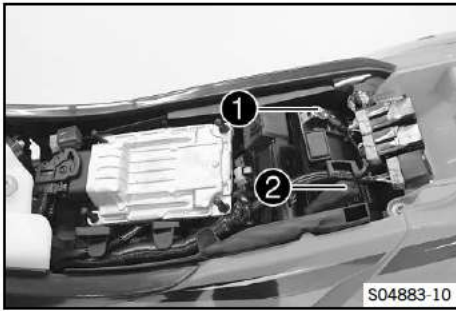
Note

Environmental hazard Hazardous substances cause environmental damage.

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

Preparatory work

- Remove the seat. (📖 p. 101)



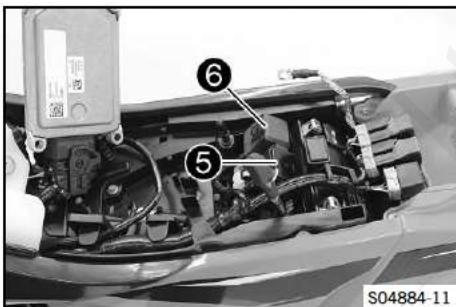
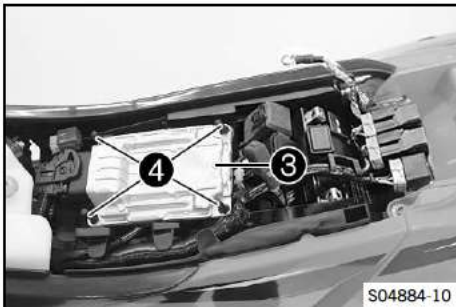
Main work



Warning

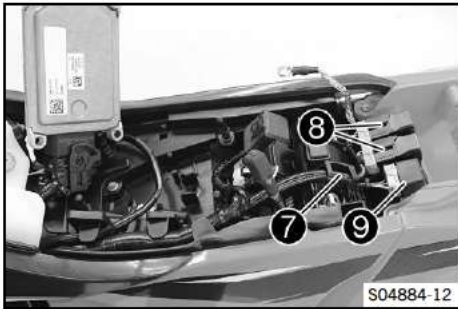
Risk of injury 12 V batteries contain harmful substances.

- Keep 12 V batteries out of the reach of children.
- Keep sparks and open flames away from 12 V batteries.
- Only charge 12 V batteries in well-ventilated rooms.
- Maintain a minimum clearance from inflammable materials when charging 12 V batteries.
Minimum clearance 1 m (3 ft)
- Do not charge deeply discharged 12 V batteries if the charge is already below the minimum voltage.
Minimum voltage before 9 V the start of the charge
- Dispose of 12 V batteries with less than the minimum voltage correctly.

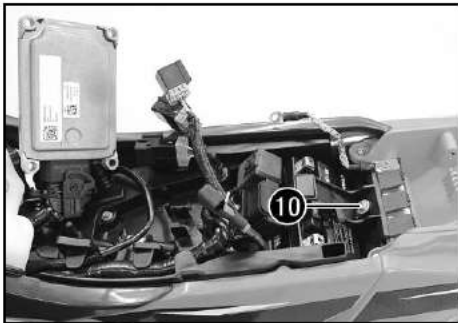


- Disconnect negative cable ① from the 12-V battery.
- Pull back positive terminal cover ② and disconnect the positive cable from the 12-V battery.
- Pull EFI control unit ③ upward off rubber lugs ④ and hang to the side.
- Pull off starter relay ⑤ and fuse box ⑥ from the battery compartment and hang to the side.

15 WIRING HARNESS, BATTERY



- Detach wiring harness 7, disconnect relays 8 and plug 9, and hang to the side.



- Remove screw 10 and detach the battery compartment.
- Lift out the 12-V battery.



15.7 Installing the 12-V battery



Main work

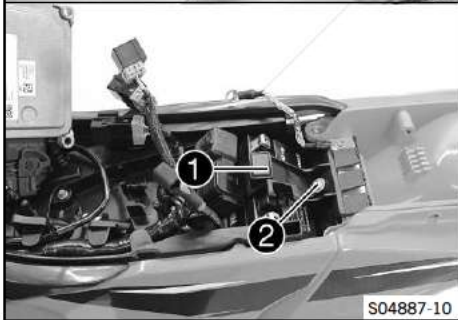
- Insert the 12 V battery into the battery compartment with the terminals facing forward and secure with holding bracket 1.

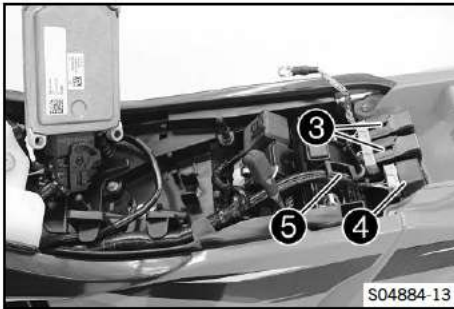
12-V battery (HJTZ5S-FP-C) (p. 313)

- Mount and tighten screw 2.

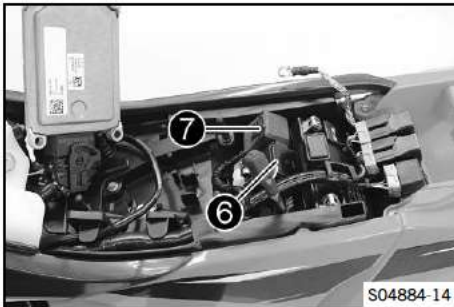
Guideline

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

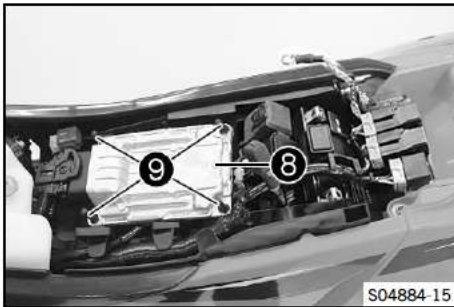




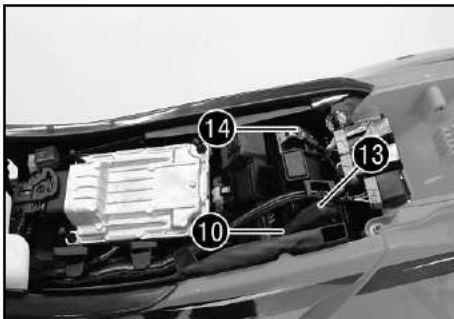
- Place relays **3** and connector **4** on the battery compartment and attach the wiring harness **5**.



- Attach starter relay **6** and fuse box **7** to the battery compartment.



- Secure EFI control unit **8** with the rubber lugs **9**.



- Connect positive cable **10** to the 12-V battery.

Guideline

Screw, battery terminal	M5	2.5 Nm (1.84 lbf ft)
-------------------------	----	-------------------------



Info

Contact disk **A** must be mounted under screw **11** and cable lug **12** with the claws toward the battery terminal.

- Slide positive terminal cover **13** over the positive terminal.
- Connect negative cable **14** to the 12-V battery.

Guideline

Screw, battery terminal	M5	2.5 Nm (1.84 lbf ft)
-------------------------	----	-------------------------

Finishing work

- Mount the seat. (p. 101)

15.8 Charging the 12-V battery



Warning

Risk of injury 12 V batteries contain harmful substances.

- Keep 12 V batteries out of the reach of children.
- Keep sparks and open flames away from 12 V batteries.
- Only charge 12 V batteries in well-ventilated rooms.
- Maintain a minimum clearance from inflammable materials when charging 12 V batteries.
Minimum clearance 1 m (3 ft)
- Do not charge deeply discharged 12 V batteries if the charge is already below the minimum voltage.
Minimum voltage before the start of the charge 9 V
- Dispose of 12 V batteries with less than the minimum voltage correctly.

Note

Danger of damage An incorrectly selected charging mode will damage the 12-V battery.

- Always select a charging mode that is compatible with the type of battery.



Note

Environmental hazard 12 V batteries contain environmentally hazardous materials.

- Do not dispose of 12 V batteries as household waste.
- Dispose of 12 V batteries at a collection point for used batteries.



Note

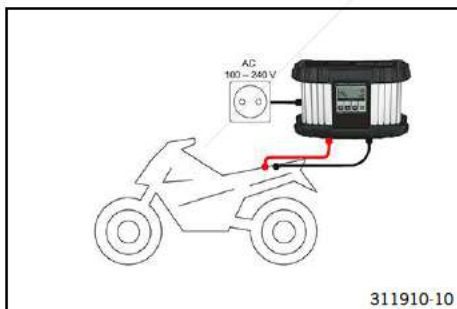
Environmental hazard Hazardous substances cause environmental damage.

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



Info

Even when there is no load on the 12-V battery, it discharges steadily each day. The charging level and the method of charging are very important for the service life of the 12-V battery. Rapid recharging with a high charging current shortens the service life of the battery. If the charging current, charging voltage, or charging time is exceeded, the 12-V battery will be destroyed. If the 12-V battery is depleted by repeated starting, the 12-V battery must be charged immediately. If the 12-V battery is left in a discharged state for an extended period, it will become deeply discharged and suffer a loss of capacity, destroying the battery. The 12-V battery is maintenance-free.



Preparatory work

- Remove the seat. (📖 p. 101)
- Disconnect the negative cable of the 12-V battery. (📖 p. 142)

Main work

- Connect a battery charger to the 12-V battery. Adjust the battery charger.

EU battery charger **XCharge-professional** (00029095050)
(📖 p. 375)

Alternative 1

US battery charger **XCharge-professional**
(00029095051) (📖 p. 375)

Alternative 2

UK battery charger **XCharge-professional**
(00029095052) (p. 376)



Info

Follow the instructions of the charger and the manual.

- Disconnect the battery charger after charging the 12-V battery.

Guideline

The charging current, charging voltage, and charging time must not be exceeded.

Recharge the 12-V battery regularly when the motorcycle is not being used	3 months
---	----------

Finishing work

- Connect the negative cable of the 12-V battery. (p. 142)
- Mount the seat. (p. 101)

15.9 Checking the charging voltage

Condition

The 12-V battery must be fully functional and completely charged.

Preparatory work

- Remove the seat. (p. 101)

Main work

- Carry out the start procedure. (p. 12)
- **V** Measure the voltage between the specified points.
Measuring point **plus (+)** – Measuring point **Ground (-)**

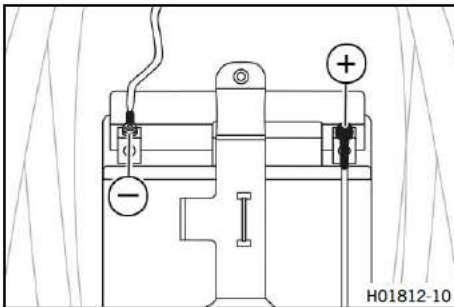
Charging voltage

5,000 rpm	13.5 ... 15.0 V
-----------	-----------------

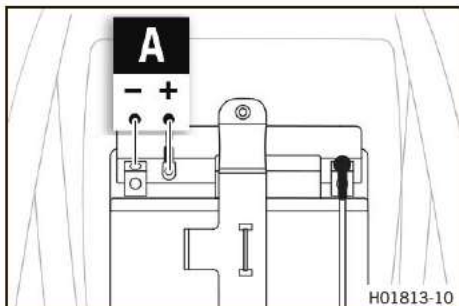
- » If the displayed value is less than the specified value:
 - Check the plug-in connections from the alternator to the voltage regulator.
 - Check the plug-in connections from the voltage regulator to the wiring harness.
 - Check the stator winding of the alternator. (p. 300)
- » If the displayed value is greater than the specified value:
 - Change voltage regulator.

Finishing work

- Mount the seat. (p. 101)



15.10 Checking the open-circuit current



Preparatory work

- Remove the seat. (p. 101)

Main work

- Disconnect the negative cable of the 12-V battery.
- Measure the current between the 12-V battery ground (–) and the negative cable.



Info

The value of the open-circuit current only applies to vehicles in their original state without additional electrical 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.

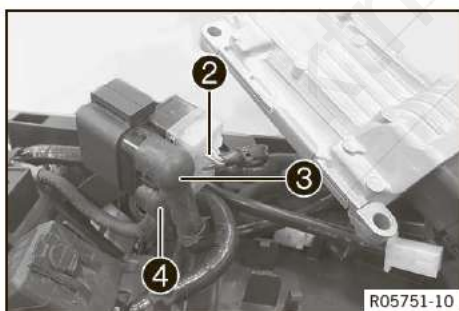
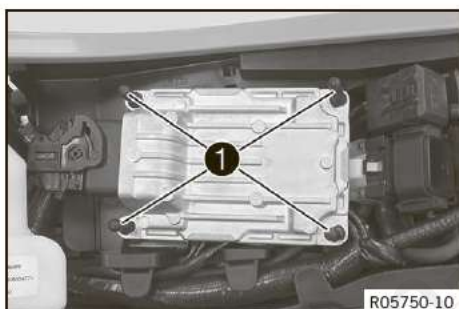
15.11 Checking the starter relay

Preparatory work

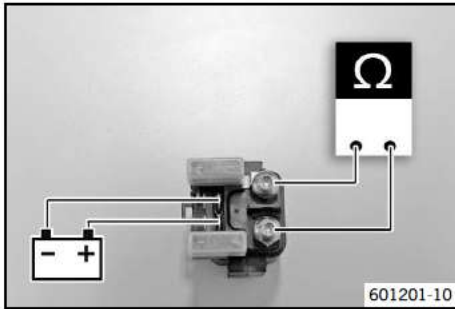
- Remove the seat. (p. 101)
- Disconnect the negative cable of the 12-V battery. (p. 142)

Main work

- Pull off the EFI control unit ① upward and hang to the side.



- Pull the starter relay off the bracket.
- Unplug connector ②.
- Disconnect cables ③ and ④ on the starter relay.



- Connect the starter relay to a 12-V power supply as shown in the figure.
- Measure the resistance between the specified points.

Resistance of open circuit	0 Ω
----------------------------	-----

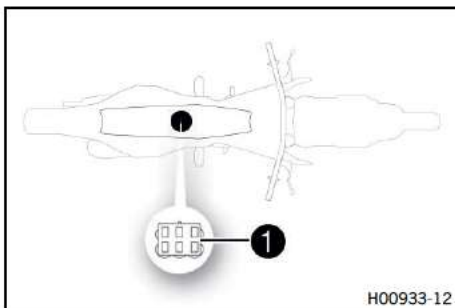
- » If the value displayed does not meet specifications:
 - Change the starter relay.

Finishing work

- Connect the negative cable of the 12-V battery. (p. 142)
- Mount the seat. (p. 101)



15.12 Diagnostics connector



Diagnostics connector ① is located under the seat below the EFI control unit.

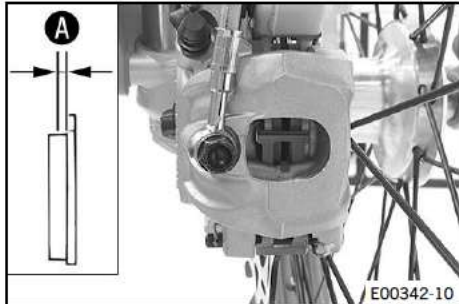
16.1 Checking the front brake linings



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 A	$\geq 1 \text{ mm } (\geq 0.04 \text{ in})$
----------------------------	---

- » If the minimum thickness is less than specified:
 - Change the brake linings of the front brake. (p. 150)

- Check the brake linings for damage and cracking.

- » If damage or wear is encountered:
 - Change the brake linings of the front brake. (p. 150)

16.2 Changing the brake linings of the front brake



Warning

Danger of accidents Incorrect servicing will cause the brake system to fail.

- Ensure that service work and repairs are performed professionally.



Warning

Skin irritation Brake fluid causes skin irritation.

- Keep brake fluid out of the reach of children.
- Wear suitable protective clothing and safety glasses.
- Do not allow brake fluid to come into contact with the skin, the eyes or clothing.
- Consult a doctor immediately if brake fluid has been swallowed.
- Rinse the affected area with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly with water immediately and consult a doctor if brake fluid comes into contact with the eyes.
- If brake fluid spills on to your clothing, change the clothing.



Warning

Danger of accidents Old brake fluid reduces the braking effect.

- Make sure that brake fluid for the front and rear brake is changed in accordance with the service schedule.



Warning

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

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



Warning

Danger of accidents Brake linings which have not been approved alter the braking efficiency.

Not all brake linings are tested and approved for KTM motorcycles. The structure and friction coefficient of the brake linings, and thus their brake power, may vary greatly from that of original brake linings. If brake linings are used that differ from the original equipment, compliance with the original homologation is not guaranteed. In this case, the vehicle no longer corresponds to its condition at delivery and the manufacturer 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.

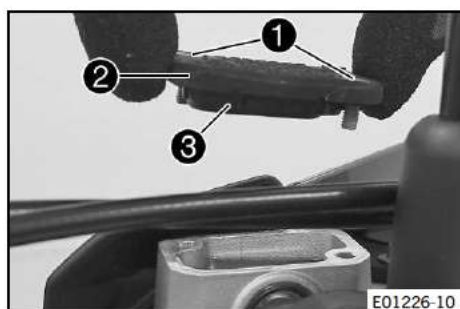


Info

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 corrodes paint.

Only use clean brake fluid from a sealed container.

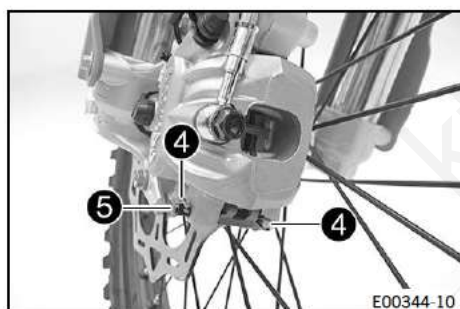


- Move the brake fluid reservoir mounted on the handlebar to a horizontal position.
- Remove screws ①.
- Take off cover ② with membrane ③.
- Manually press the brake caliper toward the brake disc to push back the brake pistons. Ensure that brake fluid does not flow out of the brake fluid reservoir, extract some if necessary.

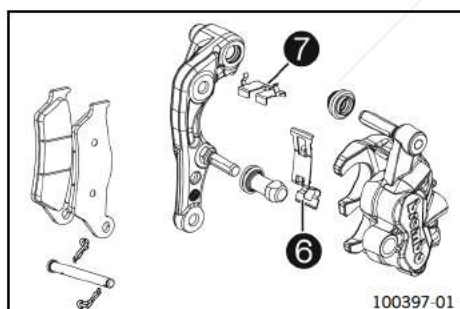


Info

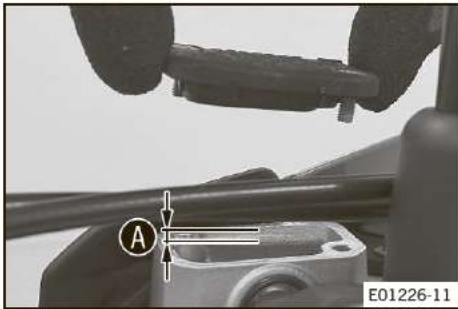
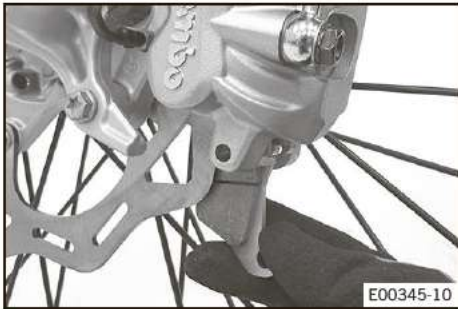
Make sure that you do not press the brake caliper against the spokes when pushing back the brake pistons.



- Remove cotter pin ④, pull out pin ⑤, and remove the brake linings.
- Clean the brake caliper and the brake caliper bracket.



- Check that spring plate ⑥ in the brake caliper and brake lining sliding plate ⑦ in the brake caliper bracket 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 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 level to level **A**.

Guideline

Level A (brake fluid level below reservoir rim)	5 mm (0.2 in)
--	---------------

Brake fluid DOT 4 / DOT 5.1 (p. 370)

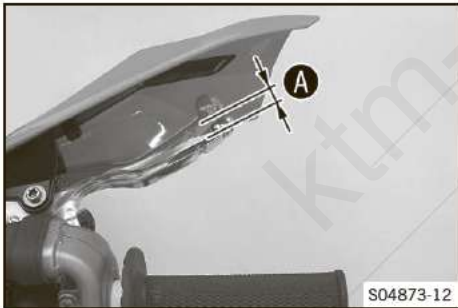
- Position the cover with the membrane. Mount and tighten the screws.



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.

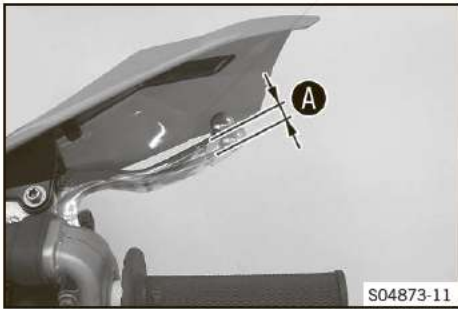


(EU/CN/ASEAN)

- 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 handbrake lever. (p. 153)



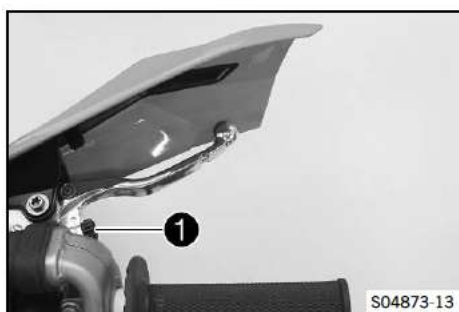
(US)

- 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. 153)

16.4 Adjusting the free travel of the handbrake lever (EU/CN/ASEAN)



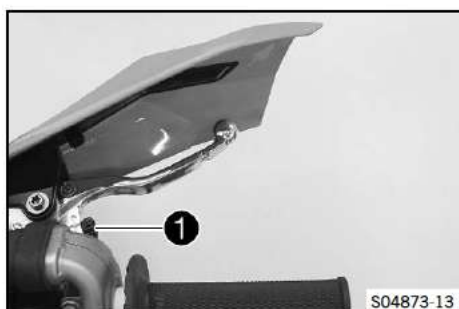
- Check the free travel of the hand brake lever. (📖 p. 152)
- Adjust the free travel of the handbrake lever with adjustment screw ①.



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 (US)



- Check the free travel of the hand brake lever. (📖 p. 152)
- Adjust the basic position of the hand brake lever to your hand size by turning adjusting screw ①.



Info

Turn the adjusting screw clockwise to 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.

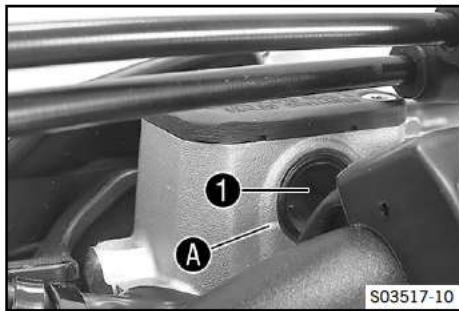
- Check the brake system and do not continue riding until the problem is eliminated.



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 the brake fluid level has dropped below marking **A** in the level viewer:
 - Add the front brake fluid. (📖 p. 154)

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

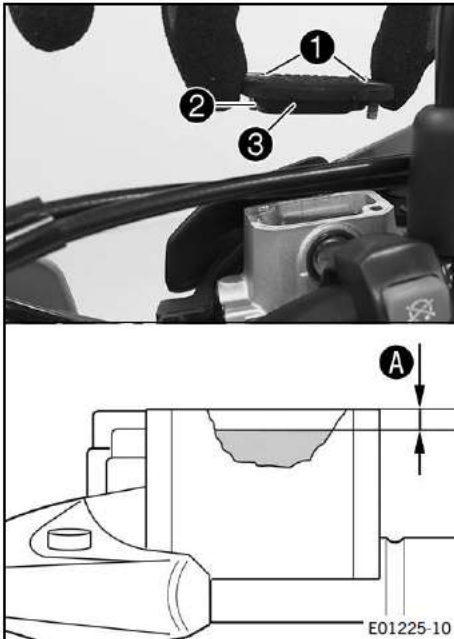
Never use DOT 5 brake fluid. It is silicone-based and purple in color. Oil seals and brake lines are not designed for DOT 5 brake fluid.

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. 150)



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 (p. 370)

- Position the cover with the membrane. Mount and tighten the screws.

i Info
Immediately clean up any brake fluid that has overflowed or spilled using 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.

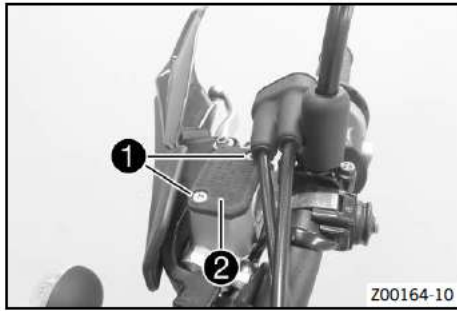


Info

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 corrodes paint.

Only use clean brake fluid from a sealed container.



- Move the brake fluid reservoir mounted on the handlebar to a horizontal position.
- Cover the painted parts.
- Remove screws ①.
- Take off cover ② with membrane.
- Extract the old brake fluid from the brake fluid reservoir using a syringe and fill with fresh brake fluid.

Syringe (50329050000) (p. 376)

Brake fluid DOT 4 / DOT 5.1 (p. 370)

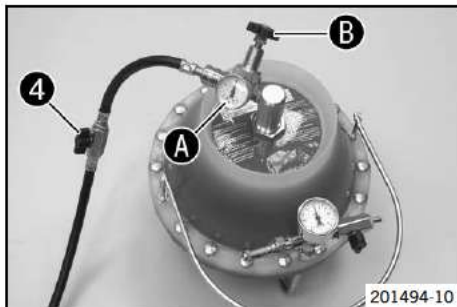


- Mount bleeder cover ③.

Bleeder cover (00029013005) (p. 374)

- Connect the bleeding device.

Bleeding device (00029013100) (p. 374)



- Open shut-off valve ④.



Info

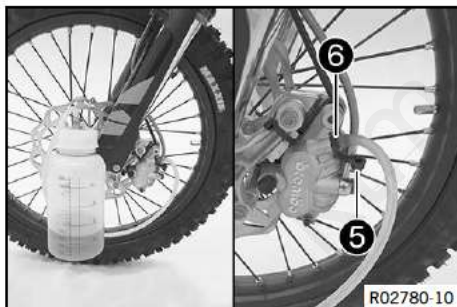
Follow the instructions in the Owner's Manual of the bleeding device.

- Ensure that the inflation pressure is set at pressure gauge A. Correct the inflation pressure on pressure regulator B if necessary.

Guideline

Inflation pressure

2 ... 2.5 bar (29 ... 36 psi)



- Pull off protection cap ⑤ of the bleeder screw. Connect the bleeder bottle hose.

Bleeding device (00029013100) (p. 374)

- Open bleeder screw ⑥ by approx. one half turn.



Info

Drain until fresh brake fluid emerges in the bleeder bottle hose without bubbles.

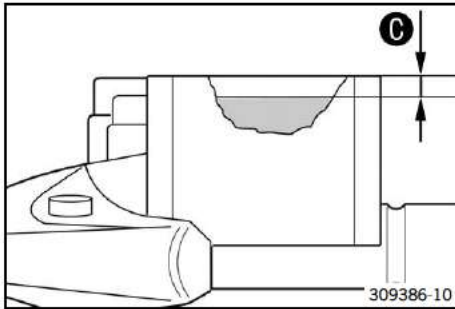
- Tighten the bleeder screw.
- Close shut-off valve ④.
- Open the bleeder screw again until brake fluid stops emerging.



Info

Overfilling the brake fluid reservoir is prevented.

- Tighten the bleeder screw. Remove the bleeder bottle hose. Mount the protection cap.
- Disconnect the bleeding device. Remove the bleeder cover.



- Add brake fluid up to level **C**.

Guideline

Level C (brake fluid level below reservoir rim)	5 mm (0.2 in)
--	---------------

Brake fluid DOT 4 / DOT 5.1 (p. 370)

- Position the cover with the membrane. Mount and tighten the screws.

i Info
Use water to immediately clean up any brake fluid that has overflowed or spilled.

- Check the hand brake lever for a firm pressure point.

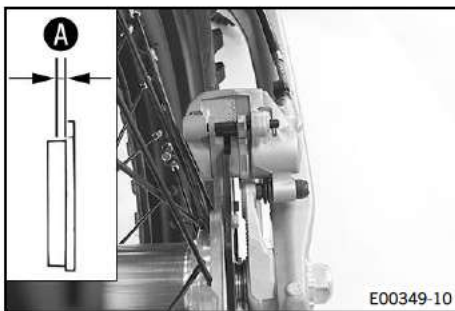
16.9 Checking the brake linings of the rear brake



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 A	$\geq 1 \text{ mm } (\geq 0.04 \text{ in})$
----------------------------	---

- » If the minimum thickness is less than specified:
 - Change the rear brake linings. (p. 157)
- Check the brake linings for damage and cracking.
 - » If damage or wear is encountered:
 - Change the rear brake linings. (p. 157)

16.10 Changing the rear brake linings



Warning

Danger of accidents Incorrect servicing will cause the brake system to fail.

- Ensure that service work and repairs are performed professionally.



Warning

Skin irritation Brake fluid causes skin irritation.

- Keep brake fluid out of the reach of children.
- Wear suitable protective clothing and safety glasses.
- Do not allow brake fluid to come into contact with the skin, the eyes or clothing.
- Consult a doctor immediately if brake fluid has been swallowed.
- Rinse the affected area with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly with water immediately and consult a doctor if brake fluid comes into contact with the eyes.
- If brake fluid spills on to your clothing, change the clothing.



Warning

Danger of accidents Old brake fluid reduces the braking effect.

- Make sure that brake fluid for the front and rear brake is changed in accordance with the service schedule.



Warning

Danger of accidents 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 manufacturer 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.

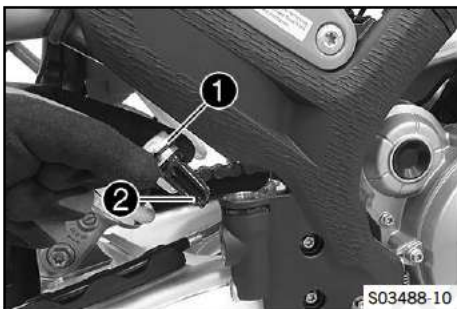


Info

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 corrodes paint.

Only use clean brake fluid from a sealed container.

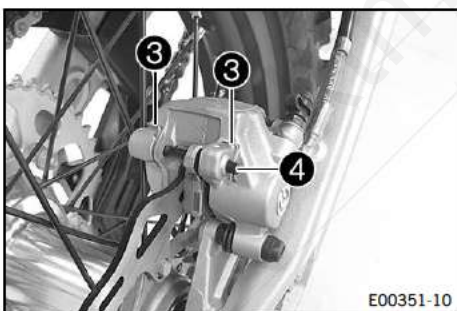


- Position the vehicle vertically.
- Remove screw cap ① with membrane ② and the O-ring.
- Press the brake piston back into the basic position and ensure that brake fluid does not flow out of the brake fluid reservoir; extract some if necessary.

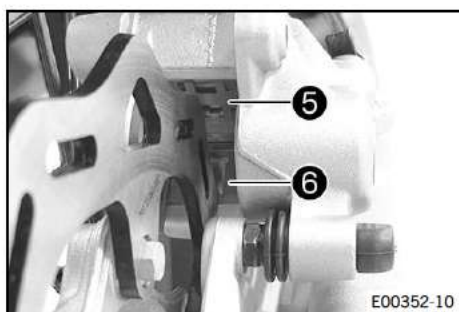


Info

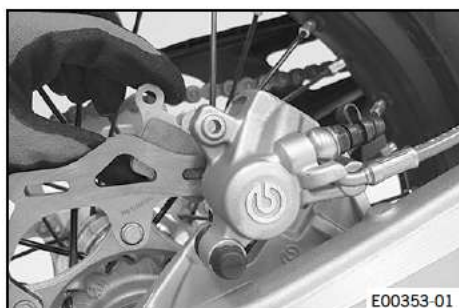
Make sure that you do not press the brake caliper against the spokes when pushing back the brake piston.



- Remove cotter pin ③, pull out pin ④, and remove the brake linings.
- Clean the brake caliper and the brake caliper bracket.



- Check that spring plate **5** in the brake caliper and brake pad sliding plate **6** in the brake caliper bracket are seated correctly.



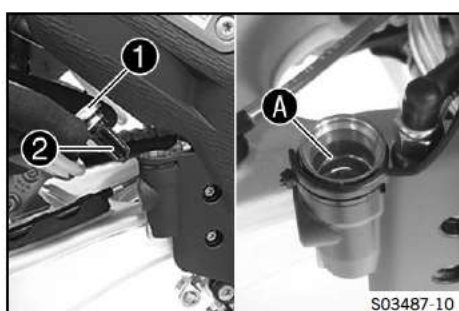
- Insert the new brake linings, insert the pin, and mount the cotter pins.



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.



- Correct brake fluid level to marking **A**.

Brake fluid DOT 4 / DOT 5.1 (p. 370)

- Mount screw cap **1** with membrane **2** and O-ring.



Info

Use water to immediately clean up any brake fluid that has overflowed or spilled.

16.11 Checking the free travel of foot brake lever

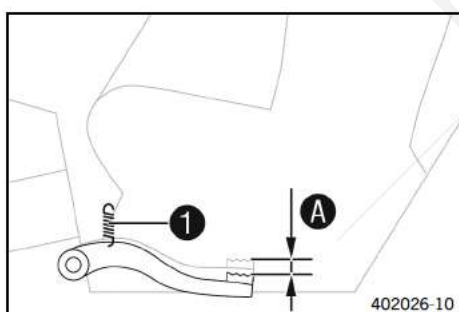


Warning

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. 160)
- Reconnect spring **1**.

16.12 Adjusting the basic position of the foot brake lever

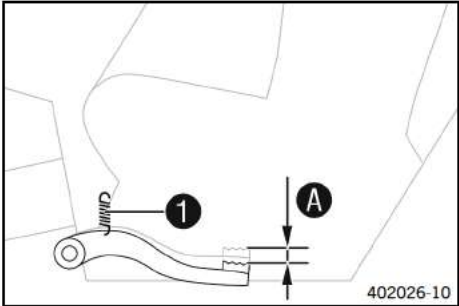


Warning

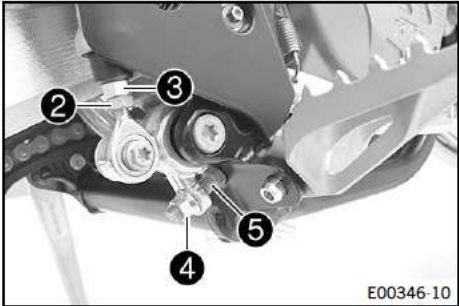
Danger of accidents The brake system fails in the event of overheating.

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.



- Detach 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)
-------------------------	----	--------------------

- Attach 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.

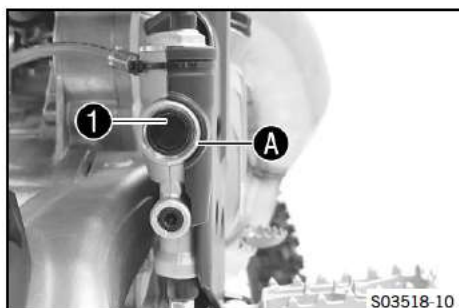
- Check the brake system and do not continue riding until the problem is eliminated.



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. 161)

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.

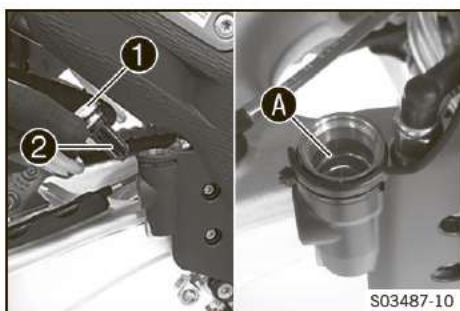


Info

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. 157)

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. 370)

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.

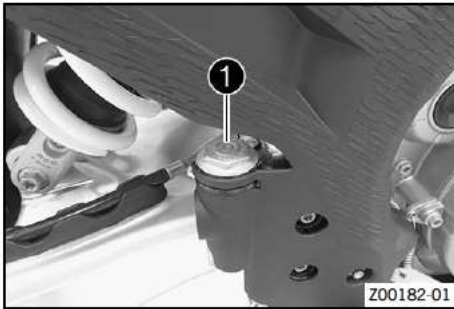


Info

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 corrodes paint.

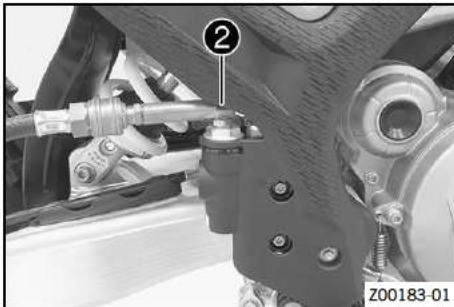
Only use clean brake fluid from a sealed container.



- Cover the painted parts.
- Remove screw cap **1** with the membrane and the O-ring.
- Extract the old brake fluid from the brake fluid reservoir using a syringe and fill with fresh brake fluid.

Syringe (50329050000) (p. 376)

Brake fluid DOT 4 / DOT 5.1 (p. 370)

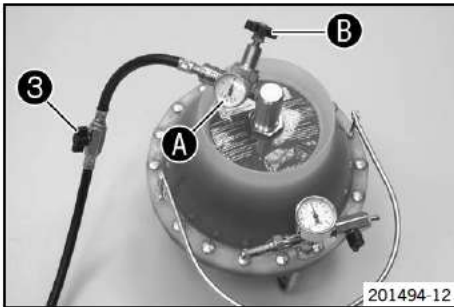


- Mount bleeder cover **2**.

Bleeder cover (00029013006) (p. 374)

- Connect the bleeding device.

Bleeding device (00029013100) (p. 374)



- Open shut-off valve **3**.

i Info

Follow the instructions in the Owner's Manual of the bleeding device.

- Ensure that the inflation pressure is set at pressure gauge **A**. Correct the inflation pressure on pressure regulator **B** if necessary.

Guideline

Inflation pressure	2 ... 2.5 bar (29 ... 36 psi)
--------------------	-------------------------------

- Pull off protection cap **4** of the bleeder screw. Connect the bleeder bottle hose.

Bleeding device (00029013100) (p. 374)

- Open bleeder screw **5** by approx. one half turn.

i Info

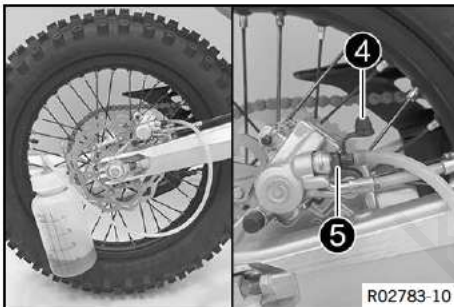
Drain until fresh brake fluid emerges in the bleeder bottle hose without bubbles.

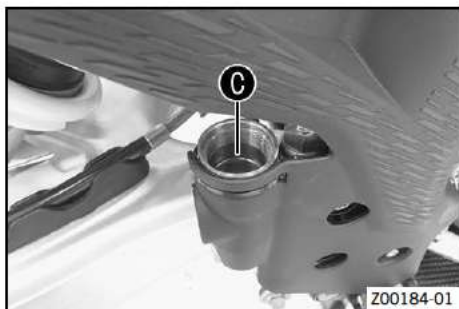
- Tighten the bleeder screw.
- Close shut-off valve **3**.
- Open the bleeder screw again until brake fluid stops emerging.

i Info

Overfilling the brake fluid reservoir is prevented.

- Tighten the bleeder screw. Remove the bleeder bottle hose. Mount the protection cap.
- Disconnect the bleeding device. Remove the bleeder cover.





- Position the vehicle vertically.
- Correct the brake fluid to marking **C**.

Brake fluid DOT 4 / DOT 5.1 (📖 p. 370)

- Mount and tighten the screw cap with the membrane and O-ring.



Info

Use water to immediately clean up any brake fluid that has overflowed or spilled.

- Check the foot brake lever for a firm pressure point.

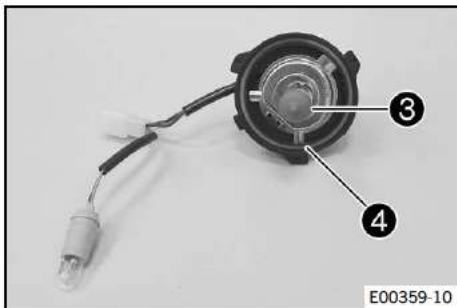
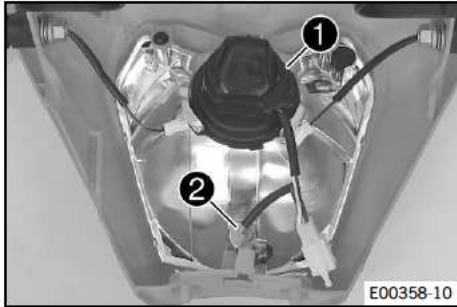
17.1 Changing the headlight bulb

Note

Damage to reflector Grease on the reflector reduces the light intensity.

Grease on the bulb will evaporate due to the heat and be deposited on the reflector.

- Clean and degrease the bulbs before mounting.
- Do not touch the bulbs with your bare hands.



Preparatory work

- Remove the headlight mask with the headlight. (p. 116)

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. 313)

- 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. 116)
- Check the headlight setting. (p. 166)

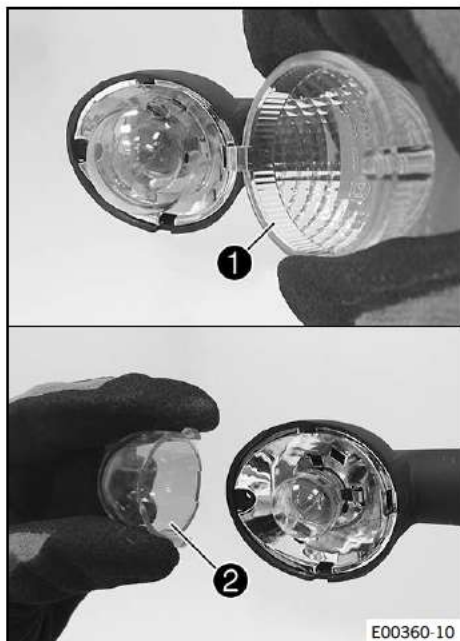
17.2 Changing the turn signal bulb (EU/CN/ASEAN)

Note

Damage to reflector Grease on the reflector reduces the light intensity.

Grease on the bulb will evaporate due to the heat and be deposited on the reflector.

- Clean and degrease the bulbs before mounting.
- Do not touch the bulbs with your bare hands.



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.

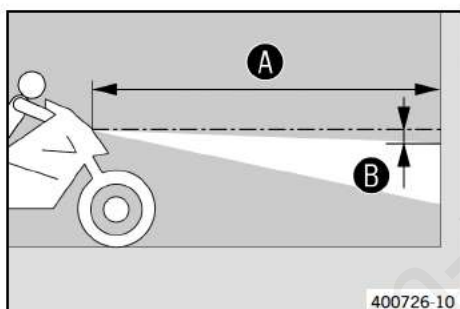
Turn signal (R10W / socket BA15s) (p. 313)

- 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



- Park the vehicle on a horizontal surface in front of a light-colored wall and make a mark at the height of the center of the low beam headlight.
- Make another mark at a distance ⑤ under the first marking.
Guideline

Distance ⑤	5 cm (2 in)
------------	-------------

- Position the vehicle vertically at a distance ⑥ away from the wall.
Guideline

Distance ⑥	5 m (16 ft)
------------	-------------

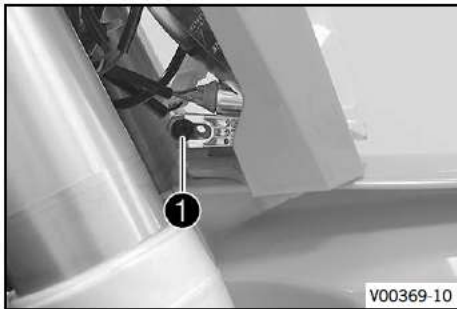
- The rider now sits down on the motorcycle.
- Switch on the low beam.
- Check the headlight setting.

The boundary between light and dark must be exactly on the lower mark for a motorcycle with rider.

- » If the boundary between light and dark does not meet specifications:

- Adjust the headlight range. (p. 167)

17.4 Adjusting the headlight range



Preparatory work

- Check the headlight setting. (📖 p. 166)

Main work

- Loosen screw ①.
- Adjust the headlight range by pivoting the headlight.

Guideline

The boundary between light and dark must be exactly on the lower mark for a motorcycle with rider (instructions on how to apply the mark: Checking the headlight setting).

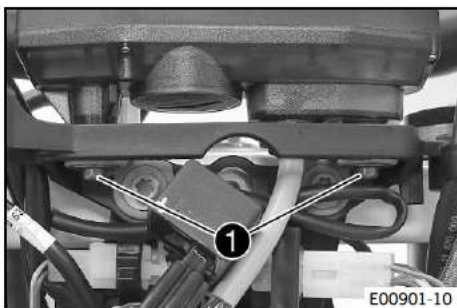


Info

If you have a payload, you may have to correct the headlight range.

- Tighten screw ①.

17.5 Changing the combination instrument battery

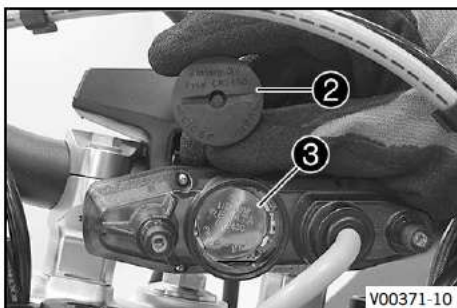


Preparatory work

- Remove the headlight mask with the headlight. (📖 p. 116)

Main work

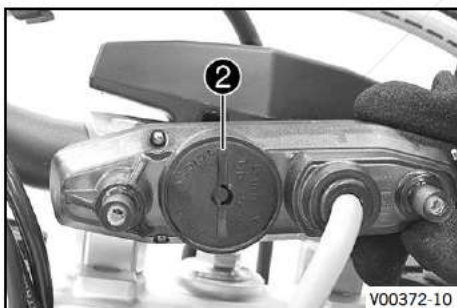
- Remove screws ①.
- Pull the combination instrument upward out of the holder.



- Using a coin, turn protection cap ② all the way counterclockwise and take it off.
- Remove combination instrument battery ③.
- Insert the combination instrument battery with the label facing outward.

Combination instrument battery (CR 2430) (📖 p. 313)

- Check the O-ring of the protection cap for correct seating.

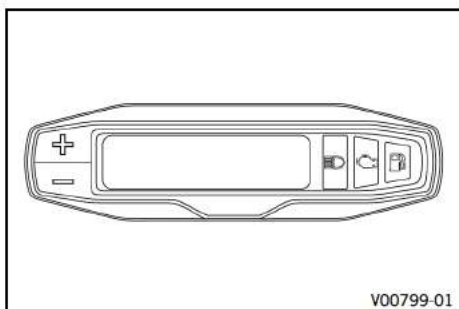


- Position protection cap ② and turn all the way clockwise using a coin.
- Press any button on the combination instrument.
- ✓ The combination instrument is activated.
- Position the combination instrument in the holder.
- Mount and tighten the screws with washers.

Finishing work

- Install the headlight mask with the headlight. (📖 p. 116)
- Check the headlight setting. (📖 p. 166)
- Set kilometers or miles. (📖 p. 168)
- Adjust combination instrument function. (📖 p. 169)
- Set the clock. (📖 p. 170)

17.6 Combination instrument overview

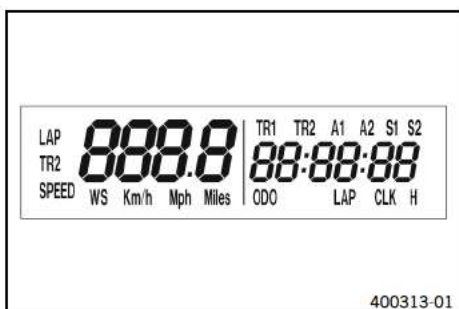


- The button is used to select menus and make settings.
- The button is used to select menus and make settings.

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.

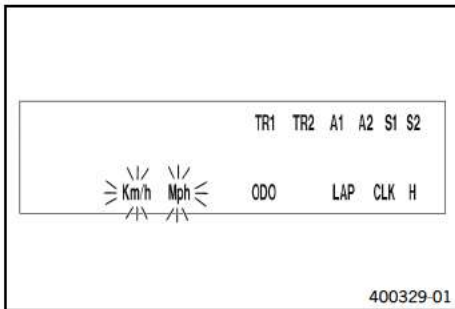
17.8 Setting kilometers or miles

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.

Adjusting the Km/h

- Press the button .

Adjusting 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 combination instrument function

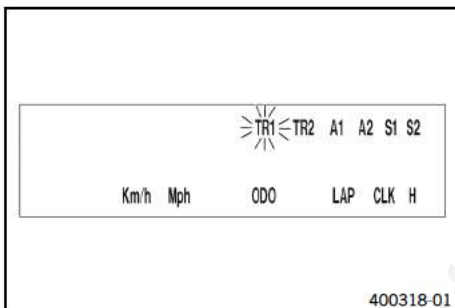


Info

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.

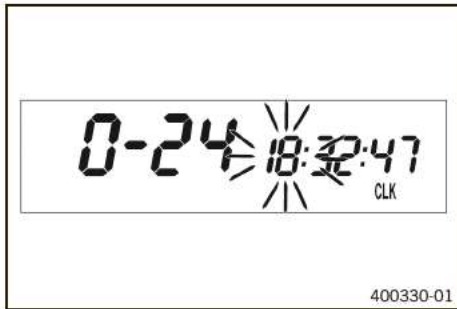
Activating the function

- 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.
- Adjust 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 .



17.11 Adjusting the wheel circumference

Note

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.

- After the conversions, only use the vehicle on closed circuits that are not open to public road traffic.
- Inform the rider and owner that the public road approval and insurance coverage are no longer valid.
- If you are requested to carry out these conversions, insist on a shop order signed by your customer, in which you also inform the customer that these conversions will be carried out at the customer's own risk and that the vehicle will thereafter no longer be approved for use on public roads.

Condition

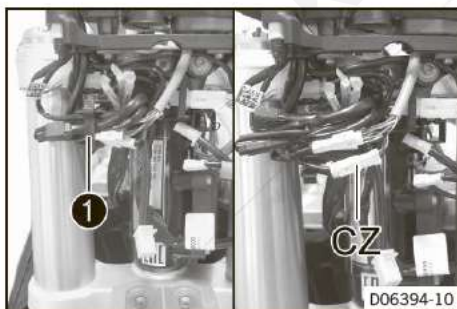
The motorcycle is stationary.

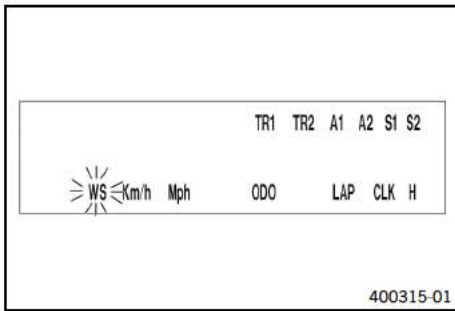
Preparatory work

- Remove the headlight mask with the headlight. (p. 116)

Main work

- Open cable holder **1** and expose the cable.
- Disconnect plug-in connector **CZ**.





- Repeatedly press the button $\oplus$ briefly until **H** appears at the bottom right of the display.
- Press the button $\oplus$ for 2–3 seconds.
- Repeatedly press the $\ominus$ button until the **WS** indicator flashes.
- Press the $\oplus$ button briefly.

i Info
The wheel circumference is displayed in millimeters.

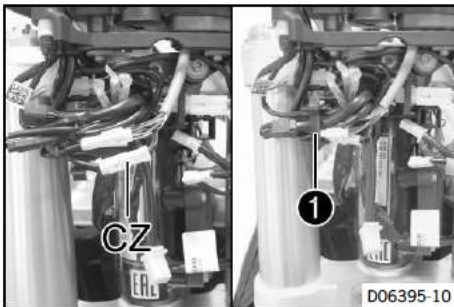
Enlarging the wheel circumference

- Press the button $\oplus$.

Reducing the wheel circumference

- Press the button $\ominus$.

i 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.



- Join plug-in connector **CZ**.
- Position the cable in the cable holder.
- Engage cable holder **1**.

Finishing work

- Remove the headlight mask with the headlight. (p. 116)

17.12 Viewing the lap time

i Info
This function can only be opened if lap times have actually been timed.

Condition

The motorcycle is stationary.



- Repeatedly press the button $\oplus$ briefly until **LAP** appears at the bottom right of the display.
- Briefly press the button $\oplus$.
 - ✓ **LAP 1** appears on the left side of the display.
- The laps 1 - 10 can be viewed with the button $\ominus$.
- Press and hold the button $\oplus$ for 3 - 5 seconds.
 - ✓ The lap times are deleted.
- Briefly press the button $\oplus$.
 - ✓ Next display mode



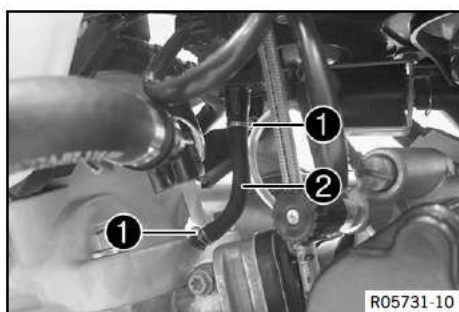
Info

When an impulse is received from the wheel speed sensor, the left side of the display changes back to the **SPEED** mode.



ktm-manuals.com

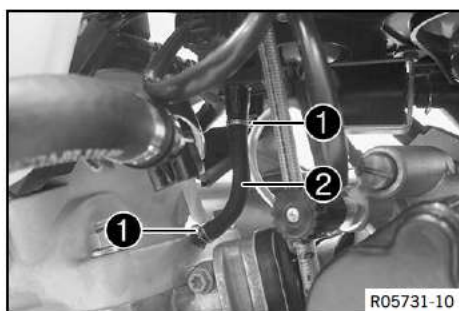
18.1 Cleaning the pressure sensor hose



- Push back hose clamps ①.
- Pull off pressure sensor hose ②.

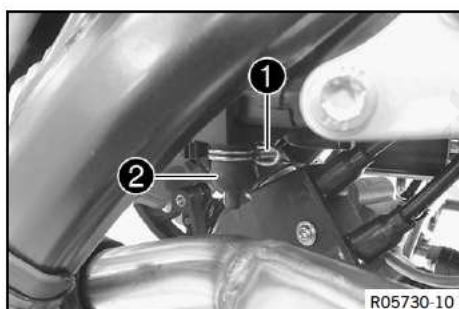


- Clean hose ② thoroughly and blow out with compressed air.



- Mount pressure sensor hose ②.
- Position hose clamps ①.

18.2 Cleaning the protection cap of the pressure sensor



- Push back hose clamp ①.
- Remove protection cap ②.
- Clean the protection cap thoroughly and blow out with compressed air.
- Mount protection cap ②.
- Position hose clamp ①.

18.3 Cleaning the hose connections of the pressure sensor

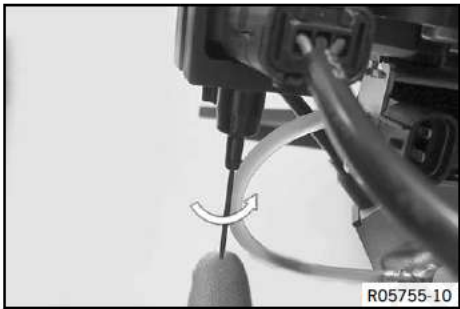
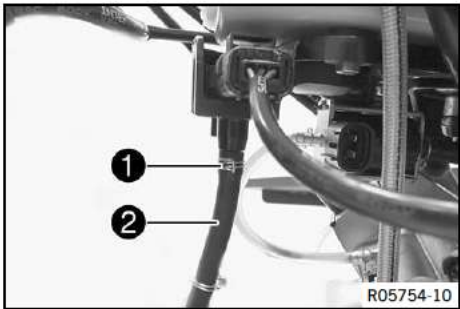
Preparatory work

(All special models)

- Remove the engine guard. (p. 55)
- Raise the motorcycle with a lift stand. (p. 12)
- Remove the seat. (p. 101)
- Disconnect the negative cable of the 12-V battery. (p. 142)
- Drain the coolant. (p. 275)
- Remove the fuel tank. (p. 102)
- Remove the manifold. (p. 92)
- Remove the air filter box cover. (p. 97)
- Remove the engine. (p. 175)

Main work

- Clean the pressure sensor cylinder connection. (p. 209)
- Push back hose clamp ①.
- Pull off hose ②.
- Pull off the pressure sensor hose.



- Clean the hose connection with a drill without applying force.
Guideline

Metal drill	2 mm (0.08 in)
-------------	----------------



Info

Do not use compressed air, as otherwise the pressure sensor will be damaged.

Finishing work

- Install the engine. (p. 181)
- Remove the motorcycle from the lift stand. (p. 12)

(All special models)

- Install the engine guard. (p. 55)
- Refill with coolant. (p. 276)
- Prime the oil pump. (p. 289)
- Mount the seat. (p. 101)
- Go for a short test ride.
- Check the engine for leaks.
- Check the gear oil level. (p. 286)
- Check the coolant level. (p. 275)

18.4 Removing the engine

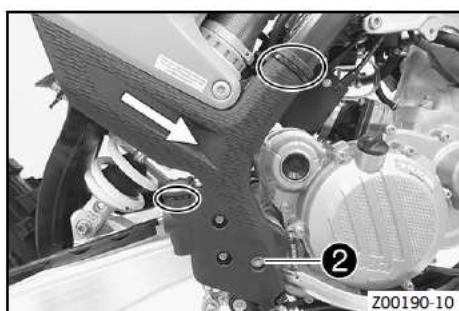
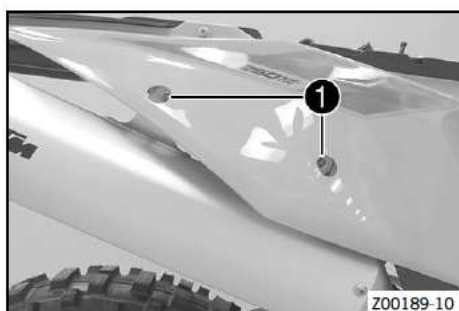
Preparatory work

(All special models)

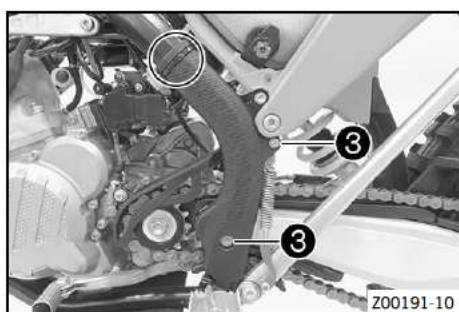
- Remove the engine guard. (p. 55)
- Raise the motorcycle with a lift stand. (p. 12)
- Remove the seat. (p. 101)
- Disconnect the negative cable of the 12-V battery. (p. 142)
- Drain the coolant. (p. 275)
- Remove the fuel tank. (p. 102)
- Remove the manifold. (p. 92)
- Remove the air filter box cover. (p. 97)

Main work

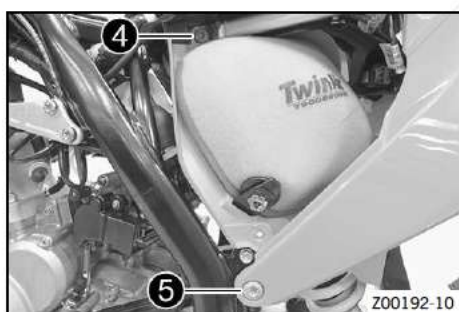
- Remove screws ① and the washers.
- Take off the main silencer.



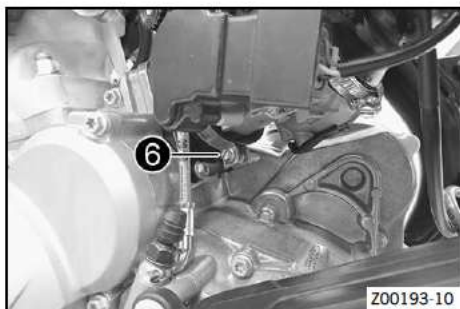
- Remove screw ② and the washers.
- Remove the cable ties.
- Push the right frame protector to the front and take off at the bottom.



- Remove screws ③ and the washers.
- Remove the cable tie.
- Take off the left frame protector.



- Loosen screw ④.
- Remove screw ⑤.
- Repeat these steps on the opposite side.



- Loosen hose clip **6**.

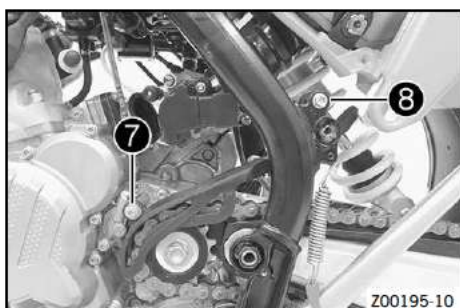


- Lift the subframe slightly and secure it.

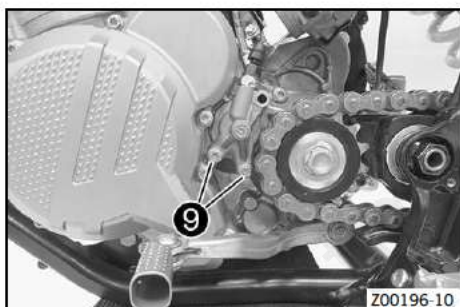


Info

Pay attention to the oil pump hose.



- Remove screw **7**.
- Remove screw **8**.
- Take off the engine sprocket cover.

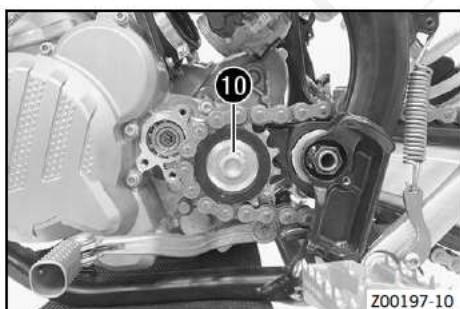


- Remove screws **9**.
- Take off the slave cylinder of the clutch and hang to the side.

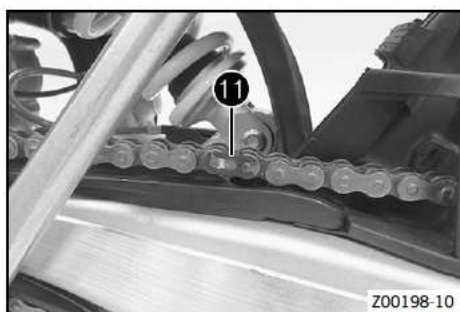


Info

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 washer.

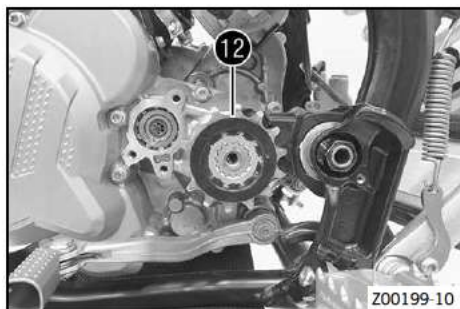


- Remove connecting link 11 of the chain.

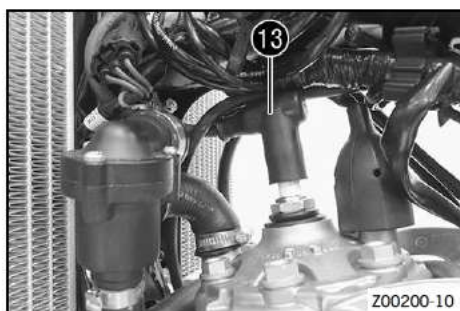
**Info**

Cover the components to protect them against damage.

- Take off the chain.



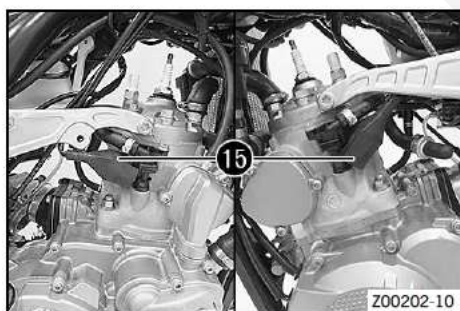
- Remove engine sprocket 12.



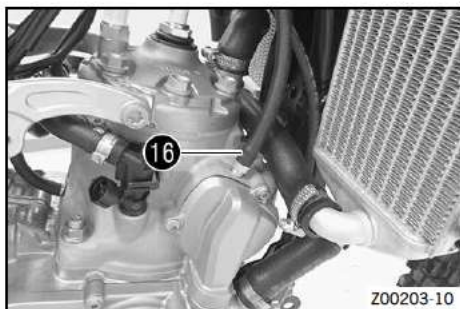
- Disconnect spark plug connector 13.



- Push back protection cap 14.
- Disconnect the connector of the coolant temperature sensor.



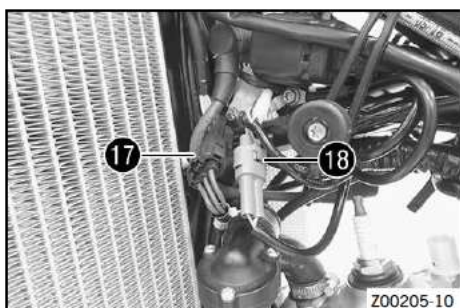
- Push back protection caps 15.
- Disconnect connector.



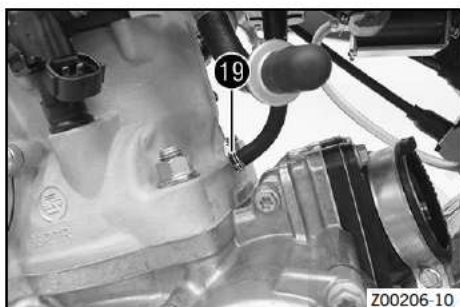
- Pull off vent hose 16.



- Remove the cable tie.



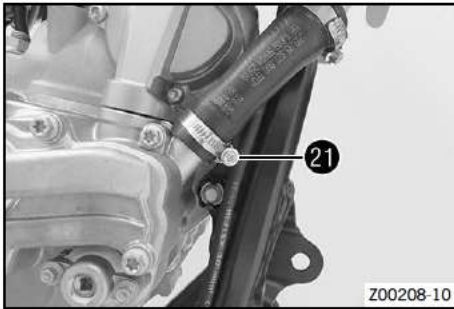
- Disconnect plug-in connector 17.
- Disconnect plug-in connector 18.
- Expose the cable.



- Push back hose clamp 19.
- Pull off the pressure sensor hose.



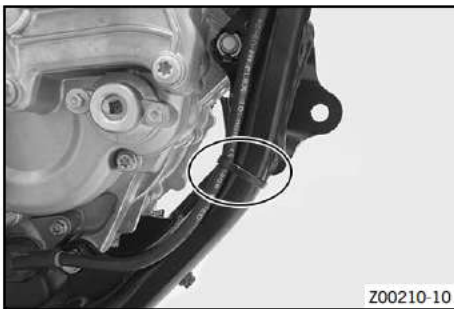
- Loosen hose clip 20.
- Pull off the radiator hose.



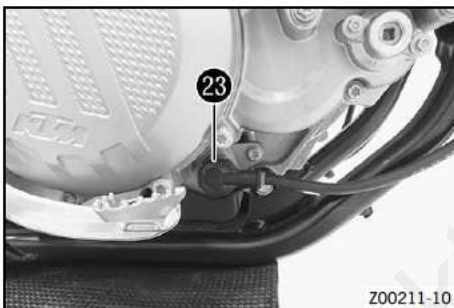
- Loosen hose clip 21.
- Pull off the radiator hose.



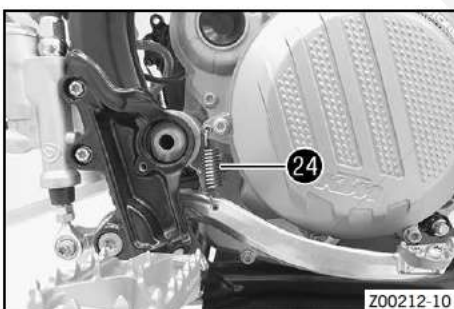
- Disconnect oil pump connector 22.



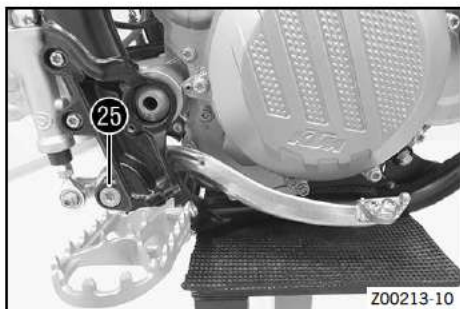
- Remove the cable tie.



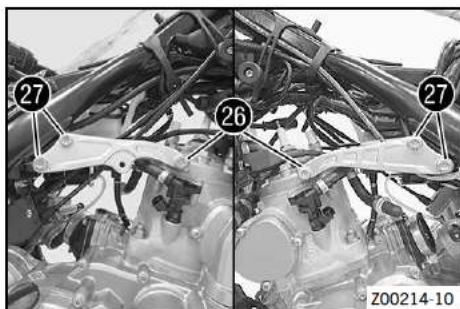
- Push back protection cap 23 and remove the nut.
- Hang the positive cable to the side.



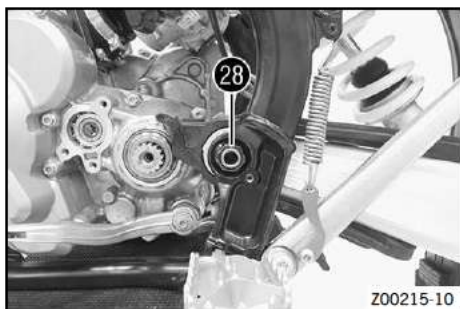
- Remove spring 24.



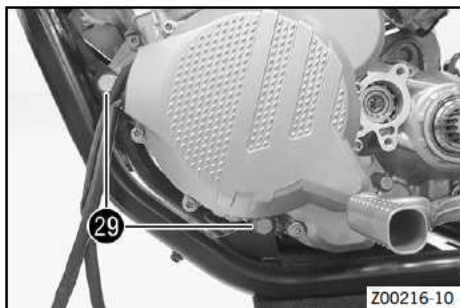
- Remove fitting 25.
- Slip the foot brake lever out toward the rear.



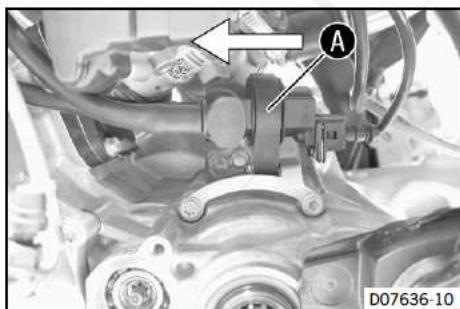
- Remove screws 26 and 27.
- Take off the engine braces.



- Remove nut 28.
- Remove the swingarm pivot.
- Carefully pull the link fork back, and secure it.



- Remove screws 29.



(EU/ASEAN)

- Pull fuel vapor valve A off the holder and hang it to the side.



- Pry out the engine sideways to the left.

**Info**

The help of an assistant is useful in this step.
Make sure that the motorcycle is sufficiently secured against falling over.
Cover the components to protect them against damage.
Pay attention to the oil pump.

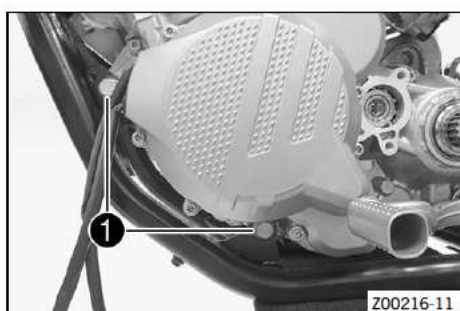
18.5 Installing the engine

**Main work**

- Position the engine in the frame.

**Info**

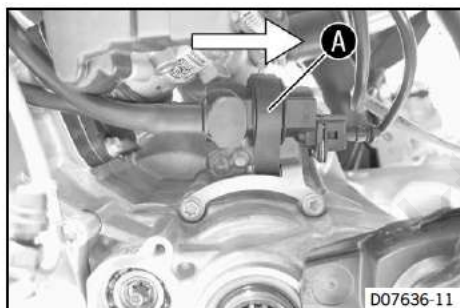
The help of an assistant is useful in this step.
Make sure that the motorcycle is sufficiently secured against falling over.
Cover the components to protect them against damage.
Pay attention to the oil pump.



- Mount screws **1**, but do not tighten yet.

Guideline

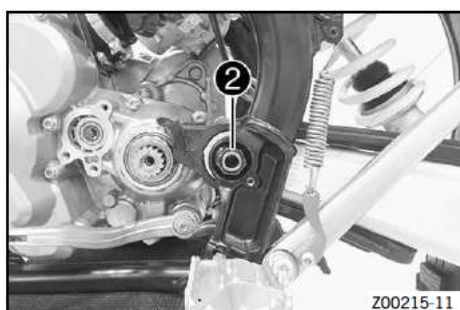
Engine bracket screw	M10	60 Nm (44.3 lbf ft)
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**(EU/ASEAN)**

- Mount fuel vapor valve **A** on the holder.

**Info**

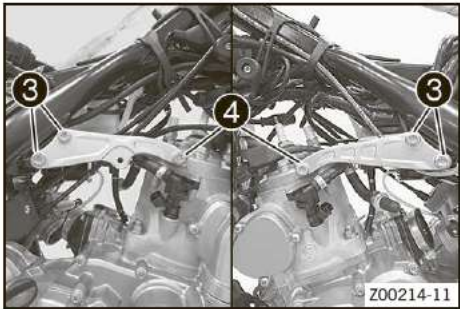
Make sure the cables and wiring are positioned correctly.



- Position the link fork.
- Mount the swingarm pivot.
- Mount nut **2**, but do not tighten yet.

Guideline

Nut, fork pivot	M16x1.5	100 Nm (73.8 lbf ft)
-----------------	---------	-------------------------



- Position the engine braces.
- Mount and tighten screws 3.

Guideline

Screw, engine brace	M8x15	25 Nm (18.4 lbf ft) Loctite®2701™
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- Mount and tighten screws 4.

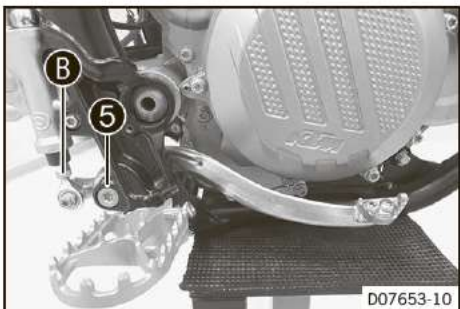
Guideline

Screw, engine brace	M8x20	25 Nm (18.4 lbf ft) Loctite®243™
---------------------	-------	--

- Tighten screws 1 and nut 2.

Guideline

Engine bracket screw	M10	60 Nm (44.3 lbf ft)
Nut, fork pivot	M16x1.5	100 Nm (73.8 lbf ft)

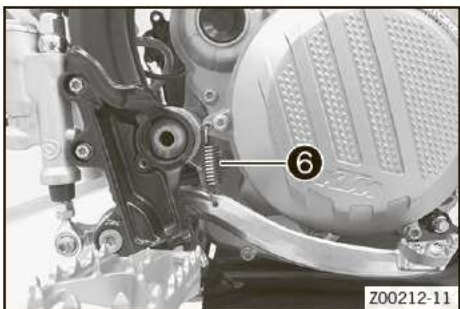


- Slip in the foot brake lever and position it.
- Mount and tighten fitting 5.

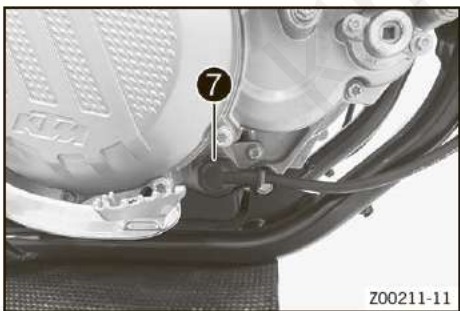
Guideline

Nut, foot brake lever	M8	
-----------------------	----	--

- ✓ Push rod B engages in the foot brake cylinder.
- ✓ The dust boot is correctly positioned.



- Mount spring 6.

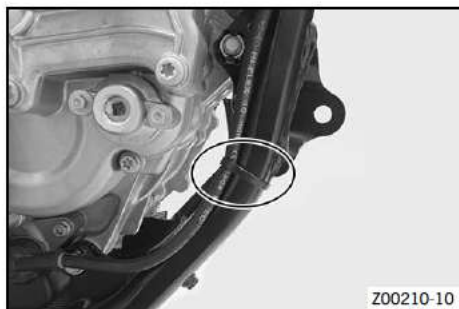


- Position the positive cable on the starter motor.
- Mount and tighten the nut.

Guideline

Remaining nuts, chassis	M6	10 Nm (7.4 lbf ft)
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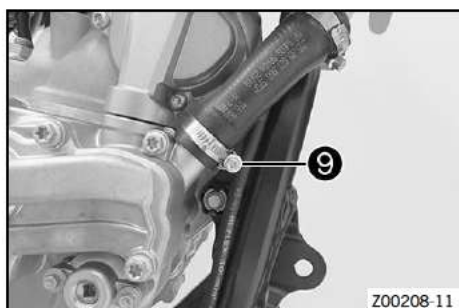
- Position protection cap 7.



- Mount the cable ties.



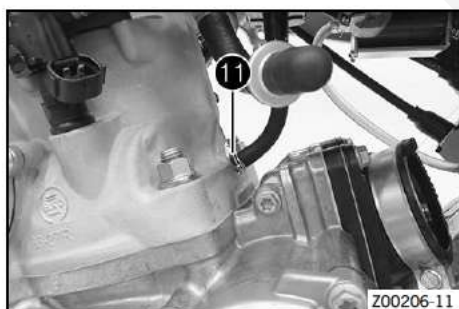
- Plug in oil pump connector ⑧.



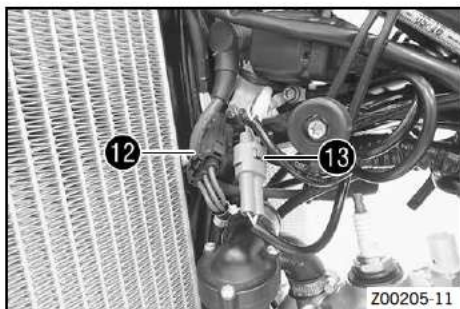
- Mount the radiator hose.
- Position and tighten hose clip ⑨.



- Mount the radiator hose.
- Position and tighten hose clip ⑩.



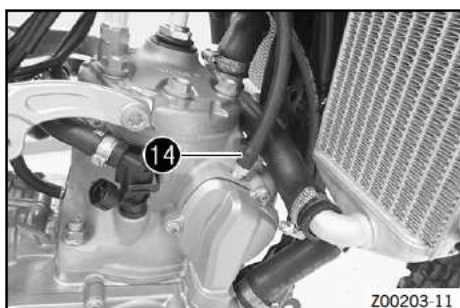
- Position pressure sensor hose.
- Position hose clamp ⑪.



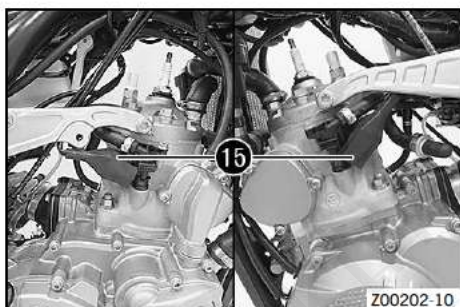
- Join plug-in connectors 12 and 13.



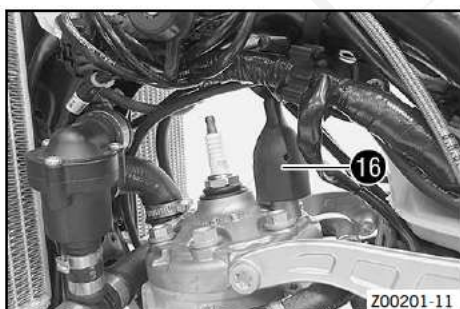
- Route the cable without tension and secure with the cable ties.



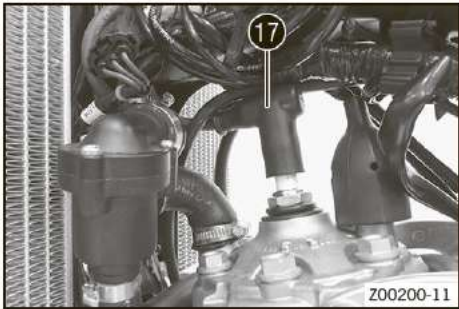
- Mount vent hose 14.



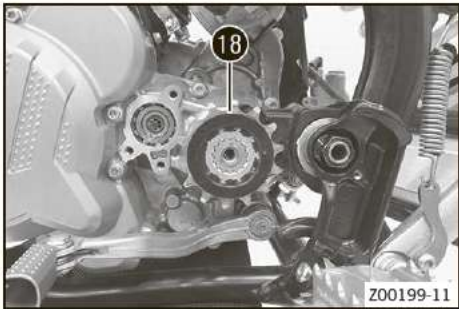
- Plug in the connectors.
- Position protection caps 15.



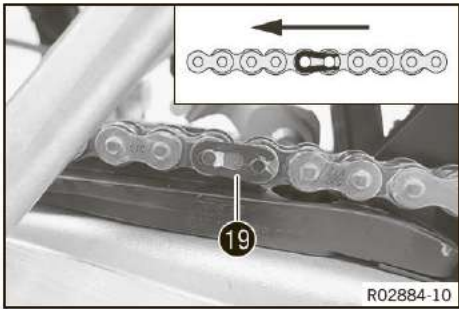
- Plug in the connector of the coolant temperature sensor.
- Position protection cap 16.



- Plug in spark plug connector 17.



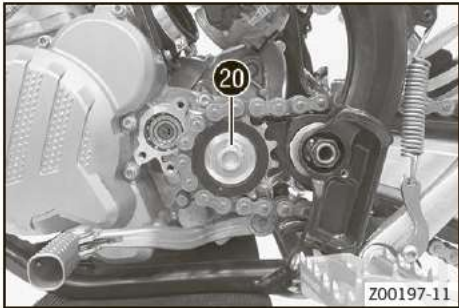
- Slide engine sprocket 18 onto the countershaft.



- Mount the chain.
- Connect the chain with connecting link 19.

Guideline

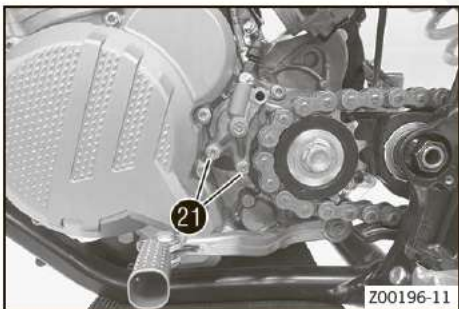
The closed side of the chain joint lock must face in the direction of travel.



- 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) Loctite®2701™
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- 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)
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- Position the engine sprocket cover.
- Mount and tighten screw **22**.

Guideline

Screw, clutch slave cylinder	M6	10 Nm (7.4 lbf ft)
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- Mount and tighten screw **23**.

Guideline

Screw, engine sprocket cover	M8	15 Nm (11.1 lbf ft)
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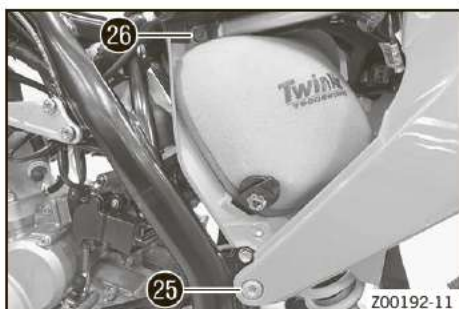
- Remove the locking piece and position the subframe.



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 bottom	M8	30 Nm (22.1 lbf ft) Loctite®2701™
-------------------------	----	---

- Remove screw **26**.
- Mount and tighten screw **26**.

Guideline

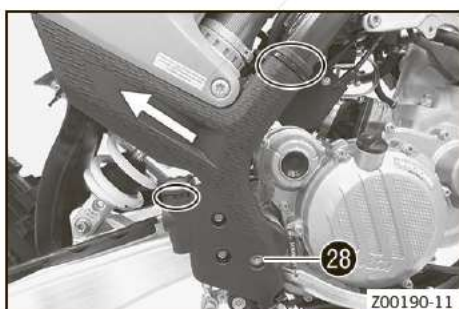
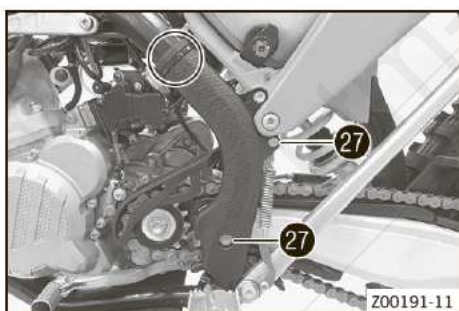
Screw, sub-frame top	M8	35 Nm (25.8 lbf ft) Loctite®2701™
----------------------	----	---

- Repeat these steps on the opposite side.
- Tighten hose clip **24**.
- Position the left frame protector.
- Mount and tighten screws **27** with the washers.

Guideline

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

- Mount the cable ties.

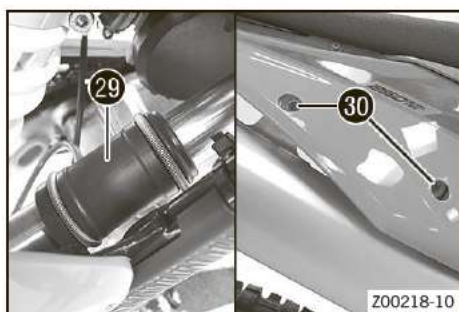


- Insert the right frame protector from below and push it to the rear.
- Mount and tighten screw **28** with washers.

Guideline

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

- Mount the cable ties.
- Install the manifold. (p. 93)



- Mount the main silencer with exhaust sleeve **29**.
- Mount and tighten screws **30** with the washers.

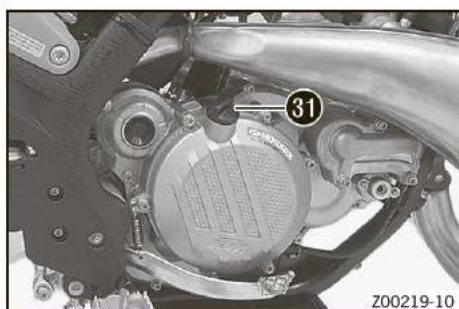
Guideline

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

- Connect the negative cable of the 12-V battery. (p. 142)
- Install the fuel tank. (p. 103)
- Install the air filter box cover. (p. 97)
- Mount the seat. (p. 101)
- Remove filler plug **31** with the O-ring, and fill up with gear oil.

Gear oil	0.80 l (0.85 qt.)	Engine oil (15W/50) (p. 370)
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- Mount and tighten filler plug **31** with the O-ring.



Finishing work

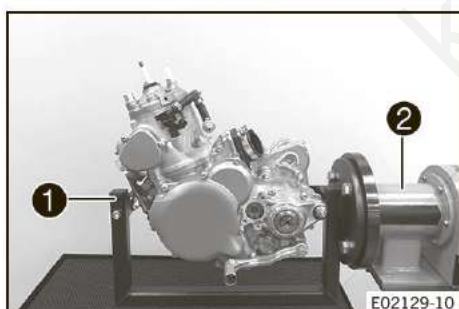
- Remove the motorcycle from the lift stand. (p. 12)

(All special models)

- Install the engine guard. (p. 55)
- Refill with coolant. (p. 276)
- Prime the oil pump. (p. 289)
- Mount the seat. (p. 101)
- Go for a short test ride.
- Check the engine for leaks.
- Check the gear oil level. (p. 286)
- Check the coolant level. (p. 275)

18.6 Engine disassembly

18.6.1 Clamping engine into the engine work stand

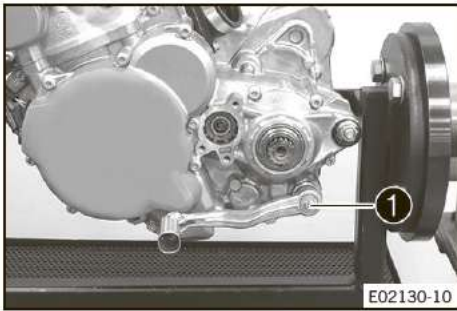


- Mount special tool **1** on engine work stand **2**.

Engine work stand (61229001000) (p. 382)
Holder and fitting for work stand (55429002000) (p. 378)

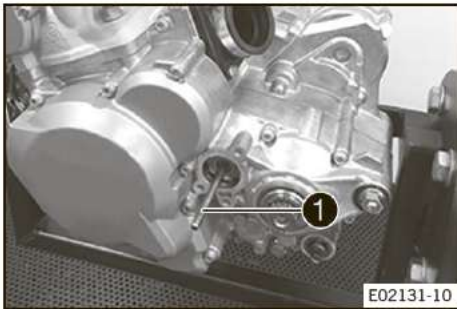
- Mount the engine on special tool **1**.

18.6.2 Removing the shift lever



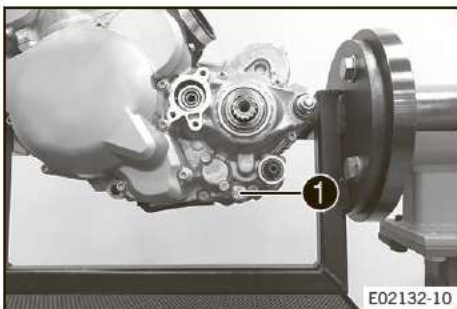
- Remove screw ① with the washers. Take off the shift lever.

18.6.3 Removing the clutch push rod



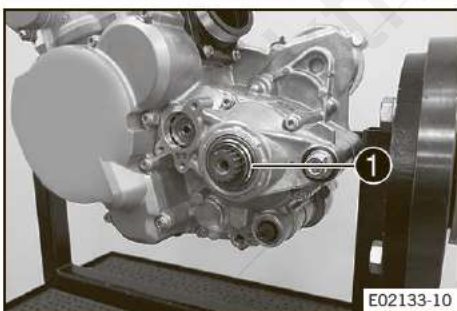
- Remove clutch push rod ①.

18.6.4 Draining the gear oil

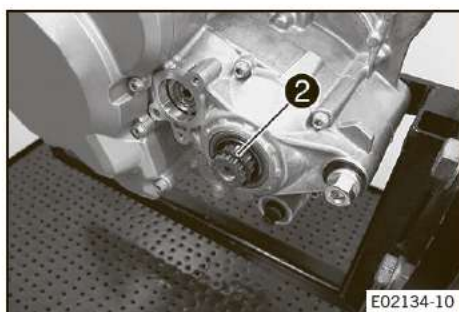


- Remove gear oil drain plug ① with the magnet and seal ring.
- Let the gear oil drain fully.

18.6.5 Removing the spacer



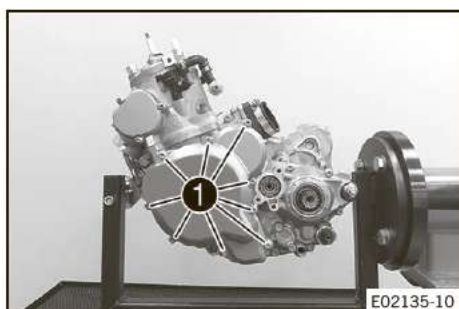
- Remove spacer ①.



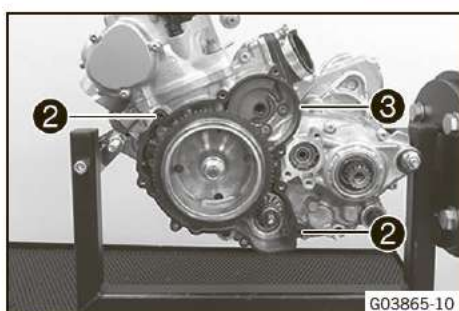
- Take off O-ring **2**.



18.6.6 Removing the alternator cover



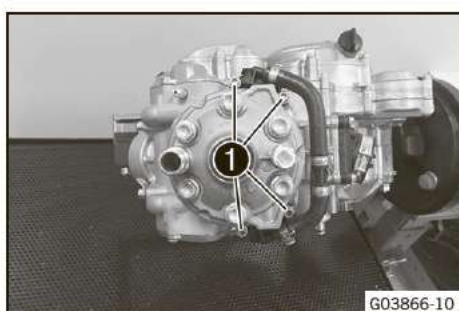
- Remove screws **1**. Take off the alternator cover.



- Remove the dowels **2** and alternator cover gasket **3**.



18.6.7 Removing injection valves



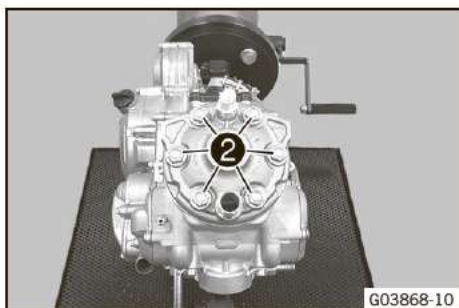
- Remove screws **1**.
- Take off the injection valves on both sides.



18.6.8 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)

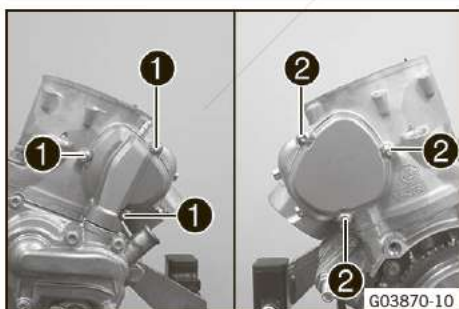
- Remove O-rings **3** and **4**.



(All 300 models)

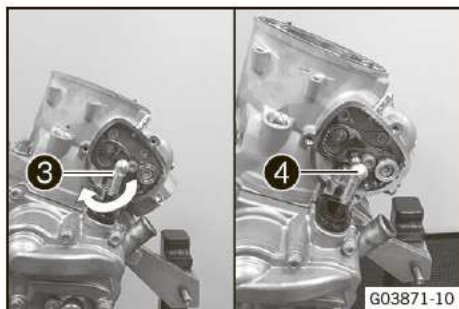
- Remove O-rings **3** and **4**.

18.6.9 Removing the cylinder

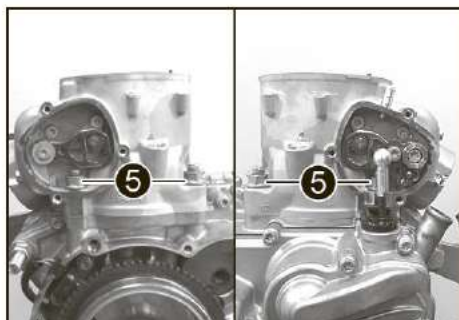


(All 250 models)

- 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.

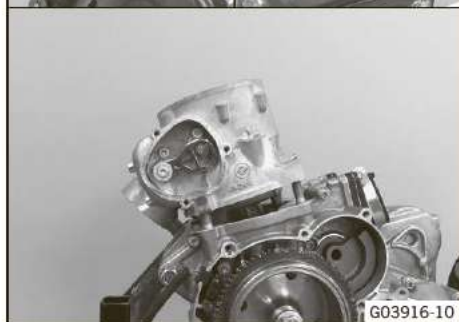


- Remove nuts **5**.

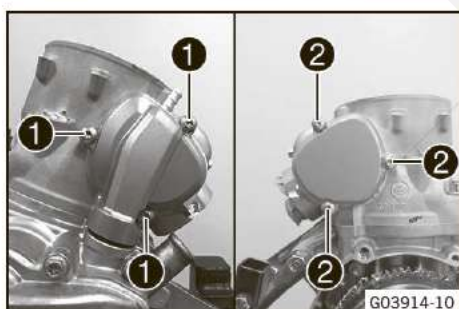
**Info**

Raise the cylinder slightly to be able to remove the front nuts.

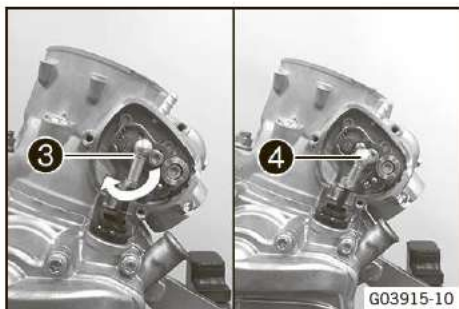
- Carefully slide the cylinder up and take it off.



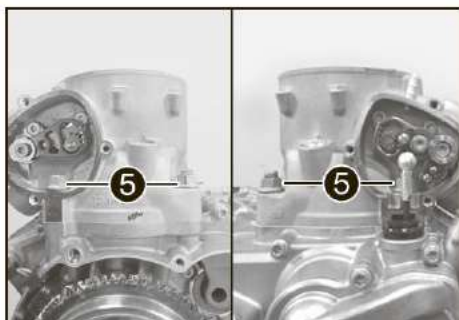
- Take off gasket **6**.

**(All 300 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.



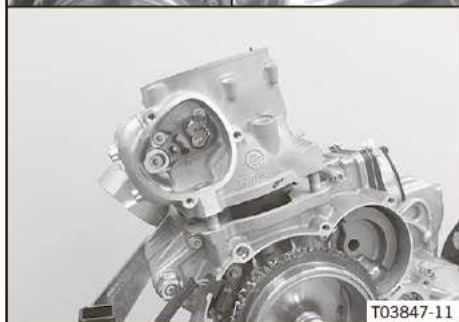
- Remove nuts ⑤.



Info

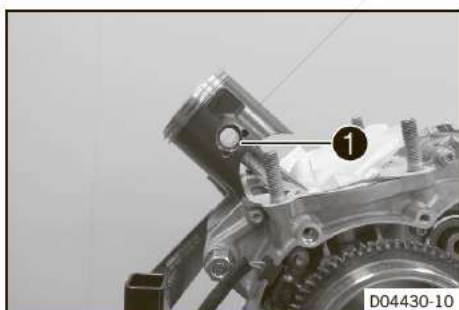
Raise the cylinder slightly to be able to remove the front nuts.

- Carefully slide the cylinder up and take it off.



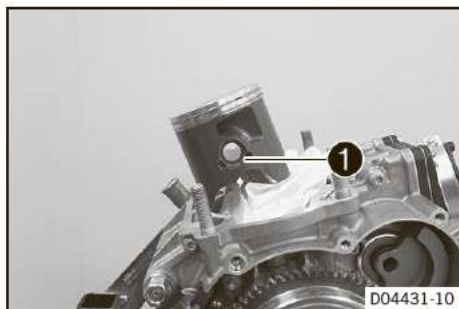
- Take off gasket ⑥.

18.6.10 Removing the piston



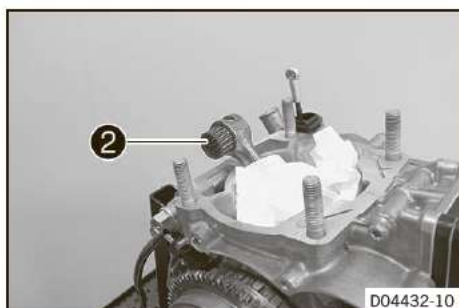
(All 250 models)

- Uncover the crankcase.
- Remove piston ring lock ①.
- Remove the piston pin.
- Take off the piston.



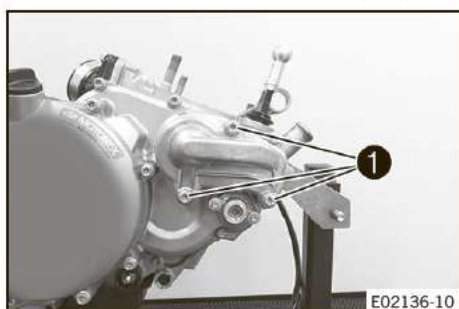
(All 300 models)

- Uncover the crankcase.
- Remove piston ring lock ①.
- Remove the piston pin.
- Take off the piston.



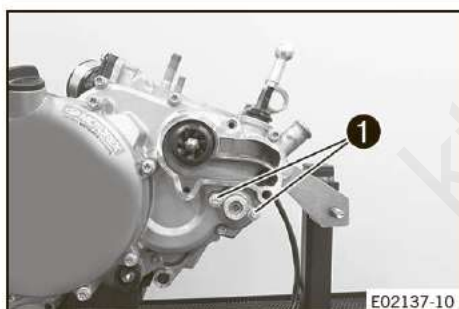
- Remove upper conrod bearing ②.

18.6.11 Removing the water pump cover

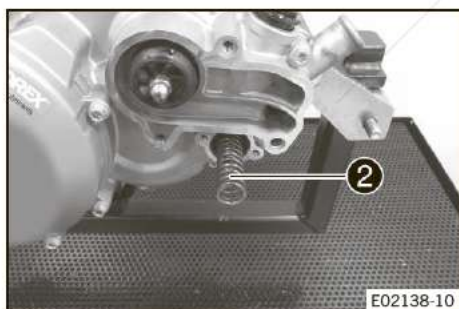


- Remove screws ①.
- Take off the water pump cover.
- Remove the form ring.

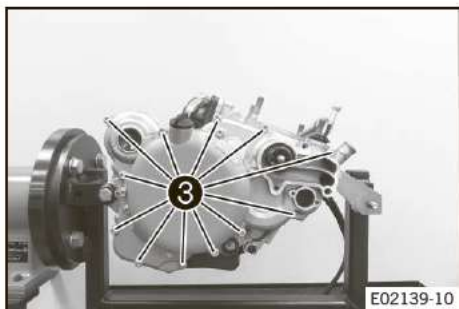
18.6.12 Removing the clutch cover



- Remove screws ①.
- Take off the cap.



- Remove adjusting spring ② with the auxiliary spring and spring insert.



- Remove screws ③.

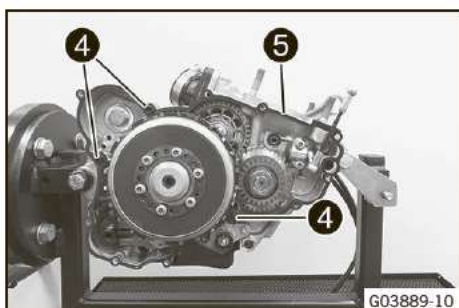


- Take off the clutch cover at the top and slip out the linkage.

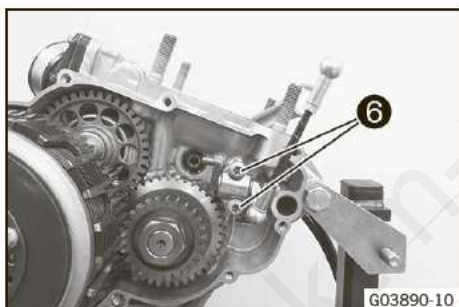


Info

Ensure that the kick starter shaft remains in the engine case.

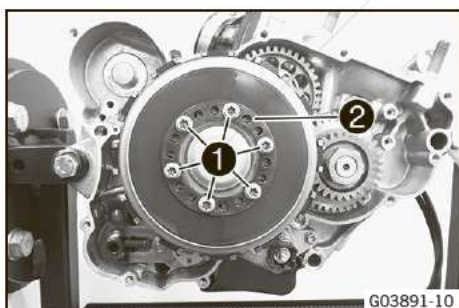


- Remove dowels ④ and clutch cover gasket ⑤.



- Remove screws ⑥.
- Take off the bearing support with the linkage and angle lever.

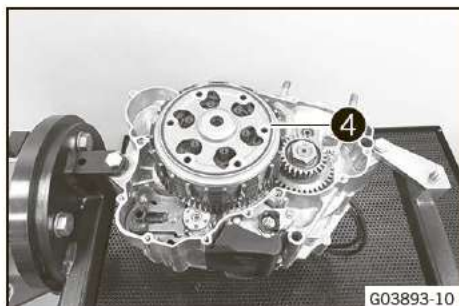
18.6.13 Removing the clutch discs



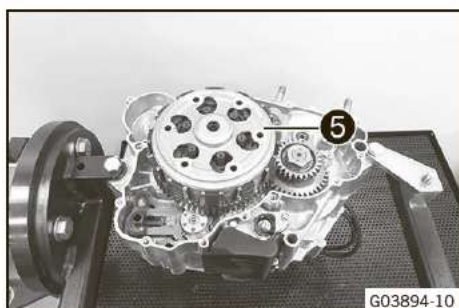
- Remove screws ①.
- Take off spring retainer ②.



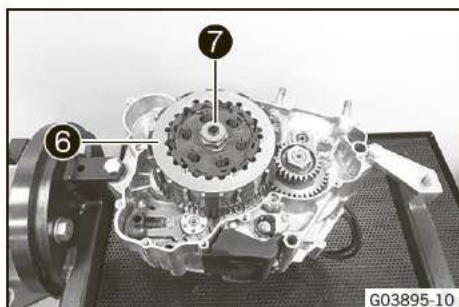
- Take off spring washer 3.



- Take off pretension ring 4.

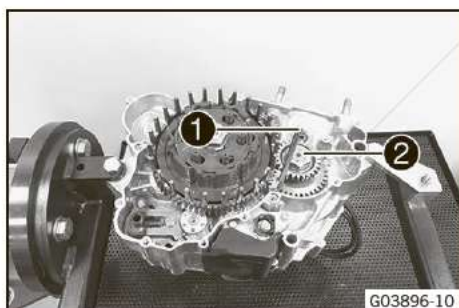


- Take off clutch pressure cap 5.



- Remove clutch disc pack 6 completely.
- Remove clutch throw-out 7.

18.6.14 Removing the clutch basket



- Hold the primary gear wheel using special tool 1.

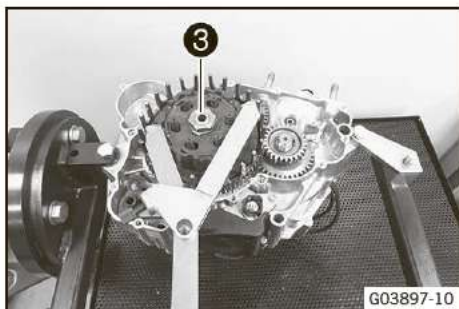
Gear segment (56012004000) (p. 378)

- Remove nut 2 with the washer.



Info

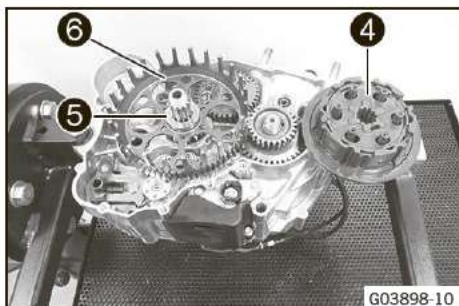
LH thread!



- Bend up the lock washer.
- Hold the inner clutch hub with the special tool. Loosen nut (3).

Holding wrench (51129003000) (p. 377)

- Remove the nut with the lock washer.



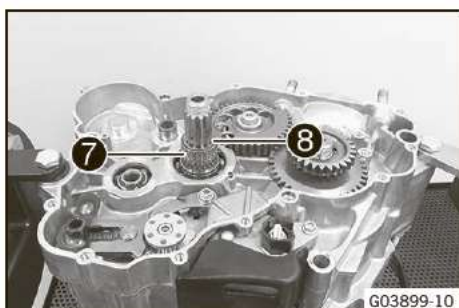
- Take off inner clutch hub (4) and washer (5).



Info

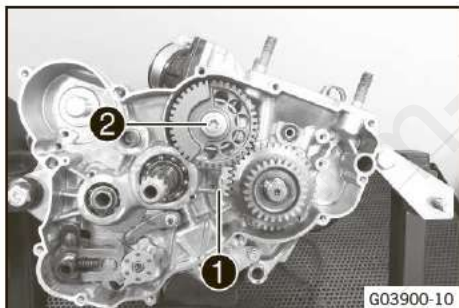
The washer usually sticks to the inner clutch hub.

- Take off clutch basket (6).



- Take off needle bearing (7) and collar bushing (8).

18.6.15 Removing the balancer shaft



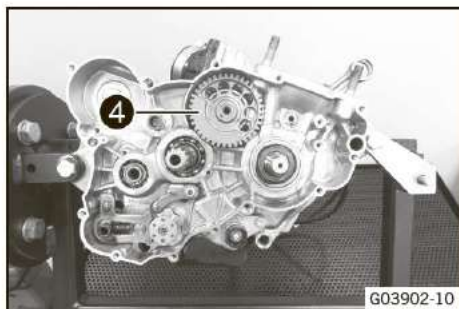
- Position the special tool.
- Hold the balancer shaft in place using the special tool (1).

Gear segment (56012004000) (p. 378)

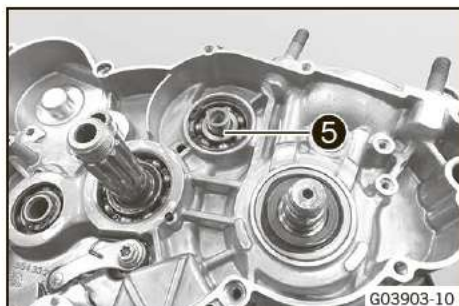
- Remove screw (2) with the washer.



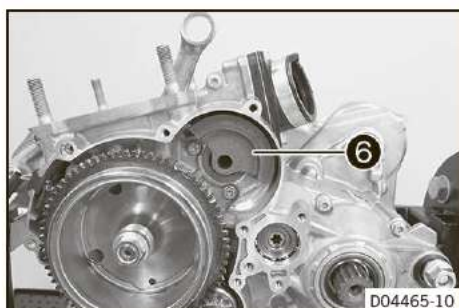
- Remove primary gear wheel (3).



- Remove balancer shaft drive wheel **4**.

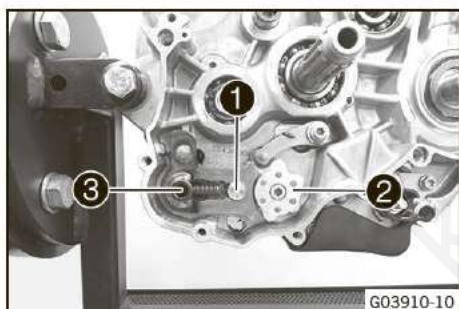


- Remove woodruff key **5**.



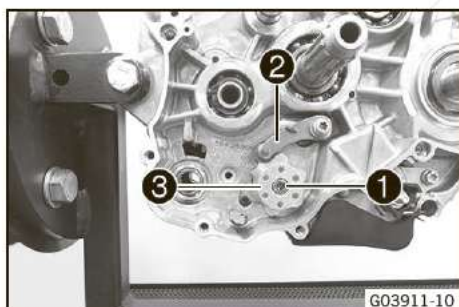
- Remove balancer shaft **6**.

18.6.16 Removing the shift shaft



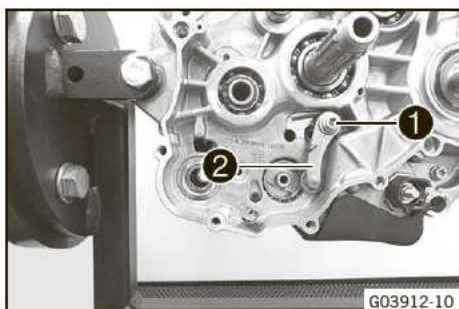
- Push sliding plate **1** away from shift drum locating unit **2**.
Remove shift shaft **3** with washer.

18.6.17 Removing the shift drum locating unit



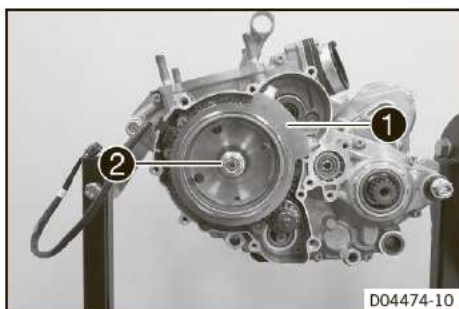
- Remove screw **1**.
- Push locking lever **2** away from shift drum locating unit **3** and take off the shift drum locating unit.
- Relieve tension from the locking lever.

18.6.18 Removing the locking lever

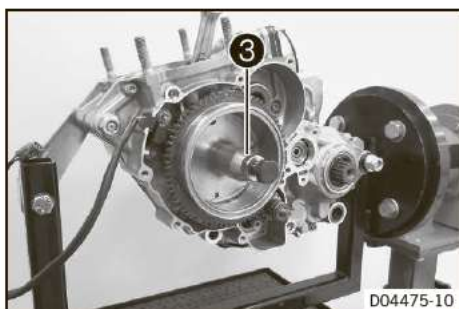


- Remove screw **1** with the washer.
- Take off locking lever **2** with the sleeve and spring.

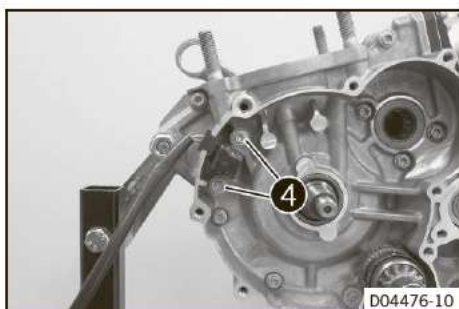
18.6.19 Removing the rotor



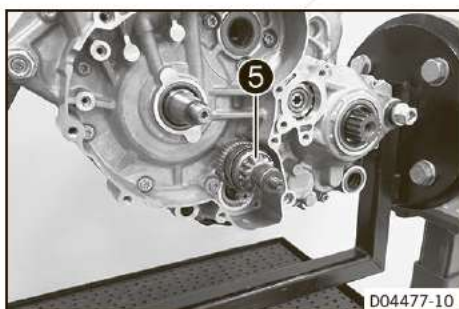
- Hold the rotor with special tool **1**.
Holding wrench (55429012000) (p. 378)
- Remove nut **2** with the washer.



- Mount special tool **3**, hold, and pull off the rotor by screwing in the screw.
Puller (58012009000) (p. 379)

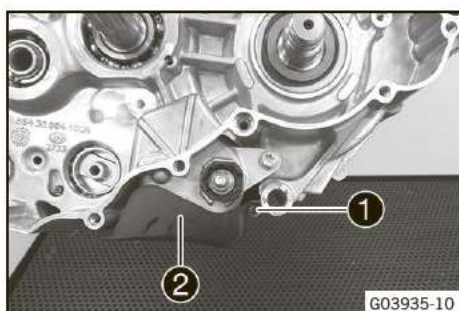


- Remove screws **4**.
- Take off the crankshaft speed sensor.



- Take off Bendix **5**.

18.6.20 Removing the starter motor



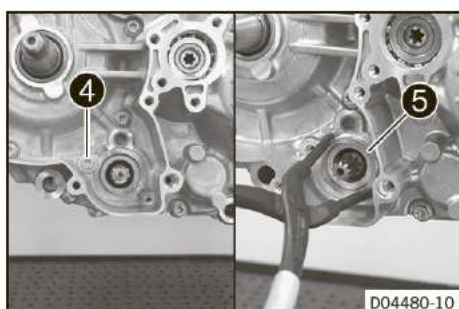
- Remove screw ①.
- Take off cover ②.



- Remove screws ③.
- Pull the starter motor out of the engine case as far as possible.

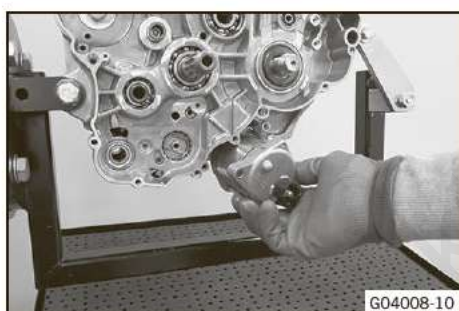
**Info**

It is not possible to completely remove the starter motor.

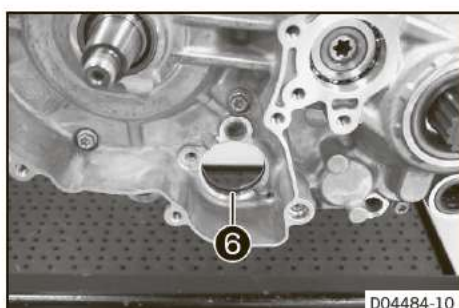


- Remove screw ④.
- Remove spacer ⑤ using the special tool.

Footrest spring plier (58429083000) (p. 379)

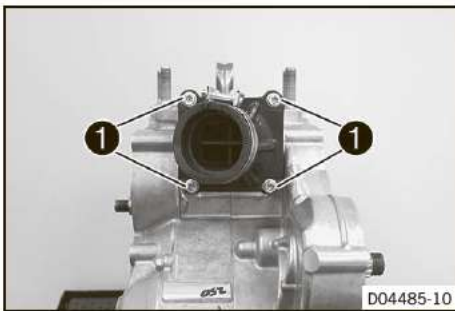


- Remove the starter motor.

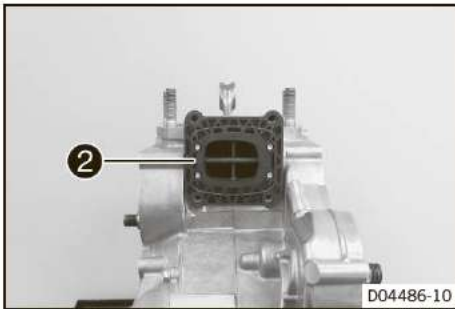


- Remove O-ring ⑥.

18.6.21 Removing the reed valve housing

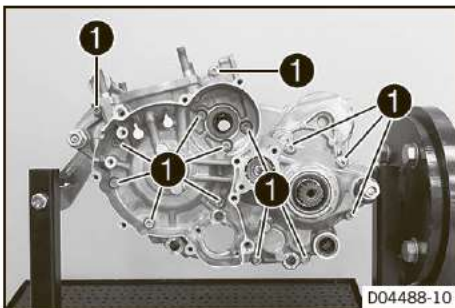


- Remove screws ①.
- Take off intake flange and gasket.



- Remove reed valve housing ②.
- Take off the gasket.

18.6.22 Removing the left section of the engine case



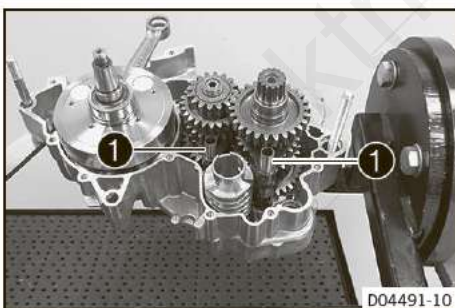
- Remove screws ①.
- Tilt the left section of the engine case upward and remove the fitting of the engine fixing arm.
- Loosen the left section of the engine case by striking it lightly with a plastic hammer and remove it.



Info

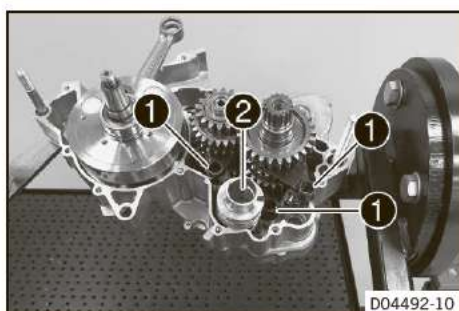
Do not pry it apart with screwdrivers, since the sealing areas are easily damaged.

18.6.23 Removing the shift rails



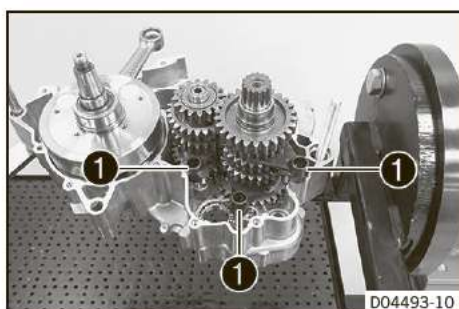
- Remove shift rails ①.

18.6.24 Removing the shift drum



- Tilt shift forks **1** to the side.
- Remove shift drum **2**.

18.6.25 Removing the shift forks

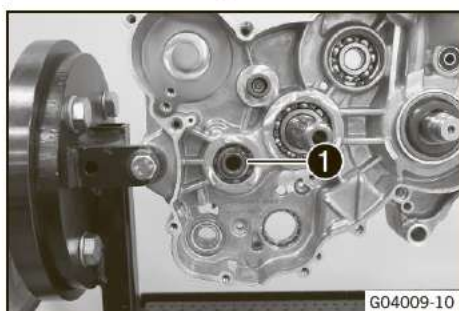


- Remove shift forks **1**.

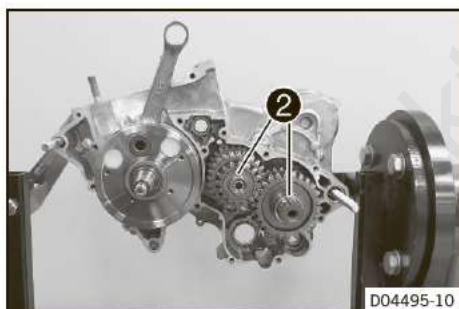
**Info**

Do not misplace the shift rollers.

18.6.26 Removing the transmission shafts



- Remove lock ring **1**.

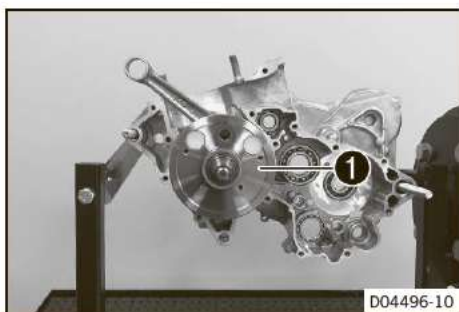


- Pull both transmission shafts **2** out of the bearing seats together.

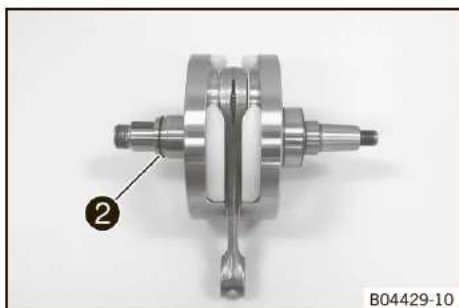
**Info**

The stop disks of the transmission shafts usually stick to the bearings.

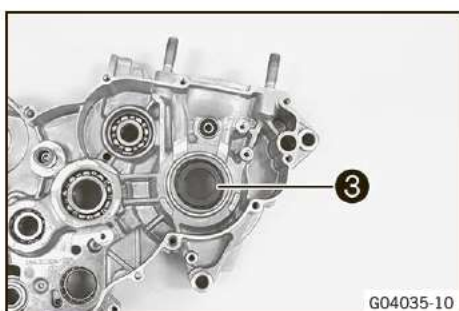
18.6.27 Removing the crankshaft



- Remove crankshaft **1**.



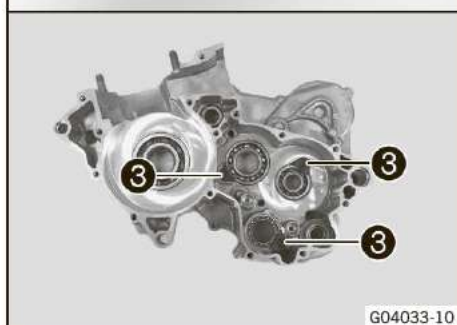
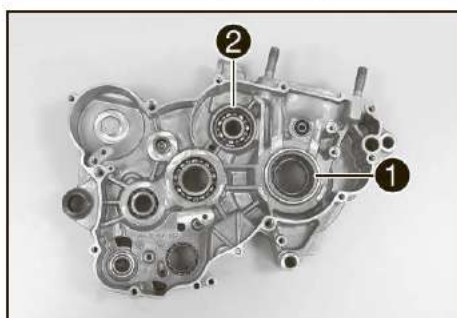
- Remove O-ring **2**.



- Remove distance sleeve **3**.

18.7 Working on individual parts

18.7.1 Working on the right section of the engine case



G04033-10



D04499-10

- Remove all dowels.
- Remove radial shaft seal ring ① of the crankshaft.
- Remove lock ring ②.
- Remove screws ③. Remove the bearing retainers.
- Clean the section of the engine case thoroughly.
- Warm the section of the engine case in an oven.

Guideline

180 °C (356 °F)

- Knock the section of the engine case against a level wooden board. This will cause the bearings to drop out of the bearing seats.



Info

Any bearings that remain in the section of the engine case 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 pressing tool 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 to prevent damage.

Only press the bearings in using the outer bearing race; otherwise, the bearings will be damaged when they are pressed in.

- After the section of the engine case has cooled, check that the bearings are firmly seated.



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.

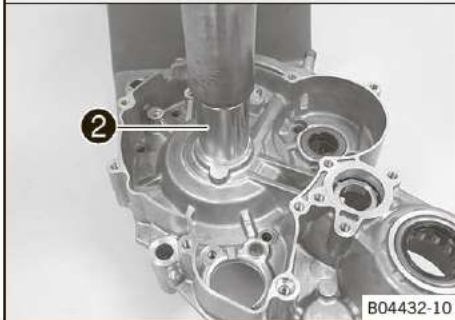
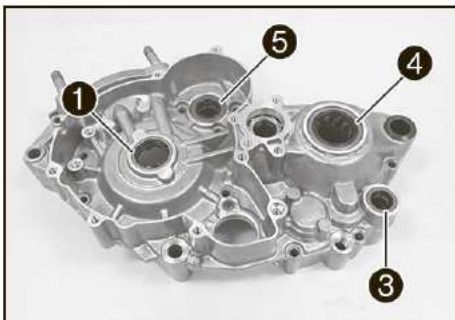
- Press in radial shaft seal ring ① of the crankshaft with the open side facing in so that it is flush.
- Mount lock ring ②.
- Mount and tighten screws ③ with the bearing retainers.

Guideline

Screw, bearing retainer	M5	6 Nm (4.4 lbf ft) Loctite®243™
-------------------------	----	--

- Mount the dowels.

18.7.2 Working on the left section of the engine case



- Remove all dowels.
- Press radial shaft seal ring 1 of the crankshaft from the outside to facing inward using special tool 2.

Pressing tool (60029046128) (p. 381)

- Remove radial shaft seal ring 3 from the shift shaft and 4 from the countershaft.
- Remove radial shaft seal ring 5 of the balancer shaft.

- Remove lock ring 6.
- Clean the section of the engine case thoroughly.
- Warm the section of the engine case in an oven.

Guideline

180 °C (356 °F)

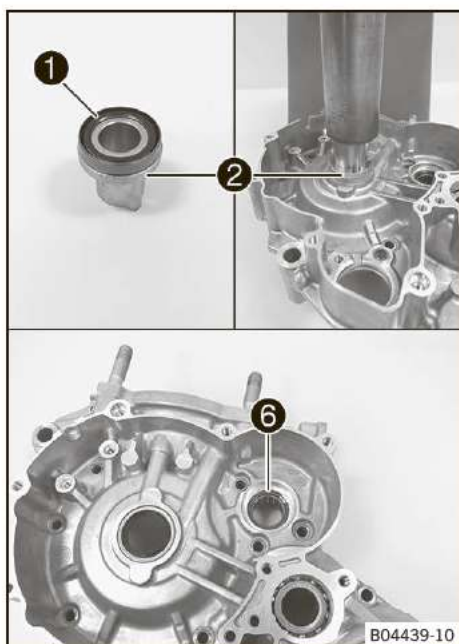
- Knock the section of the engine case against a level wooden board. This will cause the bearings to drop out of the bearing seats.



Info

Any bearings that remain in the section of the engine case 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 pressing tool 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 to prevent damage. Only press the bearings in using the outer bearing race; otherwise, the bearings will be damaged when they are pressed in.

- After the section of the engine case has cooled, check that the bearings are firmly seated.

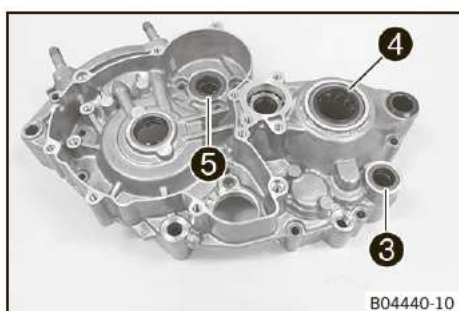
**Info**

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 replaced.

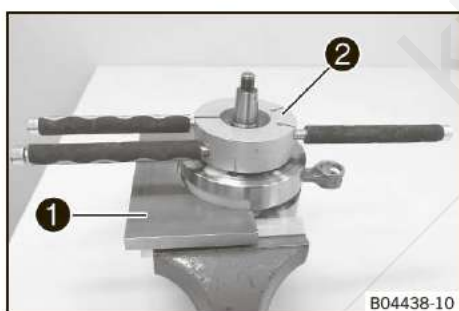
- Position radial shaft seal ring (1) for the crankshaft on special tool (2).

Pressing tool (50429005000) (p. 376)

- Press in the radial shaft seal ring of the crankshaft from the outside to the inside with the open side facing inward.
- Mount lock ring (6).
- Press in radial shaft seal ring (3) of the shift shaft so it is flush with the open side facing inward.
- Press in radial shaft seal ring (4) of the countershaft so it is flush with the open side facing in.
- Press in radial shaft seal ring (5) of the balancer shaft so it is flush with the open side facing in.



18.7.3 Removing the crankshaft bearing inner race



- Fixate the crankshaft in the vice with special tool (1).

Guideline

Use soft jaws.

Separator plate (54829009000) (p. 377)

- Warm up special tool (2).

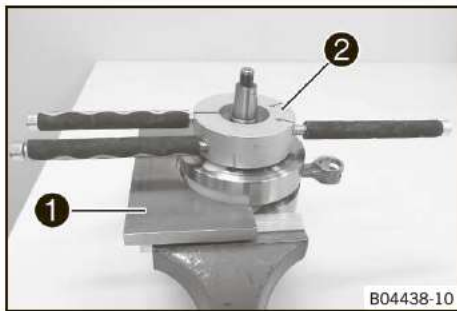
Guideline

180 °C (356 °F)

Puller (58429037043) (p. 379)

- Push the warmed up special tool (2) onto the crankshaft bearing inner race, press firmly together, and pull jointly from the crankshaft.

18.7.4 Installing the crankshaft bearing inner race



- Fixate the crankshaft in the vice with special tool ①.

Guideline

Use soft jaws.

Separator plate (54829009000) (p. 377)

- Heat the crankshaft bearing inner race in special tool ② and mount together.

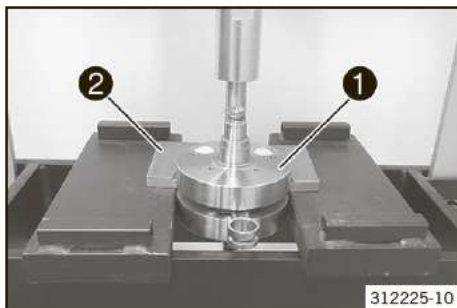
Guideline

120 °C (248 °F)

Puller (58429037043) (p. 379)

- Ensure that the new crankshaft bearing inner race is flush.

18.7.5 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. 377)

- Press the crank pin out of the upper crankweb with a suitable tool.



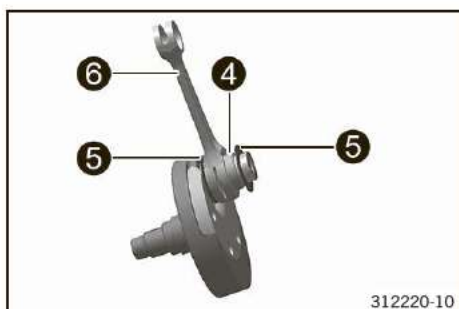
Info

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.

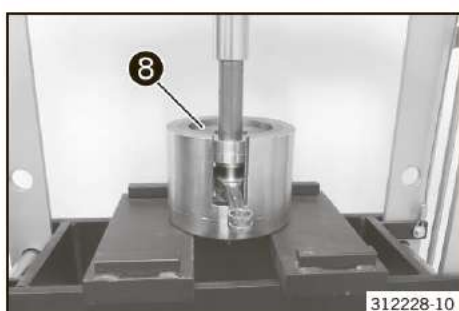


- Position special tool ⑦ on the press.

Crankshaft pressing tool (75029047000) (p. 382)

Insert for crankshaft pressing tool (54829108000)
(p. 377)

- Insert the crankweb with the connecting rod and bearing. Position the second crankweb.



- Position special tool ⑧ with the heel pointing down.

Insert for crankshaft pressing tool (54829108000)
(p. 377)

- Press in the upper crankweb as far as possible.

**Info**

The press mandrel must be positioned over the crank pin.

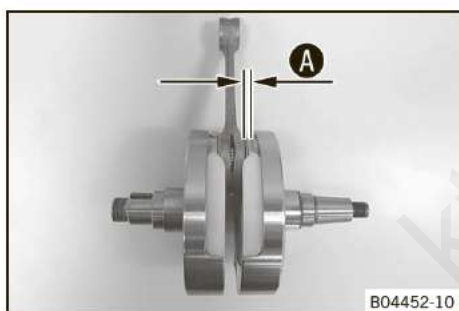
- Take the crankshaft out of the special tool and check that the connecting rod can move freely.

- Measure axial play **A** between the connecting rod and the crankwebs using the special tool.

Feeler gauge (59029041100) (p. 381)

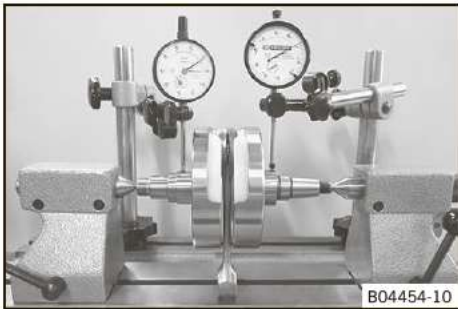
Connecting rod - axial play of lower conrod bearing	0.60 ... 0.70 mm (0.0236 ... 0.0276 in)
---	---

- » 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. 208)

18.7.6 Checking the crankshaft run-out at the bearing pin

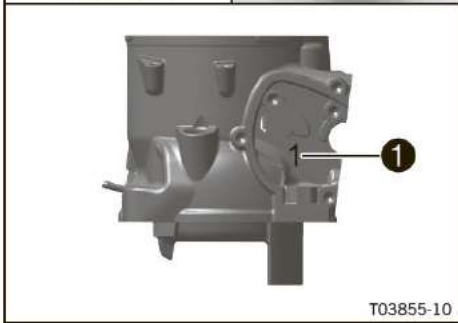
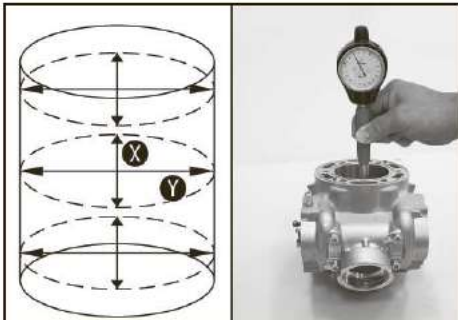


- Position the crankshaft on a roller block.
- Turn the crankshaft slowly.
- Check the crankshaft run-out on both bearing pins.

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.

18.7.7 Checking/measuring the cylinder



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)

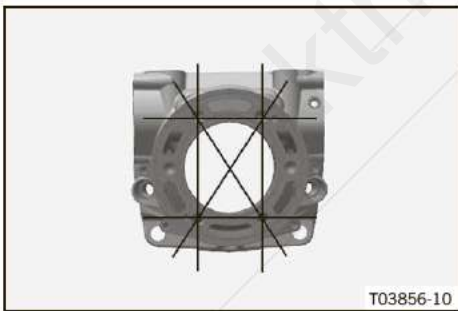
i Info
The cylinder size **1** is labeled on the right side of the cylinder.

- Using a straightedge and the special tool, check the sealing surface of the cylinder head for distortion.

Feeler gauge (59029041100) (p. 381)

Cylinder/cylinder head - distortion of sealing surface	$\leq 0.10 \text{ mm } (\leq 0.0039 \text{ in})$
--	--

- » If the measured value does not meet specifications:
 - Change the cylinder.



18.7.8 Cleaning the pressure sensor cylinder connection



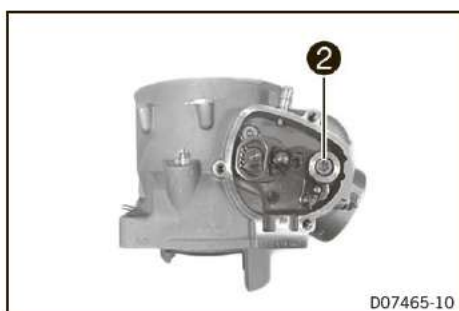
- Clean pressure connection **1** thoroughly and blow out with compressed air.

18.7.9 Removing the exhaust control

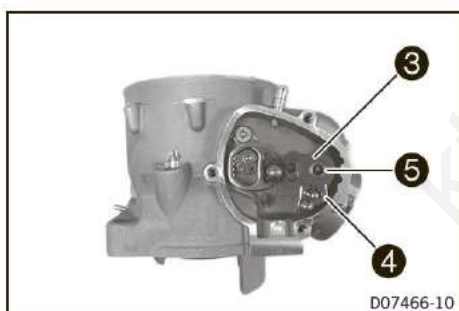


(All 250 models)

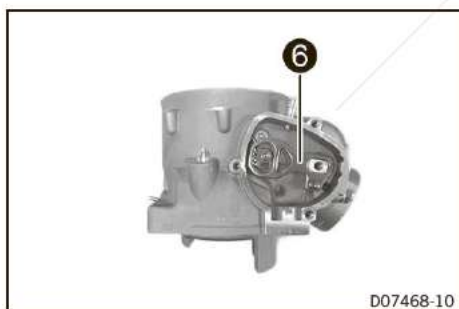
- Remove screw **1**.



- Remove screw **2** with the bushing and spring.



- Remove adjusting lever **3** and thrust bearing **4** with bushing **5**.



- Take off gear segment **6**.



- Remove screw **7**.
- Take off the retaining bracket.



- Remove control shaft **8**.



- Remove screw **9** with the washer.



- Take off gear segment **10**.



- Remove screw **11**.
- Take off the retaining bracket.



- Remove control shaft 12.



- Remove screws 13.
- Take off the exhaust flange.



- Remove O-rings 14.
- Remove the control flap evenly from the grooves on both sides.

**Info**

If the control flap is wedged, the cylinder may be damaged.

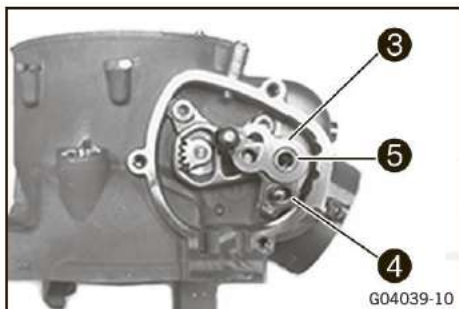


(All 300 models)

- Remove screw 1.



- Remove screw 2 with the bushing and spring.



- Remove adjusting lever **3** and thrust bearing **4** with bushing **5**.



- Take off gear segment **6**.



- Remove screws **7**.
- Take off the retaining bracket.



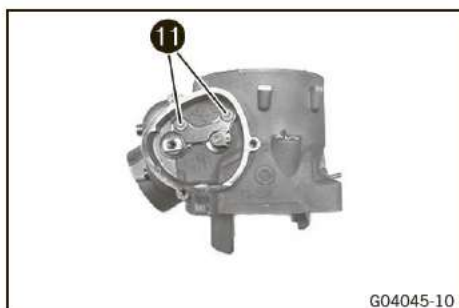
- Remove control shaft **8**.



- Remove screw **9** with the washer.



- Take off gear segment 10.



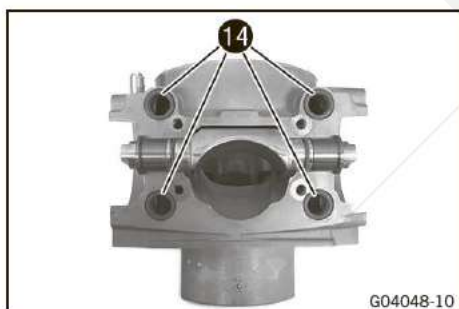
- Remove screws 11.
- Take off the retaining bracket.



- Remove control shaft 12.



- Remove screws 13.
- Take off the exhaust flange.

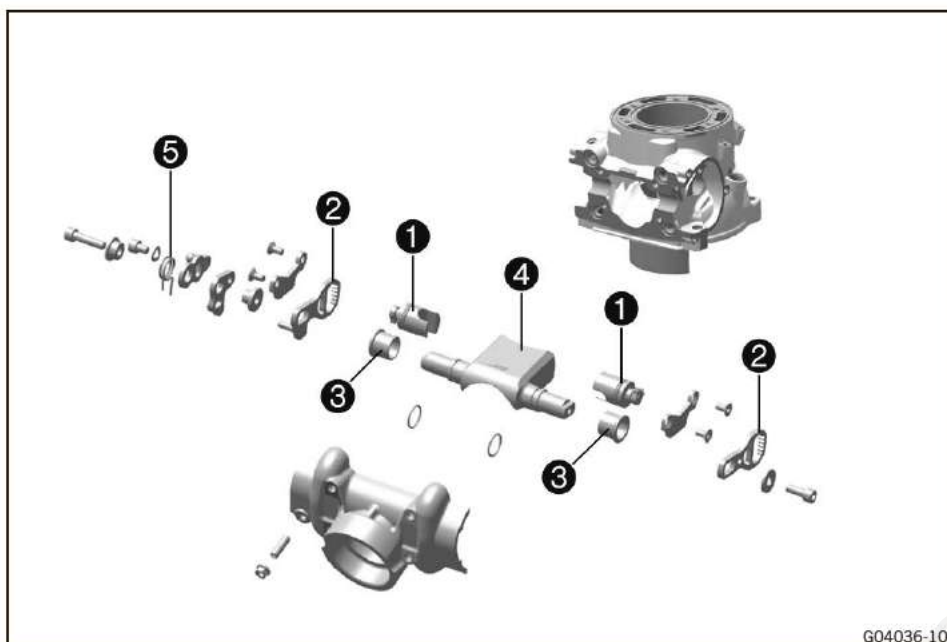


- Remove O-rings 14.
- Take off the control flap.

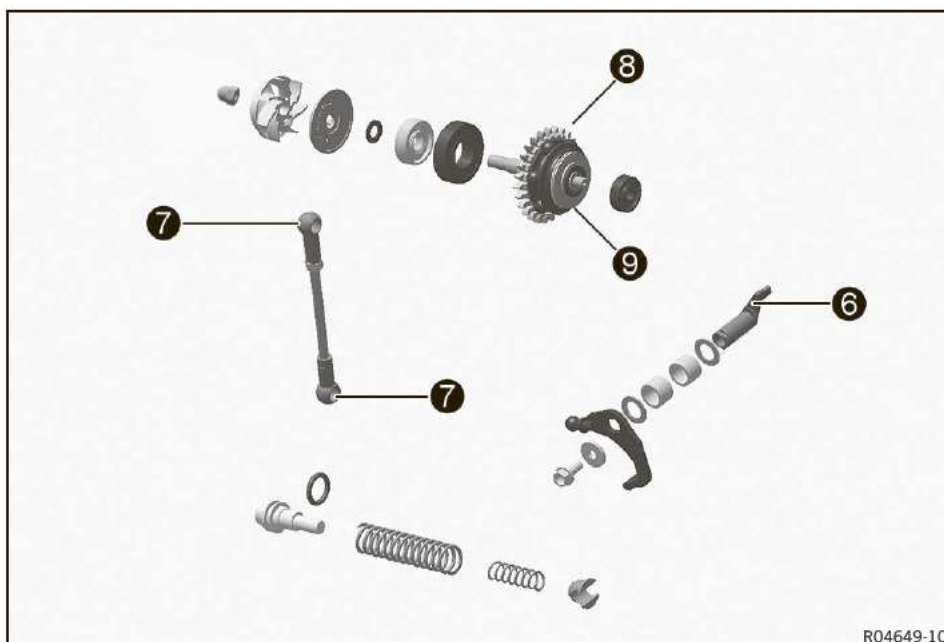
18.7.10 Checking the exhaust control

Condition

The exhaust control and the centrifugal force controller are removed.



- 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.



- 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 force controller **8** for damage and wear.
 - » If there is damage or wear:
 - Change centrifugal force controller.
- Check axial bearing **9** for damage and wear.
 - » If there is damage or wear:
 - Change the axial bearing.

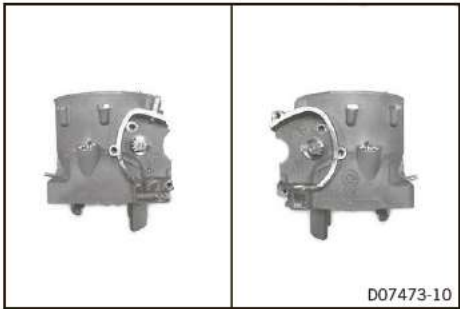
18.7.11 Installing the exhaust control

(All 250 models)

- Mount and grease O-rings **1**.

Long-life grease (p. 372)



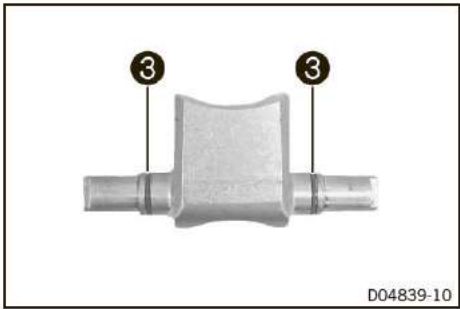


- Mount the control shafts.
 - ✓ The control shaft with marking **L** is installed on the left.



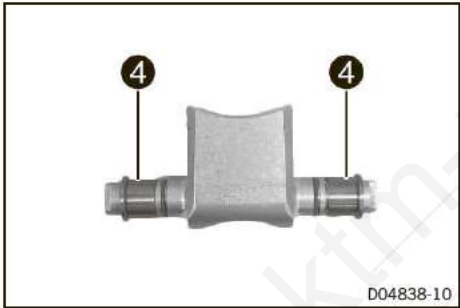
- Mount the retaining brackets.
- Mount and tighten screws **2**.

Guideline		
Screw, retaining bracket of exhaust control	M5	6 Nm (4.4 lbf ft) Loctite®2701™



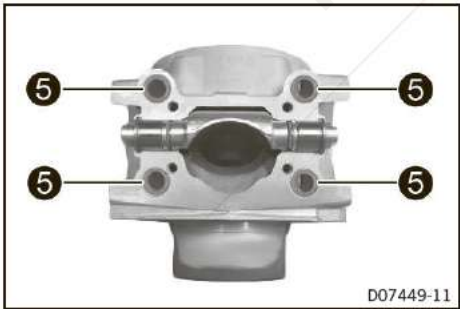
- Mount and grease O-rings **3**.

Long-life grease (p. 372)

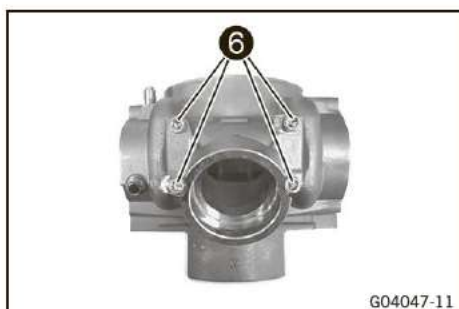


- Mount and grease bearing sleeves **4**.

Long-life grease (p. 372)



- Set the control flap to the open position in the grooves.
- Mount O-rings **5**.



- Degrease the sealing surface and coat thinly with sealing compound.

Loctite® 5910

- Position the exhaust flange.
✓ The control flap is still in the open position.
- Mount and tighten screws **6**.

Guideline

Screw, exhaust flange	M6	8 Nm (5.9 lbf ft)
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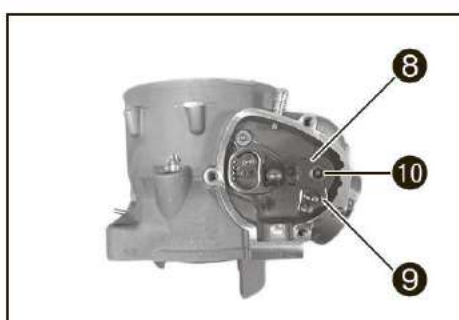


Info

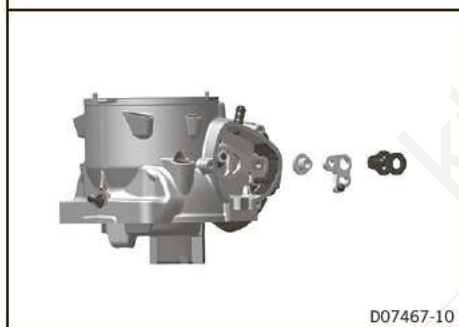
Do not forget the spring hangers.

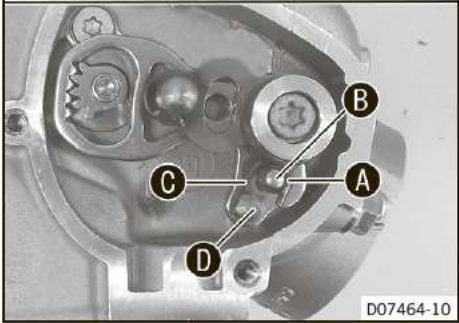


- Position gear segment **7**.



- Position adjusting lever **8** and thrust bearing **9** with bushing **10**.





D07464-10



D07463-11



D07471-11



D07470-11

- Position the spring with the short leg toward the outside.
- Mount screw 11 with the bushing and spring but do not tighten yet.

Guideline

Screw, control flap, exhaust control	M6	10 Nm (7.4 lbf ft) Loctite®243™
--------------------------------------	----	---

- Attach the spring.
 - ✓ The short leg of spring A rests on the right on top pin B.
 - ✓ The long leg of spring C rests on the left on bottom pin D.
- Tighten the screw.

Guideline

Screw, control flap, exhaust control	M6	10 Nm (7.4 lbf ft) Loctite®243™
--------------------------------------	----	---

- Mount screw 12, but do not tighten yet.

i

Info

The screw is tightened when the Z-distance is adjusted.

- Position gear segment 13.

- Mount and tighten screw 14 with the washer.

Guideline

Screw, control flap, exhaust control	M6	10 Nm (7.4 lbf ft) Loctite®243™
--------------------------------------	----	---



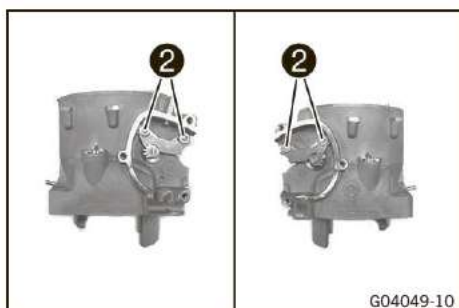
(All 300 models)

- Mount and grease O-rings **1**.

Long-life grease (p. 372)



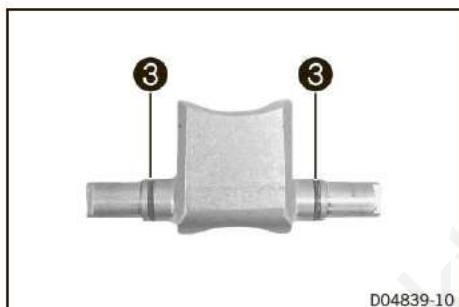
- Mount the control shafts.
- ✓ The control shaft with marking **L** is installed on the left.



- Mount the retaining brackets.
- Mount and tighten screws **2**.

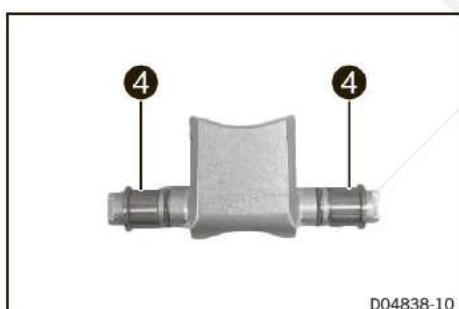
Guideline

Screw, retaining bracket of exhaust control	M5	6 Nm (4.4 lbf ft) Loctite®2701™
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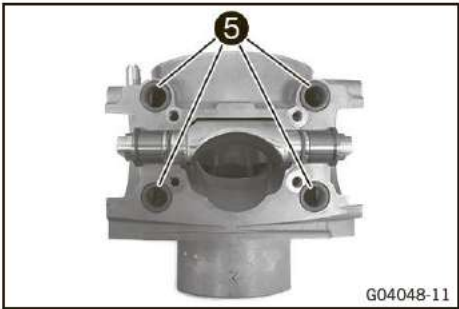
- Mount and grease O-rings **3**.

Long-life grease (p. 372)



- Mount and grease bearing sleeves **4**.

Long-life grease (p. 372)



- Set the control flap to the open position.
- Mount O-rings 5.



- Degrease the sealing surface and coat thinly with sealing compound.

Loctite® 5910

- Position the exhaust flange.
✓ The control flap is still in the open position.
- Mount and tighten screws 6.

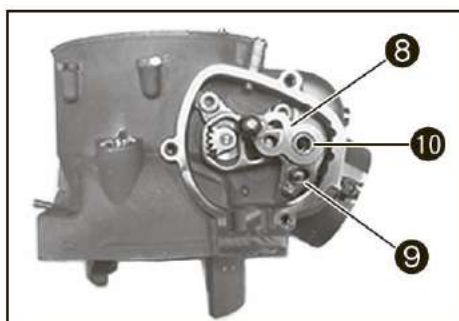
Guideline

Screw, exhaust flange	M6	8 Nm (5.9 lbf ft)
-----------------------	----	-------------------

i Info
Do not forget the spring hangers.

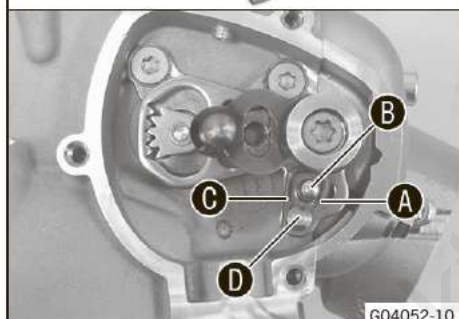


- Position gear segment 7.



G04051-10

- Position adjusting lever 8 and thrust bearing 9 with bushing 10.



G04052-10

- Position the spring with the short leg toward the outside.
- Mount screw 11 with the bushing and spring but do not tighten yet.

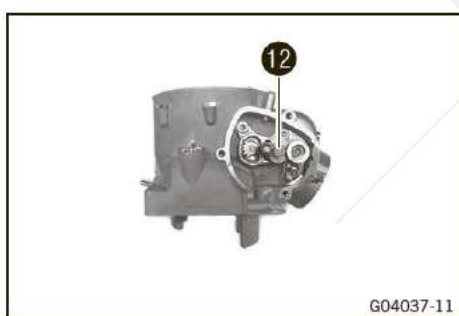
Guideline

Screw, control flap, exhaust control	M6	10 Nm (7.4 lbf ft) Loctite®243™
--------------------------------------	----	---

- Attach the spring.
 - ✓ The short leg of spring A rests on the right on top pin B.
 - ✓ The long leg of spring C rests on the left on bottom pin D.
- Tighten the screw.

Guideline

Screw, control flap, exhaust control	M6	10 Nm (7.4 lbf ft) Loctite®243™
--------------------------------------	----	---



G04037-11

- Mount screw 12, but do not tighten yet.



Info

The screw is tightened when the Z-distance is adjusted.



- Position gear segment **13**.



- Mount and tighten screw **14** with the washer.

Guideline

Screw, control flap, exhaust control	M6	10 Nm (7.4 lbf ft) Loctite®243™
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18.7.12 Cylinder - Nikasil® coating



Nikasil® is a surface protection layer for a coating procedure developed by MAHLE GmbH. 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.

18.7.13 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 **A**.

Guideline

Distance A	50 mm (1.97 in)
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	71.925 ... 71.934 mm (2.83169 ... 2.83204 in)
Size II	71.935 ... 71.944 mm (2.83208 ... 2.83244 in)

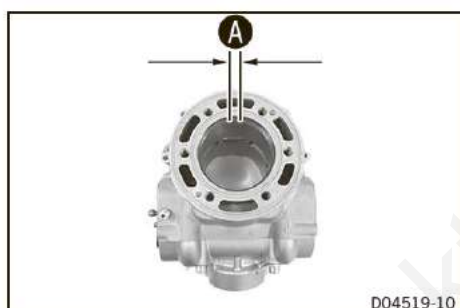


Info

Piston dimensions **1** are marked on the piston head.



18.7.14 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	≤ 0.60 mm (≤ 0.0236 in)
Ring 2	≤ 0.60 mm (≤ 0.0236 in)

- » If the end gap is greater than the specified value:
 - Check/measure the cylinder. (p. 208)
- » If cylinder wear lies within the specified tolerance:
 - Change the piston ring.
- Mount the piston ring with the marking facing toward the piston head.

18.7.15 Measuring the piston/cylinder mounting clearance



- Check/measure the cylinder. (📖 p. 208)
- Check/measure the piston. (📖 p. 222)
- 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.

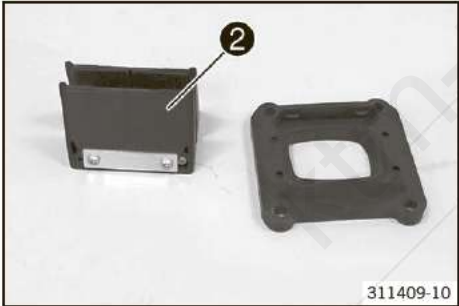
Guideline

Piston/cylinder - mounting clearance (All 250 models)	
New condition	0.050 ... 0.074 mm (0.00197 ... 0.00291 in)
Wear limit	0.10 mm (0.0039 in)
Piston/cylinder - mounting clearance (All 300 models)	
New condition	0.066 ... 0.088 mm (0.0026 ... 0.00346 in)
Wear limit	0.10 mm (0.0039 in)

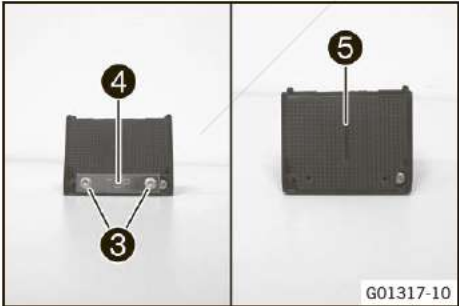
18.7.16 Disassemble the reed valve housing



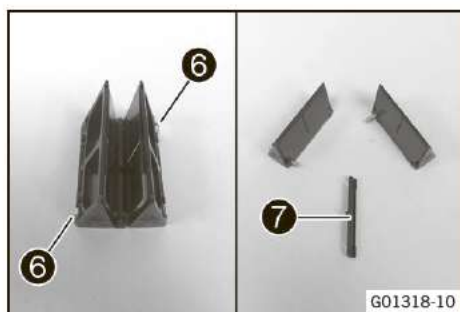
- Remove screws **1**.



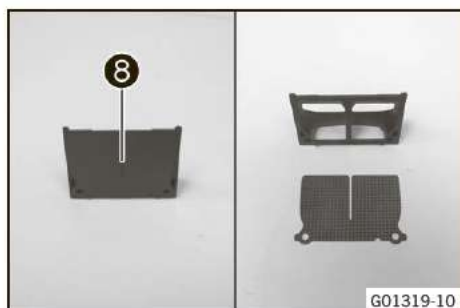
- Remove the reed valve housing **2** from the support plate.



- 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.

18.7.17 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.

18.7.18 Assembling the reed valve housing



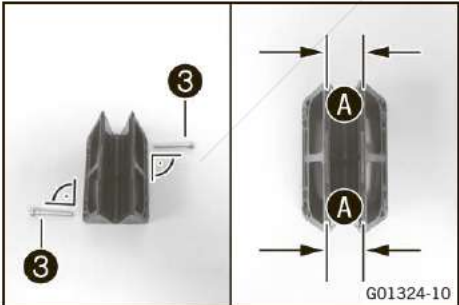
- Position the inner reed valve **1** on both reed valve holders.
✓ The recesses are located on the right side.



- Position holding strip **2**.
✓ The holding lugs engage in the drilled holes.



- Position the membrane holder.



- 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 mem- brane sheets	EJOTDELTA PT® 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	EJOTDELTA PT® 30x6	1 Nm (0.7 lbf ft)
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- 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	EJOTDELTA PT® 30x12	1 Nm (0.7 lbf ft)
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18.7.19 Working on the clutch cover

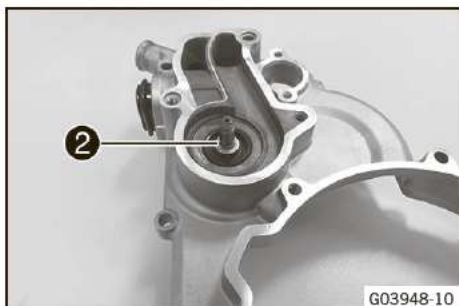


Info

Remove the outer clutch cover to avoid damage.



- Remove nut **1**.
- Take off the water pump impeller.



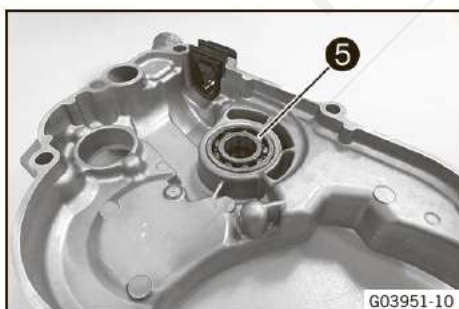
- Remove form washer **2**.



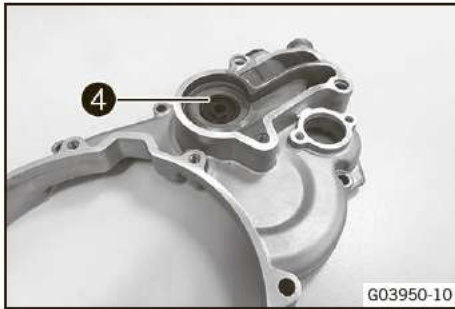
- Remove centrifugal force controller **3**.



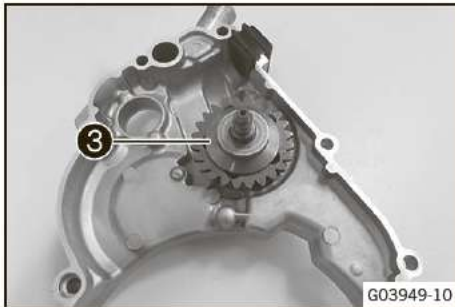
- Remove radial shaft seal ring **4**.



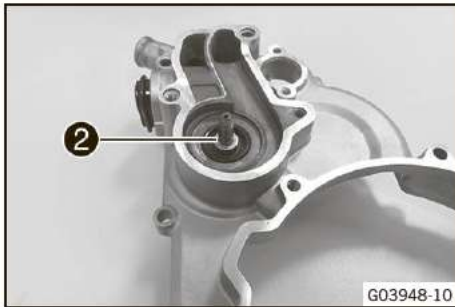
- Press out bearing **5** toward the inside.
- Press the new bearing all the way in to the stop from the inside.



- Press in the new radial shaft seal ring **4** so that it is flush.
- Ensure that the bearing can turn freely and does not touch the radial shaft seal ring.



- Mount centrifugal force controller **3**.



- Position form washer **2**.

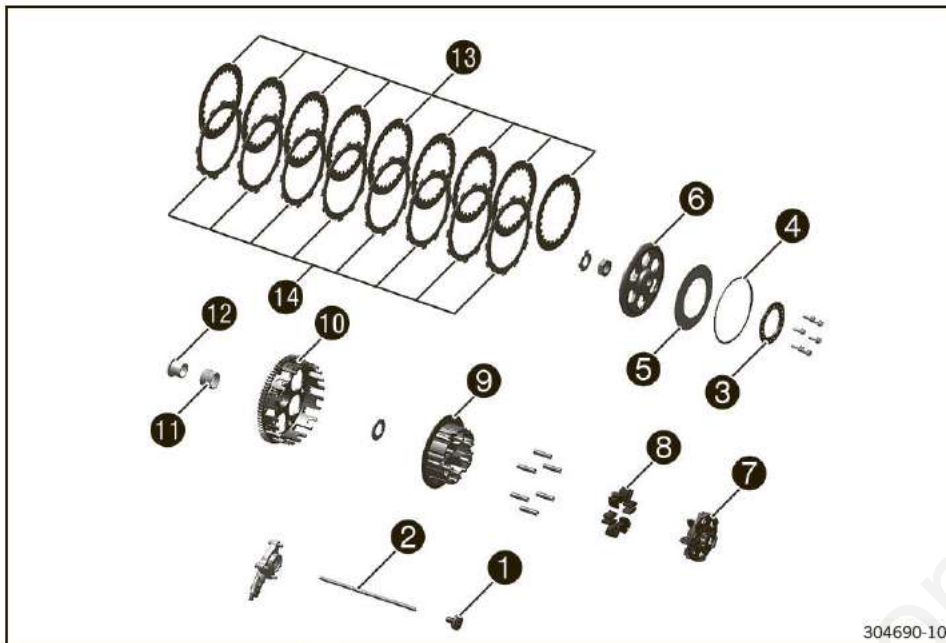


- Mount the water pump impeller.
- Mount and tighten nut **1**.

Guideline

Cap nut, water pump impeller	M6	5 Nm (3.7 lbf ft) Loctite®243™
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18.7.20 Checking the clutch



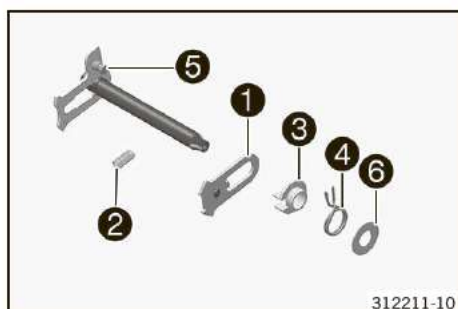
- Check clutch throw-out **1** for damage and wear.
 - » If there is damage or wear:
 - Change the clutch push rod.
- Place the clutch push rod **2** on a flat surface and check for run-out.
 - » If there is run-out:
 - Change the clutch push rod.
- Check spring retainer **3** for damage and wear.
 - » 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 clutch pressure cap **6** for damage and wear.
 - » If there is damage or wear:
 - Change the clutch 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 bushing **12** for damage and wear.
 - » If there is damage or wear:
 - Change the needle bearing and collar bushing.
- 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	$\geq 1.9 \text{ mm } (\geq 0.075 \text{ in})$
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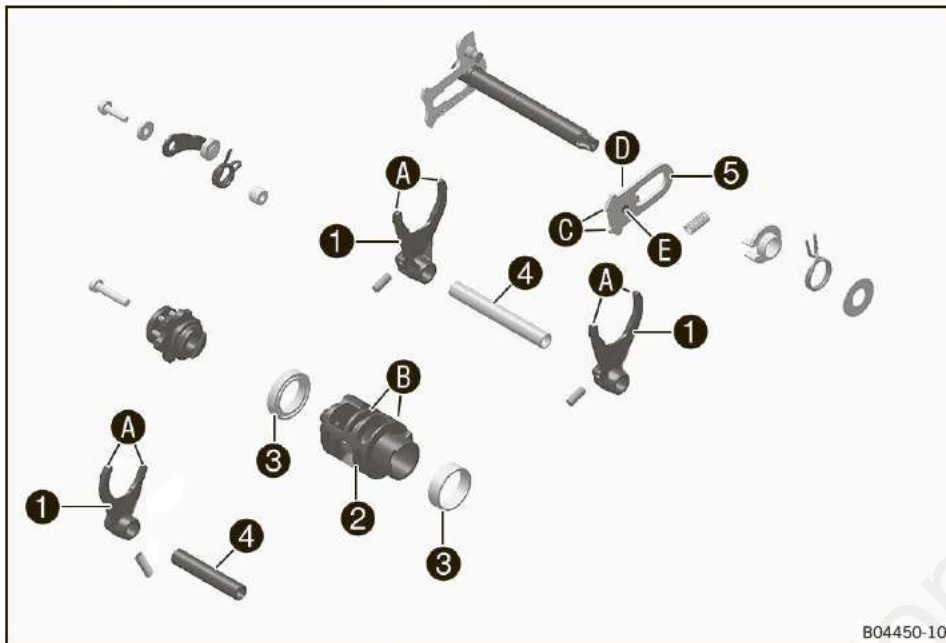
- » If the clutch facing disc does not meet specifications:
 - Change all clutch facing discs.

18.7.21 Preassembling shift shaft



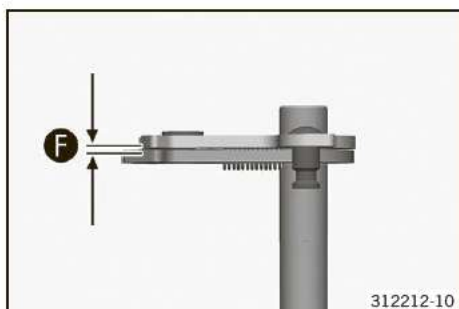
- Secure the short end of the shift shaft in the bench vise.
Guideline
Use soft jaws.
- Mount sliding plate **1** with the guide pin facing downward and put the guide pin on the shift quadrant.
- Mount pressure spring **2**.
- Slide on spring guide **3**, push return spring **4**, with the offset end facing upward, over the spring guide and lift the offset end over abutment bolt **5**.
- Mount stop disk **6**.

18.7.22 Checking the shift mechanism



- 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 are stiff 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 rail **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 rail in the shift forks 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.

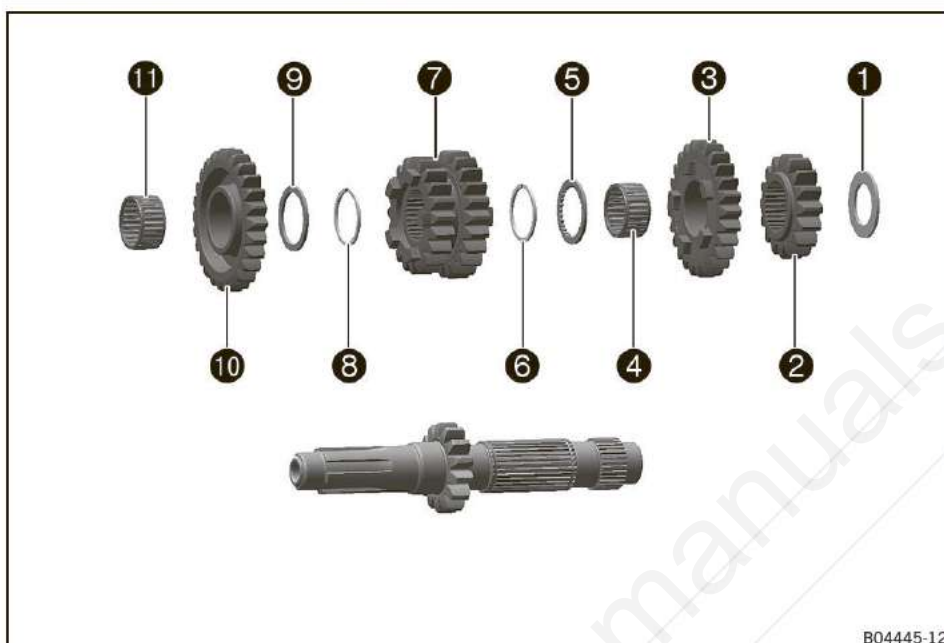


- Preassemble the shift shaft. (p. 231)
- Check clearance **F** between the sliding plate and the shift quadrant.

Shift shaft - sliding plate/shift quadrant play	0.40 ... 0.80 mm (0.0157 ... 0.0315 in)
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- » If the measured value does not meet specifications:
 - Change the sliding plate.

18.7.23 Disassembling the main shaft



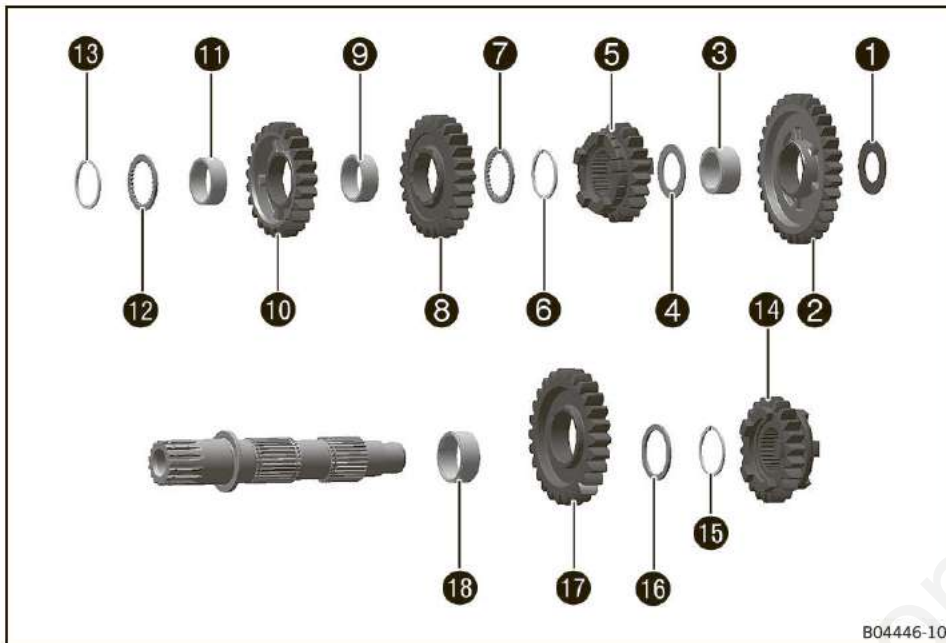
- Secure the main shaft with the toothed end facing downward in the vise.

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**.

18.7.24 Disassembling the countershaft



- Secure the countershaft in the bench vise with the toothed end facing downward.

Guideline

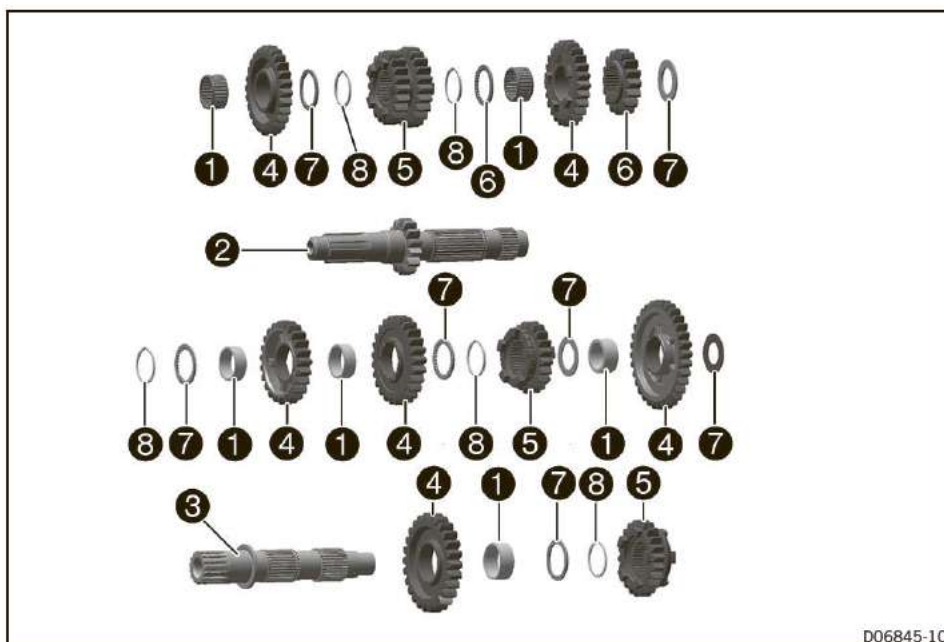
Use soft jaws.

- 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**.

18.7.25 Checking the transmission

Condition

The transmission has been disassembled.



D06845-10

- 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.

18.7.26 Assembling the main shaft

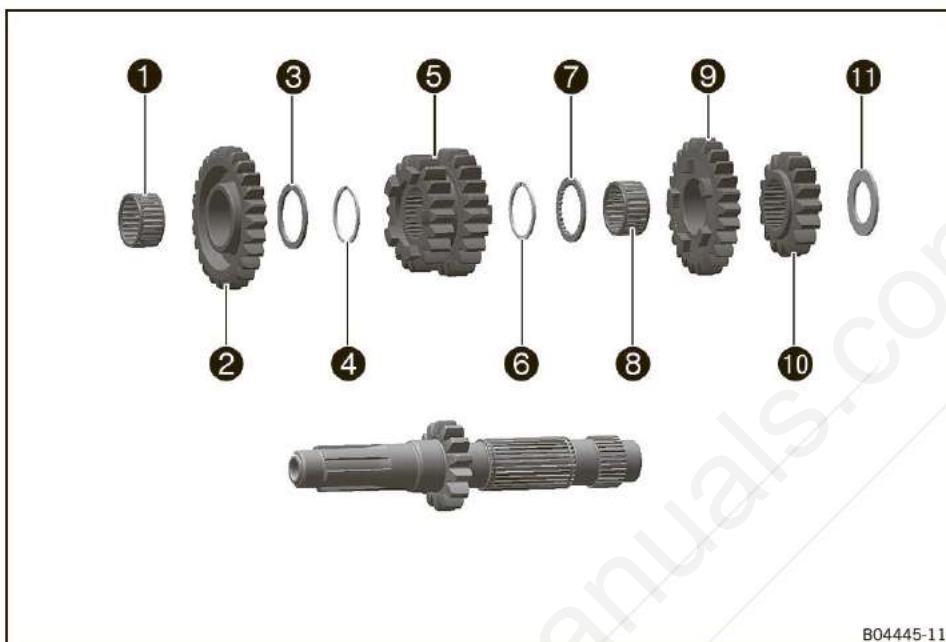


Info

Use new lock rings with every repair.

Preparatory work

- Check the transmission. (📖 p. 234)
- Carefully lubricate all parts before assembling.



B04445-11

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.

18.7.27 Assembling the countershaft

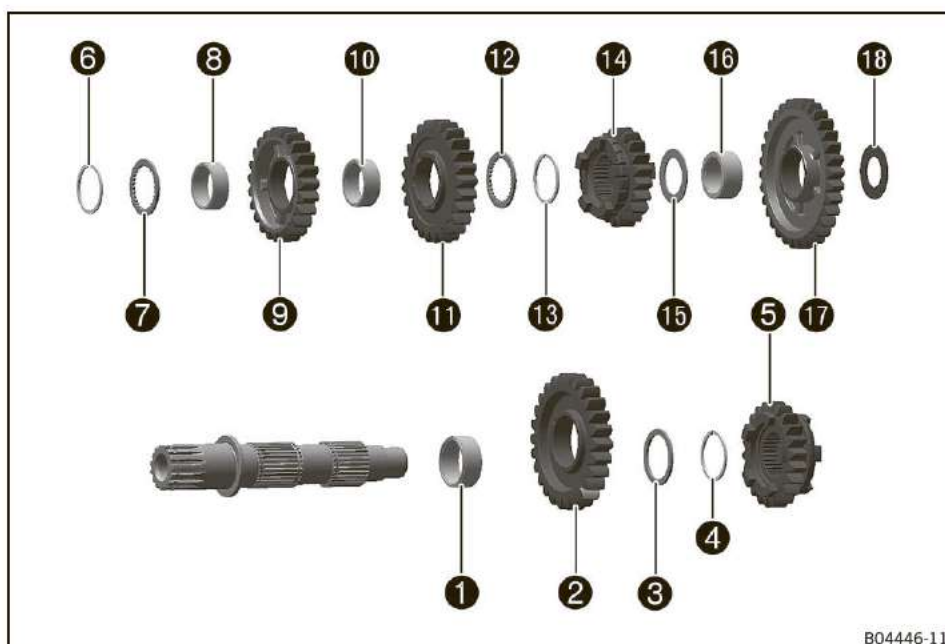


Info

Use new lock rings with every repair.

Preparatory work

- Check the transmission. (📖 p. 234)
- Carefully lubricate all parts before assembling.

**Main work**

- Secure the countershaft in the bench vise with the toothed end facing downward.

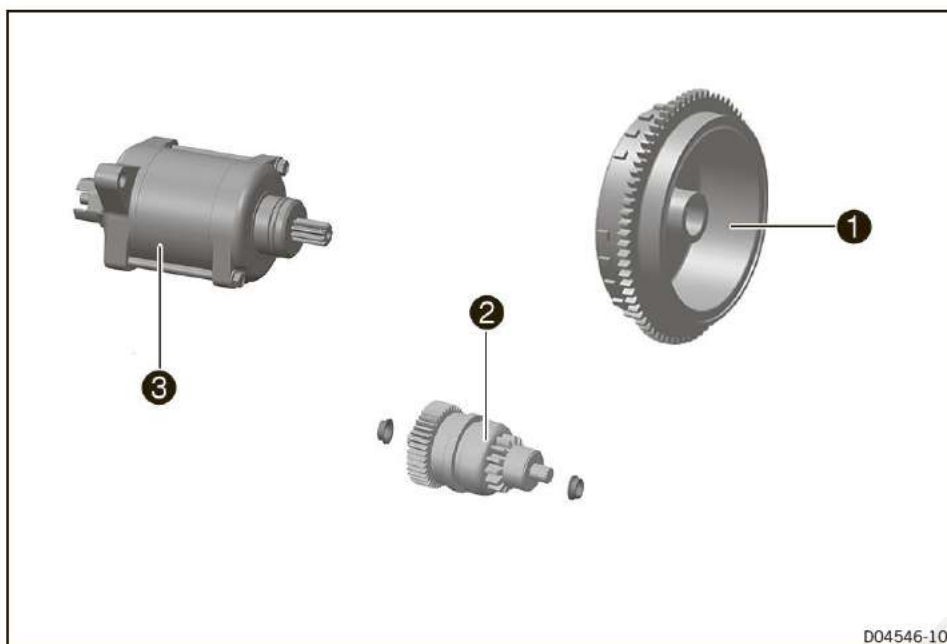
Guideline

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.

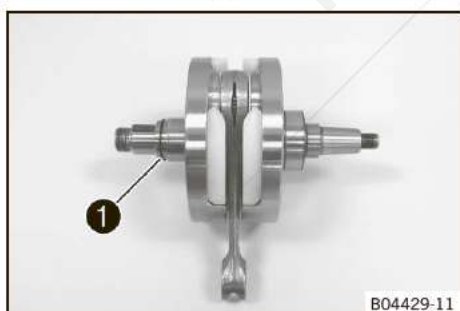
**18.7.28 Checking the electric starter drive****Condition**

Bendix has been removed.

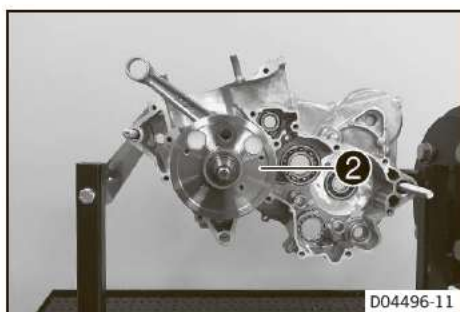


18.8 Engine assembly

18.8.1 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. 382)

Holder and fitting for work stand (55429002000)
(p. 378)

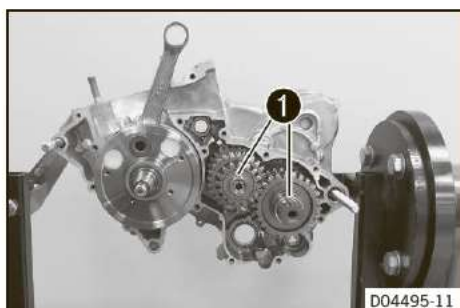
- Warm up the crankshaft bearing.

Guideline

100 °C (212 °F)

- Slide crankshaft ② all the way into the bearing seat of the right section of the engine case.

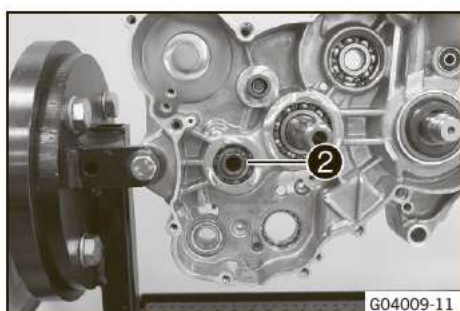
18.8.2 Installing the transmission shafts



- Oil all bearings.

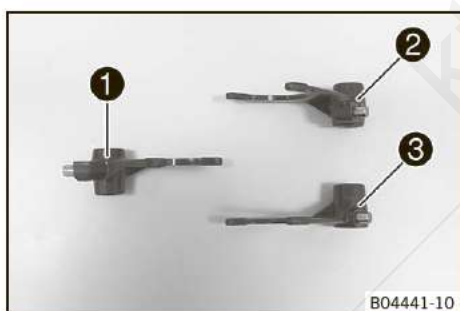
Engine oil (15W/50) (p. 370)

- Assemble the two transmission shafts ① and slide them into the bearing seats together.

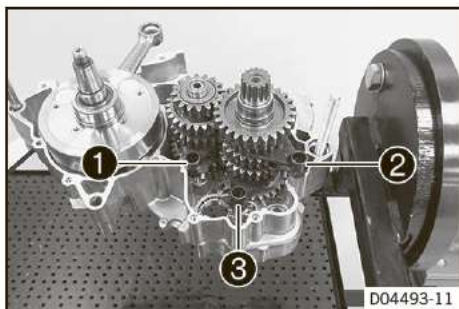


- Mount lock ring ②.

18.8.3 Installing the shift forks

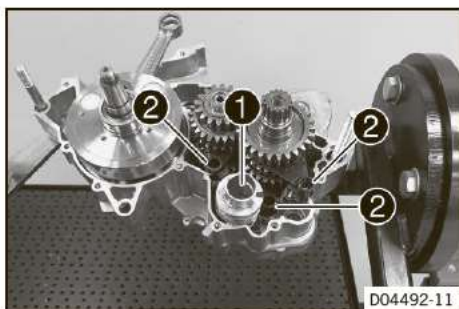


- Arrange shift forks ①, ②, and ③ as shown.



- Position shift forks ①, ②, and ③ in the sliding gears.

18.8.4 Installing the shift drum



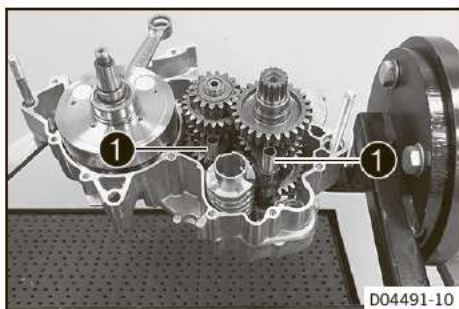
- Push shift drum ① into the bearing seat.
- Position shift forks ② in the shift grooves.



Info

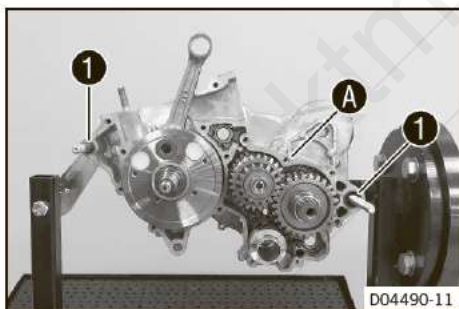
Do not misplace the shift rollers.

18.8.5 Installing the shift rails



- Mount shift rails ①.

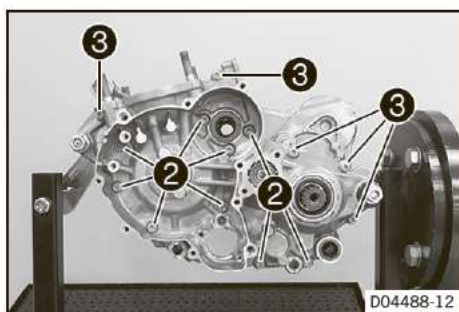
18.8.6 Installing the left section of the engine case



- Clean and degrease the sealing surface.
- Thinly coat the sealing surface A of the right section of the engine case with sealing compound.

Loctite® 5910

- Check that dowels ① are seated correctly.



- Mount the left section of the engine case.

**Info**

Do not use the screws to pull the two sections of the engine case together.

- Mount screws 2 and, once all screws of the left section of the engine case have been mounted, tighten.

Guideline

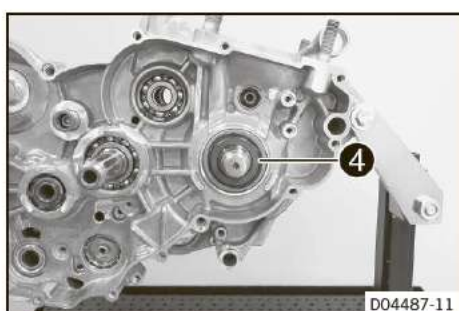
Screw, engine case	M6x45	10 Nm (7.4 lbf ft)
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- Mount screws 3 and, once all screws of the left section of the engine case have been mounted, tighten.

Guideline

Screw, engine case	M6x60	10 Nm (7.4 lbf ft)
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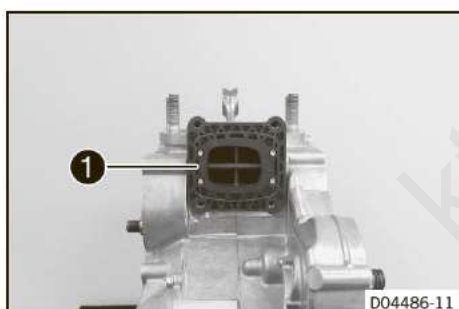
- Secure the engine in the engine work stand.
- Grease the radial shaft seal ring and mount distance sleeve 4.



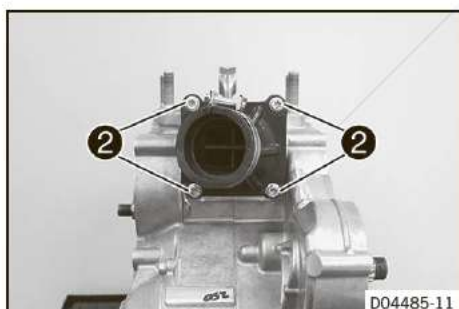
18.8.7 Installing the reed valve housing

**Info**

If the reed valve housing is removed and installed with the engine installed, the oil pump must be actuated.



- 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

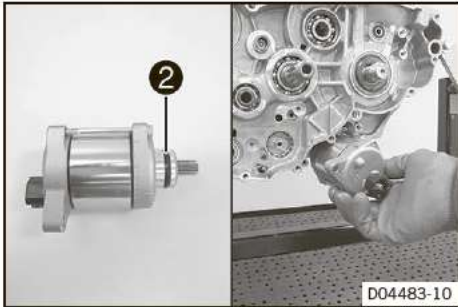
Screw, intake flange/reed valve housing	M6	6 Nm (4.4 lbf ft)
---	----	-------------------

18.8.8 Installing the starter motor



- Grease and mount O-ring 1.

Long-life grease (p. 372)



- Grease O-ring 2.

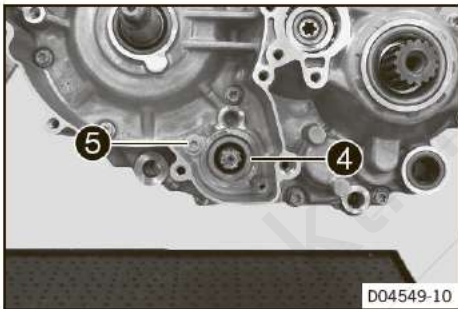
Long-life grease (p. 372)

- Position the starter motor in the engine case.



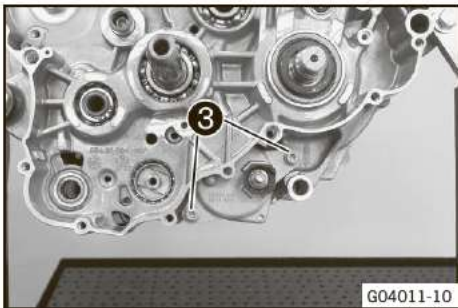
- Mount screws 3 but do not tighten yet.

Guideline		
Screw, starter motor	M6	10 Nm (7.4 lbf ft)



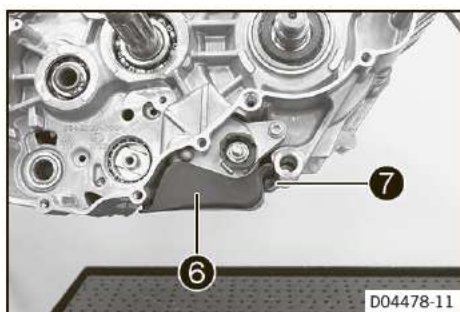
- Mount spacer 4 flush in the engine case.
- Mount and tighten screw 5.

Guideline		
Screw, starter motor bearing bush	M6	10 Nm (7.4 lbf ft) Loctite®243™



- Tighten screws 3.

Guideline		
Screw, starter motor	M6	10 Nm (7.4 lbf ft)

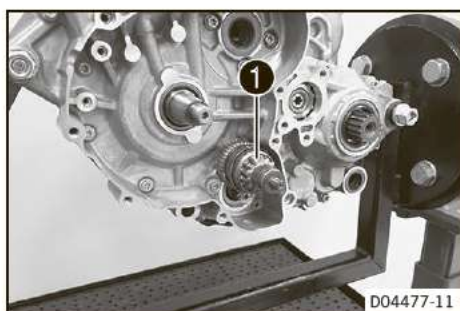


- Position cover **6**.
- Mount and tighten screw **7**.

Guideline

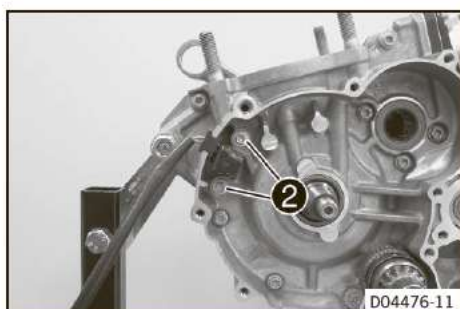
Screw, starter motor protection cap	M6	8 Nm (5.9 lbf ft)
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18.8.9 Installing the rotor



- Grease and mount Bendix **1**.

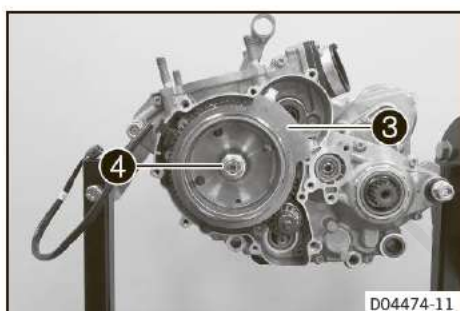
Lubricant (T625) (p. 372)



- Position the crankshaft speed sensor.
- Mount and tighten screws **2**.

Guideline

Screw, crankshaft speed sensor	M5	6 Nm (4.4 lbf ft) Loctite®243™
--------------------------------	----	--



- Ensure that the woodruff key is seated correctly.
- Degrease the cone.
- Mount the rotor and hold it with special tool **3**.

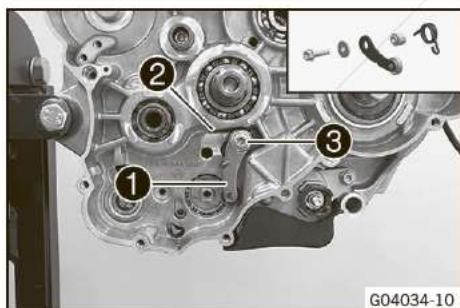
Holding wrench (55429012000) (p. 378)

- Mount and tighten nut **4** with the washer.

Guideline

Nut, rotor	M12x1	60 Nm (44.3 lbf ft)
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18.8.10 Installing the locking lever

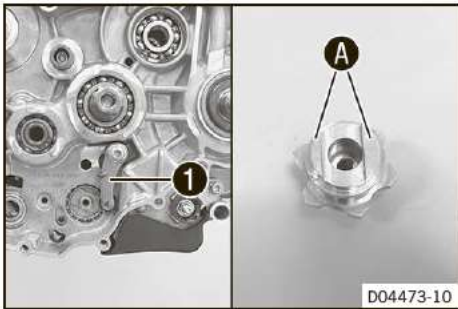


- Position locking lever **1** with the sleeve and spring **2**.
- Mount and tighten screw **3** with the washer.

Guideline

Screw, locking lever	M5	6 Nm (4.4 lbf ft) Loctite®243™
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18.8.11 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.

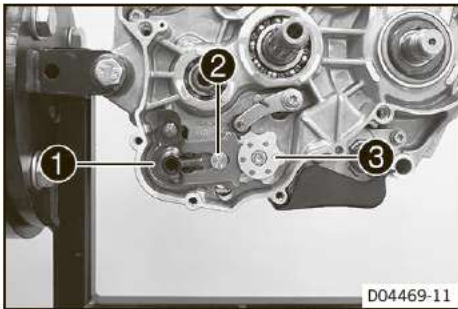
- Relieve tension from the locking lever.



- Mount and tighten screw 2.

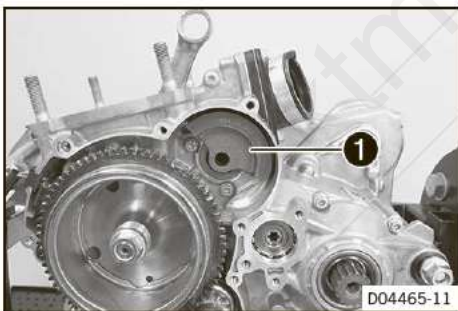
Guideline		
Screw, shift drum locating	M6	10 Nm (7.4 lbf ft) Loctite®243™

18.8.12 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.

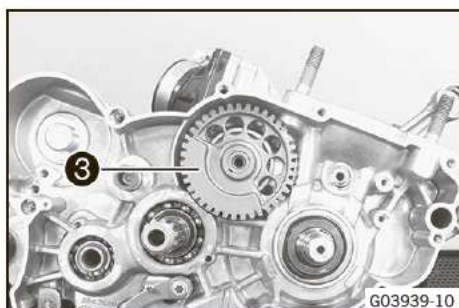
18.8.13 Installing the balancer shaft



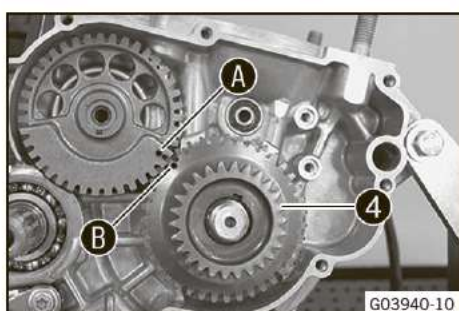
- Mount balancer shaft 1.



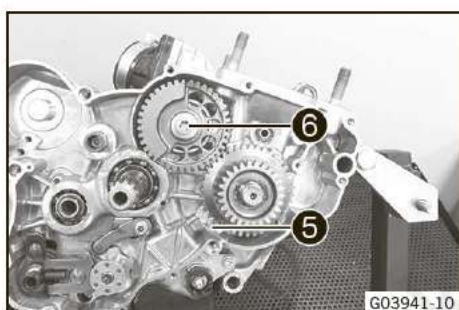
- Mount woodruff key **2**.



- Mount balancer shaft drive wheel **3**.



- Mount primary gear wheel **4**.
✓ Align markings **A** and **B**.



- Hold the primary gear wheel using special tool **5**.

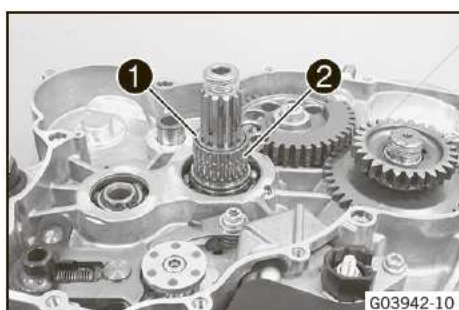
Gear segment (56012004000) (p. 378)

- Mount and tighten screw **6** with the washer.

Guideline

Screw, balancer shaft	M8	30 Nm (22.1 lbf ft) Loctite®243™
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18.8.14 Installing the clutch basket

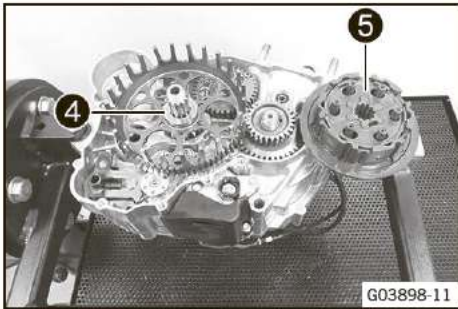


- Mount collar bushing **1**.
- Oil and mount needle bearing **2**.

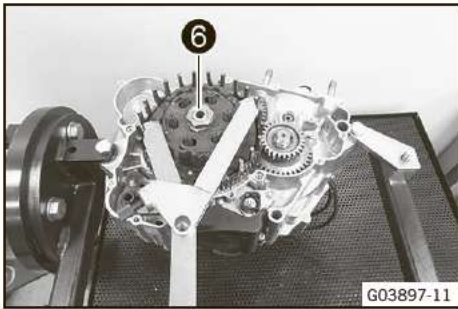
Engine oil (15W/50) (p. 370)



- Slide clutch basket 3 onto the gearbox main shaft.



- Slide on washer 4 and inner clutch hub 5.



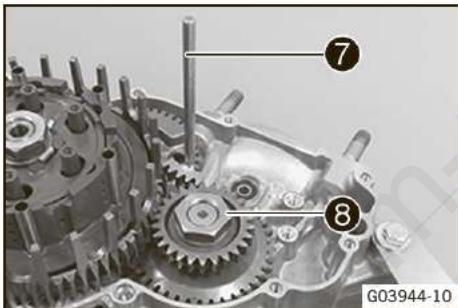
- Position the new lock washer and mount nut 6. Tighten the nut, holding the inner clutch hub with a special tool.

Guideline

Nut, inner clutch hub	M18x1.5	100 Nm (73.8 lbf ft) Loctite®243™
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Holding wrench (51129003000) (p. 377)

- Secure the nut with the lock washer.



- Hold the primary gear wheel using special tool 7.

Gear segment (56012004000) (p. 378)

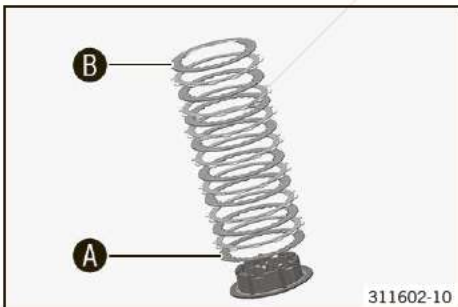
- Mount and tighten nut 8 with the washer.

Guideline

Nut, primary gear wheel	M18LHx1.5	150 Nm (110.6 lbf ft) Loctite®243™
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- Crank the engine to ensure that it can move easily.

18.8.15 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

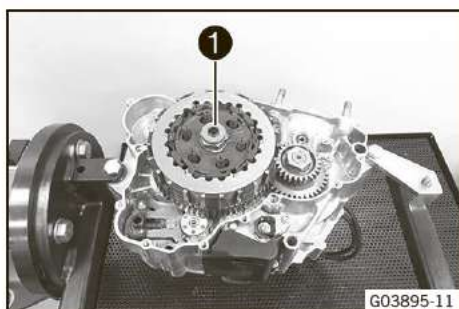
Thickness of intermediate clutch discs	1.4 mm (0.055 in)
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- Place intermediate clutch disc **B** into the clutch basket.

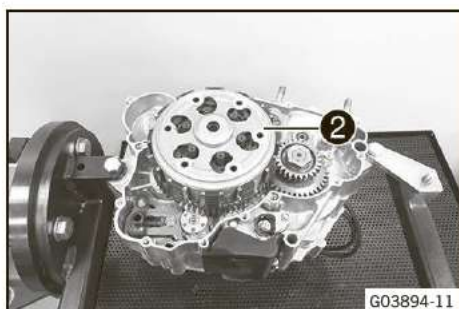
Guideline

Thickness of intermediate clutch disc B	1.0 mm (0.039 in)
--	-------------------

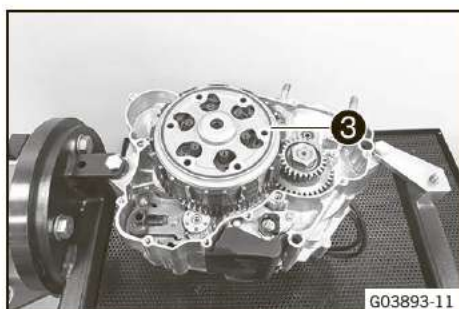
- Mount clutch throw-out **1**.



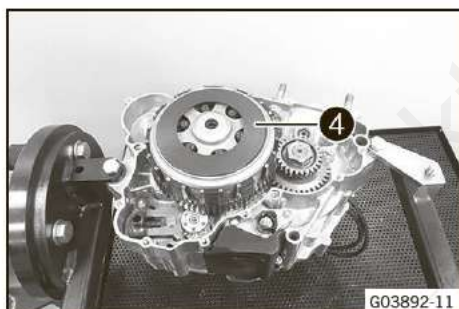
- Position clutch pressure cap **2**.

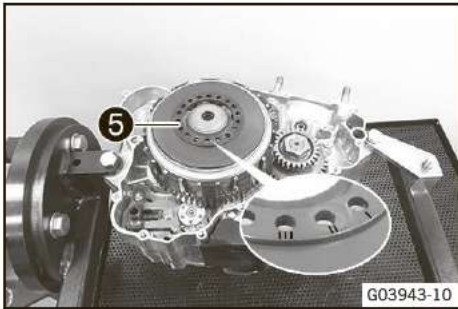


- Mount pretension ring **3** with marking **Top** facing up.



- 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)
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- Using a straightedge and the special tool, check the spring washer for distortion.

Feeler gauge (59029041100) (p. 381)	
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. 381)	
Spring washer distortion	0 ... 0.10 mm (0 ... 0.0039 in)

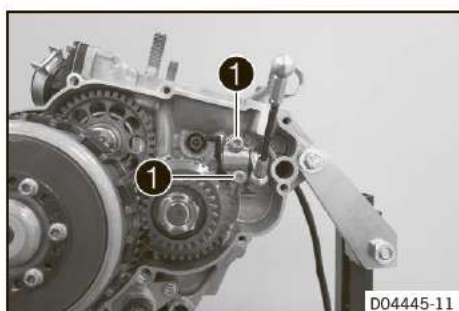
- » If the specified value is not reached:
 - Remove screws **6** and mount the spring retainer with marking III.

- Using a straightedge and the special tool, check the spring washer for distortion.

Feeler gauge (59029041100) (p. 381)	
Spring washer distortion	0 ... 0.10 mm (0 ... 0.0039 in)

- » If the specified value is not reached:
 - Change the clutch facing discs.

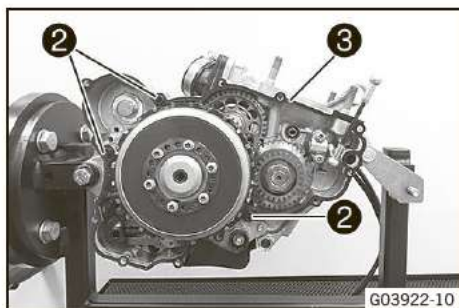
18.8.16 Installing the clutch cover



- Position bearing support with the angle lever and linkage.
- Mount and tighten screws **1**.

Guideline

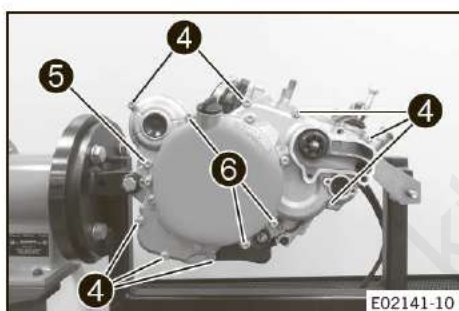
Screw, exhaust control bearing support	M5	6 Nm (4.4 lbf ft) Loctite®243™
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- Mount dowels **2**.
- Mount clutch cover gasket **3**.



- Position the clutch cover and thread in the linkage.



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

Guideline

Screw, clutch cover	M6x25	10 Nm (7.4 lbf ft)
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- Mount screw **5**, but do not tighten yet.

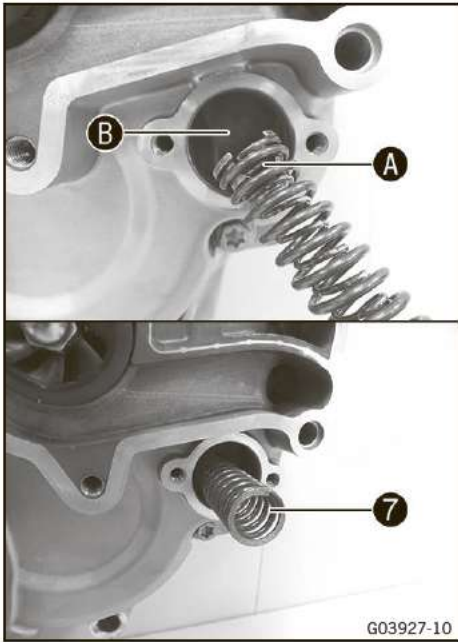
Guideline

Screw, clutch cover	M6x30	10 Nm (7.4 lbf ft)
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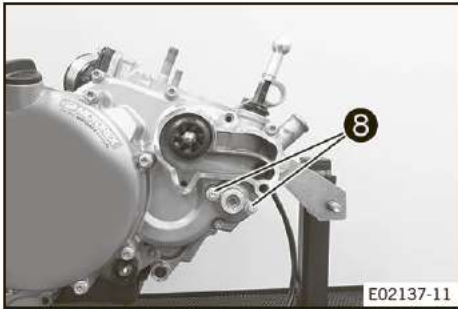
- Mount screws **6** and tighten all screws in a crisscross pattern.

Guideline

Screw, outer clutch cover	M6x60	8 Nm (5.9 lbf ft)
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- Mount adjusting spring 7 with the auxiliary spring and spring insert.
- ✓ Recess A in the spring insert engages in angle lever B.

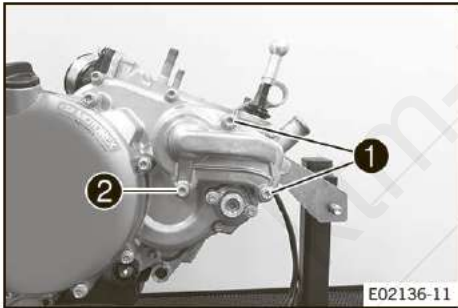


- Position the cap.
- Mount and tighten screws 8.

Guideline

Screw, exhaust control cap	M5	5 Nm (3.7 lbf ft)
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18.8.17 Installing the water pump cover



- Mount the molded ring.
- Position the water pump cover.
- Mount and tighten screws 1.

Guideline

Screw, water pump cover	M6	10 Nm (7.4 lbf ft)
-------------------------	----	--------------------

- Mount and tighten screw 2 with the seal ring.

Guideline

Screw, water pump cover	M6	10 Nm (7.4 lbf ft)
-------------------------	----	--------------------

18.8.18 Installing the piston

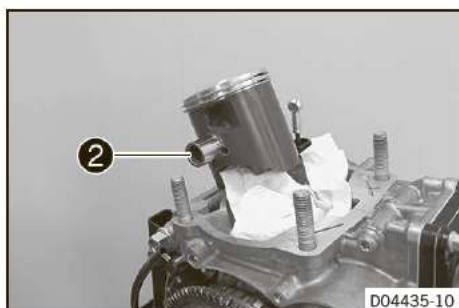
**Info**

If the piston change is carried out with the engine installed, the oil pump must be actuated.



(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.

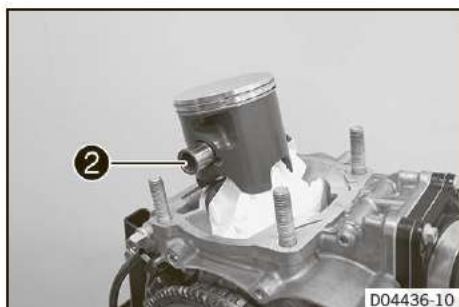


- Cover the engine case opening with a cloth.
- Slide piston pin ② into the connecting rod by hand.



(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.



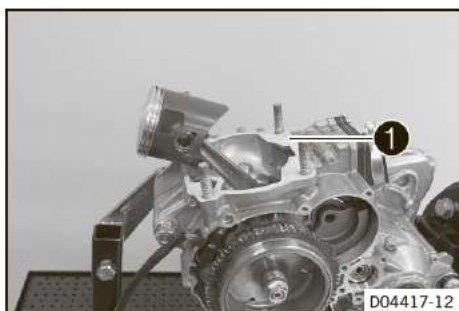
- Position the piston ring locks in the 6 o'clock or 12 o'clock position.
- Ensure that the piston ring lock is in the correct position on both sides.
- Remove the cloth.

18.8.19 Installing the cylinder



Info

If the cylinder change is carried out with the engine installed, the oil pump must be actuated.



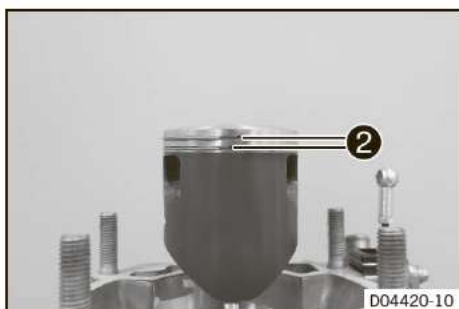
(All 250 models)

- Place new cylinder base gasket **1** in position.



Info

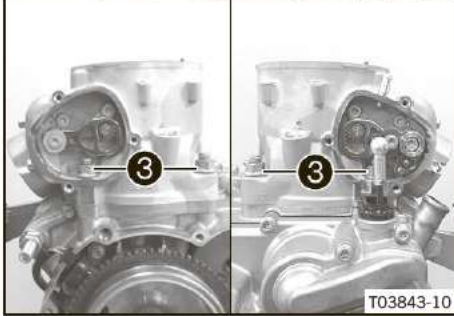
If neither the piston, cylinder, crankshaft, or engine case need to be changed, the same gasket thickness can be used as before.



- 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.

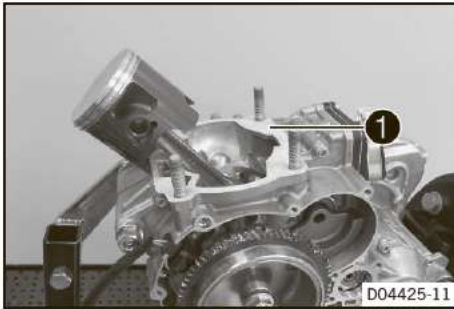


T03843-10

- Mount nuts **3** on both sides and tighten in a crisscross pattern.

Guideline

Nut, cylinder base	M10	35 Nm (25.8 lbf ft)
--------------------	-----	------------------------



D04425-11

(All 300 models)

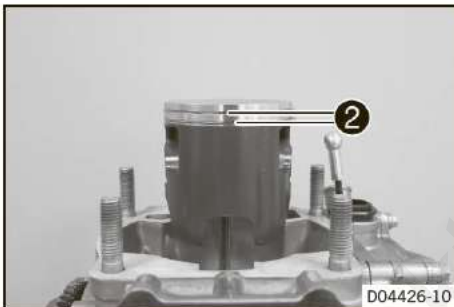
- Place new cylinder base gasket **1** in position.



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.



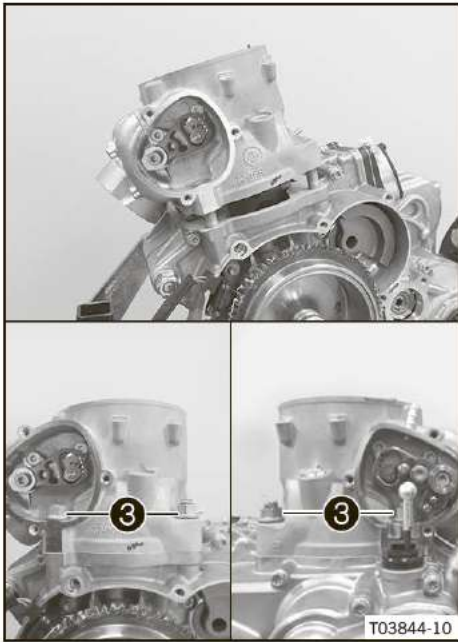
D04426-10

- Position the piston ring.
 - ✓ The anti-rotation lock engages in piston ring end **2**.



G04054-10

- 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 (25.8 lbf ft)
--------------------	-----	------------------------

18.8.20 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 ratio 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.

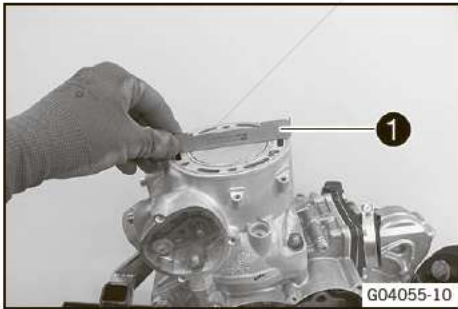
Setting gauge (54829001100) (p. 377)

- Position the piston at top dead center.
- Check the X-distance using the special tool.

Feeler gauge (59029041100) (p. 381)

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. 255)



(All 300 models)

- Apply special tool ① to the cylinder.

Setting gauge (54829001100) (p. 377)

- Position the piston at top dead center.
- Check the X-distance using the special tool.

Feeler gauge (59029041100) (p. 381)

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. 255)



18.8.21 Adjusting the X-distance



Info

The X-distance is adjusted by inserting cylinder base gaskets of various thicknesses.

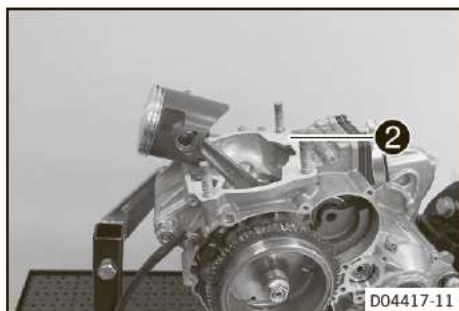
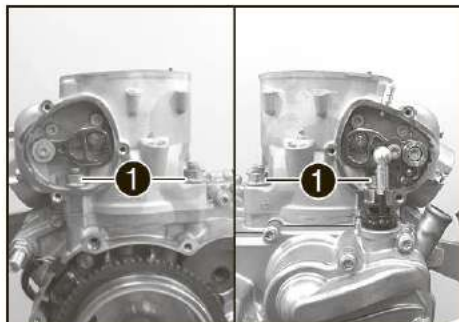
Preparatory work

- Check the X-distance. (📖 p. 254)

Main work

(All 250 models)

- Remove nuts ①.
- Carefully slide the cylinder up and take it off.

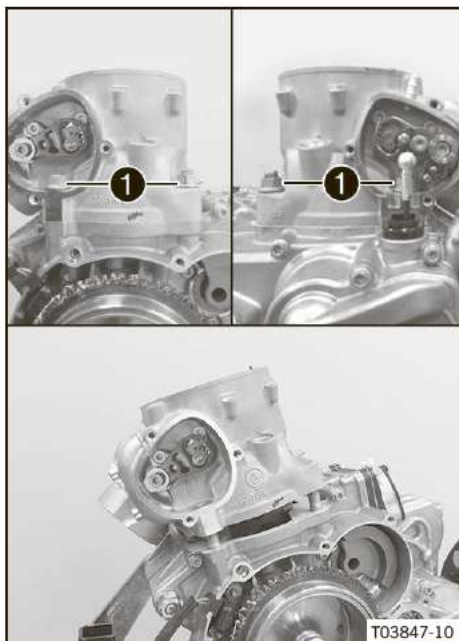


- Replace cylinder base gasket ② with a cylinder base gasket of the required X-distance.



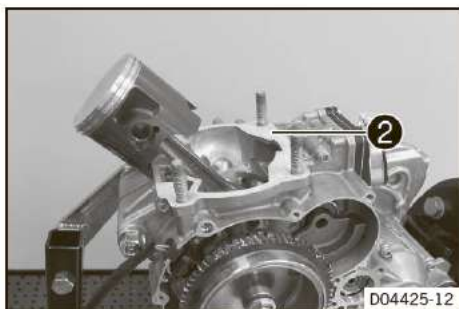
Info

Multiple cylinder base gaskets can be combined.



(All 300 models)

- Remove nuts ①.
- Carefully slide the cylinder up and take it off.



ket of the required X-distance.



Info

Multiple cylinder base gaskets can be combined.

Finishing work

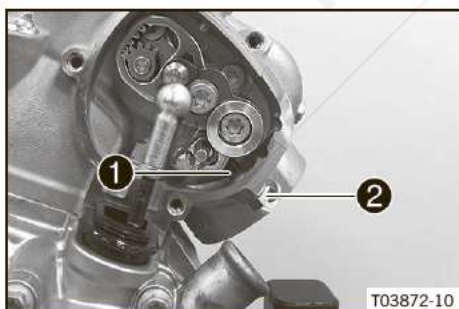
- Install the cylinder. (p. 252)

18.8.22 Adjusting the Z-distance

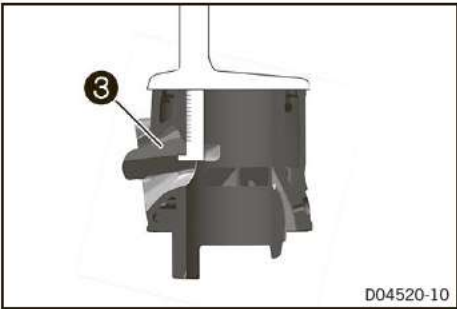


Info

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.



- Counterhold screw ① and loosen nut ②.

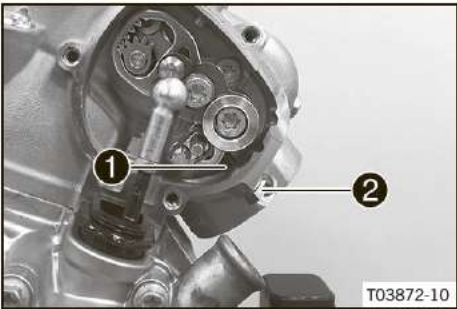


- Adjust the Z-distance using the depth micrometer.

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 micrometer.



- Adjust the Z-distance by turning screw ①.
- Hold screw ① and tighten nut ②.

Guideline

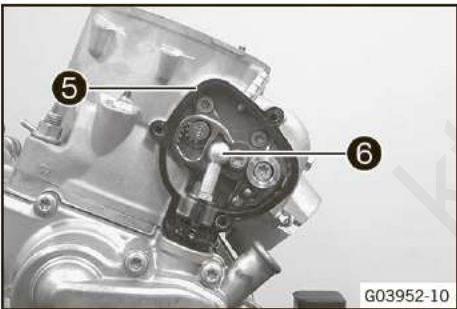
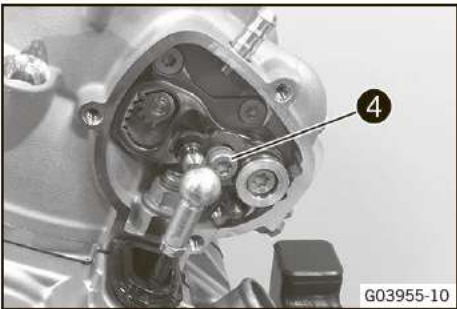
Nut, adjusting screw, power valve	M6	8 Nm (5.9 lbf ft)
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- Check the Z dimension.

Guideline

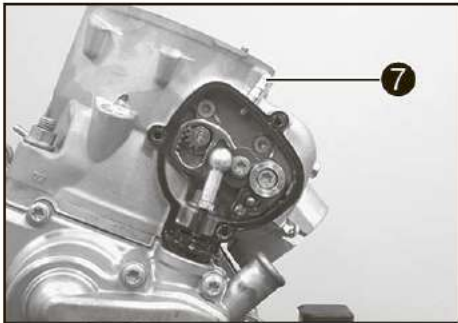
Z distance (height of control flap) (All 250 models)	49.0 mm (1.929 in)
Z distance (height of control flap) (All 300 models)	49.5 mm (1.949 in)

- Loosen screw ④.



- Mount gasket ⑤.
- Grease and mount ball socket ⑥.

Info
The linkage is preset and must not be adjusted.



- Remove vacuum connection 7.
- Mount and tighten appropriate screw A M6.

Guideline

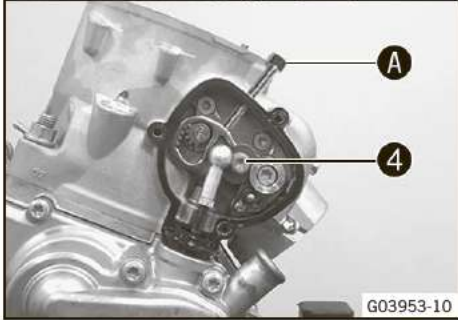
Appropriate screw	M6	1 Nm (0.7 lbf ft)
-------------------	----	-------------------

✓ Gear segment is locked.



Info

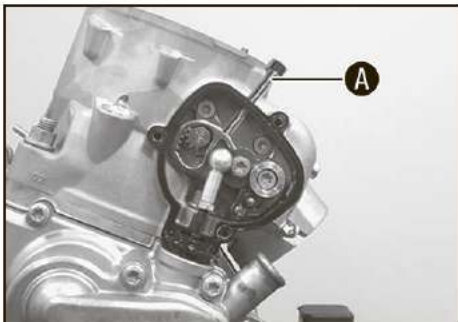
If the screw is tightened to more than 1 Nm, damage may be caused to the cylinder or to the gear segment.



- Tighten screw 4.

Guideline

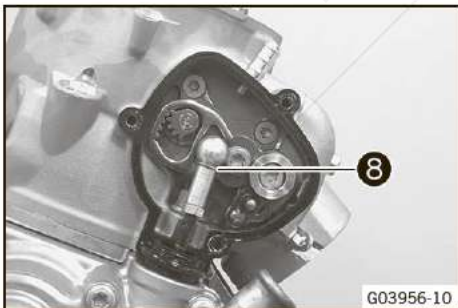
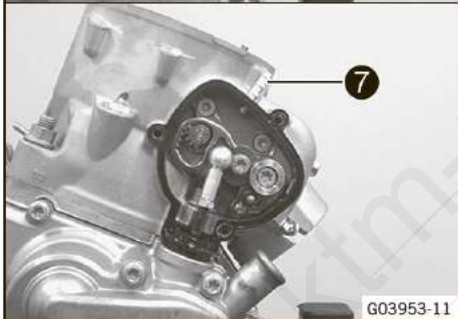
Screw, exhaust control thrust bearing	M6	8 Nm (5.9 lbf ft) Loctite®243™
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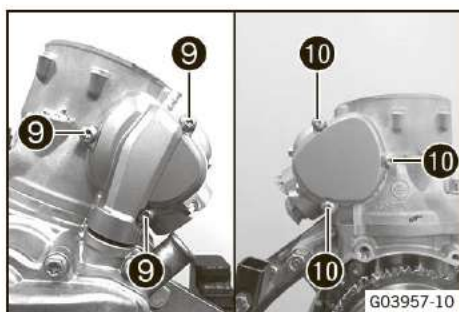
- Remove appropriate screw A.
- Mount and tighten vacuum connection 7.

Guideline

Vacuum connection, housing breather	M6	2 Nm (1.5 lbf ft) Loctite®243™
-------------------------------------	----	--



- Mount retainer 8.



- Position the gasket.
- Position both covers.
- Mount and tighten screws 9 and 10.

Guideline

Screw, exhaust control cover	M5	4 Nm (3 lbf ft)
------------------------------	----	-----------------



18.8.23 Installing the cylinder head



(All 250 models)

- Mount O-rings 1 and 2.



Info

Ensure that the pins are seated correctly.



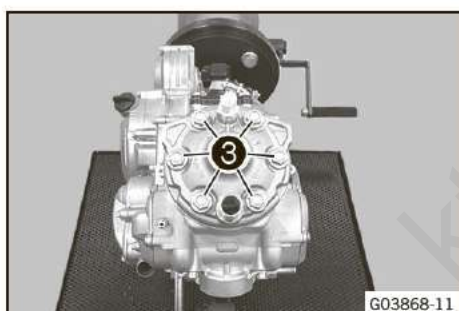
(All 300 models)

- 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.



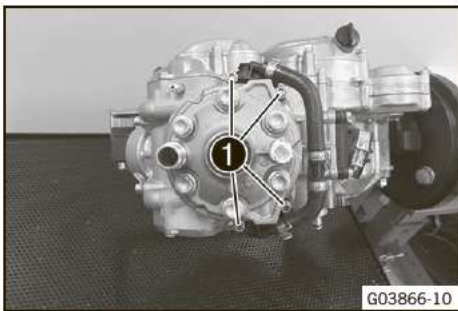
- Mount and tighten spark plug 4.

Guideline

Spark plug	M14x1.25	25 Nm (18.4 lbf ft)
------------	----------	---------------------



18.8.24 Installing injection valves

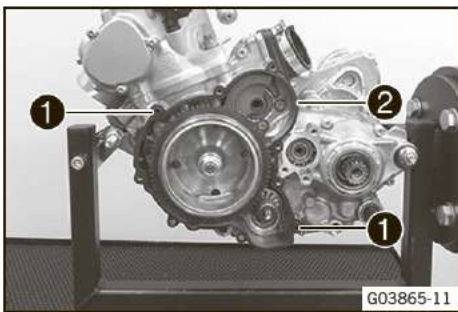


- Position injection valves on both sides.
- Mount and tighten screws ①.

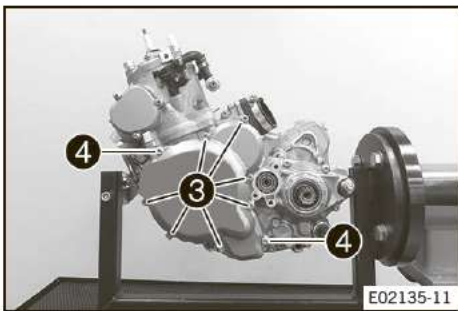
Guideline

Screw, injection valve holder	M5	5 Nm (3.7 lbf ft) Loctite®243™
-------------------------------	----	-----------------------------------

18.8.25 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

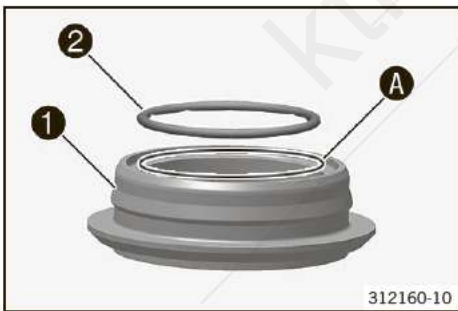
Screw, alternator cover	M6x20	8 Nm (5.9 lbf ft)
-------------------------	-------	-------------------

- Mount and tighten screws ④.

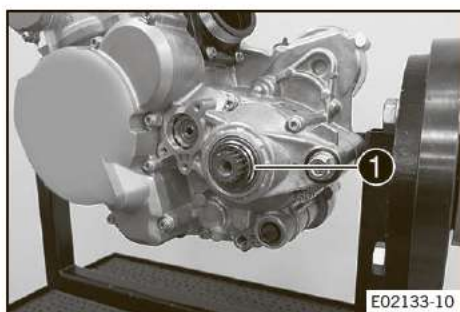
Guideline

Screw, alternator cover	M6x25	8 Nm (5.9 lbf ft)
-------------------------	-------	-------------------

18.8.26 Installing the spacer



- Before mounting, grease spacer ① in area A and O-ring ②.
Long-life grease (📖 p. 372)
- Position the O-ring in the cut-out of the spacer.



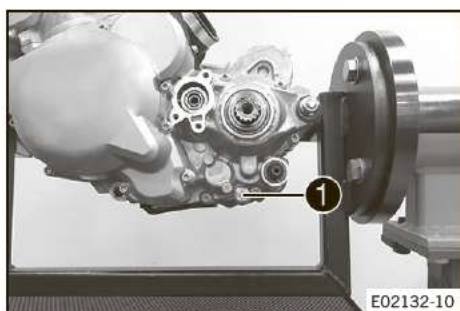
- Grease the radial shaft seal ring.

Long-life grease (🔧 p. 372)

- 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 radial shaft seal ring rests against the spacer along its entire circumference.



18.8.27 Gear oil drain plug, installing



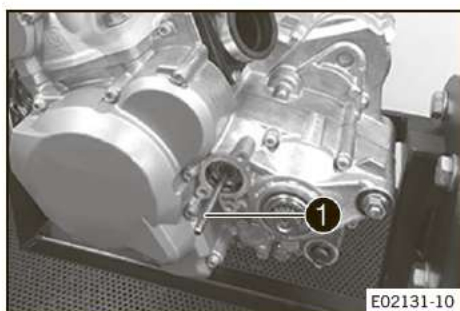
- Mount and tighten gear oil drain plug **1** with the magnet and a new seal ring.

Guideline

Gear oil drain plug with magnet	M12x1.5	20 Nm (14.8 lbf ft)
---------------------------------	---------	---------------------



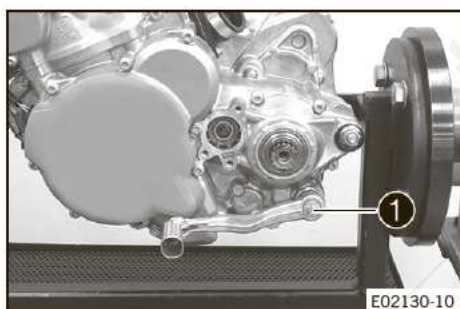
18.8.28 Installing the clutch push rod



- Mount clutch push rod **1**.



18.8.29 Installing the shift lever



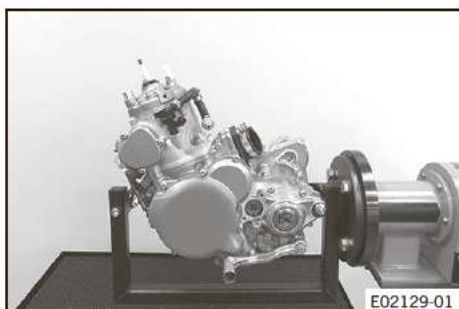
- Position the shift lever. Mount and tighten screw **1** with the washers.

Guideline

Screw, shift lever	M6	14 Nm (10.3 lbf ft) Loctite®243™
--------------------	----	-------------------------------------



18.8.30 Removing the engine from the engine work stand



- Remove the fitting from the special tool.

Holder and fitting for work stand (55429002000)
( p. 378)

- 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.



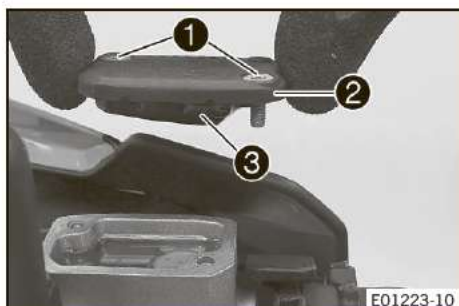
Info

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. 370)

- 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.

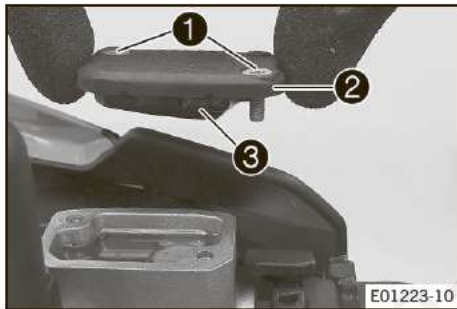


Info

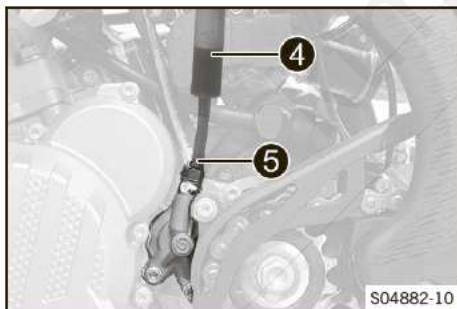
Never use DOT 5 brake fluid. It is silicone-based and purple in color. Oil seals and clutch lines are not designed for DOT 5 brake fluid.

Avoid contact between brake fluid and painted parts. Brake fluid attacks paint.

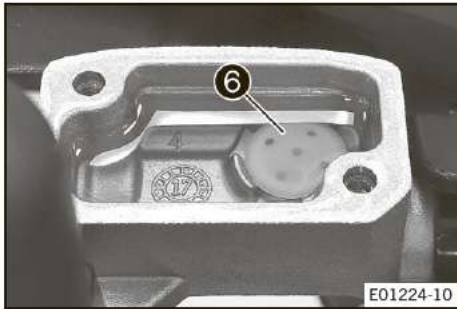
Only use clean brake fluid from a sealed container.



- 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. 376) |
| Brake fluid DOT 4 / DOT 5.1 (p. 370) |
- 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.



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.

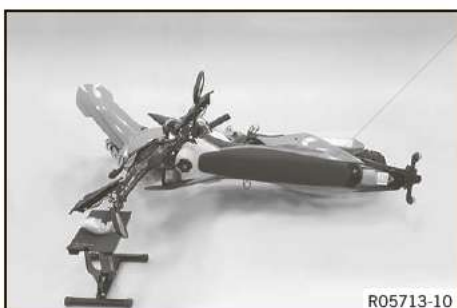
- Do not fuel the vehicle in the vicinity of open flames or lit cigarettes.
- Switch off the engine for refueling.
- Make sure that no fuel is spilled; particularly not on hot parts of the vehicle.
- If any fuel is spilled, wipe it off immediately.
- Observe the specifications for refueling.



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.



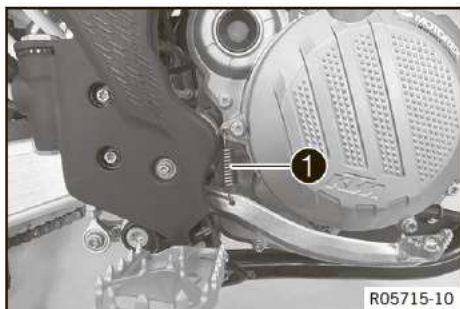
Main work

- Drain the fuel from the fuel tank into a suitable container.
- Lay the vehicle on its side on the work stand.

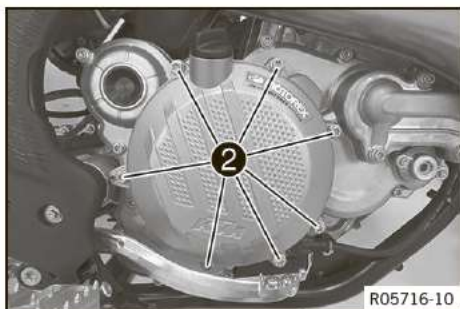


Info

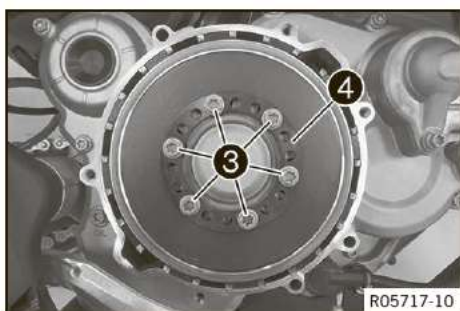
Cover the components to protect them against damage. Remaining fuel may flow out of the fuel tank.



- 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.



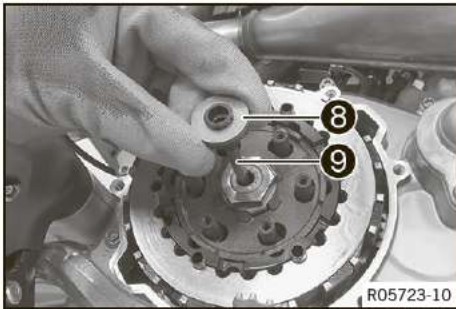
- Take off spring washer ⑤.



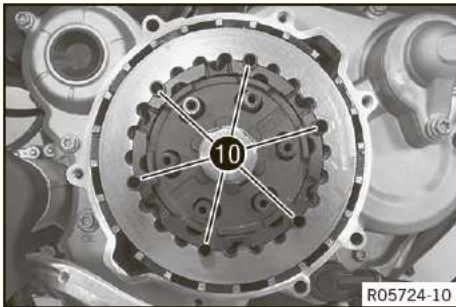
- Take off pretension ring ⑥.



- Take off clutch pressure cap **7**.



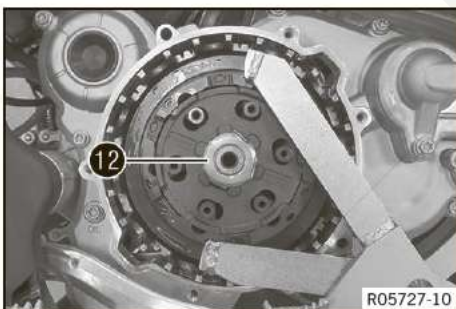
- Take off clutch throw-out **8** with clutch push rod **9**.



- Remove sleeves **10**.



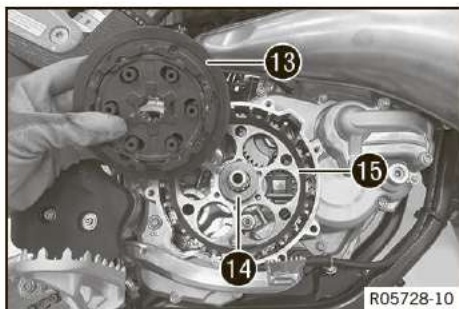
- Remove clutch discs **11** completely.



- Bend up the lock washer.
- Hold the inner clutch hub with the special tool. Loosen nut **12**.

Holding wrench (51129003000) (p. 377)

- Remove the nut with the lock washer.



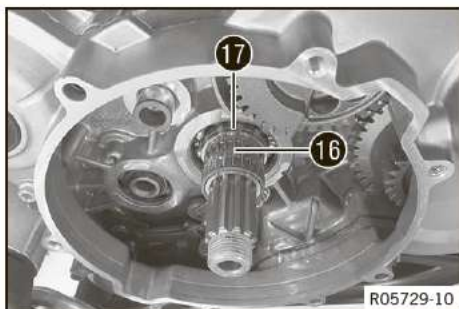
- Take off inner clutch hub **13** and washer **14**.



Info

The washer usually sticks to the inner clutch hub.

- Take off clutch basket **15**.

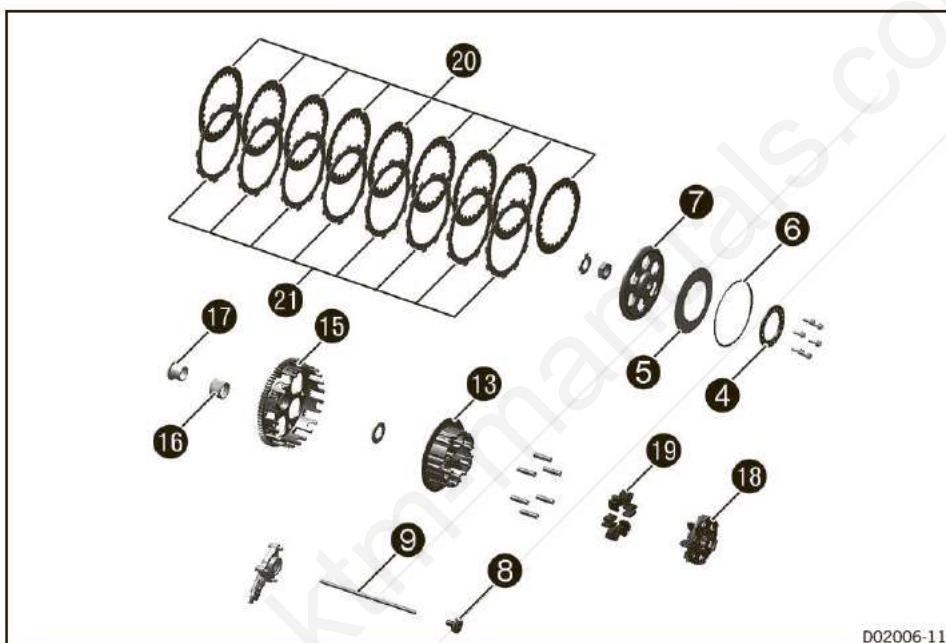


- Take off needle bearing **16** and collar bushing **17**.



Info

The needle bearing and collar bushing may be in the clutch basket.

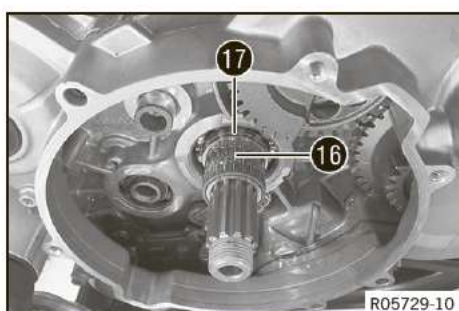


- Check clutch throw-out **8** for damage and wear.
 - » If there is damage or wear:
 - Change the clutch throw-out.
- Place the clutch push rod **9** on a flat surface and check for run-out.
 - » If there is run-out:
 - Change the clutch push rod.
- Check spring retainer **4** for damage and wear.
 - » 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.

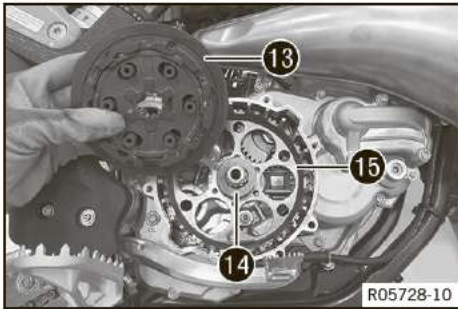
- » If there is damage or wear:
 - Change the spring washer.
- Check the contact surface of clutch pressure cap **7** for damage and wear.
 - » If there is damage or wear:
 - Change the clutch pressure cap.
- Check clutch center **18** for damage and wear.
 - » If there is damage or wear:
 - Change the 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 clutch facing discs.
- Check the thickness of clutch facing discs **21**.

Clutch facing disc - thickness	$\geq 1.9 \text{ mm } (\geq 0.075 \text{ in})$
--------------------------------	--

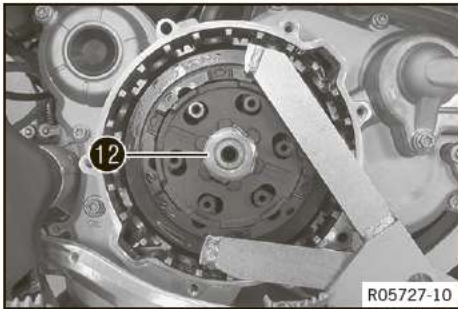
- » If the clutch facing disc does not meet specifications:
 - Change all clutch facing discs.



- Mount collar bushing **17** and needle bearing **16**.



- Mount clutch basket 15.
- Mount washer 14 and inner clutch hub 13.



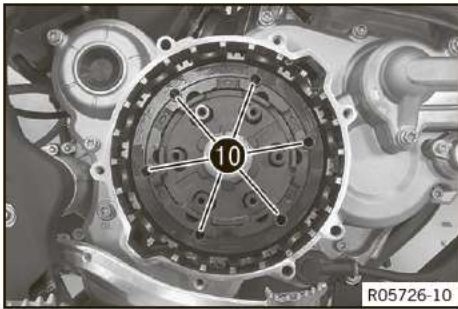
- Position the new lock washer and mount nut 12. Hold the inner clutch hub with the special tool and tighten the nut.

Guideline

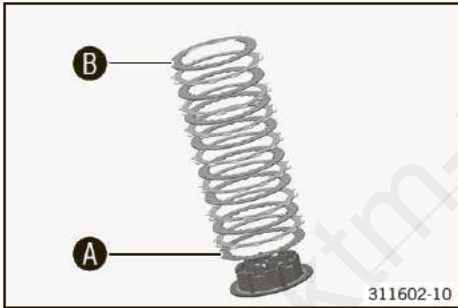
Nut, inner clutch hub	M18x1.5	100 Nm (73.8 lbf ft) Loctite®243™
-----------------------	---------	--------------------------------------

Holding wrench (51129003000) (p. 377)

- Secure the nut with a lock washer.



- Mount sleeves 10.



- 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.

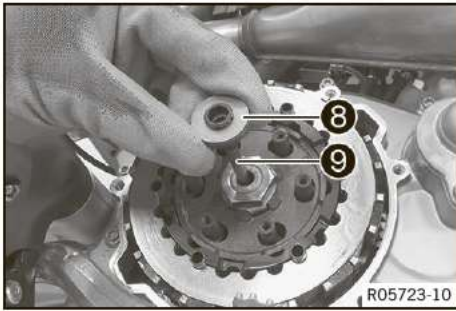
Guideline

Thickness of intermediate clutch discs	1.4 mm (0.055 in)
--	-------------------

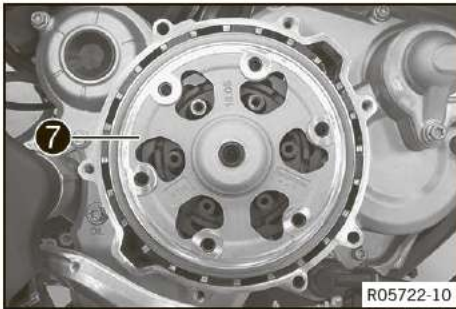
- Place intermediate clutch disc B into the clutch basket.

Guideline

Thickness of intermediate clutch disc B	1.0 mm (0.039 in)
---	-------------------



- Mount clutch throw-out **8** with clutch push rod **9**.



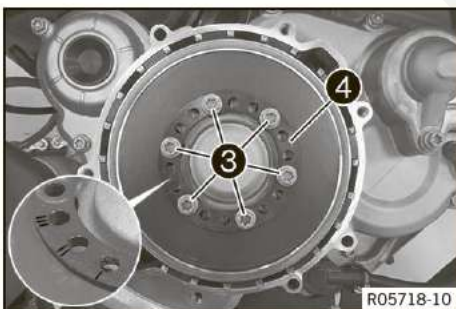
- Position clutch pressure cap **7**.



- Mount pretension ring **6** with marking **Top** facing up.



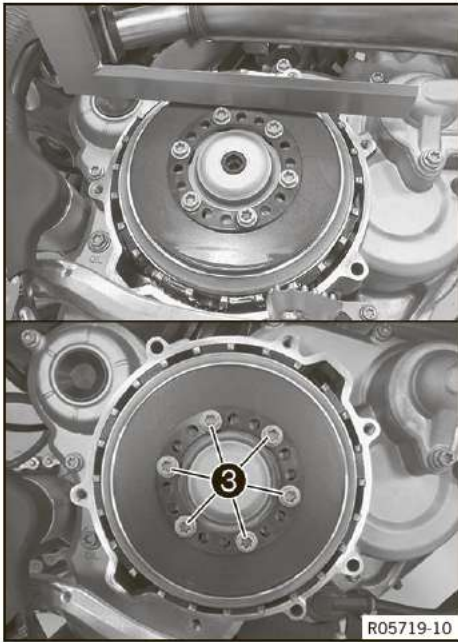
- Position spring washer **5**.



- 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)
-------------------------------	----	-------------------



- Using a straightedge and the special tool, check the spring washer for distortion.

Feeler gauge (59029041100) (p. 381)

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) (p. 381)

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) (p. 381)

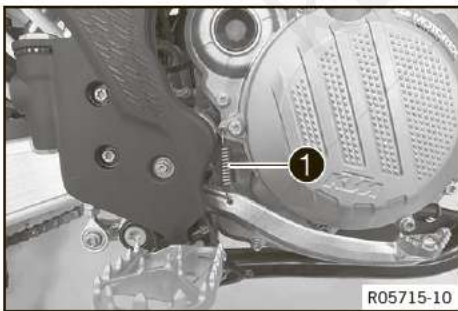
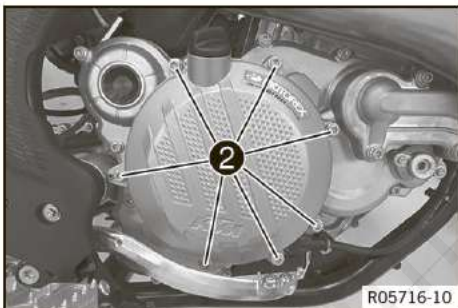
Spring washer distortion	0 ... 0.10 mm (0 ... 0.0039 in)
--------------------------	---------------------------------

- » 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, outer clutch cover	M6	8 Nm (5.9 lbf ft)
---------------------------	----	-------------------



- Attach spring 1.



- Place vehicle in upright position and lean on the side stand.

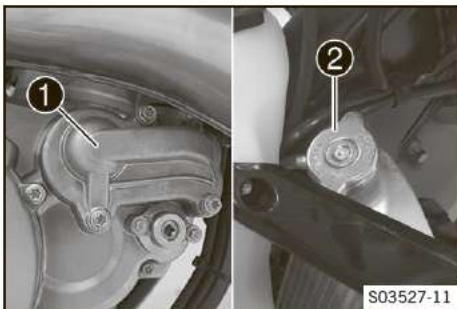
Finishing work

- Check the gear oil level. (🔧 p. 286)



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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.



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.

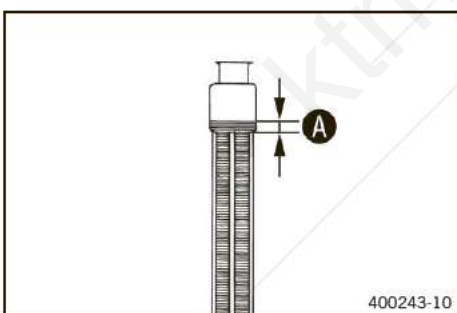
Coolant level A above the radiator fins	10 mm (0.39 in)
--	-----------------

» If the coolant level does not match the specified value:

- Correct the coolant level.

Coolant (📖 p. 370)

- 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.



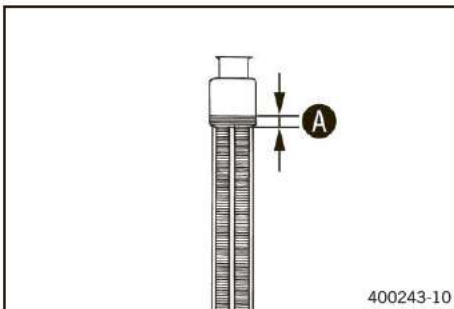
Warning

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 A 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. 370)

- 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.

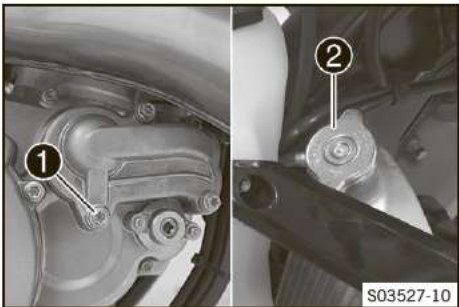
Condition

The engine is cold.

- Position the motorcycle upright.
- Place an appropriate container under the water pump cover.
- Remove screw ❶. Take off radiator cap ❷.
- Completely drain the coolant.
- Mount and tighten screw ❶ with a new seal ring.

Guideline

Screw, water pump cover	M6	
-------------------------	----	--



20.5 Refilling with coolant



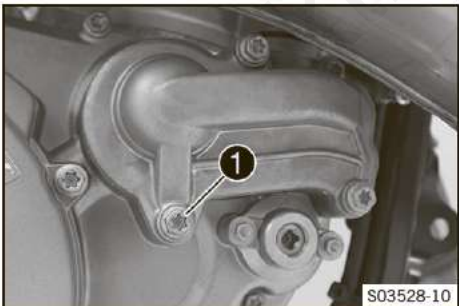
Warning

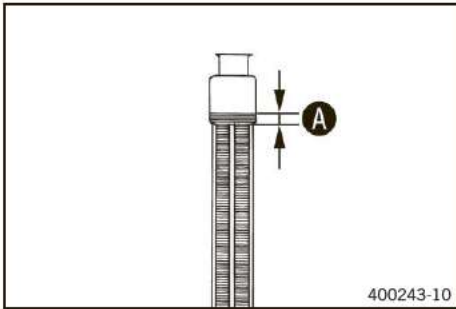
Danger of poisoning Coolant is toxic and a health hazard.

- 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 ❶ is tightened.
- Position the motorcycle upright.

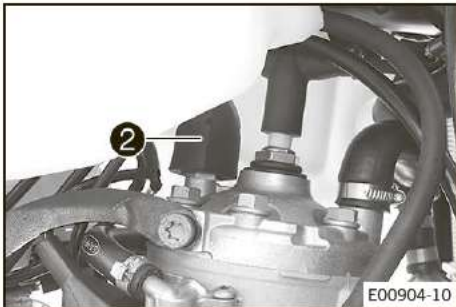




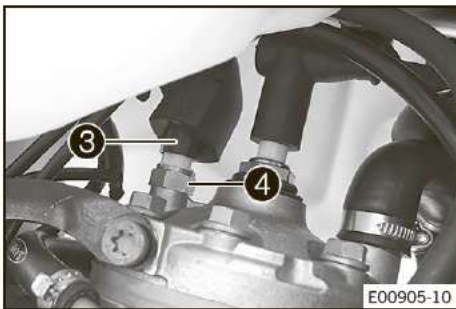
- Pour coolant in up to level **A** above the radiator fins.

Guideline

10 mm (0.39 in)		
Coolant	1.2 l (1.3 qt.)	Coolant (p. 370)



- Push protection cap **2** upward over the coolant temperature sensor.

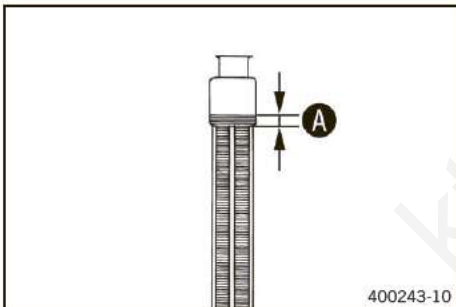


- Unplug connector **3**.
- Remove coolant temperature sensor **4** with the O-ring and wait until the coolant escapes without bubbles.
- Mount and tighten coolant temperature sensor **4** with the O-ring.

Guideline

Screw, cylinder head temperature sensor	M10x1.25	12 Nm (8.9 lbf ft)
---	----------	--------------------

- Plug in connector **3**.
- Position protection cap **2**.
- Pour coolant in up to level **A** above the radiator fins.



Guideline

10 mm (0.39 in)		
Coolant (p. 370)		



- 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 effective exhaust extraction 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. 275)

20.6 Changing the coolant



Warning

Danger of scalding During motorcycle operation, the coolant gets very hot and is under pressure.

- Do not open the radiator, the radiator hoses or other cooling system components if the engine or the cooling system are at operating temperature.
- Allow the cooling system and the engine to cool down before you open the radiator, the radiator hoses or other components of the cooling system.
- In the event of scalding, rinse the area affected immediately with lukewarm water.



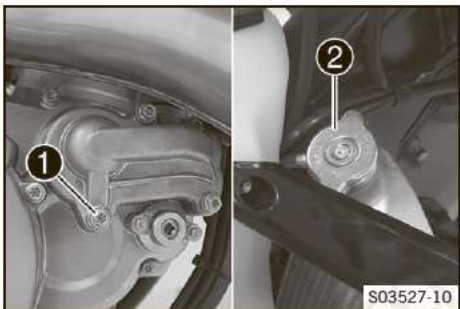
Warning

Danger of poisoning Coolant is toxic and a health hazard.

- Keep coolant out of the reach of children.
- Do not allow coolant to come into contact with the skin, the eyes and clothing.
- Consult a doctor immediately if coolant is swallowed.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly with water and consult a doctor immediately if coolant gets into the eyes.
- Change clothing if coolant spills onto your clothing.

Condition

The engine is cold.



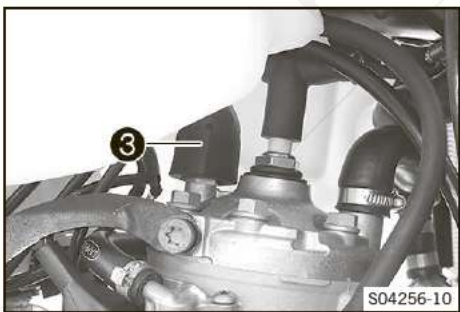
- Remove screw ❶. Take off radiator cap ❷.
- Place an appropriate container under the water pump cover.
- Completely drain the coolant.
- Mount and tighten screw ❶ with a new seal ring.

Guideline

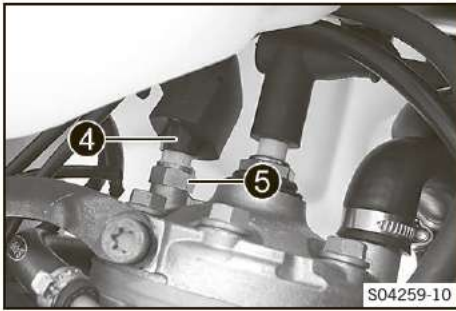
Screw, water pump cover	M6	10 Nm (7.4 lbf ft)
-------------------------	----	--------------------

- Position the motorcycle upright.
- Completely fill the radiator with coolant.

Coolant (📖 p. 370)



- Push protection cap ❸ upward over the coolant temperature sensor.



- Unplug connector ④.
- Remove coolant temperature sensor ⑤ with the O-ring and wait until the coolant escapes without bubbles.
- Mount and tighten coolant temperature sensor ⑤ with the O-ring.

Guideline

Screw, cylinder head temperature sensor	M10x1.25	12 Nm (8.9 lbf ft)
---	----------	--------------------

- Plug in connector ④.
- Mount protection cap ③.
- Mount radiator cap ②.



Danger

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

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

- Allow the engine to warm up and cool down again.
- Check the cooling system for leaks.
- Check the coolant level. (p. 275)

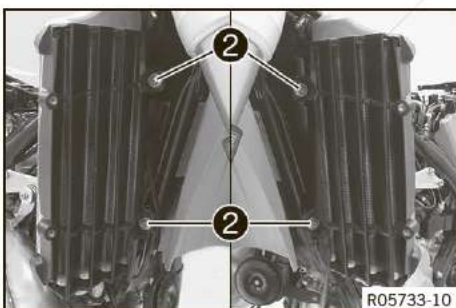
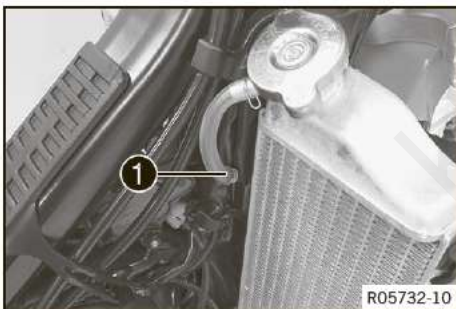
20.7 Changing the coolant pipe

Preparatory work

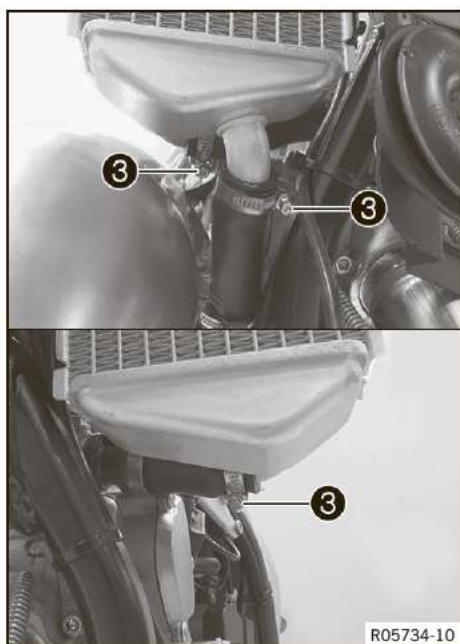
- Drain the coolant. (p. 275)
- Remove the seat. (p. 101)
- Remove the fuel tank. (p. 102)

Main work

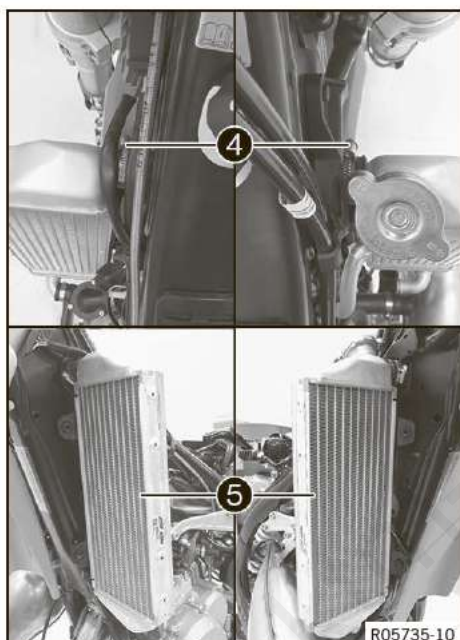
- Pull off overflow hose ①.



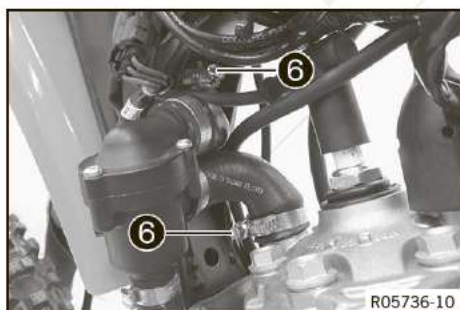
- Remove screws ②.
- Remove radiator shield on both sides.



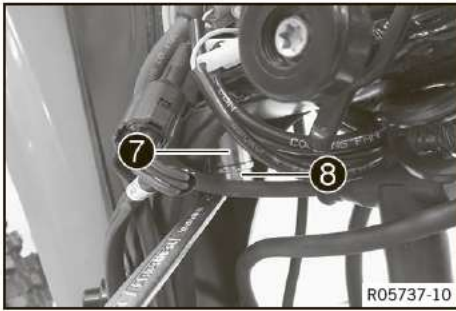
- Loosen hose clips **3**.
- Pull off the radiator hoses.



- Remove the hose clips **4**.
- Detach radiator **5** and remove to the side.



- Loosen hose clips **6**.
- Pull off the radiator hose.



- Remove coolant pipe **7** using special tool **8**.

Mounting tool (79129081000) (p. 383)

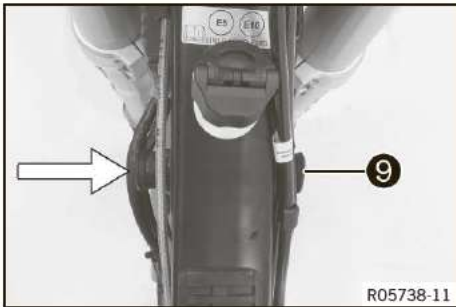


- Pull off connecting piece **9** to the side and remove.



Info

The connecting piece can only be removed from the left side.

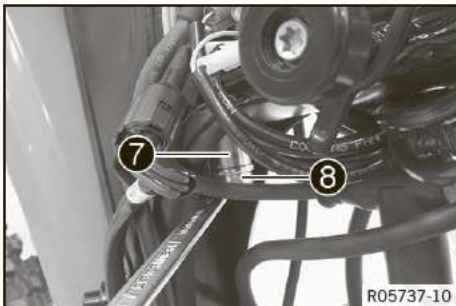


- Mount new connecting piece **9** in the frame.



Info

The connecting piece can only be mounted on the left side.

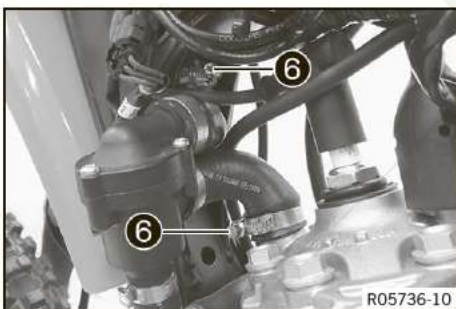


- Mount new coolant pipe **7** with special tool **8** and tighten.

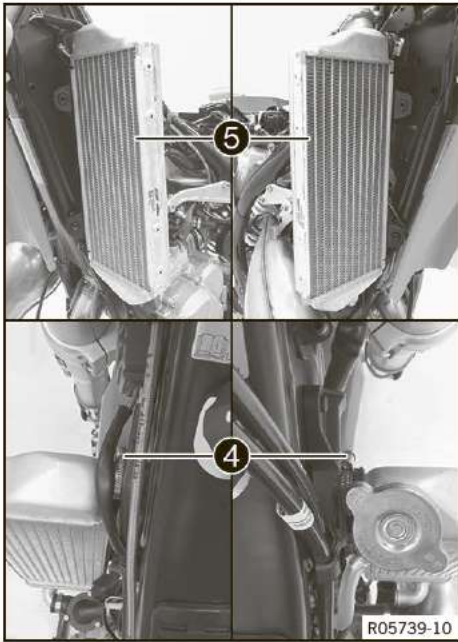
Guideline

Screw-in fitting, cooling system	M24x1.5	18 Nm (13.3 lbf ft) Loctite®243™
-------------------------------------	---------	--

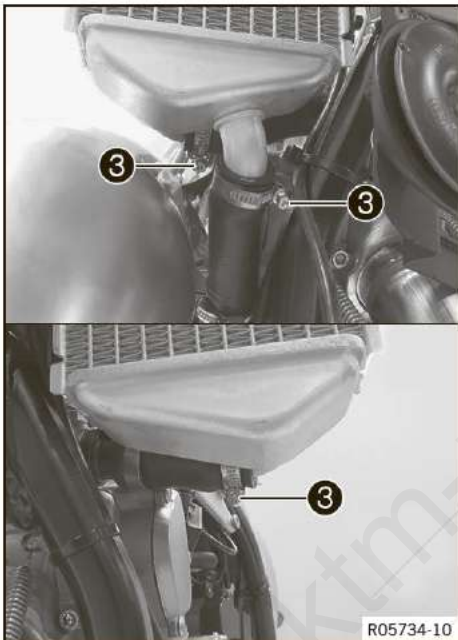
Mounting tool (79129081000) (p. 383)



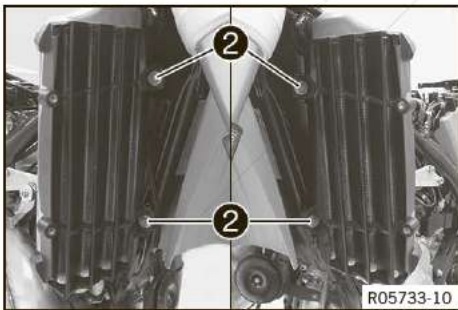
- Mount the radiator hose.
- Position and tighten hose clips **6**.



- Detach the radiator 5 and position.
- Position and tighten hose clips 4.



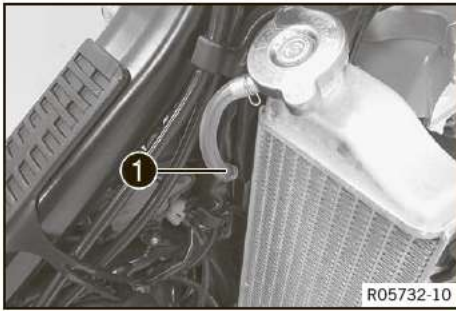
- Mount the radiator hoses.
- Position and tighten hose clips 3.



- Position the radiator shield on both sides.
- Mount and tighten screws 2.

Guideline

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



- Mount overflow hose ①.

Finishing work

- Install the fuel tank. (🔧 p. 103)
- Mount the seat. (🔧 p. 101)
- Refill with coolant. (🔧 p. 276)
- Check the coolant level. (🔧 p. 275)

21.1 Checking/adjusting the basic setting of the exhaust control



- Measure distance **A** between the housing and the adjusting screw.

Basic setting, exhaust control (All 250 models)	
Basic setting	2.7 ... 2.9 mm (0.106 ... 0.114 in)
Basic setting, exhaust control (All 300 models)	
Basic setting	2.3 ... 2.5 mm (0.091 ... 0.098 in)

- » If the measured value is less than the specified value:
 - Correct the adjusting screw to the specified value using the special tool.

Socket wrench (55529021000) (🔧 p. 378)

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.



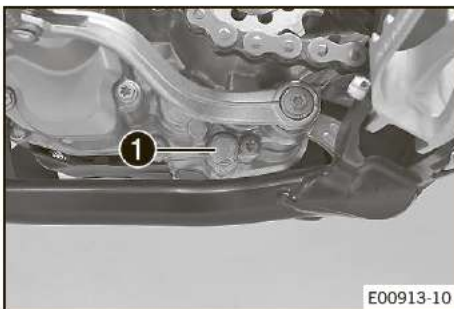
Info

Drain the gear oil while the engine is at operating temperature.

Preparatory work

(All special models)

- Remove the engine guard. (📖 p. 55)
- Park the motorcycle on a level surface.
- Position an appropriate 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.

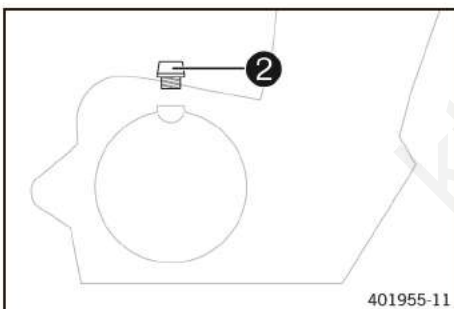
Guideline

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 (0.85 qt.)	Engine oil (15W/50) (📖 p. 370)
----------	----------------------	--------------------------------------

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

- Start the engine and check it for leaks.

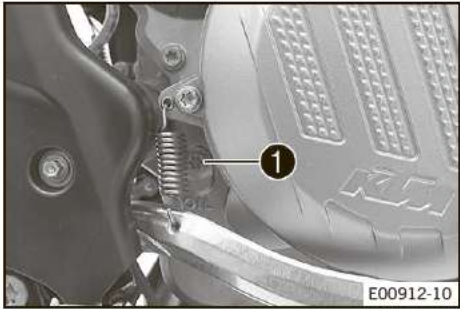
Finishing work

- Check the gear oil level. (📖 p. 286)

- (All special models)
- Install the engine guard. (📖 p. 55)

22.2 Checking the gear oil level

i 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 gear oil level monitoring screw 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 the gear oil. (📖 p. 286)
- Mount and tighten the gear oil level monitoring screw.

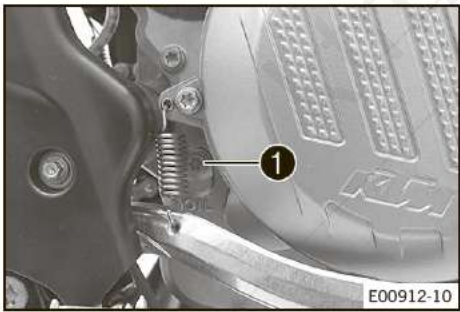
Guideline

Screw, gear oil level monitoring	M6	8 Nm (5.9 lbf ft)
----------------------------------	----	-------------------

- Attach the foot brake lever spring.

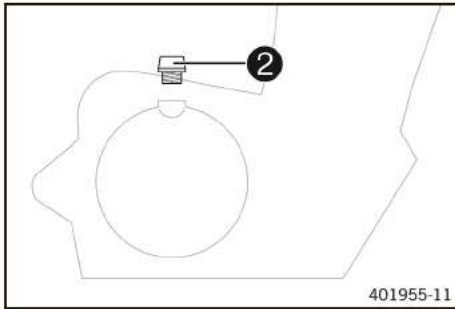
22.3 Adding the gear oil

i 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 gear oil level monitoring screw 1.



- Remove filler plug ② with the O-ring.
- Add gear oil until it emerges from the drill hole of the gear oil level monitoring screw.

Engine oil (15W/50) (p. 370)

- Mount and tighten the gear oil level monitoring screw.

Guideline

Screw, gear oil level monitoring	M6	8 Nm (5.9 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 effective exhaust extraction when starting or running the engine in an enclosed space.

- Start the engine and check it for leaks.

Finishing work

- Check the gear oil level. (p. 286)

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.

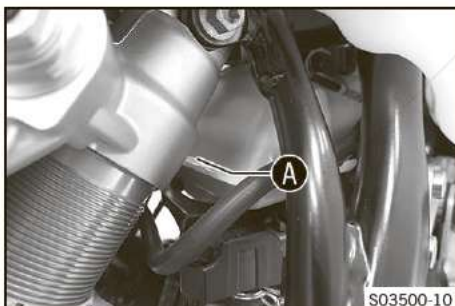
- As soon as the oil level warning light lights up, ride for no longer than until the remaining fuel in the tank is depleted.
- At the next opportunity add 2-stroke oil before you refuel.
- Time the oil pump if the 2-stroke oil hose has been removed or the 2-stroke oil tank has been fully depleted in error.

Preparatory work

- Stand the motorcycle upright on a horizontal surface.

Main work

- Check the 2-stroke oil level in the oil tank.



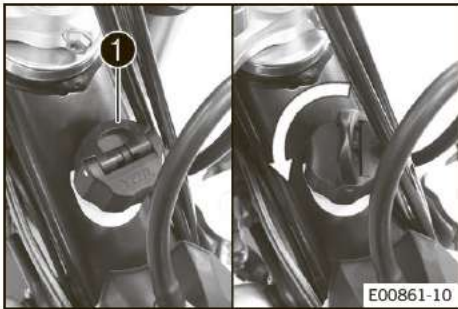
Info

For a full tank of fuel, the 2-stroke oil tank must be filled up to at least the upper abutting edge A.

The 2-stroke oil tank must be completely filled if possible.

- » If the 2-stroke oil level is too low:
 - Add 2-stroke oil. (p. 288)

22.5 Opening 2-stroke oil tank cap



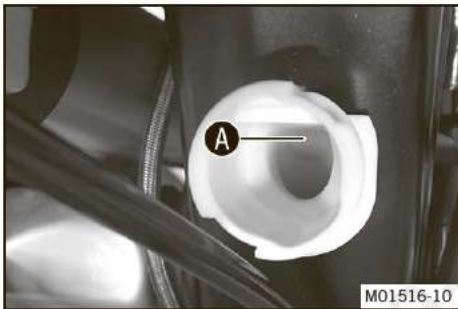
- Fold loop 1 upward.
- Turn the 2-stroke oil tank cap counterclockwise and pull it up.

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.

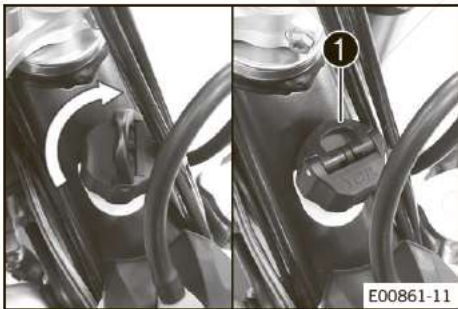
- As soon as the oil level warning light lights up, ride for no longer than until the remaining fuel in the tank is depleted.
- At the next opportunity add 2-stroke oil before you refuel.
- Time the oil pump if the 2-stroke oil hose has been removed or the 2-stroke oil tank has been fully depleted in error.



- Open 2-stroke oil tank cap. (p. 288)
 - Fill the 2-stroke oil tank up to the lower edge A of the filler neck.
- Guideline

Only use 2-stroke oil which is appropriate for separate lubrication.
- | | | |
|-----------------------------------|-----------------|-------------------------------|
| 2-stroke oil tank content approx. | 0.6 l (0.6 qt.) | Engine oil, 2-stroke (p. 370) |
|-----------------------------------|-----------------|-------------------------------|
- Close 2-stroke oil tank cap. (p. 288)

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 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

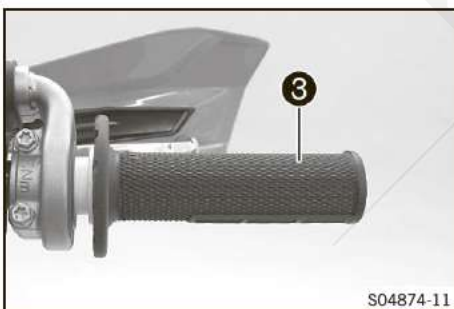
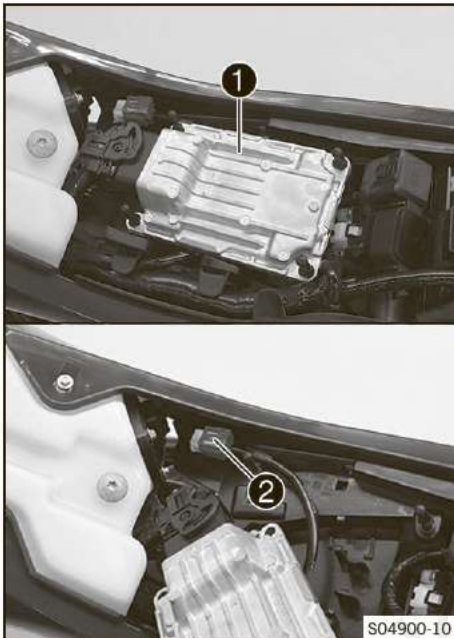
The engine is off.

Preparatory work

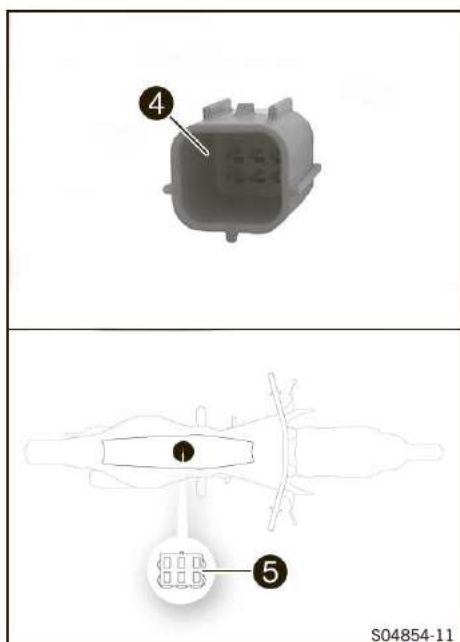
- Remove the seat. (📖 p. 101)
- Stand the motorcycle upright on a horizontal surface.
- Check 2-stroke oil level. (📖 p. 287)

Main work

- Pull the EFI control unit **1** upward off the rubber plugs and hang to the side.
- Pull diagnostics connector **2** off the holder.



- Put throttle grip **3** into full throttle position and secure.



- Plug in wake-up connector **4** for priming the oil pump to the diagnostics connector **5**.

✓ The combination instrument lighting is activated.



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.



Info

The oil pump is actuated at various speeds. The procedure is clearly audible.

Finishing work

- Mount the seat. (📖 p. 101)

22.9 Changing the oil pump, cleaning the oil screen



Note

Environmental hazard Hazardous substances cause environmental damage.

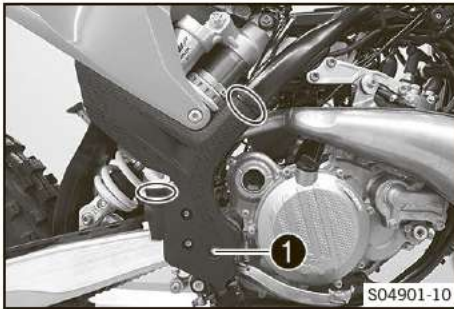
- Dispose of oils, grease, filters, fuel, cleaning agents, brake fluid, etc., correctly and in compliance with the applicable regulations.

Condition

Oil tank is empty.

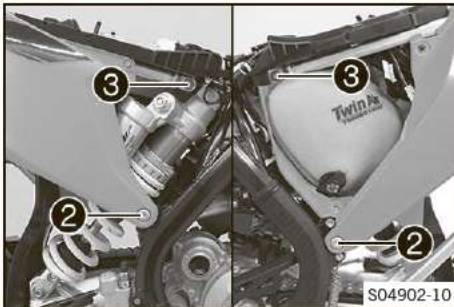
Preparatory work

- Remove main silencer. (📖 p. 95)
- Remove the seat. (📖 p. 101)
- Remove the fuel tank. (📖 p. 102)
- Remove the air filter box cover. (📖 p. 97)
- Raise the motorcycle with a lift stand. (📖 p. 12)

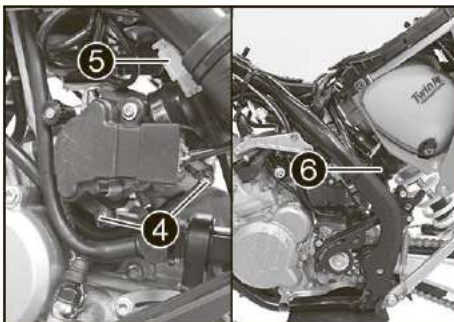


Main work

- Remove screw ① with washer.
- Remove the cable ties and take off the frame protector.



- Remove screws ②.
- Loosen screws ③.

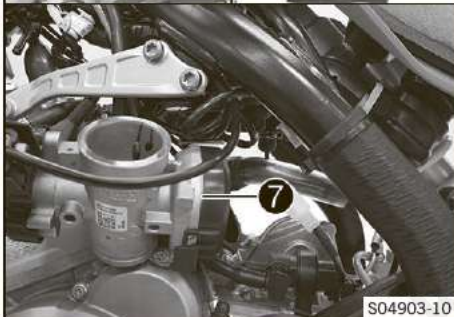


- Loosen clamps ④ of the throttle valve body.
- Disconnect plug-in connector ⑤ of the rear brake light switch.
- Lift the subframe slightly and secure it.

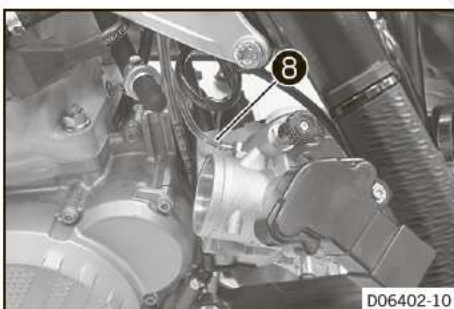


Info

Pay attention to intake flange ⑥.



- Pull throttle valve body ⑦ towards the rear, out of the intake flange, and hang it to the side.

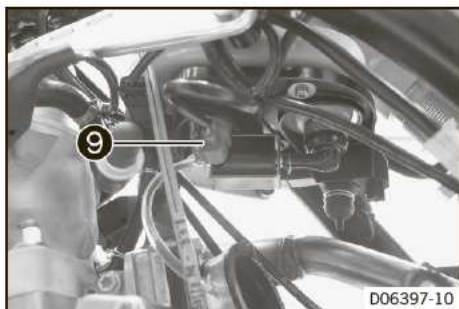


- Push back hose clamp ⑧.
- Pull off the tube from the throttle valve body.

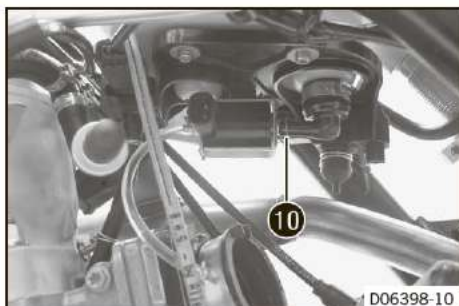


Info

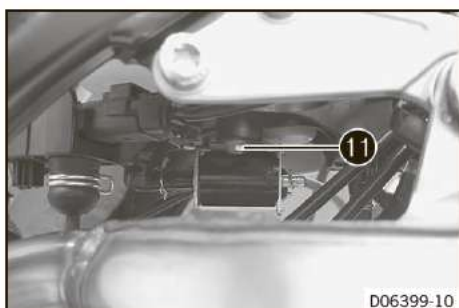
Residual oil may escape from the hose.



- Unplug connector 9.



- Push back hose clamp 10.



- Remove screw 11.
- Pull off the hose from the oil tank.



Info

Residual oil may escape from the oil tank.

- Remove the oil pump with the hose.



- Open hose clamp 12 using a screwdriver and pull off the angle piece.

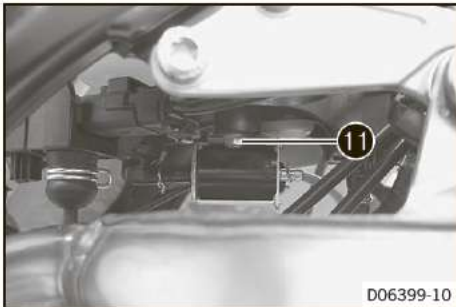


- Remove oil screen 13 and clean it.
- Check the oil screen for damage.
 - » If the oil screen is damaged:
 - Change the oil screen.



- Insert the oil screen and mount the angle piece with a new hose clamp.

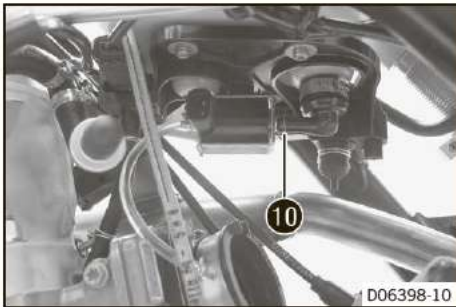
Hose clamp pliers (60029057000) (p. 381)



- Position the new oil pump with the hose.
- Mount the hose from the oil tank.
- Mount and tighten screw 11.

Guideline

Screw, oil pump	M6	7 Nm (5.2 lbf ft)
-----------------	----	-------------------



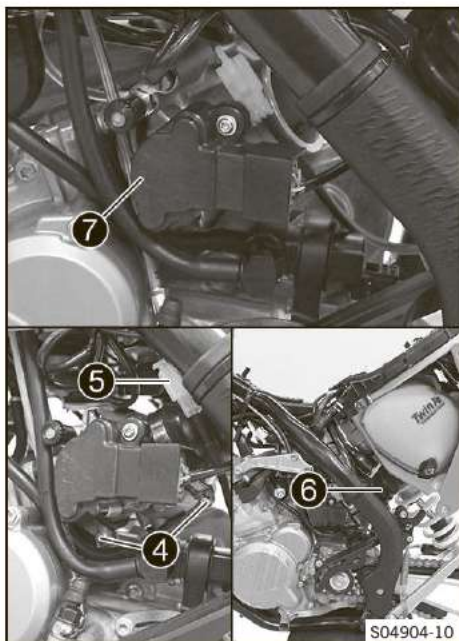
- Position hose clamp 10.



- Plug in connector 9.



- Mount hose on the throttle valve body.
- Position hose clamp 8.



- Mount throttle valve body **7**.
- Remove the locking piece and position the subframe.



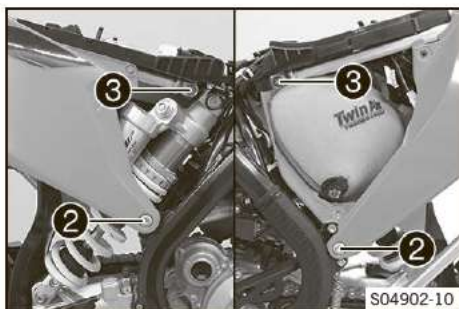
Info

Pay attention to intake flange **6**.

- Join plug-in connector **5** of the rear brake light switch.
- Position and tighten clamps **4** of the throttle valve body.

Guideline

Screw, intake flange/reed valve housing	M6	6 Nm (4.4 lbf ft)
---	----	-------------------



- Mount and tighten screws **2**.

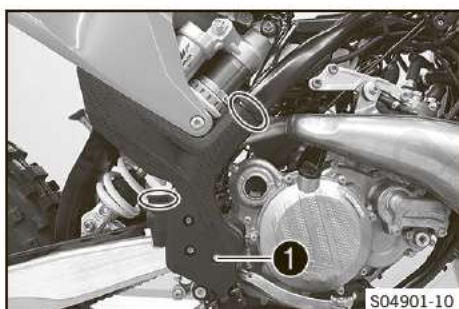
Guideline

Screw, sub-frame bottom	M8	30 Nm (22.1 lbf ft) Loctite®2701™
-------------------------	----	---

- Remove screws **3**.
- Mount and tighten screws **3**.

Guideline

Screw, sub-frame top	M8	35 Nm (25.8 lbf ft) Loctite®2701™
----------------------	----	---



- Position the frame protector.
- Mount and tighten screw **1** with the washer.

Guideline

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

- Mount the cable ties.

Finishing work

- Remove the motorcycle from the lift stand. (🔧 p. 12)
- Install the air filter box cover. (🔧 p. 97)
- Install the fuel tank. (🔧 p. 103)
- Add 2-stroke oil. (🔧 p. 288)
- Prime the oil pump. (🔧 p. 289)
- Mount the seat. (🔧 p. 101)
- Install the main silencer. (🔧 p. 95)

22.10 Cleaning the oil screen in the oil tank

**Note**

Environmental hazard Hazardous substances cause environmental damage.

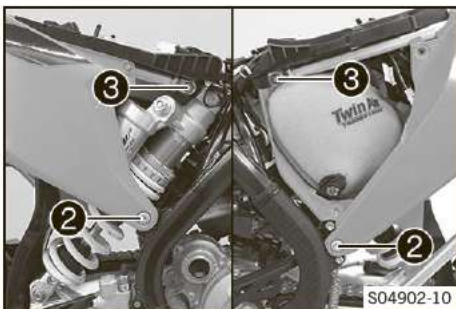
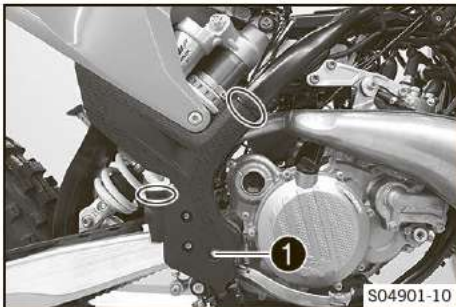
- Dispose of oils, grease, filters, fuel, cleaning agents, brake fluid, etc., correctly and in compliance with the applicable regulations.

Preparatory work

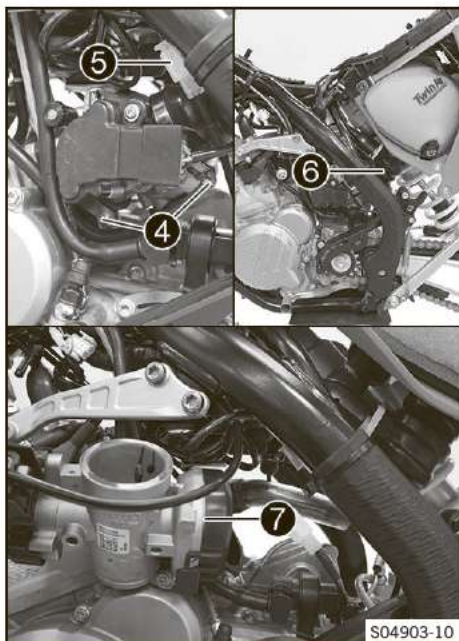
- Raise the motorcycle with a lift stand. (p. 12)
- Remove main silencer. (p. 95)
- Remove the seat. (p. 101)
- Remove the fuel tank. (p. 102)
- Remove the air filter box cover. (p. 97)

Main work

- Remove screw ① with washer.
- Remove the cable ties and take off the frame protector.



- Remove screws ②.
- Loosen screws ③.



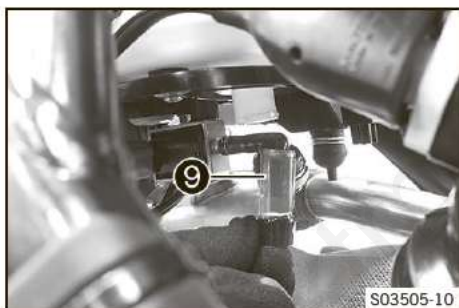
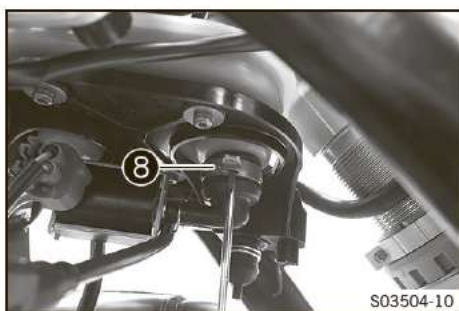
- Loosen clamps ④ of the throttle valve body.
- Disconnect plug-in connector ⑤ of the rear brake light switch.
- Lift the subframe slightly and secure it.



Info

Pay attention to intake flange ⑥.

- Pull throttle valve body ⑦ towards the rear, out of the intake flange, and hang it to the side.

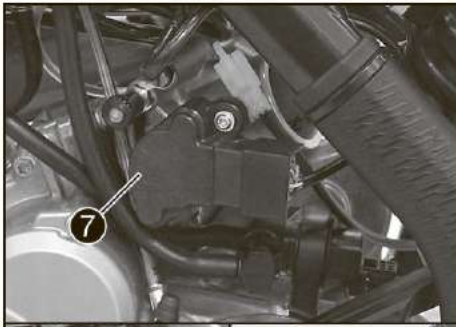


- Remove oil screen ⑨ and clean it.
- Check the oil screen for damage.
 - » If the oil screen is damaged:
 - Change the oil screen.



- Insert the oil screen and mount the angle piece with a new hose clamp.

Hose clamp pliers (60029057000) (📖 p. 381)



- Mount throttle valve body **7**.
- Remove the locking piece and position the subframe.



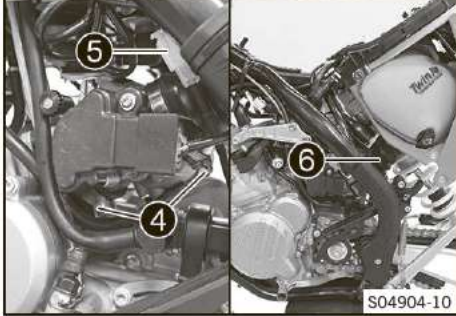
Info

Pay attention to intake flange **6**.

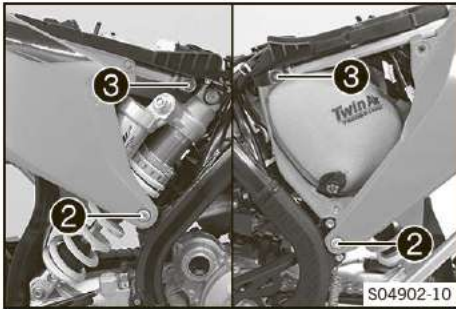
- Join plug-in connector **5** of the rear brake light switch.
- Position and tighten clamps **4** of the throttle valve body.

Guideline

Screw, intake flange/reed valve housing	M6	6 Nm (4.4 lbf ft)
---	----	-------------------



S04904-10



S04902-10

- Mount and tighten screws **2**.

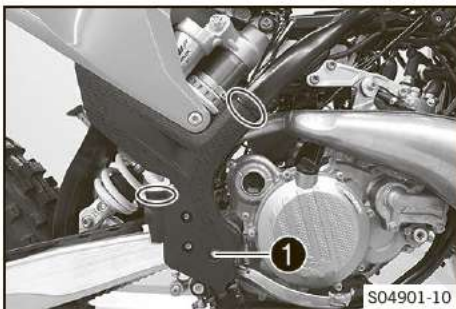
Guideline

Screw, sub-frame bottom	M8	30 Nm (22.1 lbf ft) Loctite®2701™
-------------------------	----	---

- Remove screws **3**.
- Mount and tighten screws **3**.

Guideline

Screw, sub-frame top	M8	35 Nm (25.8 lbf ft) Loctite®2701™
----------------------	----	---



S04901-10

- Position the frame protector.
- Mount and tighten screw **1** with washer.

Guideline

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

- Mount the cable ties.

Finishing work

- Install the air filter box cover. (p. 97)
- Install the fuel tank. (p. 103)
- Add 2-stroke oil. (p. 288)
- Prime the oil pump. (p. 289)
- Mount the seat. (p. 101)
- Install the main silencer. (p. 95)
- Remove the motorcycle from the lift stand. (p. 12)

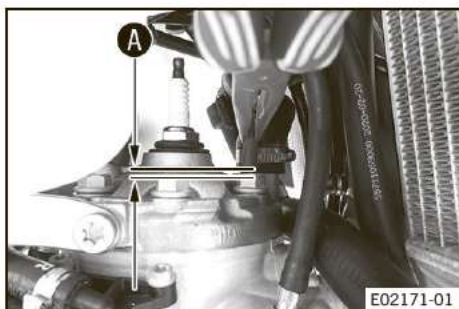
23.1 Checking the ignition system



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 the transmission to neutral position.
- Unplug the spark plug connector and remove it from the ignition wire.
- Remove the spark plug.

Guideline

Close the spark plug thread in the cylinder head, e.g., with a suitable spare spark plug.

- Hold the free end of the ignition wire at distance **A** from ground.

Guideline

Distance A	5 mm (0.2 in)
-------------------	---------------

- Press the start button.



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 stop button.
 - 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. 299)
- Check the crankshaft speed sensor. (📖 p. 301)
- Check the stator winding of the alternator. (📖 p. 300)



- Mount the spark plug connector on the ignition wire again. Mount the spark plug in the spark plug connector. Hold the spark plug to ground.
- Press the start button.



Info

Do not open the throttle.

- Check the ignition spark.
 - » If no ignition spark is visible:
 - Check the spark plug connector. (p. 300)
 - Change the spark plug. (p. 302)

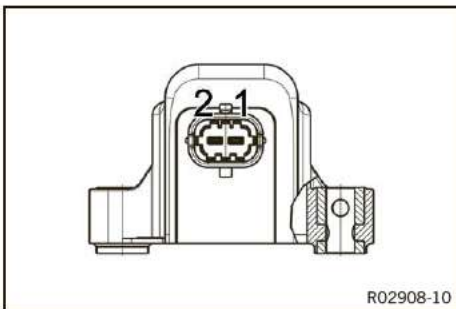
23.2 Ignition coil - checking the primary winding



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. 379)



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 (+)



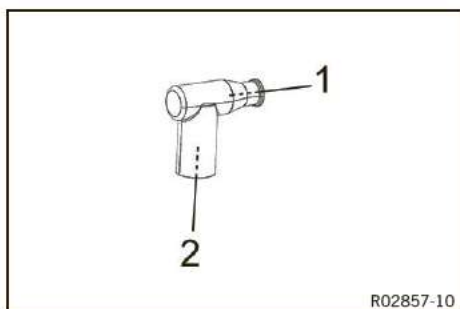
Info

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.

-  Measure the resistance between the specified points.
Measuring point 1 – Measuring point 2

Spark plug connector	
Resistance at: 20 °C (68 °F)	4.3 ... 5.7 kΩ

- » 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. 101)

Main work

Stator winding measurement I - check the resistance.

-  Measure the resistance between the specified points.
Stator, connector **EZ** pin 1 – Stator, connector **EZ** pin 2

Alternator	
Stator winding resistance at: 20 °C (68 °F)	0.368 ... 0.552 Ω

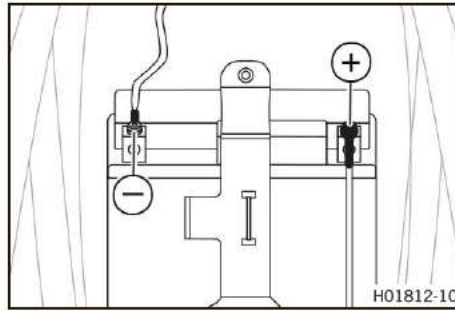
- » If the indicated value does not correspond to the setpoint value:
 - Change the stator.

Stator winding measurement II - check the resistance.

-  Measure the resistance between the specified points.
Stator, connector **EZ** pin 1 – Stator, connector **EZ** pin 3

Alternator	
Stator winding resistance at: 20 °C (68 °F)	0.368 ... 0.552 Ω

- » 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.

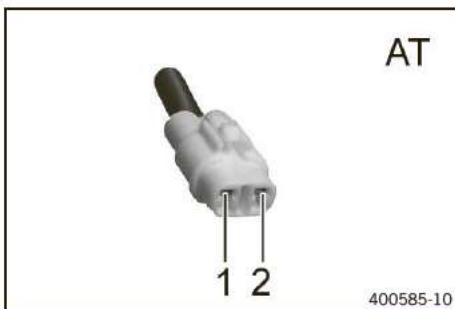
Finishing work

- Mount the seat. (p. 101)

23.5 Checking the crankshaft speed sensor

Condition

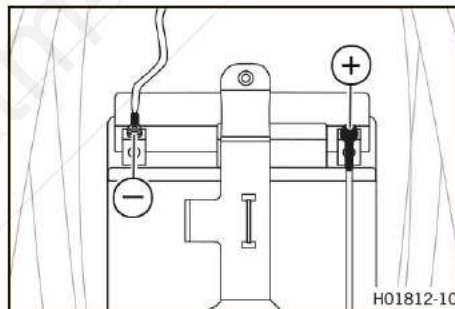
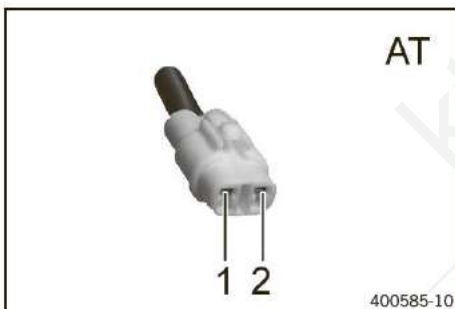
Crankshaft speed sensor is disconnected.



- Measure the resistance between the specified points.
Crankshaft speed sensor, connector **AT** pin 1 –
Crankshaft speed sensor, connector **AT** pin 2

Crankshaft speed sensor	
Resistance at: 20 °C (68 °F)	80 ... 120 Ω

- » If the specification is not reached:
 - Change the crankshaft speed sensor.



- Measure the resistance between the specified points.
Crankshaft speed sensor, connector **AT** pin 1 – Measuring point **Ground (-)**

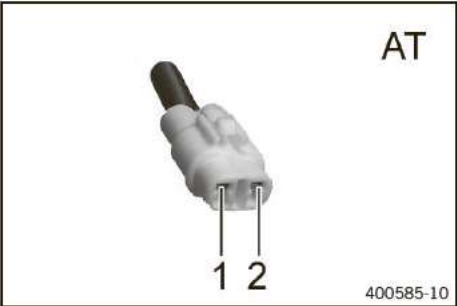
Resistance	$\infty \Omega$
------------	-----------------

- » If the specification is not reached:
 - Change the crankshaft speed sensor.
- Connect the special tool to the multimeter.

Peak voltage adapter (58429042000) (p. 379)

i 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)



- Crankshaft speed sensor – check the resistance.**
- **V** Measure the voltage between the specified points.
Crankshaft speed sensor, connector **AT** pin 1 –
Crankshaft speed sensor, connector **AT** pin 2

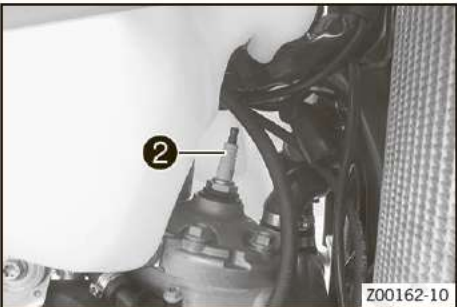
Crankshaft speed sensor	
Voltage at starting engine speed	2 ... 4 V

- » If the specification is not reached:
 - Change the crankshaft speed 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.

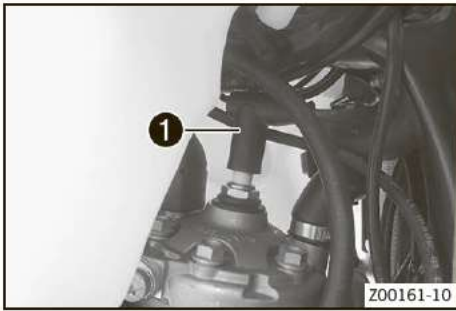
Guideline

Spark plug	M14x1.25	25 Nm (18.4 lbf ft)
------------	----------	---------------------

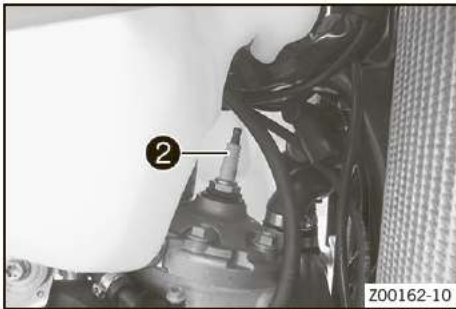


- Plug in spark plug connector **1**.

23.7 Changing the spark plug and spark plug connector



- Disconnect spark plug connector ①.



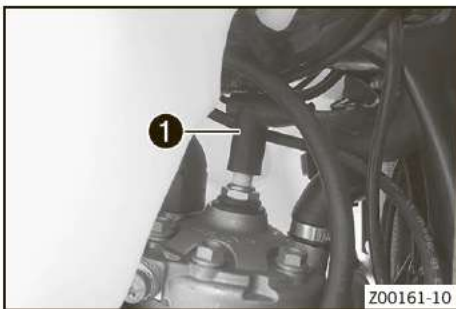
- Remove spark plug ② using a suitable tool.
- Mount and tighten the new spark plug using a suitable tool.

Guideline

Spark plug	M14x1.25	25 Nm (18.4 lbf ft)
------------	----------	---------------------



- Remove spark plug connector ①.
- Mount new spark plug connector ①.

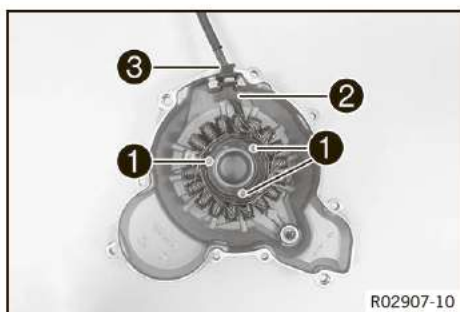


- Plug in spark plug connector ①.

23.8 Removing the stator

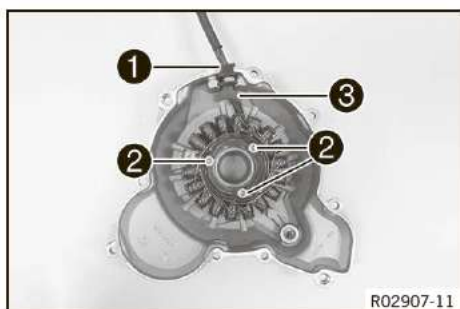
Condition

The alternator cover has been removed.



- Remove screws ①.
- Remove retaining bracket ②.
- Remove rubber grommet 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 rubber grommet ① in the alternator cover.
- Mount and tighten screws ②.

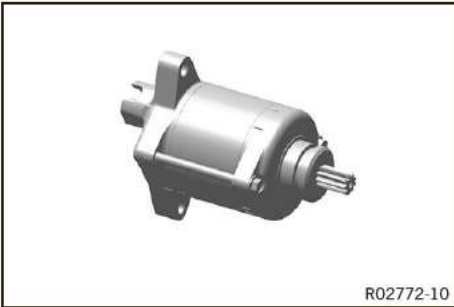
Guideline

Screw, stator	M5	6 Nm (4.4 lbf ft) Loctite®2701™
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- Mount retaining bracket ③.

24.1 Checking the starter motor**Condition**

The starter motor has been removed.



- Connect negative cable of a 12-V power supply to the housing of the starter motor. Connect 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 starter motor.

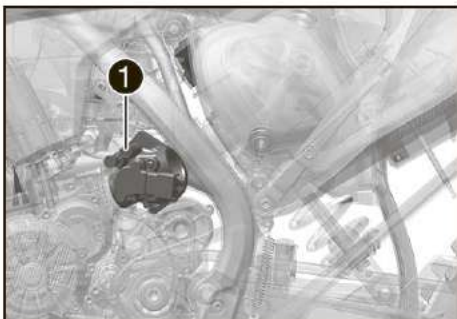


25.1 Adjusting the idle speed



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. 307)



Danger

- Danger of poisoning** Exhaust gases are toxic and inhaling them may result in unconsciousness and death.
- Always make sure there is sufficient ventilation when running the engine.
 - Use effective exhaust extraction when starting or running the engine in an enclosed space.

- Adjust the idle speed by turning idle speed adjusting screw **1**.

Guideline

Idle speed	1,400 ... 1,500 rpm
Tachometer (45129075000) (p. 376)	



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 air pressure



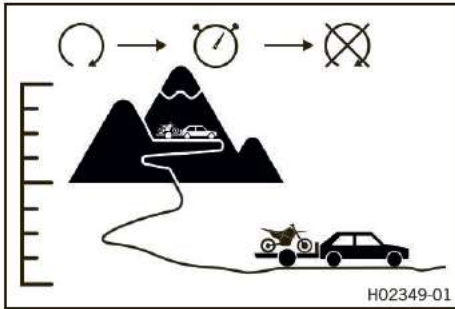
Danger

- 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 effective exhaust extraction 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 the procedure.

25.3 Cold start button



The cold start button **1** is fitted on the side of the throttle valve body.

If the engine is cold and the ambient temperature is low, the electronic fuel injection system extends the injection time. To help the engine burn the increased fuel quantity, 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 ³ (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 control - setting measurement	2.7 $\pm$ 0.2 mm (0.106 $\pm$ 0.008 in)
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 transmission, 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
Spark plug	NGK BR 7 ES
Spark plug electrode gap	0.6 mm (0.024 in)
Cooling	Water cooling, permanent circulation of coolant by water pump
Starting aid	Electric starter system

26.1.2 All 300 models

Design	1-cylinder 2-stroke engine, water-cooled, with reed intake, exhaust control and transfer duct injection
Displacement	293.15 cm ³ (17.8892 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 transmission, 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
Spark plug	NGK BR 7 ES
Spark plug electrode gap	0.6 mm (0.024 in)
Cooling	Water cooling, permanent circulation of coolant by water pump
Starting aid	Electric starter system

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	71.925 ... 71.934 mm (2.83169 ... 2.83204 in)
Size II	71.935 ... 71.944 mm (2.83208 ... 2.83244 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	0.066 ... 0.088 mm (0.0026 ... 0.00346 in)
Wear limit	0.10 mm (0.0039 in)
Piston ring end gap	
Ring 1	≤ 0.60 mm (≤ 0.0236 in)
Ring 2	≤ 0.60 mm (≤ 0.0236 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)
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	EJOTDELTA PT® 35x25	1 Nm (0.7 lbf ft)	
Screw, membrane support plate	EJOTDELTA PT® 30x12	1 Nm (0.7 lbf ft)	
Screw, outer membrane sheets	EJOTDELTA PT® 30x6	1 Nm (0.7 lbf ft)	
Screw, angle lever, exhaust control	M5	6 Nm (4.4 lbf ft)	
Screw, bearing retainer	M5	6 Nm (4.4 lbf ft)	Loctite®243™
Screw, clutch spring retainer	M5	6 Nm (4.4 lbf ft)	
Screw, crankshaft speed sensor	M5	6 Nm (4.4 lbf ft)	Loctite®243™
Screw, exhaust control bearing support	M5	6 Nm (4.4 lbf ft)	Loctite®243™
Screw, exhaust control cap	M5	5 Nm (3.7 lbf ft)	
Screw, exhaust control cover	M5	4 Nm (3 lbf ft)	
Screw, injection valve holder	M5	5 Nm (3.7 lbf ft)	Loctite®243™
Screw, locking lever	M5	6 Nm (4.4 lbf ft)	Loctite®243™
Screw, retaining bracket of exhaust control	M5	6 Nm (4.4 lbf ft)	Loctite®2701™
Screw, stator	M5	6 Nm (4.4 lbf ft)	Loctite®2701™
Cap nut, water pump impeller	M6	5 Nm (3.7 lbf ft)	Loctite®243™
Drain plug, water pump cover	M6	10 Nm (7.4 lbf ft)	
Screw, alternator cover	M6	8 Nm (5.9 lbf ft)	
Screw, clutch cover	M6	10 Nm (7.4 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)	Loctite®243™
Screw, engine case	M6	10 Nm (7.4 lbf ft)	
Screw, exhaust control thrust bearing	M6	8 Nm (5.9 lbf ft)	Loctite®243™
Screw, exhaust flange	M6	8 Nm (5.9 lbf ft)	

Screw, gear oil level monitoring	M6	8 Nm (5.9 lbf ft)
Screw, intake flange/reed valve housing	M6	6 Nm (4.4 lbf ft)
Screw, kick starter intermediate gear pin	M6	10 Nm (7.4 lbf ft) Loctite®243™
Screw, outer clutch cover	M6	8 Nm (5.9 lbf ft)
Screw, shift drum locating	M6	10 Nm (7.4 lbf ft) Loctite®243™
Screw, shift lever	M6	14 Nm (10.3 lbf ft) Loctite®243™
Screw, starter motor	M6	10 Nm (7.4 lbf ft)
Screw, starter motor bearing bush	M6	10 Nm (7.4 lbf ft) Loctite®243™
Screw, starter motor protection cap	M6	8 Nm (5.9 lbf ft)
Screw, water pump cover	M6	10 Nm (7.4 lbf ft)
Vacuum connection, cylinder	M6	4 Nm (3 lbf ft) Loctite®2701™
Screw, balancer shaft	M8	30 Nm (22.1 lbf ft) Loctite®243™
Screw, cylinder head	M8	27 Nm (19.9 lbf ft)
Nut, cylinder base	M10	35 Nm (25.8 lbf ft)
Screw, drive chain engine sprocket	M10	60 Nm (44.3 lbf ft) Loctite®2701™
Stud, cylinder base	M10	12 Nm (8.9 lbf ft)
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) Loctite®243™
Nut, primary gear wheel	M18LHx1.5	150 Nm (110.6 lbf ft) Loctite®243™

26.4 Capacities

26.4.1 Gear oil

Gear oil	0.80 l (0.85 qt.)	Engine oil (15W/50) (📖 p. 370)
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26.4.2 Engine oil

2-stroke oil tank content approx.	0.6 l (0.6 qt.)	Engine oil, 2-stroke (📖 p. 370)
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26.4.3 Coolant

Coolant	1.2 l (1.3 qt.)	Coolant (📖 p. 370)
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26.4.4 Fuel

Total fuel tank capacity, approx.	9 l (2.4 US gal)	Super unleaded (ROZ 95) ( p. 371)
Fuel reserve, approx.	1.5 l (1.6 qt.)	

26.5 Chassis

Frame	Central tube frame made of chrome molybdenum steel tubing	
Fork	WPXPLOR OC	
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	WP XPLOR PDS	
Brake system	Disc brakes, floating brake calipers	
Brake discs - diameter		
front	260 mm (10.24 in)	
rear	220 mm (8.66 in)	
Brake discs - wear limit (All standard models)		
front	2.5 mm (0.098 in)	
rear	3.5 mm (0.138 in)	
Brake discs - wear limit (All special models)		
front	2.5 mm (0.098 in)	
rear	3.7 mm (0.146 in)	
Street tire pressure (EU/CN/ASEAN)		
front	2.0 bar (29 psi)	
rear	2.0 bar (29 psi)	
Offroad tire pressure		
front	1.0 bar (15 psi)	
rear	1.0 bar (15 psi)	
Secondary ratio (All 250 models)	14:52 (13:52)	
Secondary ratio (All 300 models)	14:50 (13:50)	
Chain	5/8 x 1/4"	
Rear sprockets available	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.	104 kg (229 lb.)	
Maximum permissible front axle load	145 kg (320 lb.)	
Maximum permissible rear axle load	190 kg (419 lb.)	
Maximum permissible overall weight	335 kg (739 lb.)	

26.6 Electrical system

12-V battery	HJTZ5S-FP-C	Lithium-ion battery Battery voltage: 12 V Nominal capacity: 2.0 Ah 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 35/35 W
Position light	W5W / socket W2.1x9.5d	12 V 5 W
Indicator lamps	W2.3W / socket W2x4.6d	12 V 2.3 W
Turn signal (EU/CN/ASEAN)	R10W / socket BA15s	12 V 10 W
Brake/tail light	LED	
License plate lamp (EU/CN/ASEAN)	LED	

26.7 Tires

Validity	Front tire	Rear tire
(All standard EXC models)	90/90 - 21 M/C 54R M+S TT MAXXIS Maxx Enduro	140/80 - 18 M/C 70R M+S TT MAXXIS Maxx Enduro
(All special models)	90/90 - 21 M/C 54M M+S TT Metzeler MCE 6 DAYS EXTREME	140/80 - 18 M/C 70M M+S TT Metzeler MCE 6 DAYS EXTREME
(US)	80/100 - 21 51M TT Dunlop GEOMAX AT 81 F	110/100 - 18 64M TT Dunlop GEOMAX AT 81
The tires specified represent one of the possible series production tires. Additional information is available in the Service section under: KTM.COM		

26.8 Fork

Fork article number	0797C162V401000
Fork	WPXPLOR OC
Compression damping	
Comfort	18 clicks
Standard	15 clicks
Sport	12 clicks
Rebound damping	
Comfort	18 clicks
Standard	15 clicks
Sport	12 clicks
Spring preload – preload adjuster	
Comfort	+0
Standard	+0

Sport	+3	
Spring length with preload spacer(s)	474 mm (18.66 in)	
Spring rate		
Weight of rider: 65 ... 75 kg (143 ... 165 lb.)	4.2 N/mm (24 lb/in)	
Weight of rider: 75 ... 85 kg (165 ... 187 lb.)	4.4 N/mm (25.1 lb/in)	
Weight of rider: 85 ... 95 kg (187 ... 209 lb.)	4.6 N/mm (26.3 lb/in)	
Fork length	928 mm (36.54 in)	
Fork oil per fork leg	636 ± 10 ml (21.5 ± 0.34 fl. oz.)	Fork oil (SAE 4) (48601166S1) (📖 p. 371)

26.9 Shock absorber

Shock absorber article number	0797C461V305000
Shock absorber	WP XPLOR PDS
Low-speed compression damping	
Comfort	18 clicks
Standard	15 clicks
Sport	12 clicks
High-speed compression damping	
Comfort	2.5 turns
Standard	2 turns
Sport	1 turn
Rebound damping	
Comfort	18 clicks
Standard	15 clicks
Sport	12 clicks
Spring preload	9 mm (0.35 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	37 mm (1.46 in)
Riding sag	110 mm (4.33 in)
Fitted length	415 mm (16.34 in)
Shock absorber fluid ( p. 371)	SAE 2.5

26.10 Chassis tightening torques

Remaining screws, chassis	EJOT PT® K60x25-Z	2 Nm (1.5 lbf ft)
Screw, intake air temperature sensor	EJOTDELTA PT® 45x12-Z	0.7 Nm (0.52 lbf ft)
Screw, oil fill level sensor	G 3/4 "	7 Nm (5.2 lbf ft)
Screw, oil pump holder on oil tank	EJOTDELTA PT 45x12-Z	0.7 Nm (0.52 lbf ft)
Screw, pressure regulator	EJOT PT® K60x25-Z	2.3 Nm (1.7 lbf ft)
Screw, emergency OFF switch (EU/CN/ASEAN)	M4	0.4 Nm (0.3 lbf ft)
Screw, fixed grip	M4	5 Nm (3.7 lbf ft) Loctite®243™
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, brake line guide for link fork	M5	5 Nm (3.7 lbf ft)
Screw, ground wire in tail section	M5	5 Nm (3.7 lbf ft)
Screw, light switch (EU/CN/ASEAN)	M5	1 Nm (0.7 lbf ft)
Screw, shock absorber adjusting ring	M5	5 Nm (3.7 lbf ft)
Screw, turn signal switch (EU/CN/ASEAN)	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) Loctite®243™
Screw, battery support bracket	M6	6 Nm (4.4 lbf ft)
Screw, brake lever	M6	5 Nm (3.7 lbf ft)
Screw, cable on starter relay	M6	6 Nm (4.4 lbf ft)
Screw, chain guide	M6	10 Nm (7.4 lbf ft)
Screw, chain sliding guard	M6	10 Nm (7.4 lbf ft) Loctite®243™
Screw, clutch lever	M6	5 Nm (3.7 lbf ft)
Screw, front brake disc	M6	14 Nm (10.3 lbf ft) Loctite®243™
Screw, manifold on silent block	M6	6 Nm (4.4 lbf ft)
Screw, rear brake disc	M6	14 Nm (10.3 lbf ft) Loctite®243™
Screw, seat fixing	M6	10 Nm (7.4 lbf ft)
Screw, seat fixing	M6	10 Nm (7.4 lbf ft)
Screw, silent block on frame	M6	6 Nm (4.4 lbf ft)
Screw, throttle grip	M6	5 Nm (3.7 lbf ft)
Fuel connection on fuel pump	M8	15 Nm (11.1 lbf ft)

Nut, foot brake lever	M8	20 Nm (14.8 lbf ft)
Nut, foot brake lever stop	M8	20 Nm (14.8 lbf ft)
Nut, pull switch (US)	M8	0.8 Nm (0.59 lbf ft)
Nut, rear sprocket screw	M8	35 Nm (25.8 lbf ft) Loctite®2701™
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 models)	M8	15 Nm (11.1 lbf ft)
Screw, bottom triple clamp (All special models)	M8	15 Nm (11.1 lbf ft)
Screw, chain sliding piece	M8	15 Nm (11.1 lbf ft)
Screw, engine brace	M8x15	25 Nm (18.4 lbf ft) Loctite®2701™
Screw, engine brace	M8x20	25 Nm (18.4 lbf ft) Loctite®243™
Screw, engine sprocket cover	M8	15 Nm (11.1 lbf ft)
Screw, fork stub	M8	15 Nm (11.1 lbf ft)
Screw, front brake caliper	M8	25 Nm (18.4 lbf ft) Loctite®243™
Screw, handlebar clamp	M8	20 Nm (14.8 lbf ft)
Screw, manifold	M8	15 Nm (11.1 lbf ft)
Screw, side stand attachment (EU/CN/ASEAN)	M8x20	33 Nm (24.3 lbf ft) Loctite®2701™
Screw, side stand attachment (US)	M8x26	33 Nm (24.3 lbf ft) Loctite®2701™
Screw, subframe bottom	M8	30 Nm (22.1 lbf ft) Loctite®2701™
Screw, subframe top	M8	35 Nm (25.8 lbf ft) Loctite®2701™
Screw, top steering stem (All stan- dard models)	M8	20 Nm (14.8 lbf ft)
Screw, top steering stem (All spe- cial models)	M8	17 Nm (12.5 lbf ft) Loctite®243™
Screw, top triple clamp (All stan- dard models)	M8	20 Nm (14.8 lbf ft)
Screw, top triple clamp (All special 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) Loctite®243™
Nut, fuel pump	M12	15 Nm (11.1 lbf ft)
Screw, bottom shock absorber	M12	80 Nm (59 lbf ft) Loctite®2701™
Screw, top shock absorber	M12	80 Nm (59 lbf ft) Loctite®2701™

Nut, fork 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 fitting, cooling system	M24x1.5	18 Nm (13.3 lbf ft)

Loctite®243™

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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

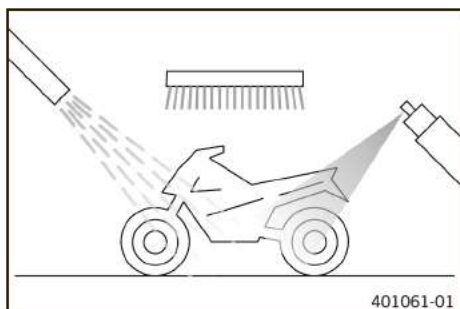
Environmental hazard Hazardous substances cause environmental damage.

- 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 exhaust system to keep water from entering.
- Remove the coarse dirt particles with a gentle water jet.
- Spray the heavily soiled parts with a normal commercial motorcycle cleaner and clean using a brush.

Motorcycle cleaner (📖 p. 373)



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 down, lubricate all moving parts and pivot points.
- Clean the chain. (📖 p. 131)

- Treat bare metal (except for brake discs and the exhaust system) with a corrosion inhibitor.

Preserving materials for paints, metal and rubber
( p. 373)

- 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. 373)

(EU/CN/ASEAN)

- Oil the steering lock.

Universal oil spray ( p. 373)



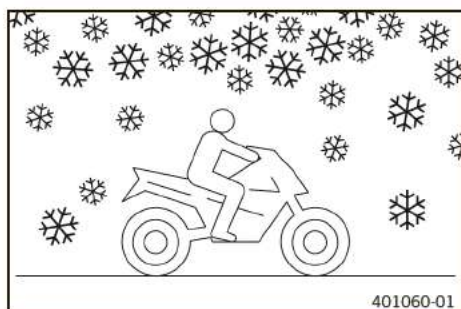
27.2 Checks and maintenance steps for winter operation



Info

If you use the motorcycle in winter, salt can be expected on the roads. You should therefore take precautions against aggressive road salt.

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. 318)
- Clean the brakes.



Info

After **EVERY** trip on salted roads, thoroughly clean the brake calipers and brake linings, after they have cooled down and without removing them, with cold water and dry them carefully.

After riding on salted roads, thoroughly clean the vehicle with cold water and dry it well.

- Treat engine, link fork, and all other bare or zinc-plated parts (except the brake discs) with a wax-based corrosion inhibitor.



Info

Corrosion inhibitor must not come in contact with the brake discs as this would greatly reduce the braking force.

- Clean the chain. ( p. 131)



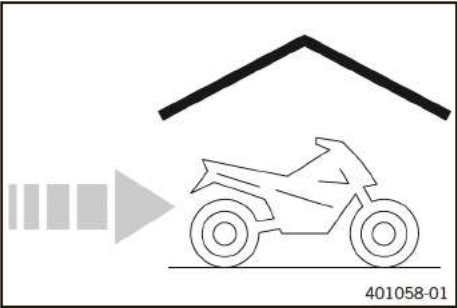
28.1 Storage



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.



- Clean the motorcycle. (📖 p. 318)
- Change the gear oil. (📖 p. 285)
- Check the antifreeze and coolant level. (📖 p. 274)
- When refueling for the last time before taking the motorcycle out of service, add fuel additive.

Fuel additive (📖 p. 372)

- Refuel.
- Add 2-stroke oil. (📖 p. 288)
- Check tire pressure. (📖 p. 118)
- Remove the 12-V battery. (📖 p. 142)
- Charge the 12-V 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.



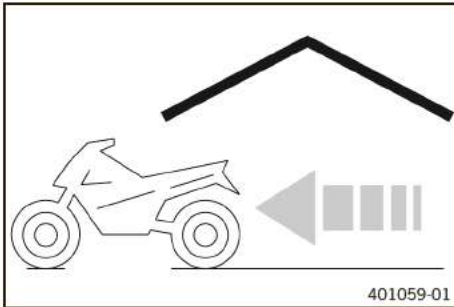
Info

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

- Remove the motorcycle from the lift stand. (📖 p. 12)
- Install the 12-V battery. (📖 p. 144)
- 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				
After 5 operating hours				
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 12-V battery.			●	●
Check the front brake linings. (📖 p. 150)			●	●
Check the brake linings of the rear brake. (📖 p. 157)			●	●
Check the brake discs. (📖 p. 120)			●	●
Check the brake lines for damage and leakage.			●	●
Check the rear brake fluid level. (📖 p. 161)			●	●
Check the free travel of the foot brake lever. (📖 p. 159)			●	●
Check the frame. (📖 p. 55)			●	●
Check the link fork. (📖 p. 83)			●	●
Check the fork bearing for play. (📖 p. 86)			●	●
Check the shock absorber heim joint for play. (📖 p. 83)			●	●
Check the tire condition. (📖 p. 118)	○		●	●
Check tire pressure. (📖 p. 118)	○		●	●
Check the wheel bearing for play. (📖 p. 119)			●	●
Check the wheel hubs.			●	●
Check the rim run-out. (📖 p. 120)	○		●	●
Check the spoke tension. (📖 p. 121)	○		●	●
Check the chain, rear sprocket, engine sprocket, and chain guide. (📖 p. 132)			●	●
Check the chain tension. (📖 p. 132)	○		●	●
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. 263)			●	●
Check the front brake fluid level. (📖 p. 153)			●	●
Check the free travel of the hand brake lever. (📖 p. 152)			●	●
Check the steering head bearing for play. (📖 p. 43)	○		●	●
Change the spark plug and spark plug connector. (📖 p. 303)			●	
Check the reed valve housing, reed valve, and intake flange. (📖 p. 225)			●	●
Change the gear oil. (📖 p. 285)		○	●	
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				
After 5 operating hours				
After 1 operating hour				
Check the antifreeze and coolant level. (📖 p. 274)	○		●	●
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. 99)			●	●
Change the glass fiber yarn filling of the main silencer. (📖 p. 96)			●	●
Service the fork. (📖 p. 19)				●
Perform the shock absorber service. (📖 p. 65)				●
Check the tightness of the easily accessible, safety-relevant screws and nuts.	○		●	●
Change the fuel screen. (📖 p. 105)	○		●	●
Check the fuel pressure. (📖 p. 112)			●	●
Check the headlight setting. (📖 p. 166)	○		●	●
Check the idle speed.			●	●
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 a service entry in KTM Dealer.net .	○	○	●	●

○ 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				
every 48 months				
every 12 months				
Every 80 operating hours				
Every 40 operating hours				
After 20 operating hours				
After 10 operating hours				
Change the front brake fluid. (📖 p. 155)			●	●
Change the rear brake fluid. (📖 p. 162)			●	●
Change the hydraulic clutch fluid. (📖 p. 264)			●	●
Lubricate the steering head bearing. (📖 p. 37)			●	●
Clean the pressure sensor hose. (📖 p. 173)			●	●
Service the fork. (📖 p. 19)	○			
Perform the shock absorber service. (📖 p. 65)		○		
Check the electric starter drive. (📖 p. 237)			●	●
Change the fuel filter. (📖 p. 106)			●	●
Change the piston and check the cylinder.			●	●
Change the oil pump; clean the oil screen. (📖 p. 290)			●	
Clean the oil screen in the oil tank. (📖 p. 295)		●		
Clean the protection cap of the pressure sensor. (📖 p. 173)		●	●	●

	Every 40 operating hours when used for motorsports				Every 10 operating hours when used for motorsports			
					every 48 months			
					every 12 months			
	Every 80 operating hours							
	Every 40 operating hours							
	After 20 operating hours							
	After 10 operating hours							
Change the coolant. (📖 p. 278)							•	
Perform minor engine service. (Check the exhaust control for functioning and smooth operation. Check the clutch.)			•	•			•	•
Perform major engine service including removing and installing the engine. (Change the connecting rod, conrod bearing, and crank pin. Clean the hose connections of the pressure sensor. Check the transmission and shift mechanism. Change all engine bearings.)				•				•

- One-time interval
- Periodic interval

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Components:

A11	EFI control unit
G10	12-V battery
K10	Starter relay with main fuse
M10	Electric starter system
S21	Start button

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Components:

A11	EFI control unit
F2	Fuse
F3	Fuse
G20	Alternator
K12	Light relay
K30	Power relay
K50	Radiator fan relay (if installed)
M14	Radiator fan (if installed)
T20	Voltage regulator

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Components:

E13	Low beam, high beam
P13	Combination instrument
P15	Horn
P35	Parking light
S22	Light switch, horn button, stop button

ktm-manuals.com



Components:

B76	Front brake light switch
B77	Rear brake light switch
P36	Brake/tail light

ktm-manuals.com



Components:

E60	License plate lamp
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

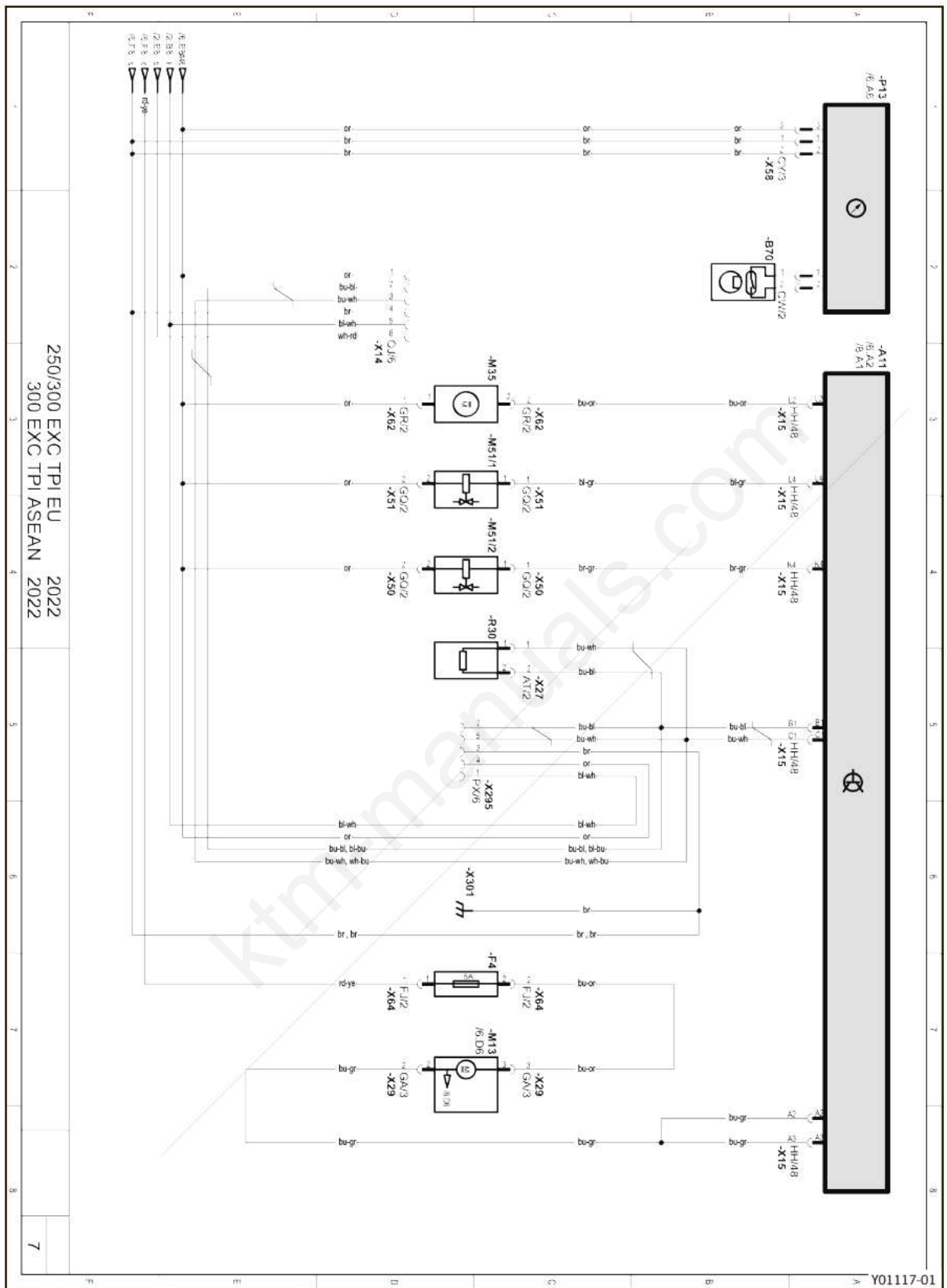
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Components:

A11	EFI control unit
B32	Fuel level sensor
B46	Oil level sensor
B51	Lambda sensor
F1	Fuse
M20	Fuel vapor valve
P13	Combination instrument
P27	Oil level warning lamp
R51/1	Ignition coil 1, cylinder 1

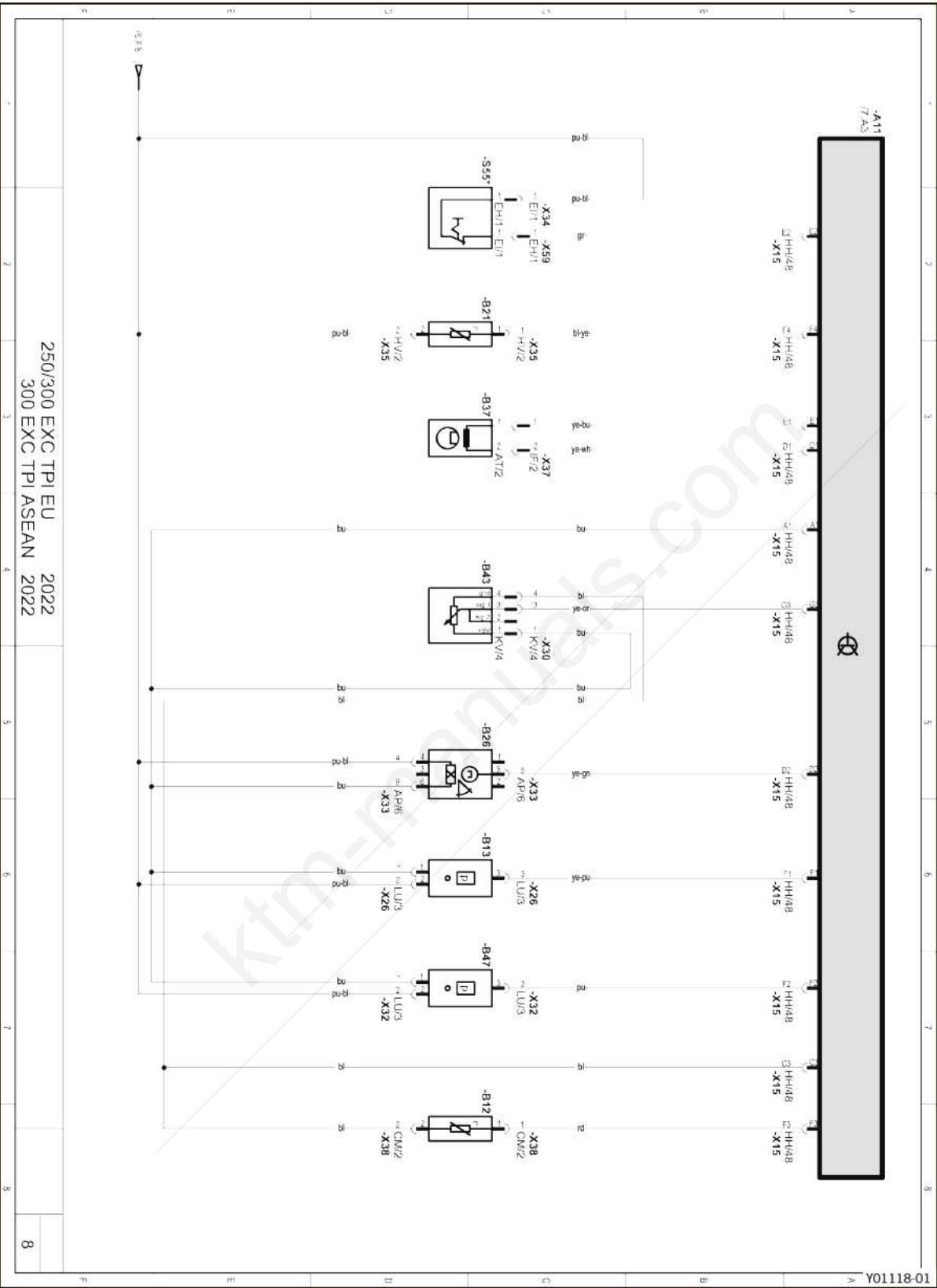
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Components:

A11	EFI control unit
B70	Front wheel speed sensor
F4	Fuse
M13	Fuel pump
M35	Oil pump
M51/1	Injection valve 0
M51/2	Injection valve 1
P13	Combination instrument
R30	CAN-bus terminating resistor 1
X295	Diagnostics connector

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Components:

A11	EFI control unit
B12	Intake air temperature sensor
B13	Ambient air pressure sensor
B21	Coolant temperature sensor
B26	Tilt sensor
B37	Crankshaft speed sensor
B43	Throttle valve position sensor
B47	Crankcase pressure sensor
S55	Riding mode button (if installed)

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	12-V battery
K10	Starter relay with main fuse
M10	Electric starter system
S21	Start button
S20	Stop button

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Components:

A11	EFI control unit
F2	Fuse
F3	Fuse
G20	Alternator
K12	Light relay
K30	Power relay
K50	Radiator fan relay (if installed)
M14	Radiator fan (if installed)
T20	Voltage regulator

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Components:

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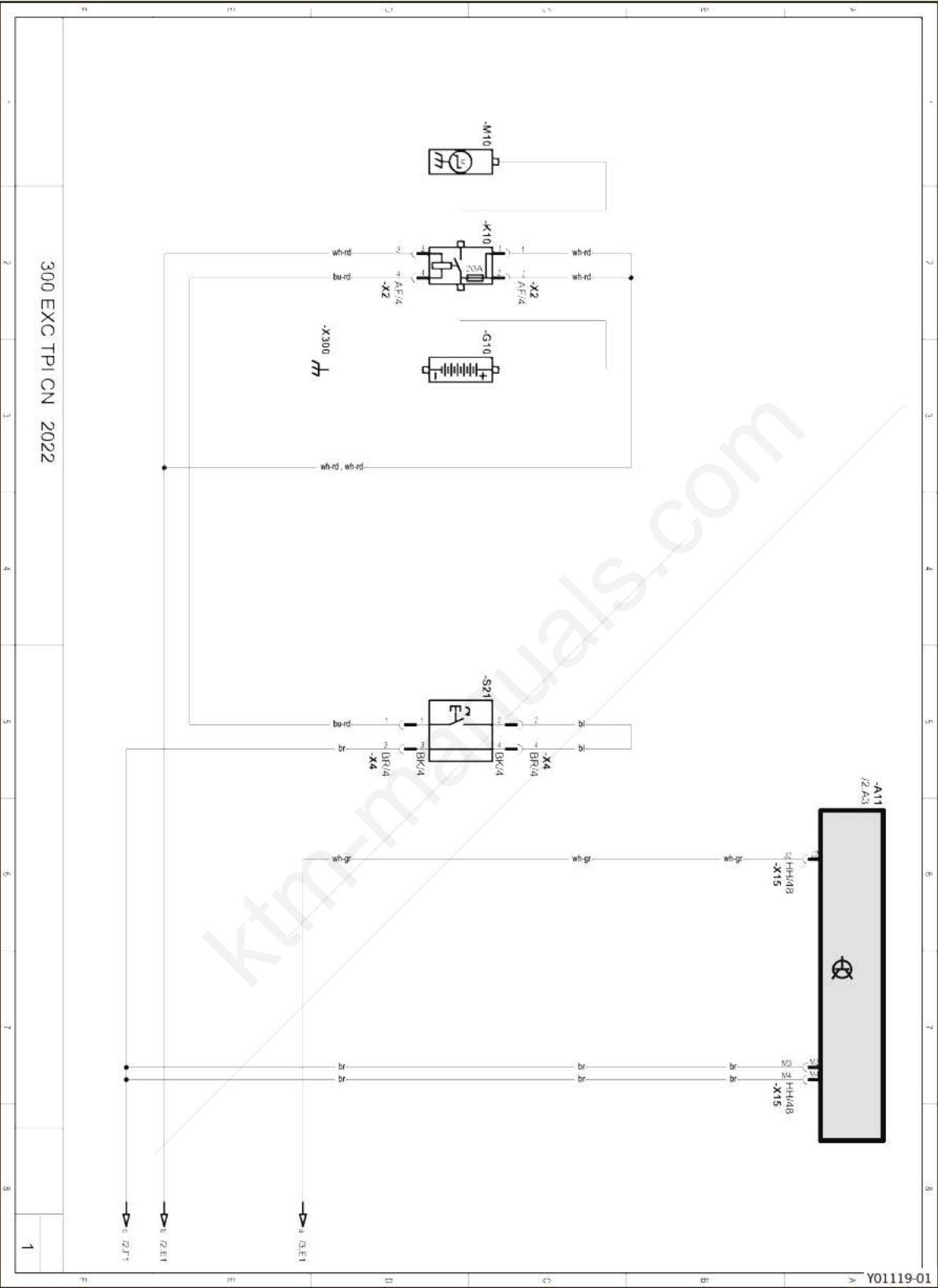
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Components:

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Components:

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Components:

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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. 393)
- SAE (📖 p. 393) (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. 393)

Guideline

- Only use high-grade 2-stroke engine oil from a reputable brand.

fully synthetic

Recommended supplier**MOTOREX®**

- Cross Power 2T

Fork oil (SAE 4) (48601166S1)**Standard/classification**

- SAE (📖 p. 393) (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. 393) (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)**Standard/classification**

- DIN EN 228 (ROZ 95)

Guideline

- Only use super unleaded fuel that matches or is equivalent to the specified standard.
- 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).

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

Silicone spray

Recommended supplier

MOTOREX®

- Silicone Spray

Special cleaner for glossy and matte paint finishes, metal and plastic surfaces

Recommended supplier

MOTOREX®

- Quick Cleaner

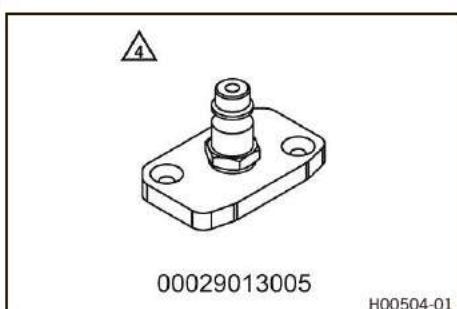
Universal oil spray

Recommended supplier

MOTOREX®

- Joker 440 Synthetic

Bleeder cover



Art. no.: 00029013005

Bleeder cover



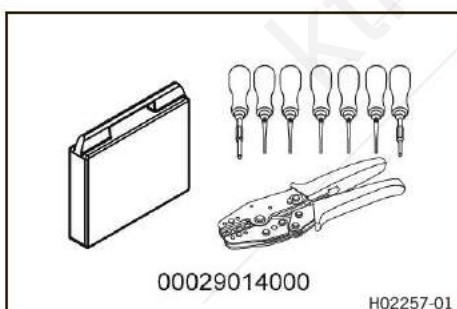
Art. no.: 00029013006

Bleeding device

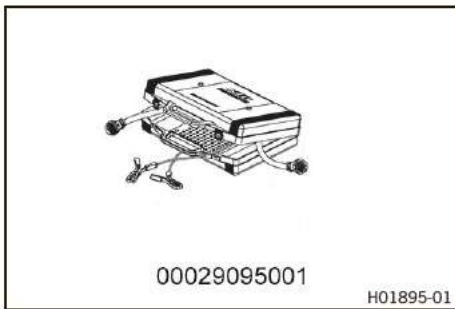


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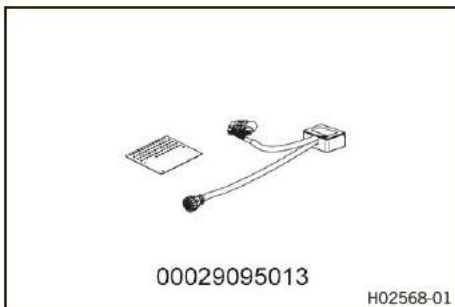
Cable connector unlocking kit



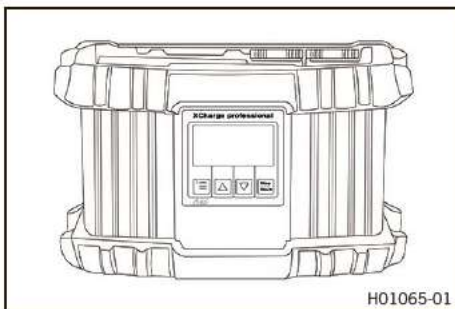
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Break out box

Art. no.: 00029095001

Adapter and template M3C

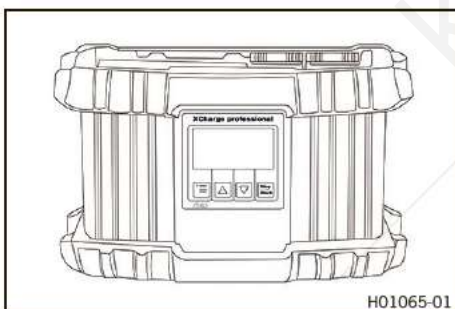
Art. no.: 00029095013

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)

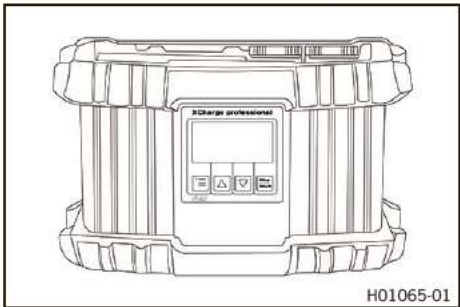
US battery charger XCharge-professional

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

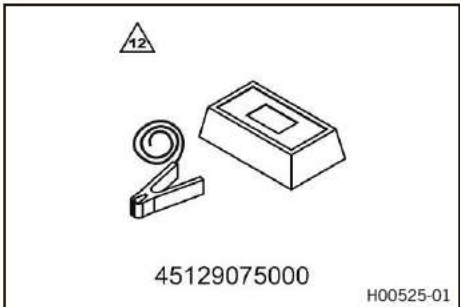


Art. no.: 00029095052

Feature

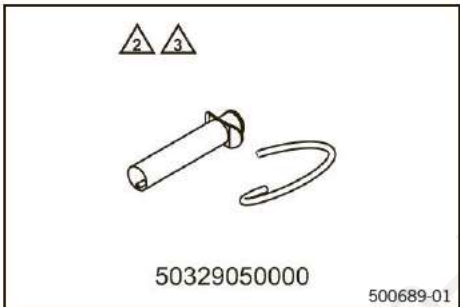
UK safety plug	
Nominal voltage	230 V
Mains fuse	16 A
Power cable length approx.	5 m (16 ft)
Charger cable length approx.	5 m (16 ft)

Tachometer



Art. no.: 45129075000

Syringe



Art. no.: 50329050000

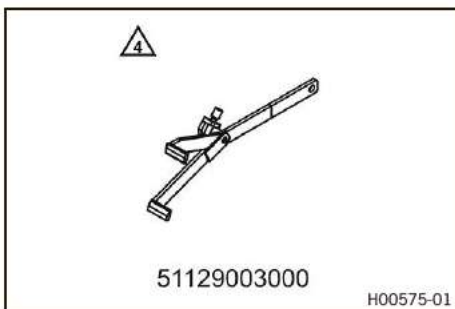
Pressing tool



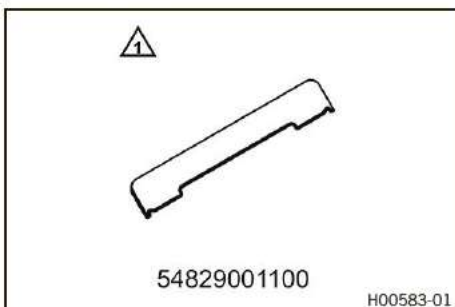
Art. no.: 50429005000

Holding wrench

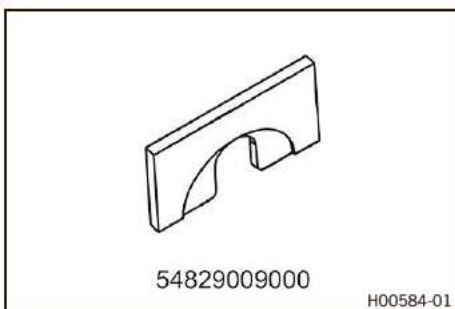
Art. no.: 51129003000

**Setting gauge**

Art. no.: 54829001100

**Separator plate**

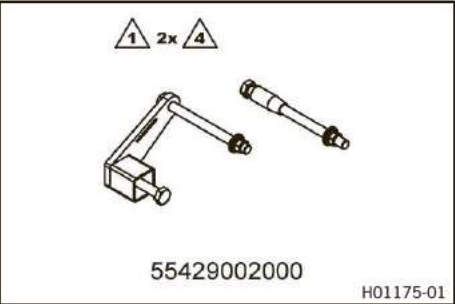
Art. no.: 54829009000

**Insert for crankshaft pressing tool**

Art. no.: 54829108000



Holder and fitting for work stand



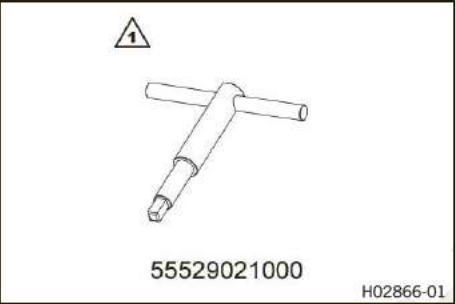
Art. no.: 55429002000

Holding wrench



Art. no.: 55429012000

Socket wrench

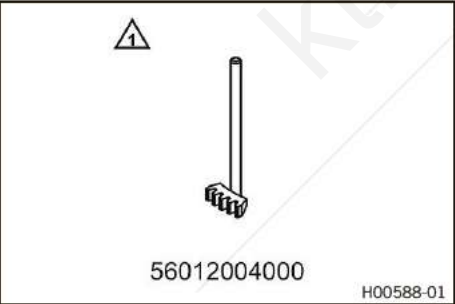


Art. no.: 55529021000

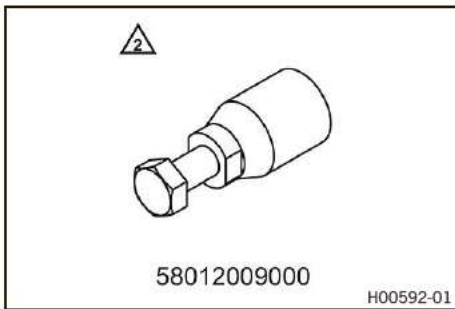
Feature

Square	5 mm (0.2 in)
--------	---------------

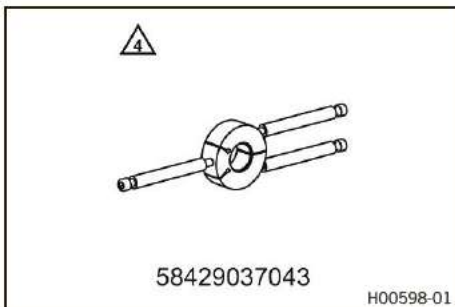
Gear segment



Art. no.: 56012004000

Puller

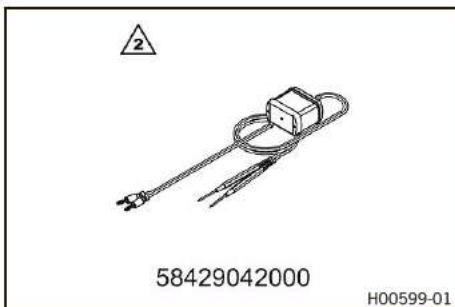
Art. no.: 58012009000

Puller

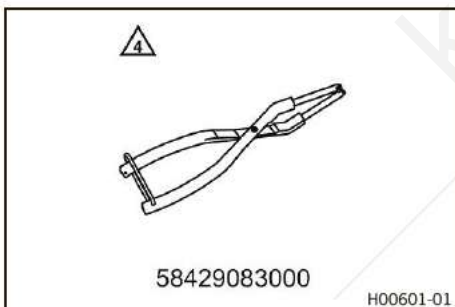
Art. no.: 58429037043

Feature

Inside diameter	43.9 mm (1.728 in)
-----------------	--------------------

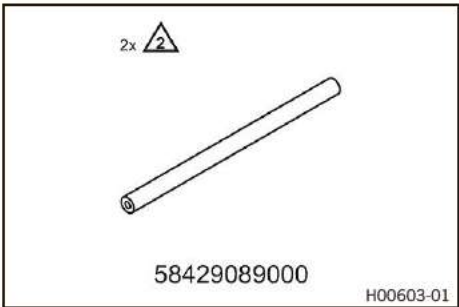
Peak voltage adapter

Art. no.: 58429042000

Footrest spring plier

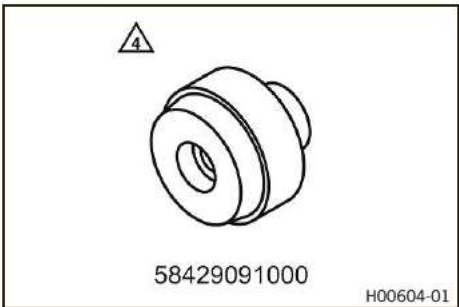
Art. no.: 58429083000

Tool bracket



Art. no.: 58429089000

Pressing tool



Art. no.: 58429091000

Pressing tool



Art. no.: 58429092000

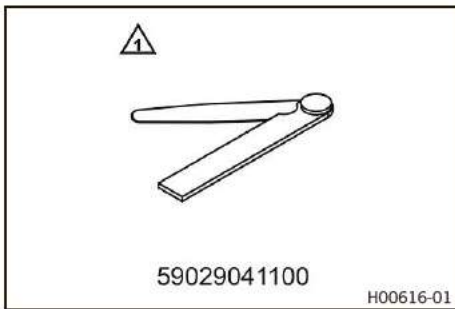
Torque wrench kit



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	6.0 mm (0.236 in)
Open ended bit	6.8 mm (0.268 in)
Bit diameter	5.9 mm (0.232 in)

Feeler gauge

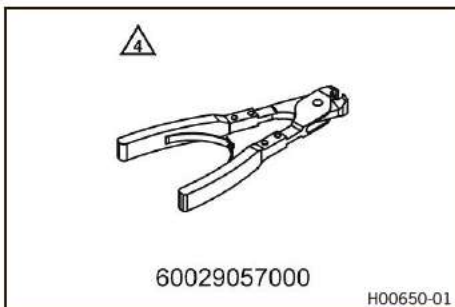
Art. no.: 59029041100

Feature

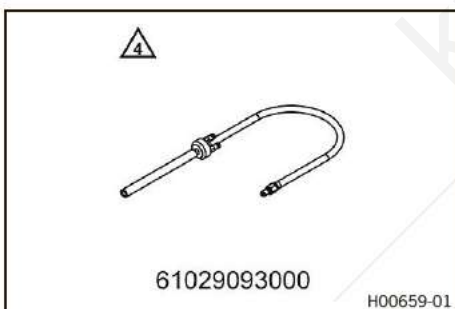
5 piece	0.10 ... 0.25 mm (0.0039 ... 0.0098 in)
---------	---

Pressing tool

Art. no.: 60029046128

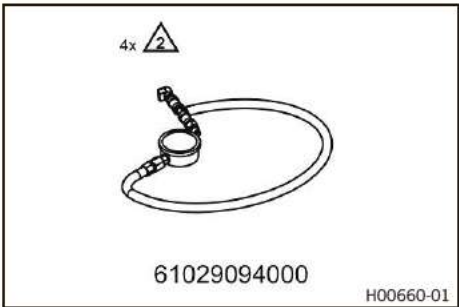
Hose clamp pliers

Art. no.: 60029057000

Testing hose

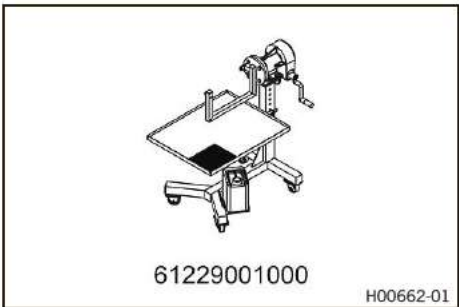
Art. no.: 61029093000

Pressure testing tool



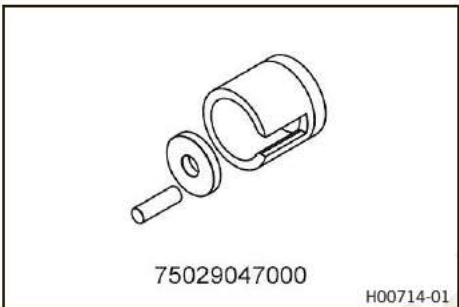
Art. no.: 61029094000

Engine work stand



Art. no.: 61229001000

Crankshaft pressing tool



Art. no.: 75029047000

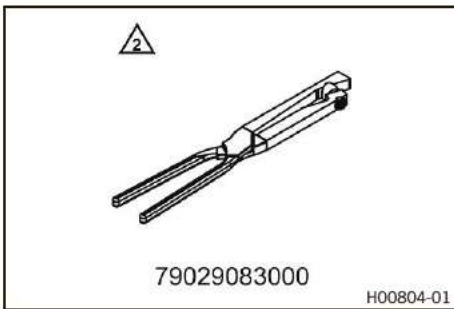
Lift stand



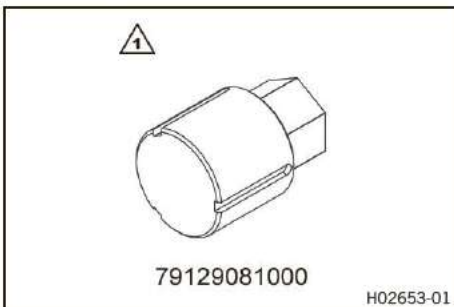
Art. no.: 78129955100

Feature

Height	315 ... 425 mm (12.4 ... 16.73 in)
Load	≤ 150 kg (≤ 331 lb.)

Footrest spring plier

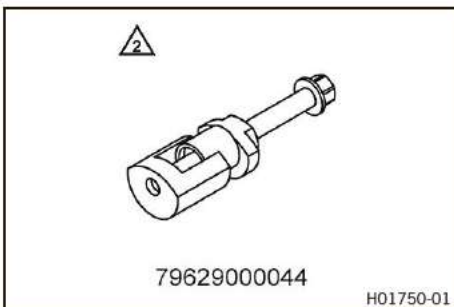
Art. no.: 79029083000

Mounting tool

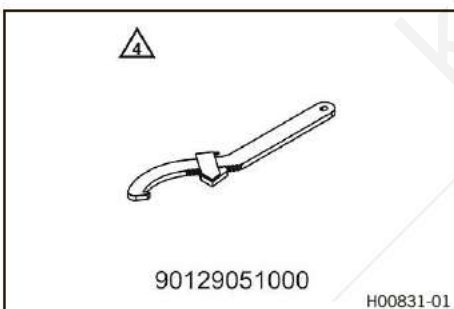
Art. no.: 79129081000

Feature

Hexagonal driver	13 mm (0.51 in)
------------------	-----------------

Pressing tool

Art. no.: 79629000044

Hook wrench

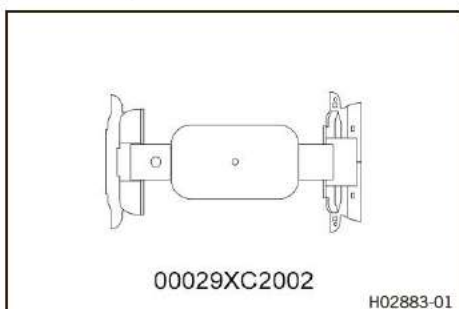
Art. no.: 90129051000

Diagnostics tablet



Art. no.: 00029XC2001

Hand strap



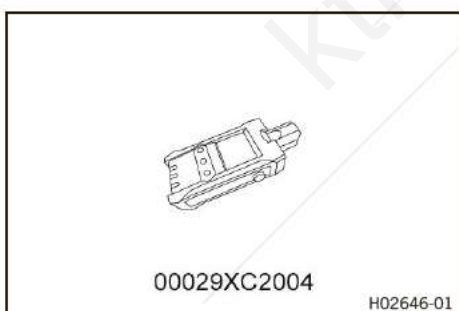
Art. no.: 00029XC2002

Battery charger



Art. no.: 00029XC2003

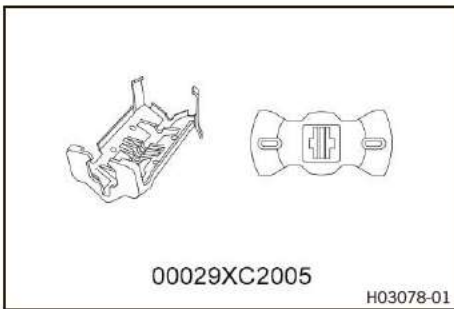
VCI



Art. no.: 00029XC2004

VCI attachment

Art. no.: 00029XC2005

**Protective film**

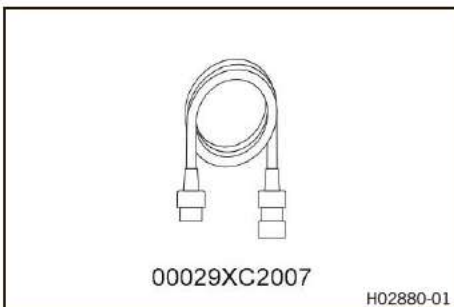
Art. no.: 00029XC2006

**Diagnostics cable extension**

Art. no.: 00029XC2007

Feature

Length approx.	1.15 m (3.77 ft)
----------------	------------------

**USB cable**

Art. no.: 00029XC2008

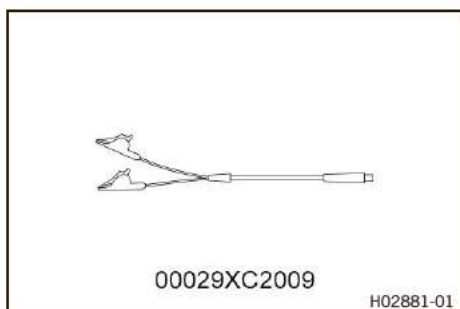
Feature

Length approx.	5 m (16 ft)
----------------	-------------



12-V power supply cable

Art. no.: 00029XC2009



RideRecorder trigger

Art. no.: 00029XC2010



Case

Art. no.: 00029XC2011



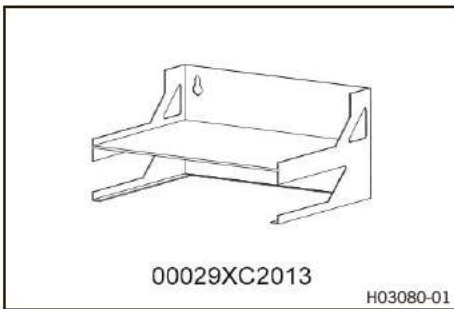
Docking station

Art. no.: 00029XC2012

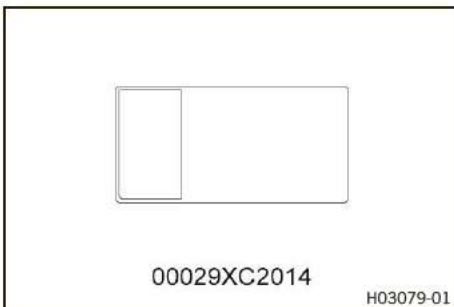


Wall attachment

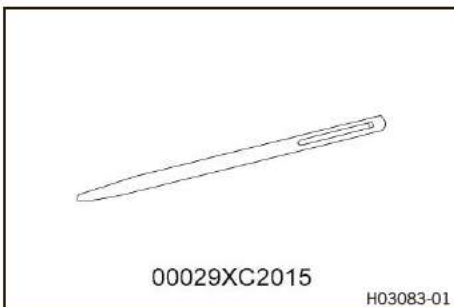
Art. no.: 00029XC2013

**Battery**

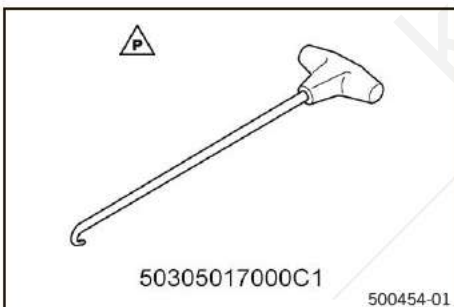
Art. no.: 00029XC2014

**Input stylus**

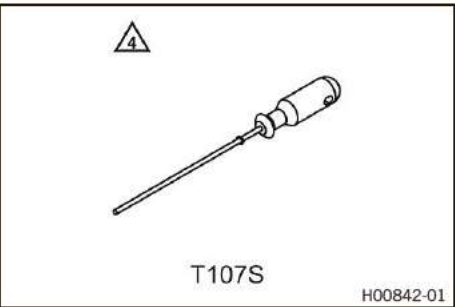
Art. no.: 00029XC2015

**Spring hook**

Art. no.: 50305017000C1

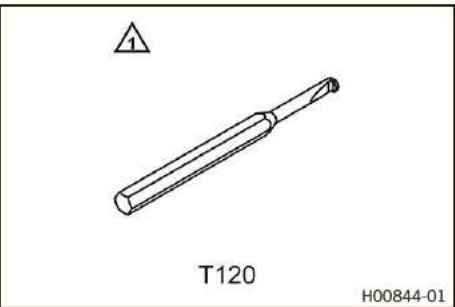


Depth micrometer



Art. no.: T107S

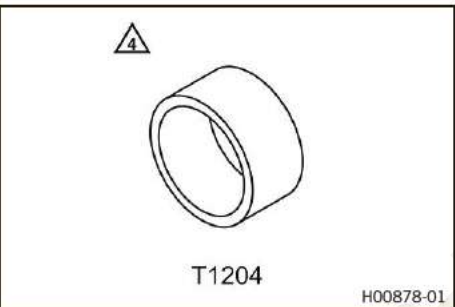
Drift



Art. no.: T120

Feature	
Diameter	8 mm (0.31 in)

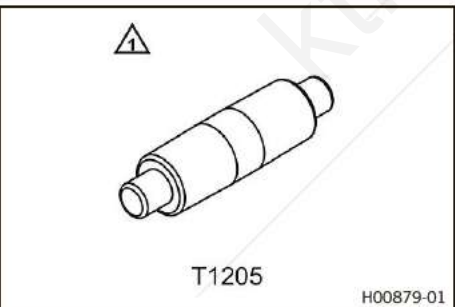
Mounting sleeve



Art. no.: T1204

Feature	
Diameter	25.5 ... 30.5 mm (1.004 ... 1.201 in)

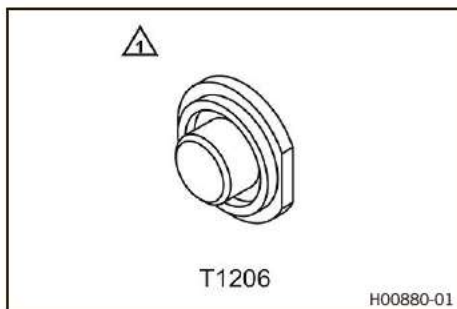
Calibrating unit



Art. no.: T1205

Feature	
Diameter	18 mm (0.71 in)

Pressing tool

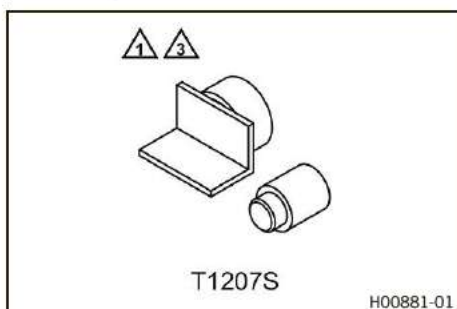


Art. no.: T1206

Feature

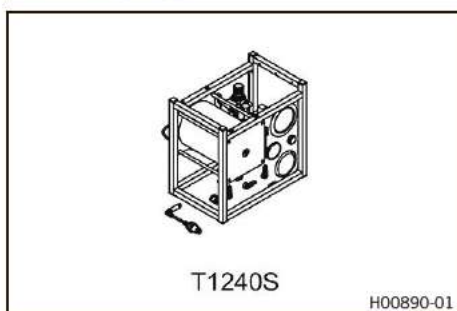
Diameter	15 ... 30 mm (0.59 ... 1.18 in)
----------	---------------------------------

Pressing tool



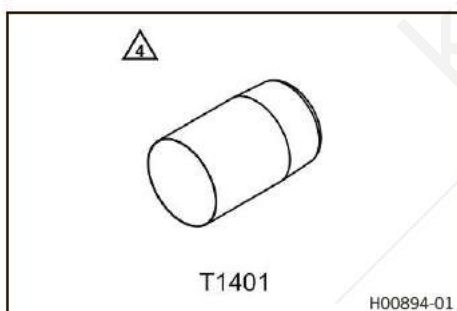
Art. no.: T1207S

Vacuum pump



Art. no.: T1240S

Protecting sleeve

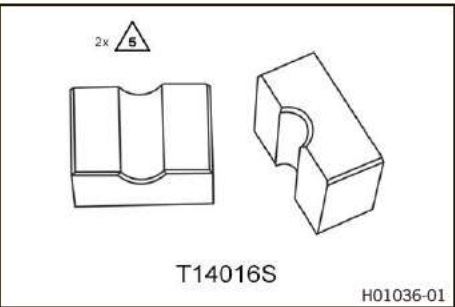


Art. no.: T1401

Feature

Diameter	48 mm (1.89 in)
----------	-----------------

Clamping stand

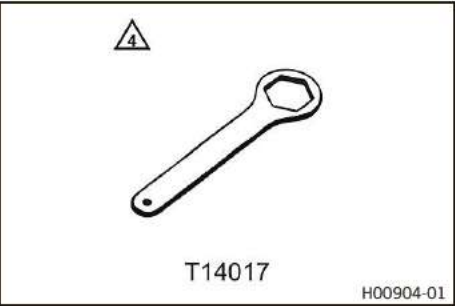


Art. no.: T14016S

Feature

Diameter	12 mm (0.47 in)
----------	-----------------

Ring wrench

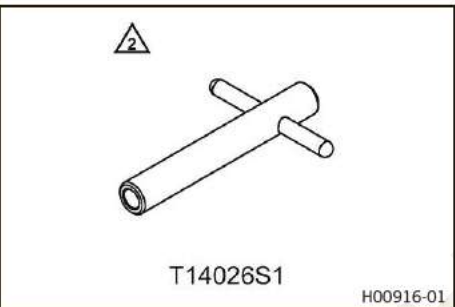


Art. no.: T14017

Feature

Hexagonal part	50 mm (1.97 in)
----------------	-----------------

Support tool

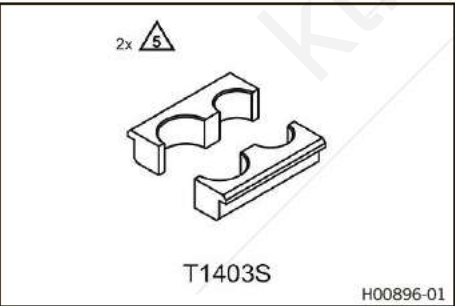


Art. no.: T14026S1

Feature

M12	
Diameter	17 mm (0.67 in)

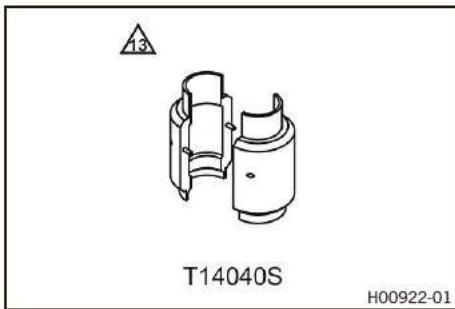
Clamping stand



Art. no.: T1403S

Feature

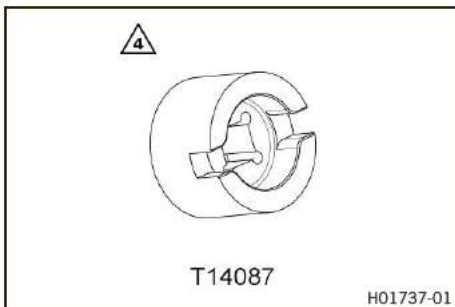
Diameter	48 mm (1.89 in)
Diameter	60 mm (2.36 in)

Mounting tool

Art. no.: T14040S

Feature

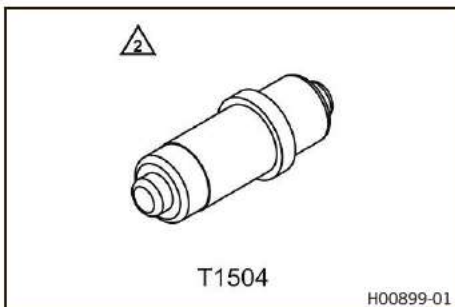
Diameter	48 mm (1.89 in)
----------	-----------------

Special socket

Art. no.: T14087

Feature

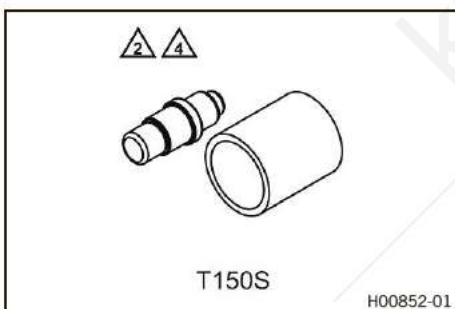
Drive	1/2 in
External diameter	44 mm (1.73 in)
Internal diameter	29.5 mm (1.161 in)

Pressing tool

Art. no.: T1504

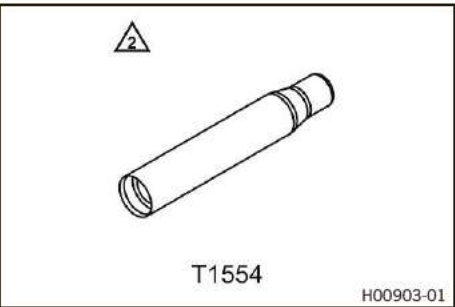
Feature

Diameter	18 mm (0.71 in)
----------	-----------------

Mounting tool

Art. no.: T150S

Mounting sleeve

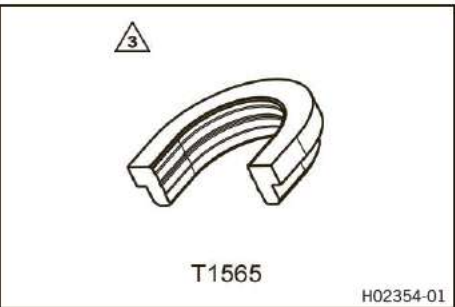


Art. no.: T1554

Feature

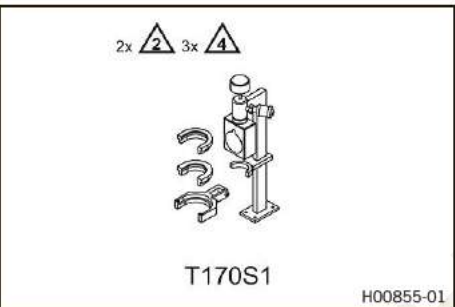
Diameter	18 mm (0.71 in)
----------	-----------------

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.

ktm-manuals.com

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 suspension components that enables the 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

ktm-manuals.com

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