

125 SX
150 SX

Art. no. 3206354en



KTM

Read this repair manual carefully and thoroughly before beginning work.

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

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

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KTM Sportmotorcycle GmbH
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5230 Mattighofen, Austria

This document is valid for the following models:

125 SX EU (F6101S0)

125 SX US (F6175S0)

150 SX EU (F6101S1)

150 SX US (F6175S1)



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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

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

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

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

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

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

3.1 Manufacturer and implied warranty

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

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

3.2 Fuel, auxiliary substances



Note

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

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

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

3.3 Spare parts, accessories

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

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

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

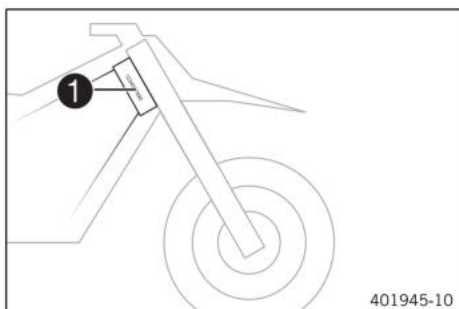
3.4 Figures

The figures contained in the manual may depict special equipment.

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

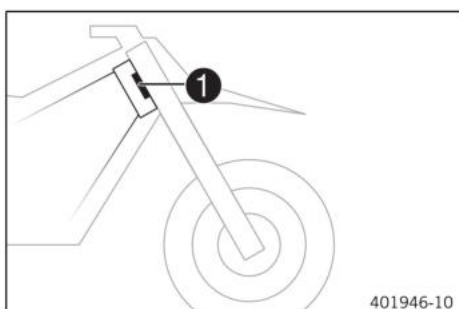
4 SERIAL NUMBERS

4.1 Vehicle identification number



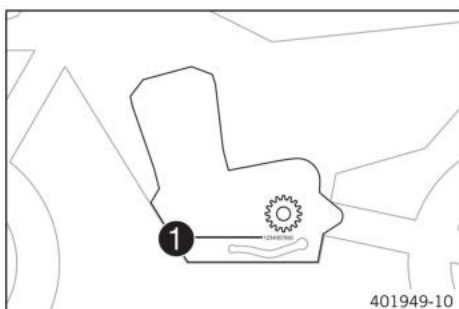
The vehicle identification number ❶ is stamped on the right side of the steering head.

4.2 Type label



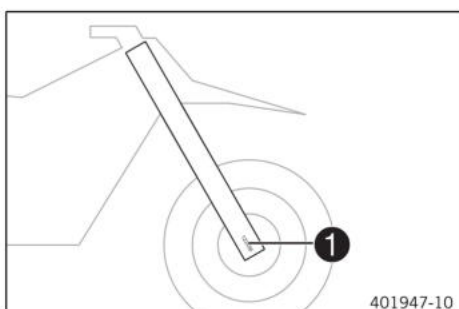
The type label ❶ is fixed to the front of the steering head.

4.3 Engine number



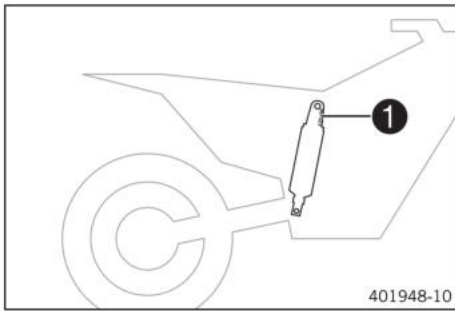
The engine number ❶ is stamped on the left side of the engine under the engine sprocket.

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



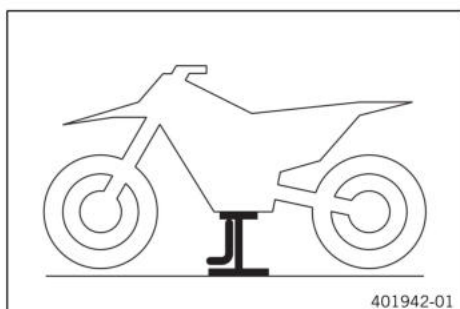
Shock absorber article number **1** is stamped on the top of the shock absorber above the adjusting ring towards the engine side.

5.1 Raising the motorcycle with a lift stand

Note

Material damage The vehicle may be damaged by incorrect procedure when parking. Significant damage may be caused if the vehicle rolls away or falls over. The components for parking the vehicle are designed only for the weight of the vehicle.

- Park the vehicle on a firm and level surface.
- Ensure that nobody sits on the vehicle when the vehicle is parked on a stand.



- Raise the motorcycle at the frame underneath the engine.

Lift stand (78129955100) (p. 296)

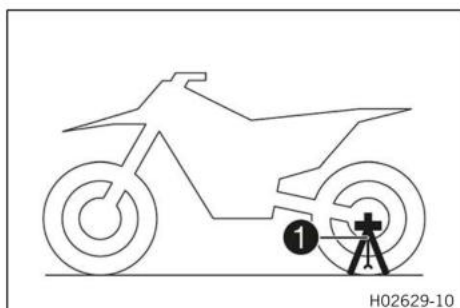
- ✓ Neither wheel is in contact with the ground.
- Secure the motorcycle against falling over.

5.2 Removing the motorcycle from the lift stand

Note

Material damage The vehicle may be damaged by incorrect procedure when parking. Significant damage may be caused if the vehicle rolls away or falls over. The components for parking the vehicle are designed only for the weight of the vehicle.

- Park the vehicle on a firm and level surface.
- Ensure that nobody sits on the vehicle when the vehicle is parked on a stand.



- Remove the motorcycle from the lift stand.
- Remove the lift stand.
- To park the motorcycle, insert plug-in stand ① into the left side of the wheel spindle.



Info

Remove the plug-in stand before riding.

5.3 Starting



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.

**Info**

If the motorcycle is unwilling to start, the cause can be old fuel in the float chamber. The flammable elements of the fuel evaporate after a long time of standing.
If the float chamber is filled with fresh fuel, the engine starts immediately.

The motorcycle has been out of use for more than 1 week

- Empty the carburetor float chamber. (📖 p. 221)
- Turn tap handle of the fuel tap to the **ON** position.
 - ✓ Fuel can flow from the fuel tank to the carburetor.
- Remove the plug-in stand.
- Shift the transmission to neutral position.

Condition

The engine is cold

- Pull the choke lever out as far as possible.
- Press the kick starter lever robustly through its full range.

**Info**

Do not open the throttle.



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 kick starter lever robustly through its full range.

**Info**

Do not open the throttle.



6.1 Air suspension AER 48



Air suspension **WP Suspension AER 48** is used in the fork. In this system, suspension is located in the left fork leg and damping in the right fork leg.

As fork springs are no longer required, a significant weight advantage is achieved when compared to conventional forks. The response on slightly uneven surfaces is significantly improved. In normal driving mode, suspension is provided exclusively by an air cushion. A steel spring is located in the left fork leg as an end stop.

i Info

If the fork is frequently overloaded, then the air pressure in the fork must be increased to avoid damage to the fork and frame.

The air pressure in the fork can be quickly adjusted to the rider's weight, surface conditions and the rider's preference using a fork airpump. The fork does not have to be dismantled. The time consuming mounting of harder or softer fork springs is not required. If the air chamber loses air due to a damaged seal, the fork will still not sag. In this case the air is retained in the fork. The suspension travel is maintained as far as possible. The damping becomes harder and the riding comfort reduces.

As with a conventional fork, the damping can be adjusted in rebound and compression stages.

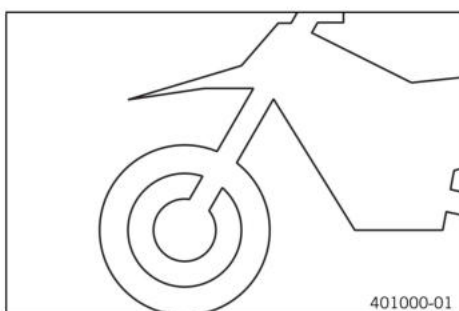
The rebound adjuster is located at the lower end of the right fork leg.

The compression adjuster is located at the upper end of the right fork leg.

6.2 Checking the basic setting of the fork

i Info

For various reasons, no exact riding sag can be determined for the fork.



- Smaller differences in the rider's weight can be compensated for by the fork air pressure.
- However, if the fork frequently bottoms out (hard end stop on compression), the fork air pressure must be increased, within the specified values, to avoid damage to the fork and frame.
- If the fork feels unusually hard after extended periods of operation, the fork legs need to be bled.

6.3 Adjusting the fork air pressure



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.

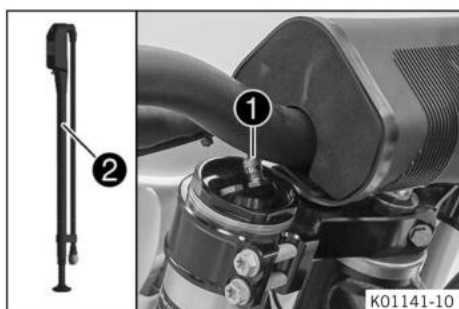
- Only make adjustments within the recommended range.
- Ride slowly to start with after making adjustments to get the feel of the new handling characteristic.



Info

Check or adjust the air pressure under the same conditions at the earliest 5 minutes after switching off the engine.

The air suspension is located in the left fork leg. The pressure and rebound damping is located in the right fork leg.



Preparatory work

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

Main work

- Remove protection cap ①.
- Push together fork airpump ② fully.

Fork airpump (79412966000) (p. 297)



Info

The fork airpump is included as part of the motorcycle's accessory pack.

- Connect the fork airpump to the left fork leg.
 - ✓ The fork airpump indicator switches on automatically.
 - ✓ A little air escapes from the fork leg when connecting.



Info

This is due to the volume of the hose and not due to a defect in the fork airpump or the fork.
Read the accompanying **KTM PowerParts** instructions.

- Adjust the air pressure as specified.

Guideline

Air pressure (All EU models)	8.3 bar (120 psi)
Air pressure (All US models)	8.4 bar (122 psi)
Changing the air pressure in steps of	0.2 bar (3 psi)
Minimum air pressure	7 bar (102 psi)
Maximum air pressure	12 bar (174 psi)



Info

Never adjust the air pressure to a value outside the stated range.

- Disconnect the fork airpump from the left fork leg.

- ✓ When disconnecting, excess pressure will escape from the hose – the fork leg itself does not lose any air.
- ✓ The fork airpump indicator switches off automatically after 80 seconds.
- Mount the protection cap.



Info

Only mount the protection cap by hand.

Finishing work

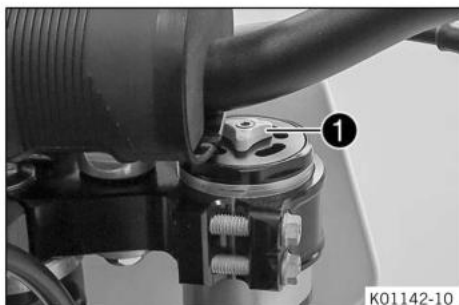
- Remove the motorcycle from the lift stand. (📖 p. 12)

6.4 Adjusting the compression damping of the fork



Info

The hydraulic compression damping determines the fork suspension behavior.



- Turn adjusting screw ① clockwise all the way.



Info

Adjusting screw ① is located at the upper end of the right fork leg.

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

Guideline

Compression damping (All EU models)	
Comfort	17 clicks
Standard	12 clicks
Sport	7 clicks
Compression damping (All US models)	
Comfort	17 clicks
Standard	12 clicks
Sport	7 clicks



Info

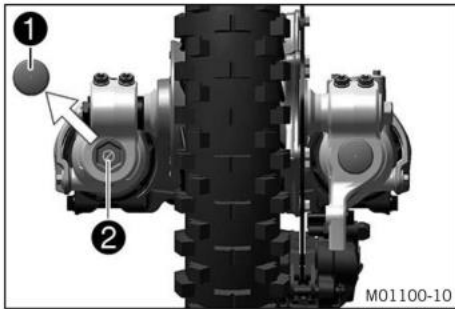
Turn clockwise to increase damping; turn counterclockwise to reduce damping.

6.5 Adjusting the rebound damping of the fork



Info

The hydraulic rebound damping determines the fork suspension behavior.



- Remove protection cap ①.
- Turn adjusting screw ② clockwise all the way.



Info

Adjusting screw ② is located at the lower end of the right fork leg.

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

Guideline

Rebound damping (All EU models)	
Comfort	17 clicks
Standard	12 clicks
Sport	7 clicks
Rebound damping (All US models)	
Comfort	17 clicks
Standard	12 clicks
Sport	7 clicks



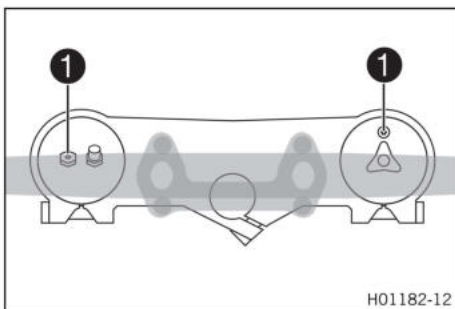
Info

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

- Mount protection cap ①.



6.6 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)



6.7 Cleaning the dust boots of the fork legs



Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 12)
- Remove the fork protector. (📖 p. 20)

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.

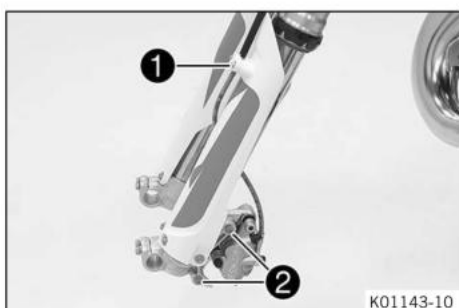
Universal oil spray (📖 p. 289)

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

Finishing work

- Install the fork protector. (📖 p. 20)
- Remove the motorcycle from the lift stand. (📖 p. 12)

6.8 Removing the fork legs



Preparatory work

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

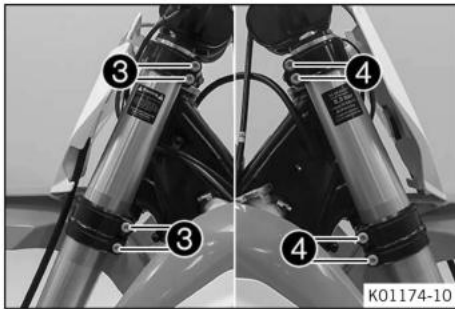
Main work

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



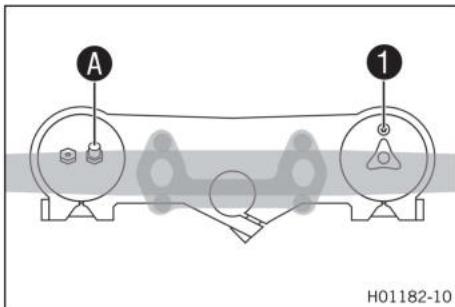
Info

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



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

6.9 Installing the fork legs

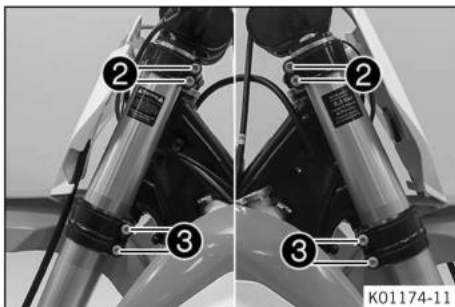


Main work

- Position the fork legs.
- ✓ Air bleeder screw 1 of the right fork leg is positioned to the front.
- ✓ Valve A of the left fork leg faces the front.

Info

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. The air suspension is located in the left fork leg. The pressure and rebound damping is located in the right fork leg.



- Tighten screws 2.

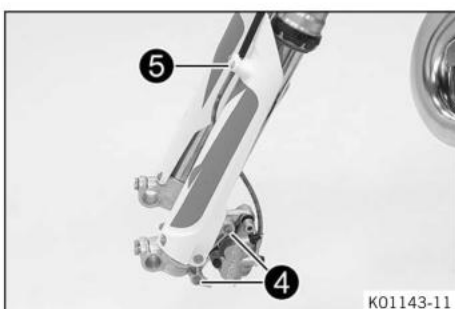
Guideline

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

- Tighten screws 3.

Guideline

Screw, bottom triple clamp	M8	12 Nm (8.9 lbf ft)
----------------------------	----	--------------------



- Position the brake caliper. Mount and tighten screws 4.

Guideline

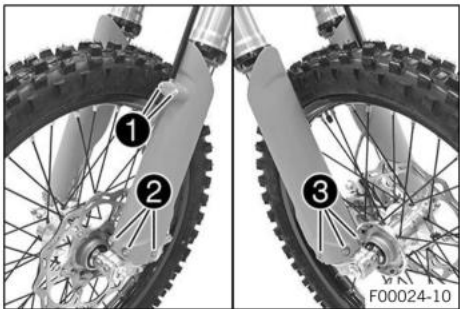
Screw, front brake caliper	M8	25 Nm (18.4 lbf ft) Loctite®243™
----------------------------	----	--

- Position the brake line and the clamp. Mount and tighten screws 5.

Finishing work

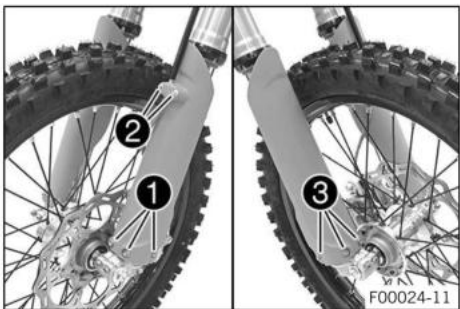
- Install the front wheel. (p. 117)

6.10 Removing the fork protector



- Remove screws ❶. Remove the clamp.
- Remove screws ❷. Take off the left fork protector.
- Remove screws ❸. Take off the right fork protector.

6.11 Installing the fork protector



- Position the fork protection on the left fork leg. Mount and tighten screws ❶.

Guideline

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

- Position the brake line and clamp. Mount and tighten screws ❷.
- Position the fork protector on the right fork leg. Mount and tighten screws ❸.

Guideline

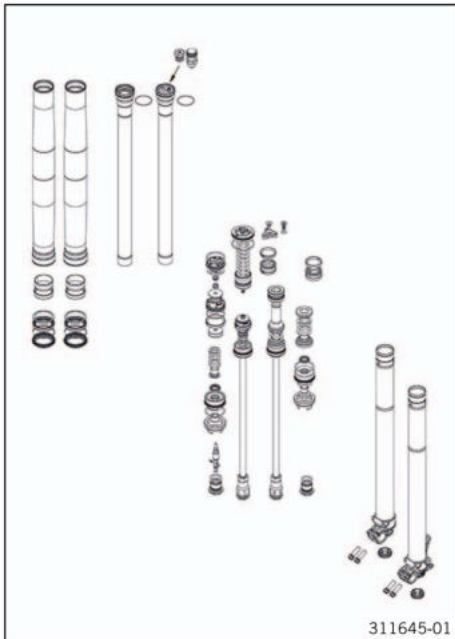
Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
---------------------------	----	--------------------

6.12 Servicing the fork



Caution
Danger of accidents Disassembling pressurized parts can cause injuries.
- The fork is filled with compressed air. Please follow the description provided.

Condition
The fork legs have been removed.



- Disassemble the fork legs. (p. 21)
- Disassemble the air cartridge. (p. 25)
- Disassemble the shock absorber cartridge. (p. 27)
- Check the fork legs. (p. 28)
- Assemble the shock absorber cartridge. (p. 30)
- Assemble the air cartridge. (p. 32)
- Assemble the fork legs. (p. 35)

6.13 Disassembling the fork legs



Caution

- Danger of accidents** Disassembling pressurized parts can cause injuries.
- The fork is filled with compressed air. Please follow the description provided.

Condition

The fork legs have been removed.

Left fork leg

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

Clamping stand (T1403S) (p. 300)

- Release cartridge ① using special tool ②.

Ring wrench (T14017) (p. 300)



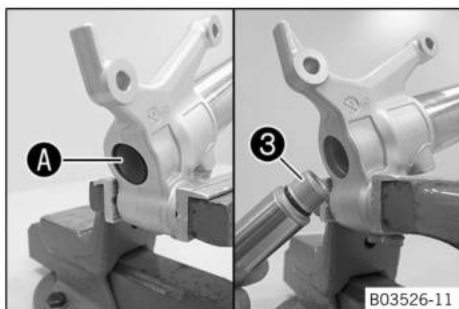
Info

The cartridge cannot be taken off yet.



- Unclamp the fork leg.
- Drain the fork oil.

6 FORK, TRIPLE CLAMP



- Clamp the fork leg with the axle clamp.

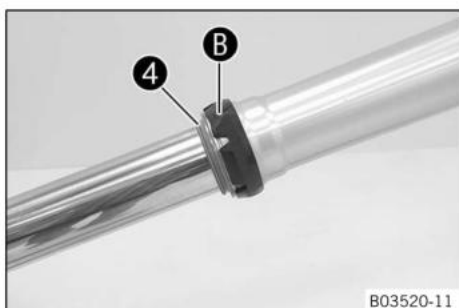
Guideline

Use soft jaws.

- Remove protection cap (A).
- Remove screw (3).



- Remove the cartridge.

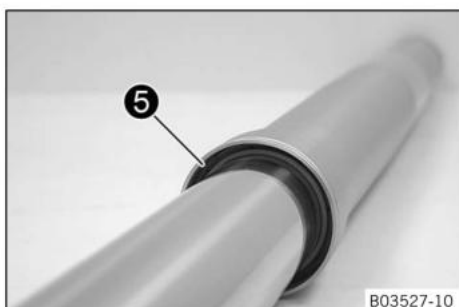


- Remove dust boot (4).
- Remove fork protector ring (B).



Info

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

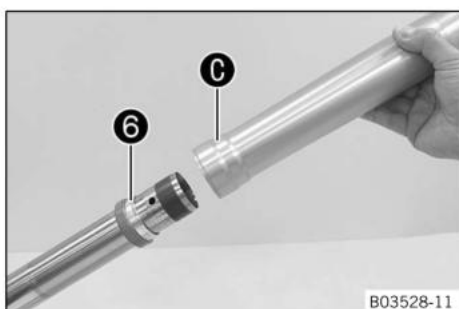


- Remove lock ring (5).



Info

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



- Warm up the outside fork tube in area (C) of the lower slide bearing.

Guideline

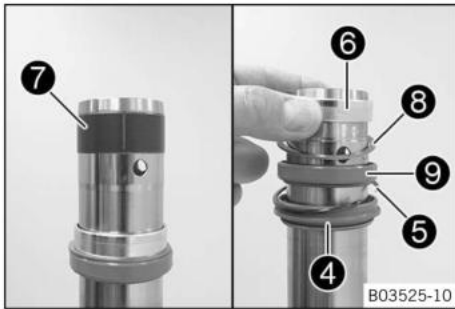
50 °C (122 °F)

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



Info

Lower slide bearing (6) must be drawn out of its bearing seat.



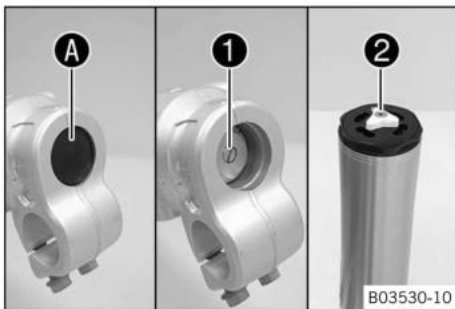
- Remove upper slide bearing 7.



Info

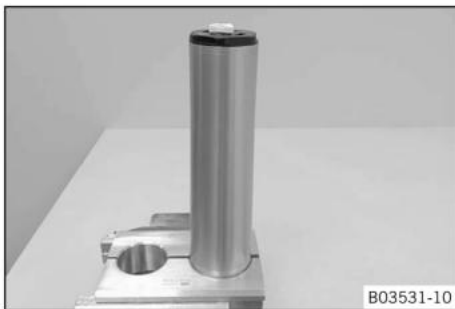
Without using a tool, pull the stack slightly apart by hand.

- Take off lower slide bearing 6.
- Take off support ring 8.
- Take off seal ring 9.
- Take off lock ring 5.
- Take off dust boot 4.
- Unclamp the fork leg.



Right fork leg

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



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

Clamping stand (T1403S) (p. 300)



- Remove the screw. Remove adjuster 3 on compression damping.



- Loosen cartridge 4.

Ring wrench (T14017) (p. 300)



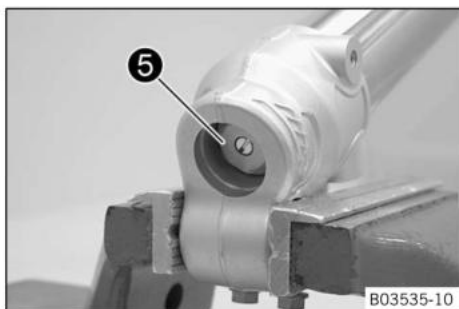
Info

The cartridge cannot be taken off yet.

6 FORK, TRIPLE CLAMP



- Unclamp the fork leg.
- Drain the fork oil.



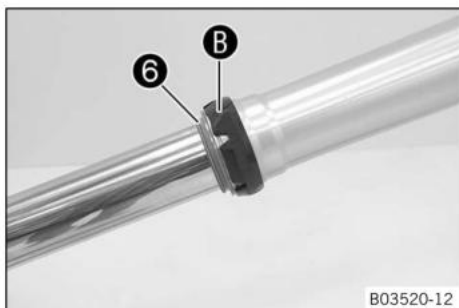
- Clamp the fork leg with the axle clamp.
- Guideline

Use soft jaws.

- Remove rebound adjuster 5.



- Remove the cartridge.

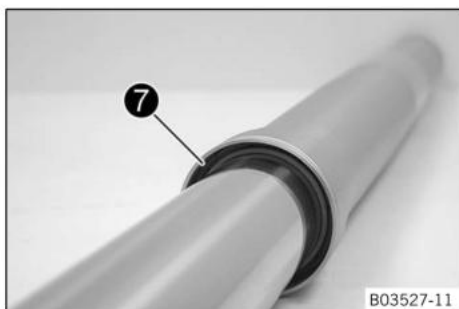


- Remove dust boot 6.
- Remove fork protector ring B.



Info

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

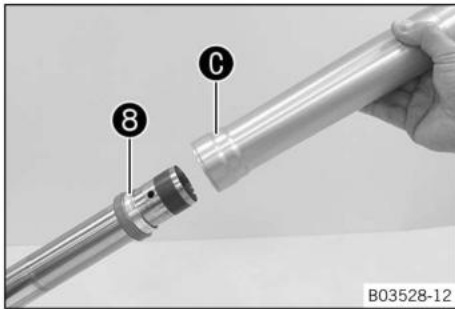


- Remove lock ring 7.



Info

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



- Warm up the outside fork tube in area **C** of the lower slide bearing.

Guideline

50 °C (122 °F)

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



Info

The lower slide bearing **8** must be drawn out of its bearing seat.

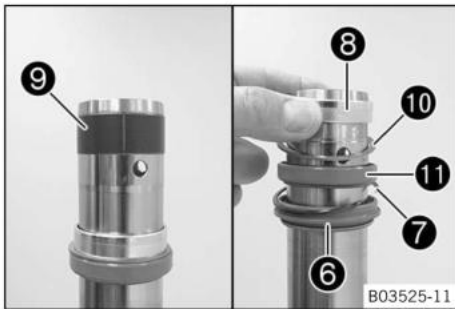
- Remove upper slide bearing **9**.



Info

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

- Take off lower slide bearing **8**.
- Take off support ring **10**.
- Take off seal ring **11**.
- Take off lock ring **7**.
- Take off dust boot **6**.
- Unclamp the fork leg.



6.14 Disassembling the air cartridge



Caution

Danger of accidents Disassembling pressurized parts can cause injuries.

- The fork is filled with compressed air. Please follow the description provided.

Preparatory work

- Disassemble the fork legs. (p. 21)

Main work

- Remove valve cap **1**.
- Slowly release the pressure from the air cartridge.



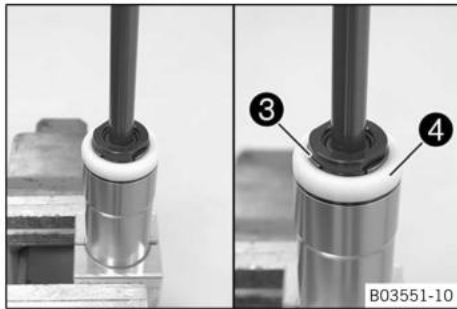
Info

Hold the piston rod in extended position to allow the air pressure to balance between the positive air chamber and the negative air chamber.

- Remove valve core **2**.



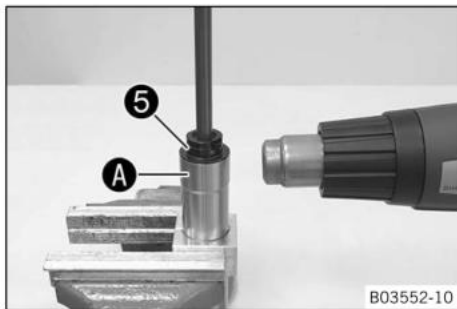
6 FORK, TRIPLE CLAMP



- Clamp the air cartridge.

Clamping stand (T14072) (p. 301)

- Remove lock ring ③.
- Remove fluid barrier ④.



- Heat up thread area of air cartridge A.

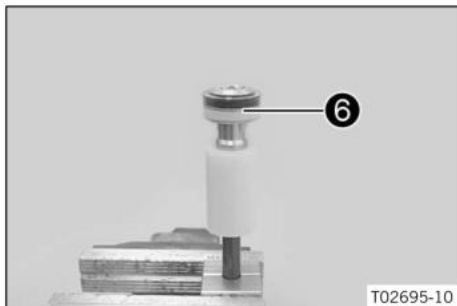
Guideline

50 °C (122 °F)

- Loosen seal ring retainer ⑤.



- Remove the piston rod with the seal ring retainer.



- Degrease and clamp the top of the piston rod.

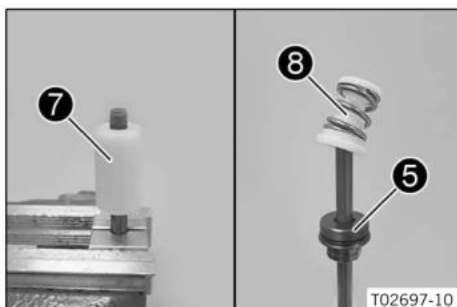
Clamping stand (T14016S) (p. 300)

- Heat up the thread area of piston ⑥.

Guideline

50 °C (122 °F)

- Remove piston ⑥.



- Remove end stop ⑦.
- Remove spring pack ⑧.
- Remove seal ring retainer ⑤.

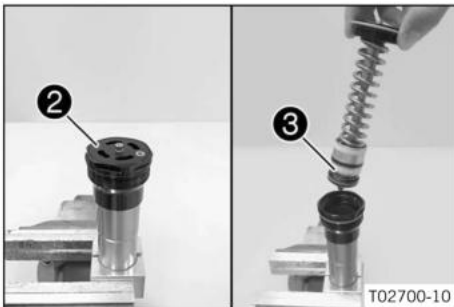
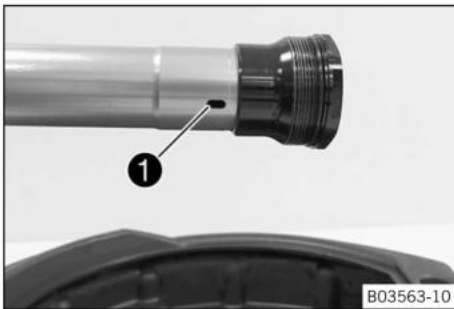
6.15 Disassembling the shock absorber cartridge

Preparatory work

- Disassemble the fork legs. (📖 p. 21)

Main work

- Allow oil to drain from breathing hole ❶.



- Degrease and clamp the top of the shock absorber cartridge.

Clamping stand (T14072) (📖 p. 301)

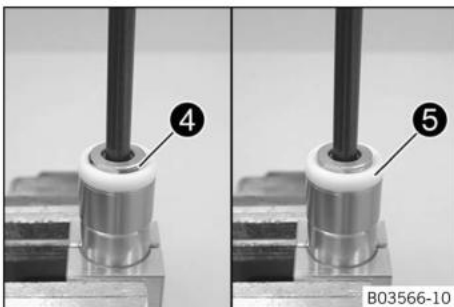
- Loosen screw cap ❷.

Special socket (T14084) (📖 p. 301)

- Remove the screw cap with shock absorber unit ❸.



- Drain the shock absorber cartridge.

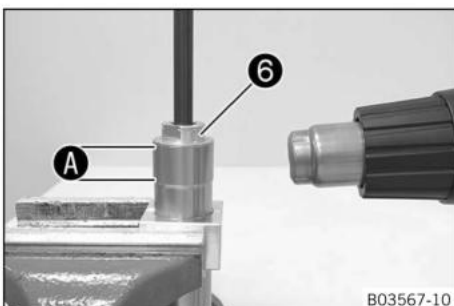


- Turn the shock absorber cartridge, degrease and clamp at the bottom.

Clamping stand (T14072) (📖 p. 301)

- Remove lock ring ❹.

- Remove fluid barrier ❺.



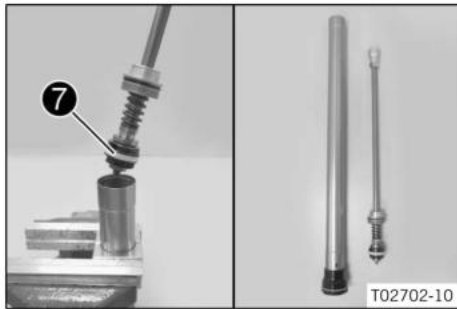
- Heat up thread area of shock absorber cartridge A.

Guideline

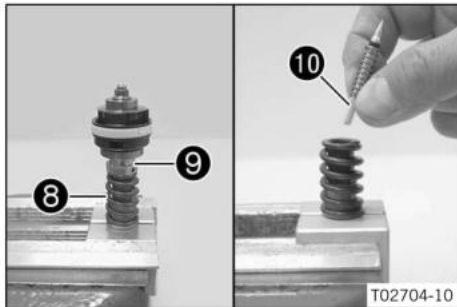
50 °C (122 °F)

- Loosen seal ring retainer ❻.

6 FORK, TRIPLE CLAMP



- Remove piston rod with seal ring retainer and shock absorber unit **7**.



- Degrease piston rod and clamp underneath spring **8**.

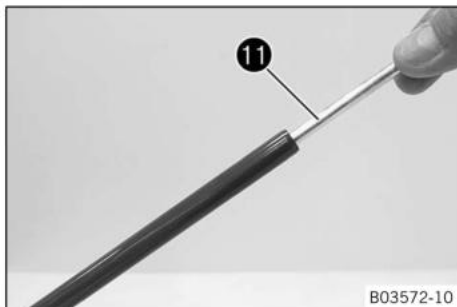
Clamping stand (T14016S) (p. 300)

- Heat up the thread area of piston retainer **9**.

Guideline

50 °C (122 °F)

- Remove piston retainer **9** with the shock absorber unit.
- Remove adjustment valve **10** with the spring from the piston rod.
- Remove spring **8** with the spring seat.
- Remove the seal ring retainer from the piston rod.

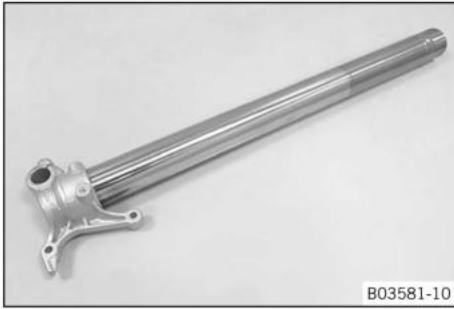


- Remove adjusting tube **11** from the piston rod.

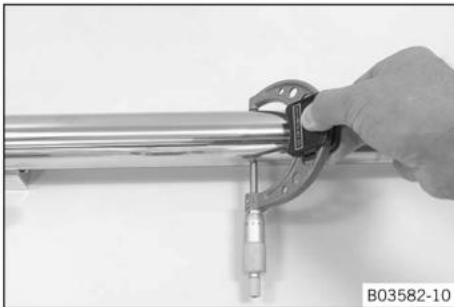
6.16 Checking the fork legs

Condition

The fork legs have been disassembled.



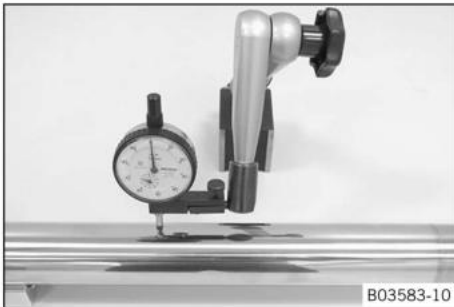
- Check the inside fork tube and the axle clamp for damage.
 - » If damage is found:
 - Change the inside fork tube.



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

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

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



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

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

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



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

Inside diameter of the outside fork tube	≤ 49.20 mm (≤ 1.937 in)
--	------------------------------------

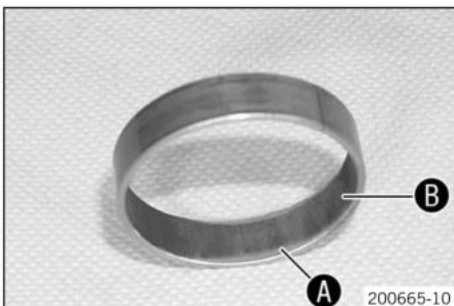
- » If the measured value is greater than the specified value:
 - Change the outside fork tube.

- Check the outside fork tube for damage.

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

- Check the surface of the slide bearings.

- » If a bronze-colored layer **A** under sliding layer **B** is visible or the surface is rough:
 - Change the slide bearing.



6 FORK, TRIPLE CLAMP



- Check the piston rod for damage.
 - » If damage is found:
 - Replace the piston rod.
- Measure the outside diameter of the piston rod at several locations.

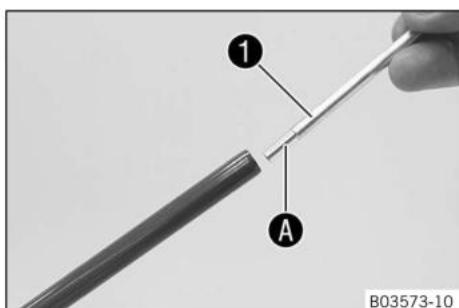
Outside diameter of the piston rod	$\geq 11.965 \text{ mm}$ ($\geq 0.47106 \text{ in}$)
------------------------------------	---

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

Run-out of the piston rod	$\leq 0.40 \text{ mm}$ ($\leq 0.0157 \text{ in}$)
---------------------------	---

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

6.17 Assembling the shock absorber cartridge



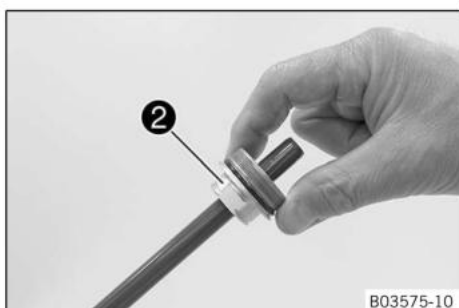
- Lubricate and mount adjusting tube ①.

Fork oil (SAE 4) (48601166S1) (p. 287)



Info

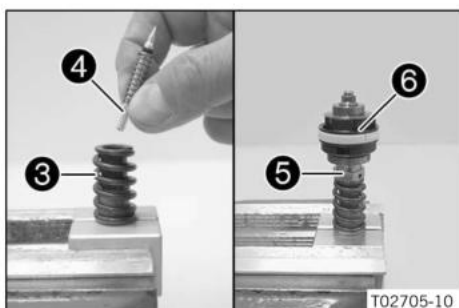
Mount detached end A at the bottom.



- Lubricate seals on seal ring retainer ②.

Lubricant (T14034) (p. 288)

- Push the seal ring retainer onto the piston rod.
 - ✓ The thread faces upward.



- Degrease and clamp the top of the piston rod.

Clamping stand (T14016S) (p. 300)

- Mount spring ③.



Info

Mount the spring retainer at the bottom.

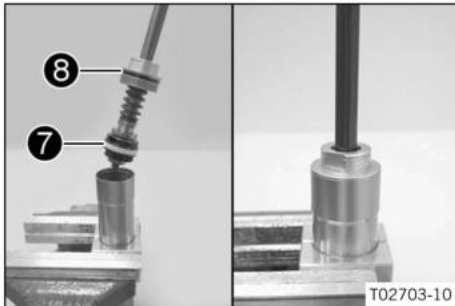
- Mount adjusting valve ④ in the piston rod with spring and new O-ring.
 - ✓ The tip faces upward.
- Lubricate O-ring of adjustment valve.

Lubricant (T158) (p. 288)

- Mount and tighten piston retainer **5** with shock absorber unit **6**.

Guideline

Piston retainer on piston rod	M9x1	20 Nm (14.8 lbf ft) Loctite®2701™
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- Clamp the shock absorber cartridge at the bottom.

Clamping stand (T14072) (p. 301)

- Lubricate friction ring **7** on the shock absorber cartridge.

Fork oil (SAE 4) (48601166S1) (p. 287)

- Push the piston rod into the shock absorber cartridge.

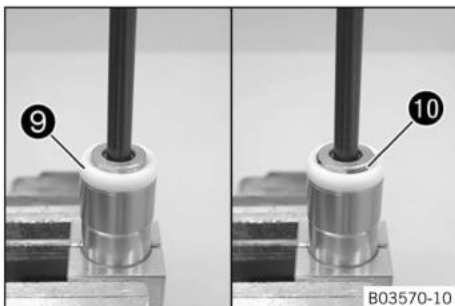
- Lubricate O-ring **8** of the seal ring retainer.

Lubricant (T158) (p. 288)

- Mount and tighten the seal ring retainer.

Guideline

Seal ring retainer on cartridge	M35.5x0.8	40 Nm (29.5 lbf ft) Loctite®2701™
---------------------------------	-----------	---



- Position fluid barrier **9**.

- Mount lock ring **10**.



- Turn the shock absorber cartridge around and clamp at top.

Clamping stand (T14016S) (p. 300)

- Fill with fork oil.

Oil capacity, right cartridge	380 ml (12.85 fl. oz.)	Fork oil (SAE 4) (48601166S1) (p. 287)
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Info

To bleed the oil, move the piston rod up and down multiple times until air bubbles stop rising.

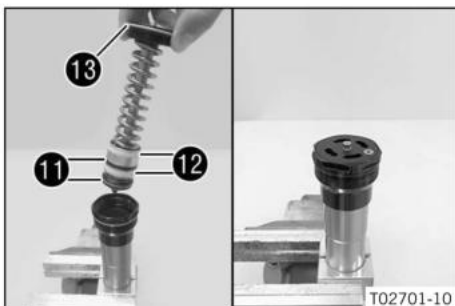
- Lubricate seals **11** and friction rings **12**.

Fork oil (SAE 4) (48601166S1) (p. 287)

- Lubricate O-ring **13** on the screw cover.

Lubricant (T158) (p. 288)

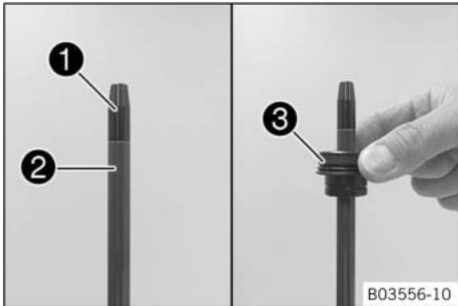
- Mount the screw cover with pressure stage unit; tighten with special tool.



Guideline

Pressure stage unit on shock absorber cartridge	M44x1	40 Nm (29.5 lbf ft)
Special socket (T14084) (📖 p. 301)		

6.18 Assembling the air cartridge (All EU models)



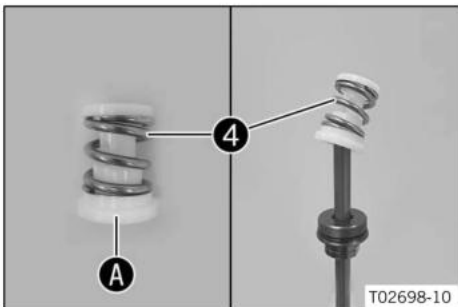
- Slot special tool 1 over thread on piston rod 2.

Protecting sleeve (T14073) (📖 p. 301)

- Lubricate inner seals on seal ring retainer 3.

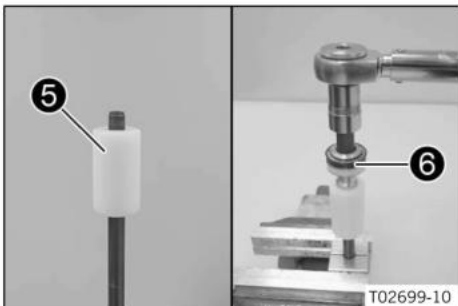
Lubricant (T14034) (📖 p. 288)

- Mount the seal ring retainer.
✓ The thread faces upward.



- Mount spring pack 4.

✓ The wide side of spring guide A is mounted facing down.



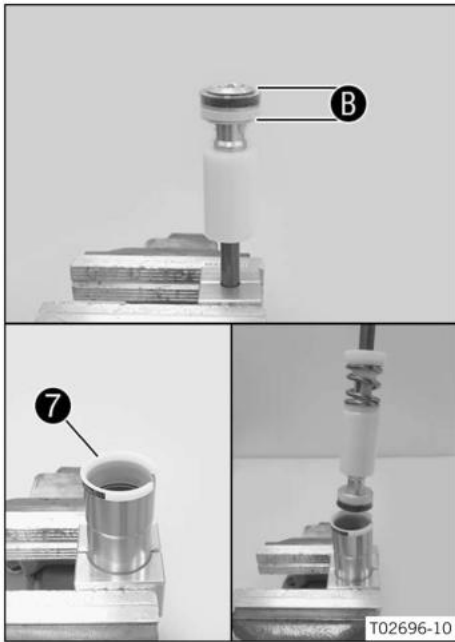
- Slot end stop 5 onto the piston rod.
- Clamp the piston rod underneath the end stop.

Clamping stand (T14016S) (📖 p. 300)

- Mount and tighten piston 6.

Guideline

Piston on piston rod	M12x1	20 Nm (14.8 lbf ft) Loctite®2701™
----------------------	-------	---



- Lubricate piston in area of **B** and inside of the cartridge.

Grease capacity, left cartridge	5 g (0.18 oz)	Multi-purpose grease (00062010051) (p. 289)
---------------------------------	---------------	---

- Clamp the air cartridge.

Clamping stand (T14072) (p. 301)

- Position the special tool **7** in the cartridge.

Mounting sleeve (T14092) (p. 302)

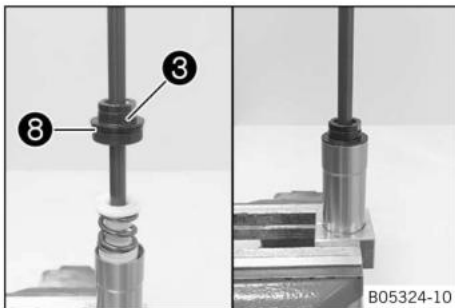
- Push the piston rod into the air cartridge.



Info

The air cartridge must be absolutely clean on the inside.
Do not damage the gasket when inserting the piston.

- Remove the special tool.



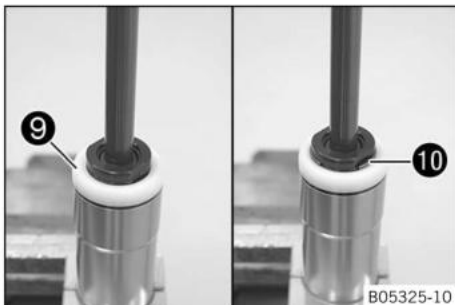
- Lubricate O-ring **8** of seal ring retainer **3**.

Lubricant (T158) (p. 288)

- Mount and tighten the seal ring retainer.

Guideline

Seal ring retainer on cartridge	M35.5x0.8	40 Nm (29.5 lbf ft) Loctite®2701™
---------------------------------	-----------	---



- Position fluid barrier **9**.

✓ The cut-out faces upward.

- Mount lock ring **10**.



- Mount and tighten valve core **11**.

- Fill the cartridge with air.

Guideline

Minimum air pressure	7 bar (102 psi)
Maximum air pressure	15 bar (218 psi)

- Adjust air pressure with special tool **12** as per specifications.

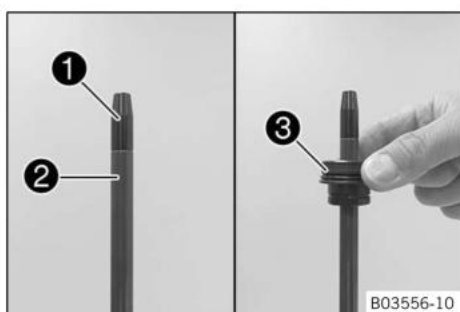
Guideline

Air pressure	8.3 bar (120 psi)
--------------	-------------------

Fork airpump (79412966000) (p. 297)

- Mount valve cap **13**.

6.19 Assembling the air cartridge (All US models)



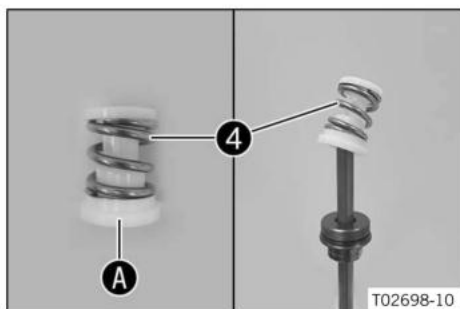
- Slot special tool **1** over thread on piston rod **2**.

Protecting sleeve (T14073) (p. 301)

- Lubricate inner seals on seal ring retainer **3**.

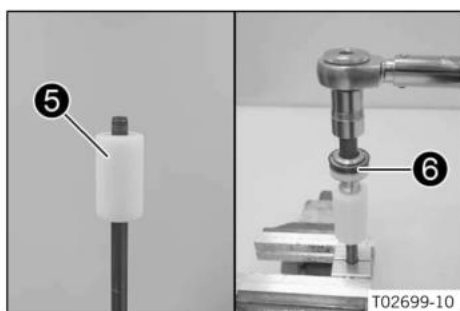
Lubricant (T14034) (p. 288)

- Mount the seal ring retainer.
✓ The thread faces upward.



- Mount spring pack **4**.

✓ The wide side of spring guide **A** is mounted facing down.



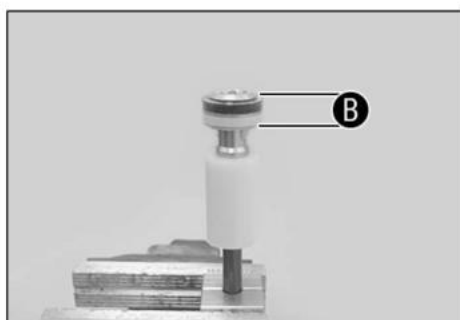
- Slot end stop **5** onto the piston rod.
- Clamp the piston rod underneath the end stop.

Clamping stand (T14016S) (p. 300)

- Mount and tighten piston **6**.

Guideline

Piston on piston rod	M12x1	20 Nm (14.8 lbf ft) Loctite®2701™
----------------------	-------	---



- Lubricate piston in area of **B** and inside of the cartridge.

Grease capacity, left cartridge	5 g (0.18 oz)	Multi-purpose grease (00062010051) (p. 289)
---------------------------------	---------------	---

- Clamp the air cartridge.

Clamping stand (T14072) (p. 301)

- Position the special tool **7** in the cartridge.

Mounting sleeve (T14092) (p. 302)

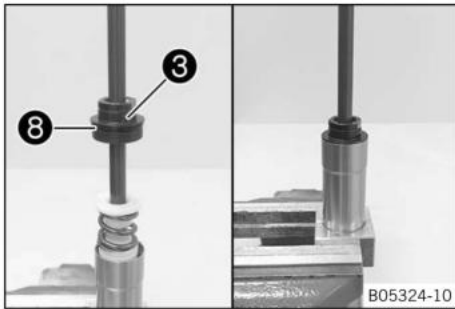
- Push the piston rod into the air cartridge.



Info

The air cartridge must be absolutely clean on the inside.
Do not damage the gasket when inserting the piston.

- Remove the special tool.



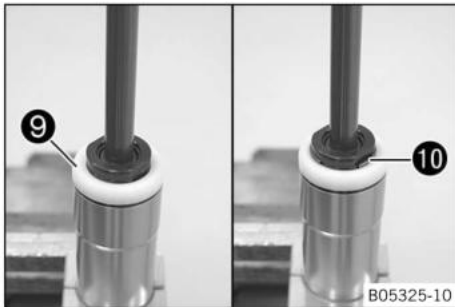
- Lubricate O-ring **8** of seal ring retainer **3**.

Lubricant (T158) (p. 288)

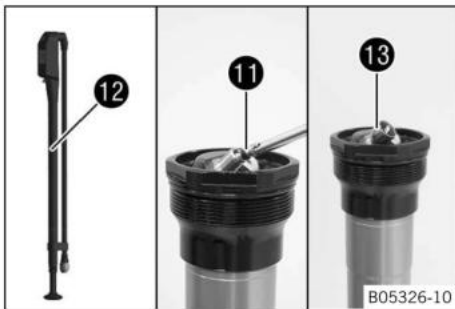
- Mount and tighten the seal ring retainer.

Guideline

Seal ring retainer on cartridge	M35.5x0.8	40 Nm (29.5 lbf ft) Loctite®2701™
---------------------------------	-----------	---



- Position fluid barrier **9**.
✓ The cut-out faces upward.
- Mount lock ring **10**.



- Mount and tighten valve core **11**.
- Fill the cartridge with air.

Guideline

Minimum air pressure	7 bar (102 psi)
Maximum air pressure	15 bar (218 psi)

- Adjust air pressure with special tool **12** as per specifications.

Guideline

Air pressure	8.4 bar (122 psi)
Fork airpump (79412966000) (p. 297)	

- Mount valve cap **13**.

6.20 Assembling the fork legs (All EU models)

Preparatory work

- Check the fork legs. (p. 28)

Left fork leg

- Clamp the inside fork tube using the axle clamp.

Guideline

Use soft jaws.

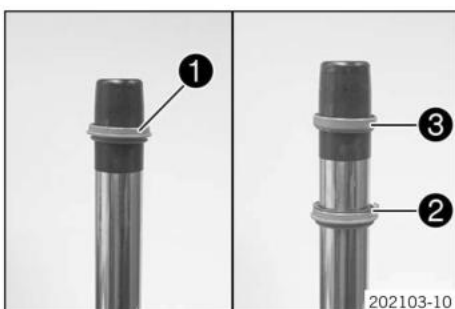
- Mount the special tool.

Protecting sleeve (T1401) (p. 300)

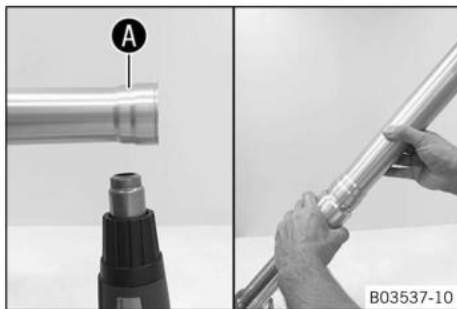
- Grease and push on dust boot **1**.

Lubricant (T14034) (p. 288)

- ✓ The sealing lip is mounted with the spring expander facing down.



6 FORK, TRIPLE CLAMP



Info

Always change the dust boot, seal ring, lock ring, and support ring.

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

Lubricant (T14034) (📖 p. 288)

- ✓ The sealing lip points downward, the open side upward.

- Remove the special tool.
- Push on support ring ④.
- Sand the edges of the slide bearings with 600 grit sandpaper; then clean and grease the bearings.

Fork oil (SAE 4) (48601166S1) (📖 p. 287)

- Slide on lower slide bearing ⑤.
- Mount upper slide bearing ⑥.



Info

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

- Warm up the outside fork tube in area A of the lower slide bearings.

Guideline

50 °C (122 °F)

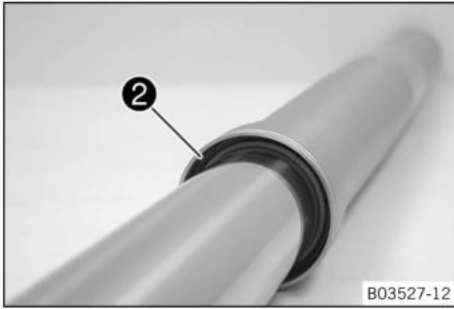
- Hold the lower slide bearing with the longer side of the special tool.

Mounting tool (T14040S) (📖 p. 301)

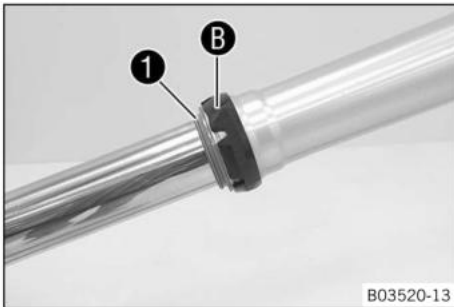
- Slide on the outside fork tube.
- Press the slide bearing all the way into the outside fork tube.
- Position the support ring.
- Hold the seal ring with the shorter side of the special tool.

Mounting tool (T14040S) (📖 p. 301)

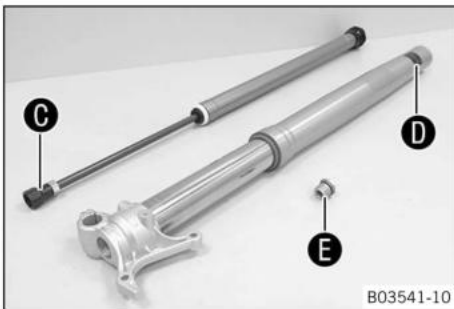
- Press the seal ring and support ring all the way into the outside fork tube.



- Mount lock ring **2**.
- ✓ The lock ring engages audibly.



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



- Assemble the individual components that belong together.

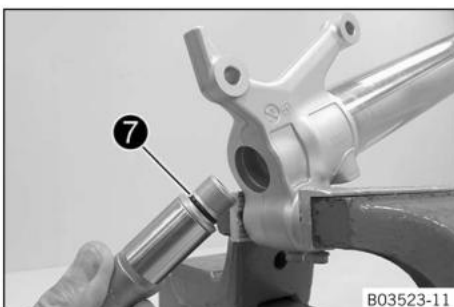


Info

Air cartridge (left fork leg): cartridge with blue adapter **C**, axle clamp with brake mount and outside fork tube with warning label **D**, screw cartridge **E**.



- Slide the air cartridge into the inside fork tube.



- Lubricate O-ring **7**.

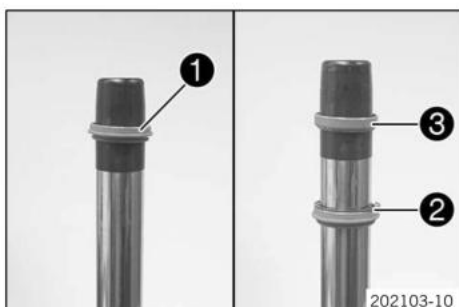
Lubricant (T158) (📖 p. 288)

- Mount and tighten the screw.

Guideline

Screw cartridge on axle clamp	M20x1	45 Nm (33.2 lbf ft)
-------------------------------	-------	------------------------

6 FORK, TRIPLE CLAMP



- Clamp the left fork leg vertically.

Guideline

Use soft jaws.

- Fill with fork oil.

Oil capacity external mechanism left	210 ± 30 ml (7.1 ± 1.01 fl. oz.)	Fork oil (SAE 4) (48601166S1) (p. 287)
--------------------------------------	-------------------------------------	--

- Lubricate O-ring (8) on the air cartridge.

Lubricant (T158) (p. 288)

- Push the outside fork tube upwards.

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

Clamping stand (T1403S) (p. 300)

- Tighten air cartridge (9).

Guideline

Cartridge on the outside fork tube	M51x1.5	50 Nm (36.9 lbf ft)
------------------------------------	---------	------------------------

Ring wrench (T14017) (p. 300)

Right fork leg

- Clamp the inside fork tube using the axle clamp.

Guideline

Use soft jaws.

- Mount the special tool.

Protecting sleeve (T1401) (p. 300)

- Grease and push on dust boot (1).

Lubricant (T14034) (p. 288)

- ✓ The sealing lip is mounted with the spring expander facing down.



Info

Always change the dust boot, seal ring, lock ring, and support ring.

- Push on lock ring (2).

- Grease and push on seal ring (3).

Lubricant (T14034) (p. 288)

- ✓ The sealing lip points downward, the open side upward.

- Remove the special tool.



- Push on support ring ④.
- Sand the edges of the slide bearings with 600 grit sandpaper; then clean and grease the bearings.

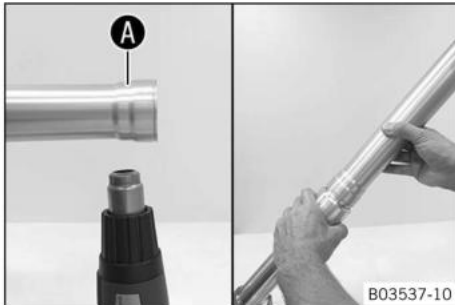
Fork oil (SAE 4) (48601166S1) (p. 287)

- Slide on lower slide bearing ⑤.
- Mount upper slide bearing ⑥.



Info

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



- Warm up the outside fork tube in area A of the lower slide bearings.

Guideline

50 °C (122 °F)

- Hold the lower slide bearing with the longer side of the special tool.

Mounting tool (T14040S) (p. 301)

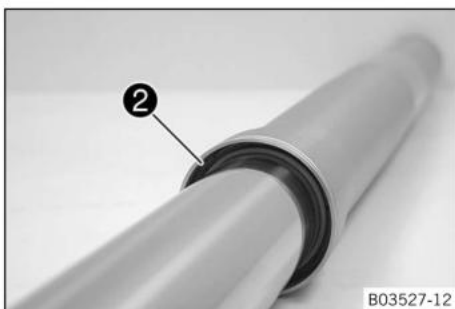
- Slide on the outside fork tube.
- Press the slide bearing all the way into the outside fork tube.



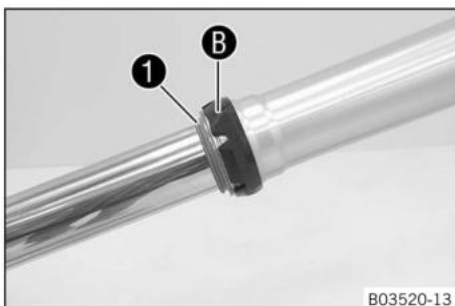
- Position the support ring.
- Hold the seal ring with the shorter side of the special tool.

Mounting tool (T14040S) (p. 301)

- Press the seal ring and support ring all the way into the outside fork tube.

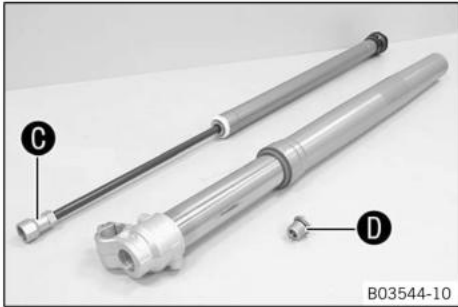


- Mount lock ring ②.
- ✓ The lock ring engages audibly.



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

6 FORK, TRIPLE CLAMP



- Assemble the individual components that belong together.

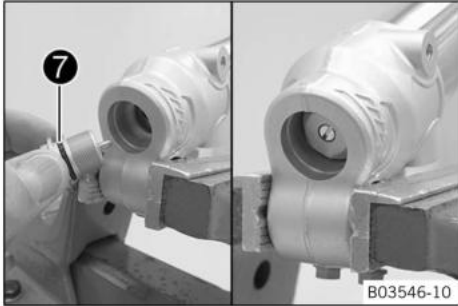
i

Info

Shock absorber cartridge (right fork leg): cartridge with silver adapter **C**, axle clamp without brake mount, and outside fork tube without warning label, rebound adjuster **D**.



- Slide the shock absorber cartridge into the inside fork tube.



- Lubricate O-ring **7** on the rebound adjuster.

Lubricant (T158) (📖 p. 288)

- Mount and tighten the rebound adjuster.

Guideline		
Rebound adjuster on the axle clamp	M20x1	45 Nm (33.2 lbf ft)



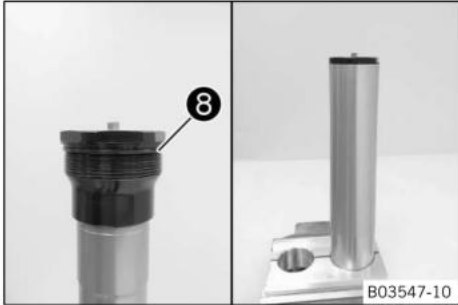
- Clamp the left fork leg vertically.

Guideline

Use soft jaws.

- Fill with fork oil.

Oil capacity external mechanism right	210 ± 30 ml (7.1 ± 1.01 fl. oz.)	Fork oil (SAE 4) (48601166S1) (📖 p. 287)
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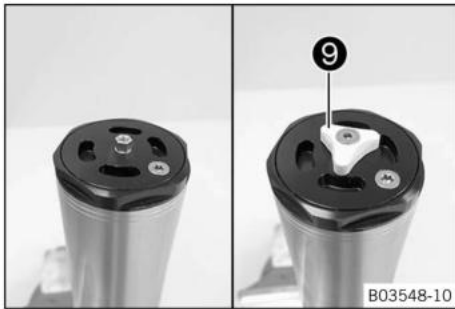
- Lubricate O-ring **8** on the shock absorber cartridge.

Lubricant (T158) (📖 p. 288)

- Push the outside fork tube upwards and screw in the shock absorber cartridge.

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

Clamping stand (T1403S) (📖 p. 300)



- Tighten the shock absorber cartridge.

Guideline

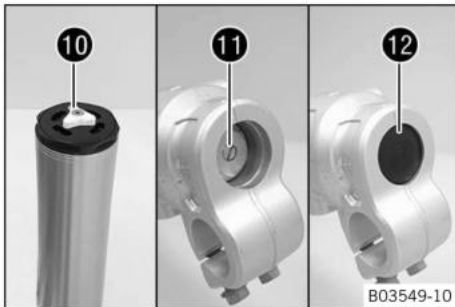
Cartridge on the outside fork tube	M51x1.5	50 Nm (36.9 lbf ft)
------------------------------------	---------	------------------------

Ring wrench (T14017) (p. 300)

- Mount adjuster (9) of the compression damping. Mount and tighten the screw.

Guideline

Screw, compression adjuster	M4x0.5	1.5 Nm (1.11 lbf ft)
-----------------------------	--------	-------------------------



Condition

Value not determined on removal:

- Turn compression adjusting screw (10) and rebound adjusting screw (11) clockwise all the way.
- Turn counterclockwise by the number of clicks corresponding to the fork type.

Guideline

Compression damping	
Comfort	17 clicks
Standard	12 clicks
Sport	7 clicks
Rebound damping	
Comfort	17 clicks
Standard	12 clicks
Sport	7 clicks

- Mount protection cap (12).

Condition

Value determined on removal:

- Turn compression adjusting screw (10) and rebound adjusting screw (11) clockwise all the way.
- Turn the adjusting screws to the position they were in before removing.
- Mount protection cap (12).



6.21 Assembling the fork legs (All US models)

Preparatory work

- Check the fork legs. (p. 28)

Left fork leg

- Clamp the inside fork tube using the axle clamp.

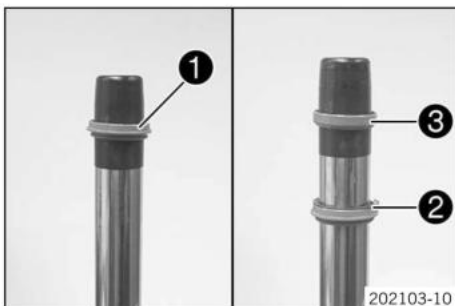
Guideline

Use soft jaws.

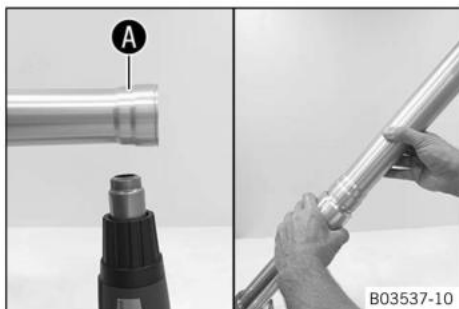
- Mount the special tool.

Protecting sleeve (T1401) (p. 300)

- Grease and push on dust boot (1).



6 FORK, TRIPLE CLAMP



Lubricant (T14034) (📖 p. 288)

- ✓ The sealing lip is mounted with the spring expander facing down.



Info

Always change the dust boot, seal ring, lock ring, and support ring.

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

Lubricant (T14034) (📖 p. 288)

- ✓ The sealing lip points downward, the open side upward.
- Remove the special tool.
- Push on support ring (4).
- Sand the edges of the slide bearings with 600 grit sandpaper; then clean and grease the bearings.

Fork oil (SAE 4) (48601166S1) (📖 p. 287)

- Slide on lower slide bearing (5).
- Mount upper slide bearing (6).



Info

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

- Warm up the outside fork tube in area (A) of the lower slide bearings.

Guideline

50 °C (122 °F)

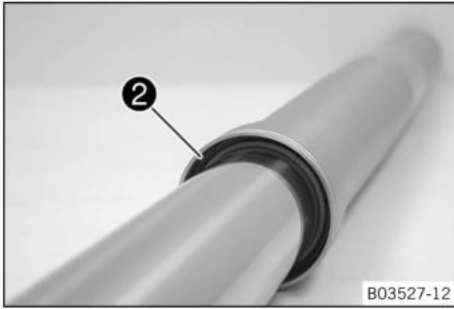
- Hold the lower slide bearing with the longer side of the special tool.

Mounting tool (T14040S) (📖 p. 301)

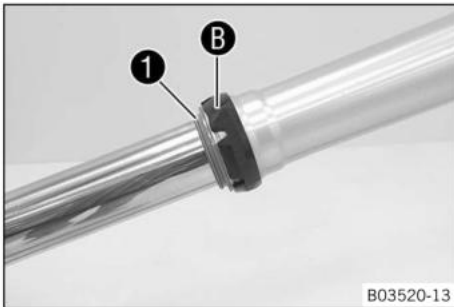
- Slide on the outside fork tube.
- Press the slide bearing all the way into the outside fork tube.
- Position the support ring.
- Hold the seal ring with the shorter side of the special tool.

Mounting tool (T14040S) (📖 p. 301)

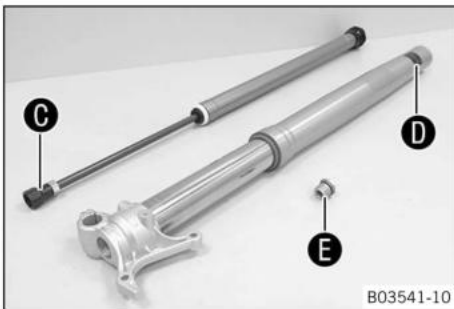
- Press the seal ring and support ring all the way into the outside fork tube.



- Mount lock ring **2**.
- ✓ The lock ring engages audibly.



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



- Assemble the individual components that belong together.

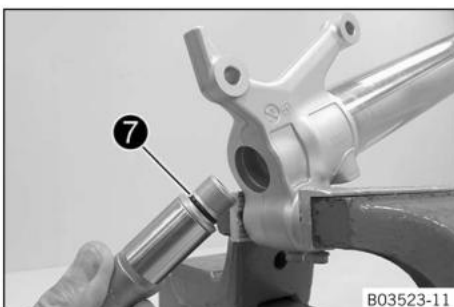


Info

Air cartridge (left fork leg): cartridge with blue adapter **C**, axle clamp with brake mount and outside fork tube with warning label **D**, screw cartridge **E**.



- Slide the air cartridge into the inside fork tube.



- Lubricate O-ring **7**.

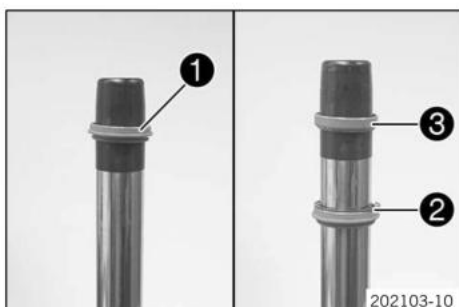
Lubricant (T158) (📖 p. 288)

- Mount and tighten the screw.

Guideline

Screw cartridge on axle clamp	M20x1	45 Nm (33.2 lbf ft)
-------------------------------	-------	------------------------

6 FORK, TRIPLE CLAMP



- Clamp the left fork leg vertically.

Guideline

Use soft jaws.

- Fill with fork oil.

Oil capacity external mechanism left	200 $\pm$ 40 ml (6.76 $\pm$ 1.35 fl. oz.)	Fork oil (SAE 4) (48601166S1) (p. 287)
--------------------------------------	--	--

- Lubricate O-ring (8) on the air cartridge.

Lubricant (T158) (p. 288)

- Push the outside fork tube upwards.

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

Clamping stand (T1403S) (p. 300)

- Tighten air cartridge (9).

Guideline

Cartridge on the outside fork tube	M51x1.5	50 Nm (36.9 lbf ft)
------------------------------------	---------	------------------------

Ring wrench (T14017) (p. 300)

Right fork leg

- Clamp the inside fork tube using the axle clamp.

Guideline

Use soft jaws.

- Mount the special tool.

Protecting sleeve (T1401) (p. 300)

- Grease and push on dust boot (1).

Lubricant (T14034) (p. 288)

- ✓ The sealing lip is mounted with the spring expander facing down.



Info

Always change the dust boot, seal ring, lock ring, and support ring.

- Push on lock ring (2).

- Grease and push on seal ring (3).

Lubricant (T14034) (p. 288)

- ✓ The sealing lip points downward, the open side upward.

- Remove the special tool.



- Push on support ring ④.
- Sand the edges of the slide bearings with 600 grit sandpaper; then clean and grease the bearings.

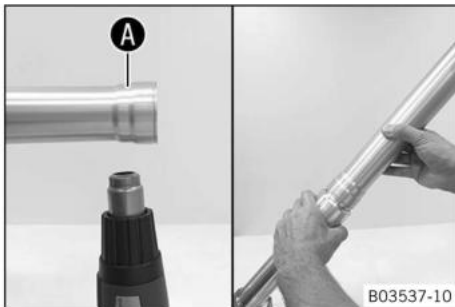
Fork oil (SAE 4) (48601166S1) (📖 p. 287)

- Slide on lower slide bearing ⑤.
- Mount upper slide bearing ⑥.



Info

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



- Warm up the outside fork tube in area A of the lower slide bearings.

Guideline

50 °C (122 °F)

- Hold the lower slide bearing with the longer side of the special tool.

Mounting tool (T14040S) (📖 p. 301)

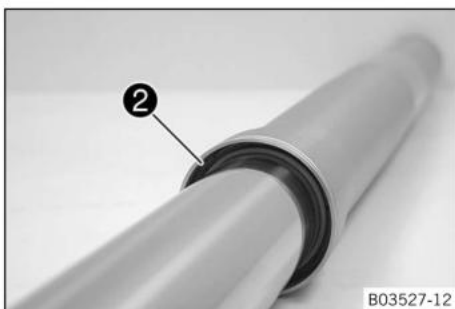
- Slide on the outside fork tube.
- Press the slide bearing all the way into the outside fork tube.



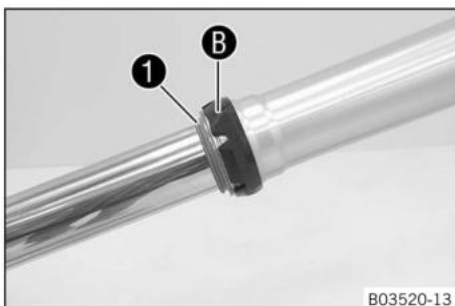
- Position the support ring.
- Hold the seal ring with the shorter side of the special tool.

Mounting tool (T14040S) (📖 p. 301)

- Press the seal ring and support ring all the way into the outside fork tube.

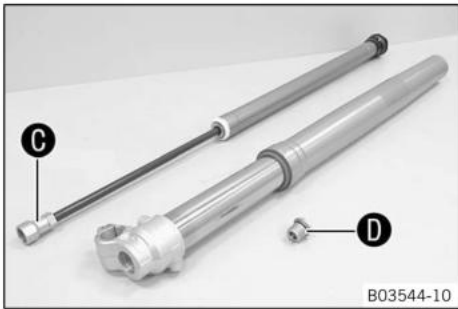


- Mount lock ring ②.
- ✓ The lock ring engages audibly.



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

6 FORK, TRIPLE CLAMP



- Assemble the individual components that belong together.

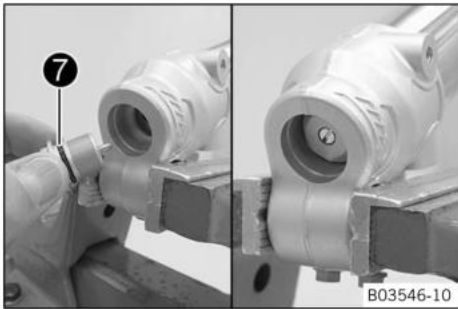


Info

Shock absorber cartridge (right fork leg): cartridge with silver adapter C, axle clamp without brake mount, and outside fork tube without warning label, rebound adjuster D.



- Slide the shock absorber cartridge into the inside fork tube.



- Lubricate O-ring 7 on the rebound adjuster.

Lubricant (T158) (p. 288)

- Mount and tighten the rebound adjuster.

Guideline

Rebound adjuster on the axle clamp	M20x1	45 Nm (33.2 lbf ft)
------------------------------------	-------	------------------------



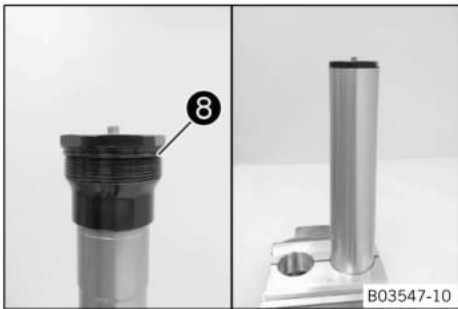
- Clamp the left fork leg vertically.

Guideline

Use soft jaws.

- Fill with fork oil.

Oil capacity external mechanism right	200 ± 40 ml (6.76 ± 1.35 fl. oz.)	Fork oil (SAE 4) (48601166S1) (p. 287)
---------------------------------------	--------------------------------------	--



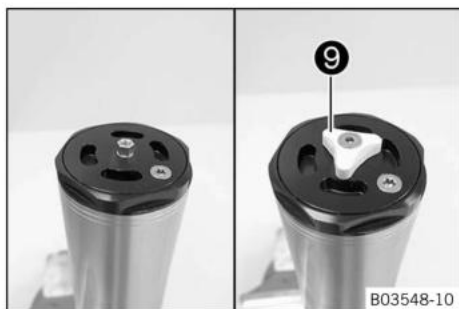
- Lubricate O-ring 8 on the shock absorber cartridge.

Lubricant (T158) (p. 288)

- Push the outside fork tube upwards and screw in the shock absorber cartridge.

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

Clamping stand (T1403S) (p. 300)



- Tighten the shock absorber cartridge.

Guideline

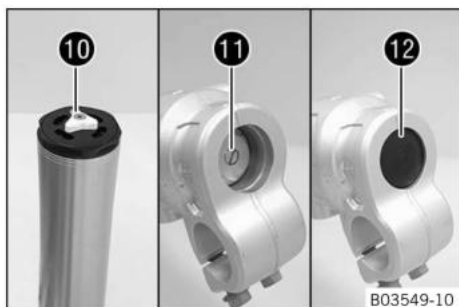
Cartridge on the outside fork tube	M51x1.5	50 Nm (36.9 lbf ft)
------------------------------------	---------	------------------------

Ring wrench (T14017) (p. 300)

- Mount adjuster 9 of the compression damping. Mount and tighten the screw.

Guideline

Screw, compression adjuster	M4x0.5	1.5 Nm (1.11 lbf ft)
-----------------------------	--------	-------------------------



Condition

Value not determined on removal:

- Turn compression adjusting screw 10 and rebound adjusting screw 11 clockwise all the way.
- Turn counterclockwise by the number of clicks corresponding to the fork type.

Guideline

Compression damping	
Comfort	17 clicks
Standard	12 clicks
Sport	7 clicks
Rebound damping	
Comfort	17 clicks
Standard	12 clicks
Sport	7 clicks

- Mount protection cap 12.

Condition

Value determined on removal:

- Turn compression adjusting screw 10 and rebound adjusting screw 11 clockwise all the way.
- Turn the adjusting screws to the position they were in before removing.
- Mount protection cap 12.



6.22 Checking steering head bearing play



Warning

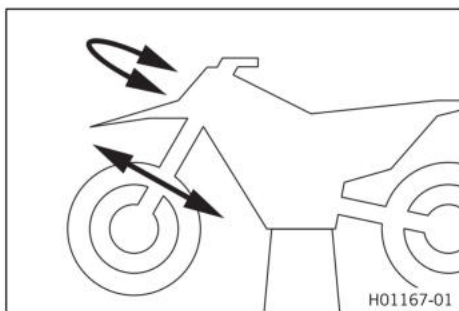
Danger of accidents Incorrect steering head bearing play impairs the handling characteristic and damages components.

- 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 steering head bearing play. (p. 51)

- Move the handlebar to and fro over the entire steering range.

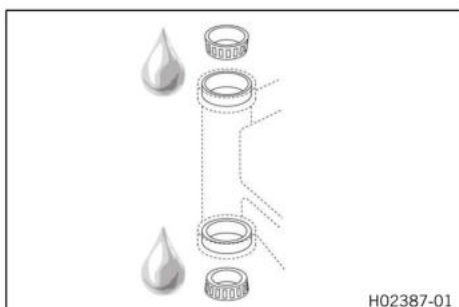
It must be possible to move the handlebar easily over the entire steering range. There should be no detectable detent positions.

- » If detent positions are detected:
 - Adjust steering head bearing play. (p. 51)
 - Check the steering head bearing and change if necessary.

Finishing work

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

6.23 Lubricating the steering head bearing



- Remove the lower triple clamp. (p. 48)
- Install the lower triple clamp. (p. 49)



Info

The steering head bearing is cleaned and lubricated in the course of removal and installation.

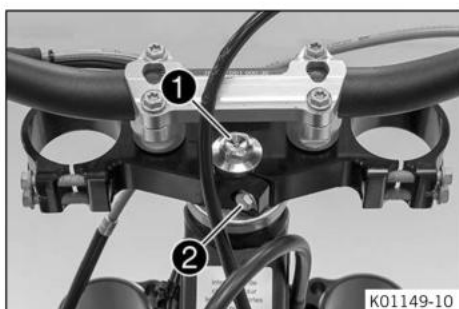
6.24 Removing the lower triple clamp

Preparatory work

- Raise the motorcycle with a lift stand. (p. 12)
- Remove the front wheel. (p. 116)
- Remove the fork legs. (p. 18)
- Remove the start number plate. (p. 112)
- Remove front fender. (p. 112)
- Remove the handlebar cushion.

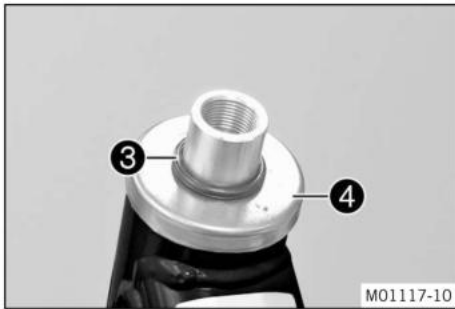
Main work

- Remove screw ①.
- Remove screw ②.
- Take off the upper triple clamp with the handlebar and hang them to the side.



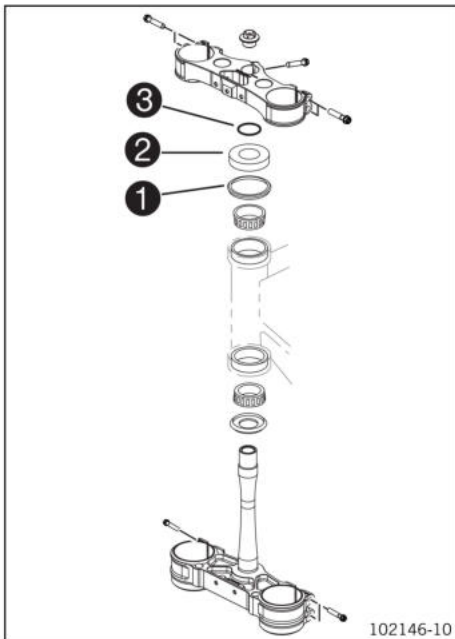
Info

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



- Remove O-ring (3). Remove protective ring (4).
- Take off the lower triple clamp with the steering stem.
- Remove the upper steering head bearing.

6.25 Installing the lower triple clamp

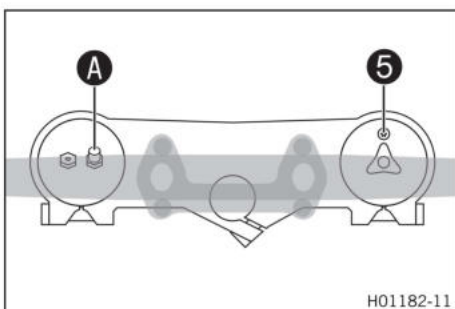


Main work

- Clean the bearing and sealing elements, check for damage, and grease.
- High viscosity grease (📖 p. 288)
- Insert the lower triple clamp with the steering stem. Mount the upper steering head bearing.
 - Check whether upper steering head seal (1) is correctly positioned.
 - Slide on protective ring (2) and O-ring (3).



- Position the upper triple clamp with the handlebar.
- Mount screw (4) but do not tighten yet.



- Position the fork legs.
- ✓ Air bleeder screw (5) of the right fork leg is positioned to the front.
- ✓ Valve (A) of the left fork leg faces the front.

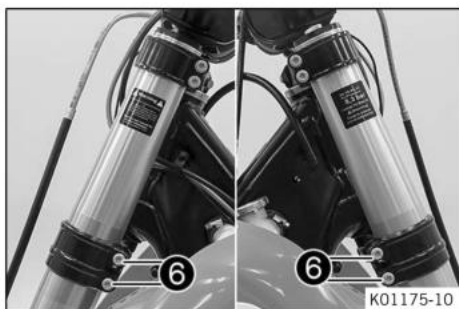


Info

The air suspension **AER** valve is located in the left fork leg.

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 ⑥.

Guideline

Screw, bottom triple clamp	M8	12 Nm (8.9 lbf ft)
----------------------------	----	--------------------



- Tighten screw ④.

Guideline

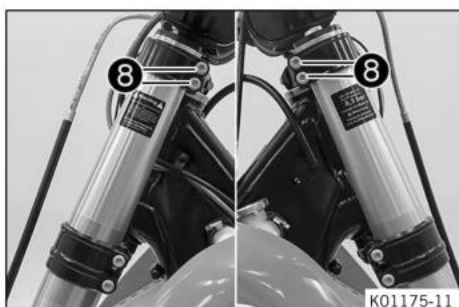
Screw, top steering head	M20x1.5	12 Nm (8.9 lbf ft)
--------------------------	---------	--------------------



- Mount and tighten screw ⑦.

Guideline

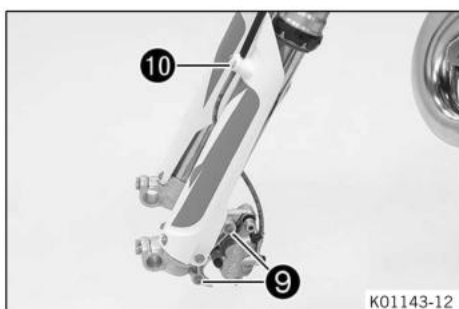
Screw, top steering stem	M8	20 Nm (14.8 lbf ft) Loctite®243™
--------------------------	----	--



- Tighten screws ⑧.

Guideline

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



- Position the brake caliper. Mount and tighten screws ⑨.

Guideline

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

- Position the brake line and the clamp. Mount and tighten screws ⑩.

Finishing work

- Check that the wiring harness, throttle cables, and brake and clutch lines can move freely and are routed correctly.
- Install front fender. (📖 p. 112)
- Install the front wheel. (📖 p. 117)

- Check steering head bearing play. (📖 p. 47)
- Remove the motorcycle from the lift stand. (📖 p. 12)
- Install the start number plate. (📖 p. 112)
- Mount the handlebar cushion.



6.26 Adjusting steering head bearing play

Preparatory work

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

Main work

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

Guideline

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

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

- Tighten screws ❶.

Guideline

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

- Mount and tighten screw ❷.

Guideline

Screw, top steering stem	M8	20 Nm (14.8 lbf ft) Loctite®243™
--------------------------	----	--

Finishing work

- Check steering head bearing play. (📖 p. 47)
- Remove the motorcycle from the lift stand. (📖 p. 12)
- Mount the handlebar cushion.

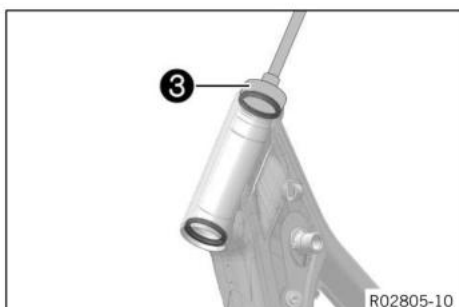
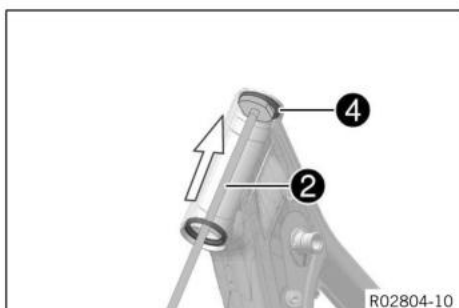
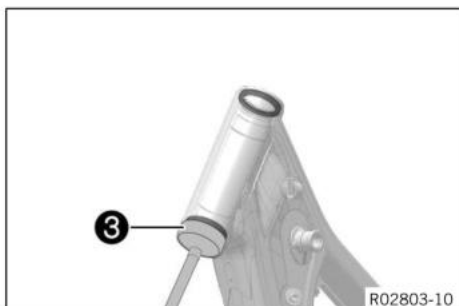
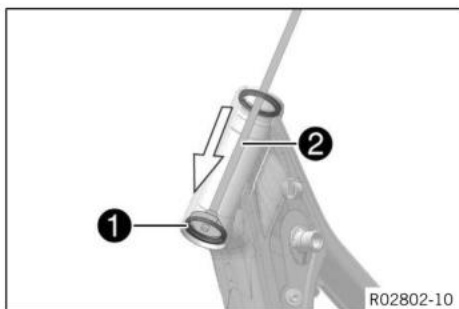


6.27 Changing the steering head bearing

Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 12)
- Remove the front wheel. (📖 p. 116)
- Remove the fork legs. (📖 p. 18)
- Remove the start number plate. (📖 p. 112)
- Remove front fender. (📖 p. 112)
- Remove the handlebar cushion.
- Remove the lower triple clamp. (📖 p. 48)

6 FORK, TRIPLE CLAMP



Main work

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

Tool bracket (58429089000) (📖 p. 294)

Pressing tool (58429092000) (📖 p. 295)
--

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

Tool bracket (58429089000) (📖 p. 294)

Pressing tool (58429091000) (📖 p. 295)
--

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

Tool bracket (58429089000) (📖 p. 294)

Pressing tool (58429092000) (📖 p. 295)
--

- Remove the seal ring.

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

Tool bracket (58429089000) (📖 p. 294)

Pressing tool (58429091000) (📖 p. 295)
--

- Grease and mount the new seal ring.

- 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 bearing race.

Finishing work

- Install the lower triple clamp. (📖 p. 49)

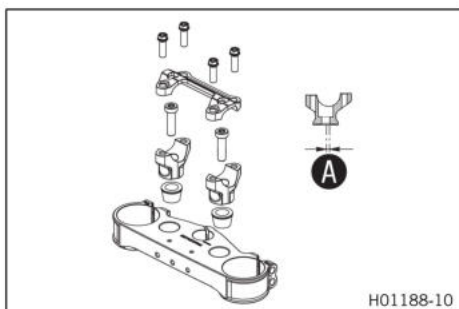
- Check that the wiring harness, throttle cables, and brake and clutch lines can move freely and are routed correctly.

- Install front fender. (📖 p. 112)

- Install the front wheel. (📖 p. 117)
- Check steering head bearing play. (📖 p. 47)
- Remove the motorcycle from the lift stand. (📖 p. 12)
- Install the start number plate. (📖 p. 112)
- Mount the handlebar cushion.



7.1 Handlebar position



The holes on the handlebar supports are placed at a distance of **A** from the center.

Hole distance A	3.5 mm (0.138 in)
-----------------	-------------------

The handlebar can be mounted in 2 different positions. In this way, the handlebar can be mounted in the most comfortable position for the rider.

7.2 Adjusting the handlebar position

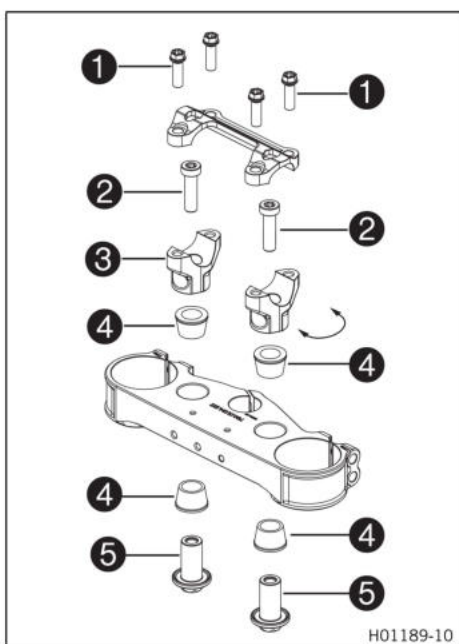


Warning

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.



Preparatory work

- Remove the handlebar cushion.

Main work

- Remove screws **1**. Remove the handlebar clamp. 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 handlebar supports **3**.
- Position rubber bushings **4** and push through nuts **5** from below.
- Place the handlebar supports in the required position.



Info

The handlebar supports are longer and higher on one side. Position the left and right handlebar supports evenly.

- Mount and tighten screws **2**.

Guideline

Screw, handlebar support	M10	40 Nm (29.5 lbf ft) Loctite®243™
--------------------------	-----	--

- Position the handlebar.



Info

Make sure the cables and wiring are positioned correctly.

- Position the handlebar clamp.
- Mount screws **1** but do not tighten yet.

- First bolt the handlebar clamp with screws ❶ onto the longer, higher side of the handlebar supports so that both parts touch.

Guideline

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

- Tighten screws ❶ evenly.

Guideline

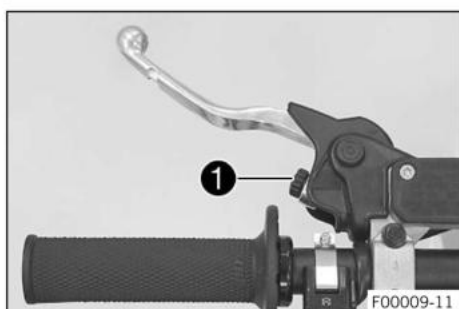
Screw, handlebar clamp	M8	20 Nm (14.8 lbf ft)
------------------------	----	---------------------

Finishing work

- Mount the handlebar cushion.



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 ❶.



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 throttle cable routing



Warning

Danger of accidents The throttle cable may slip out of the guide if routed incorrectly.

The throttle slide will then no longer be closed and the speed can no longer be controlled.

- Make sure that the throttle cable routing and the play in the throttle cable comply with the specification.

Preparatory work

- Remove the seat. (📖 p. 108)
- Turn tap handle of the fuel tap to the **OFF** position.
- Remove the fuel tank. (📖 p. 109)



Main work

- Check throttle cable routing.

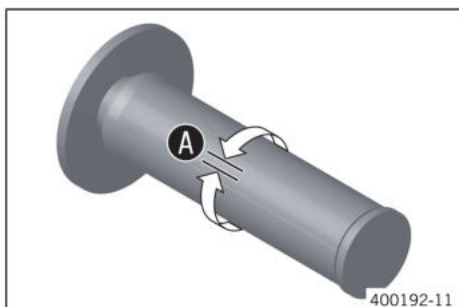
The throttle cable must be routed along the back of the handlebar, to the right of the frame, above the fuel tank bracket, and to the carburetor. The throttle cable must be secured on the fuel tank bracket with a rubber strap.

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

Finishing work

- Install the fuel tank. (📖 p. 110)
- Mount the seat. (📖 p. 108)

7.5 Checking throttle cable play



- Check the throttle grip for smooth operation.
- Move the handlebar to the straight-ahead position. Turn the throttle grip back and forth slightly and determine the play in throttle cable **A**.

Throttle cable play	2 ... 3 mm (0.08 ... 0.12 in)
---------------------	-------------------------------

- » If the throttle cable play does not meet specifications:
 - Adjust throttle cable play. (📖 p. 57)



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 let it run at idle speed. Move the handlebar to and fro over the entire steering range.

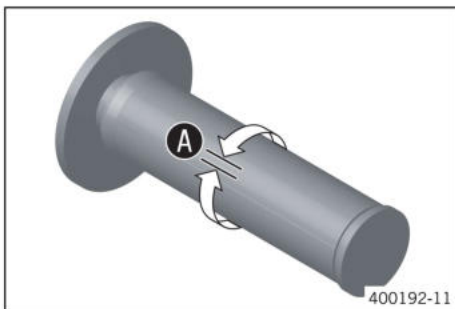
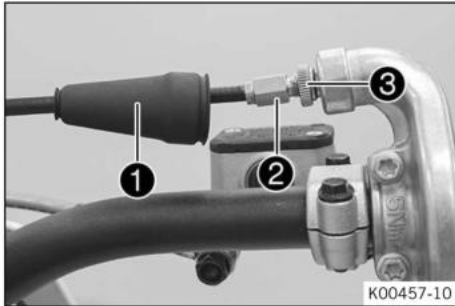
The idle speed must not change.

- » If the idle speed changes:
 - Adjust throttle cable play. (📖 p. 57)

7.6 Adjusting throttle cable play

i Info

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



Preparatory work

- Remove the seat. (📖 p. 108)
- Turn tap handle of the fuel tap to the **OFF** position.
- Remove the fuel tank. (📖 p. 109)
- Check throttle cable routing. (📖 p. 55)

Main work

- Move the handlebar to the straight-ahead position.
- Push back sleeve ❶.
- Ensure that the throttle cable sleeve is pushed all the way into barrel adjuster ❷.
- Loosen nut ❸.

- Turn barrel adjuster ❷ so that there is play **A** in the throttle cable at the throttle grip.

Guideline

Throttle cable play	2 ... 3 mm (0.08 ... 0.12 in)
---------------------	-------------------------------

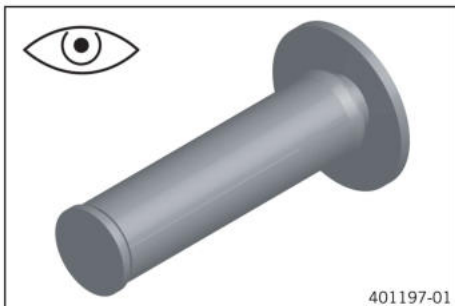
- Tighten nut ❸.
- Slide on sleeve ❶.

Finishing work

- Check the throttle grip for smooth operation.
- Install the fuel tank. (📖 p. 110)
- Mount the seat. (📖 p. 108)
- Check throttle cable play. (📖 p. 56)



7.7 Checking the rubber grip



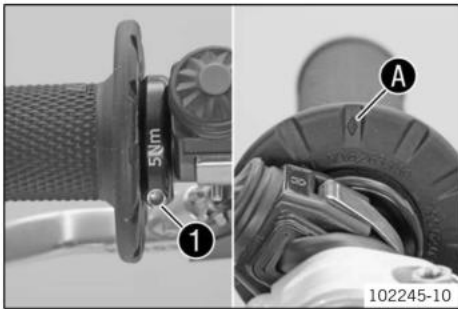
- Check the rubber grips on the handlebar for damage, wear, and looseness.

i 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.

7 HANDLEBAR, CONTROLS



- Check that screw 1 is firmly seated.

Guideline

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

Diamond A must be located at the top.

8.1 Changing the footrests

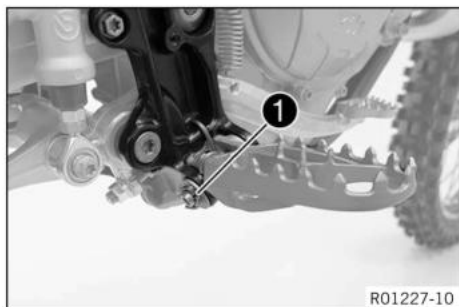
i Info

The procedures are the same on both footrests.

Condition

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

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

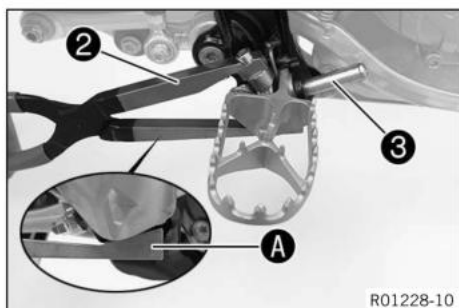


- Press the spring with special tool **2**.

Footrest spring plier (79029083000) (📖 p. 296)

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

- Remove pin **3**.

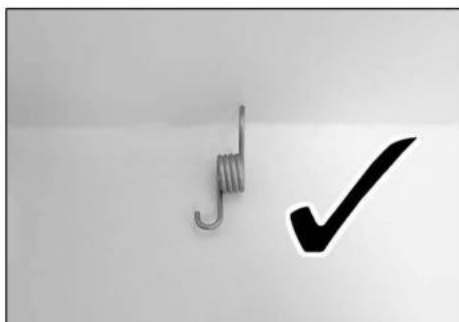


- Position the new footrest and pin.

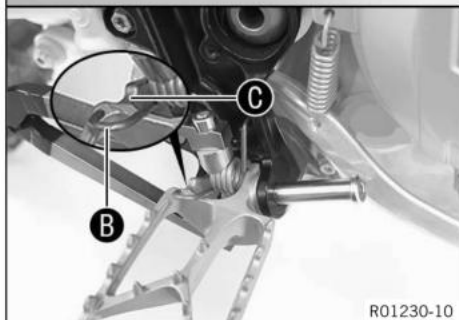
i Info

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

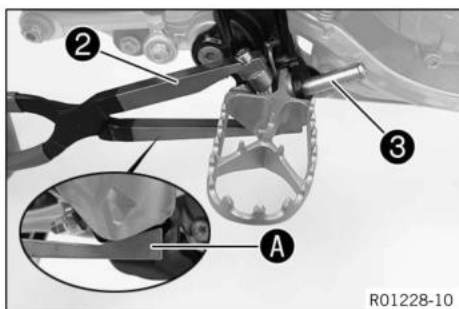




- Position spring as shown.
- ✓ Spring **B** engages in area **C**.



R01230-10

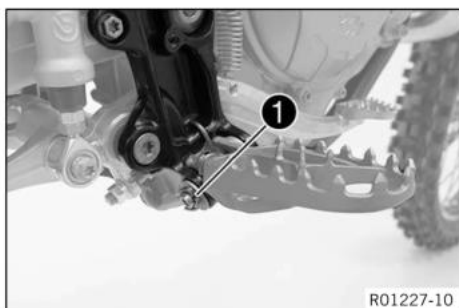


R01228-10

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

Footrest spring plier (79029083000) (p. 296)

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



R01227-10

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

8.2 Checking the frame



S02306-01

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



Info

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

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



Caution

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

- Please follow the description provided.



Info

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



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



Info

Do not loosen fitting **2**!

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

Guideline

Highspeed compression damping (All EU models)	
Comfort	2 turns
Standard	1.5 turns
Sport	1 turn
Highspeed compression damping (All US models)	
Comfort	2 turns
Standard	1.5 turns
Sport	1 turn



Info

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

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



Caution

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

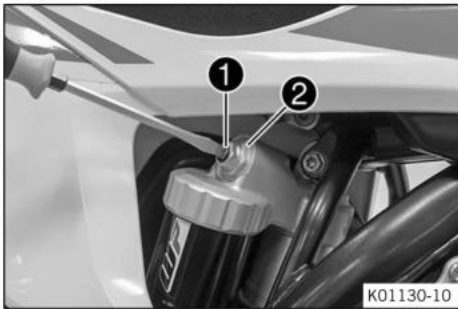
- Please follow the description provided.



Info

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

9 SHOCK ABSORBER, LINK FORK



- 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.

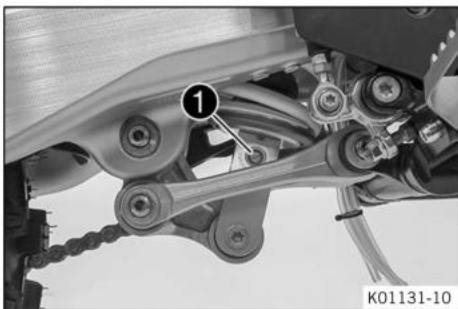
Guideline

Lowspeed compression damping (All EU models)	
Comfort	17 clicks
Standard	15 clicks
Sport	13 clicks
Lowspeed compression damping (All US models)	
Comfort	17 clicks
Standard	15 clicks
Sport	13 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 (All EU models)	
Comfort	17 clicks
Standard	15 clicks
Sport	13 clicks
Rebound damping (All US models)	
Comfort	17 clicks
Standard	15 clicks
Sport	13 clicks

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

9.4 Measuring the rear wheel dimension unloaded

Preparatory work

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

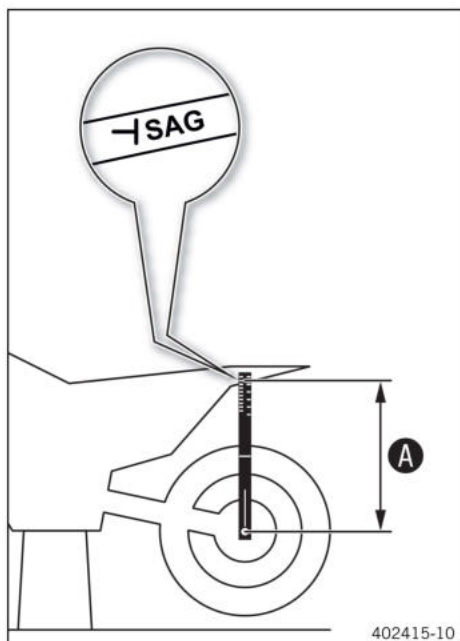
Main work

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

Sag gauge (00029090000)

Sag gage pin (00029990010)

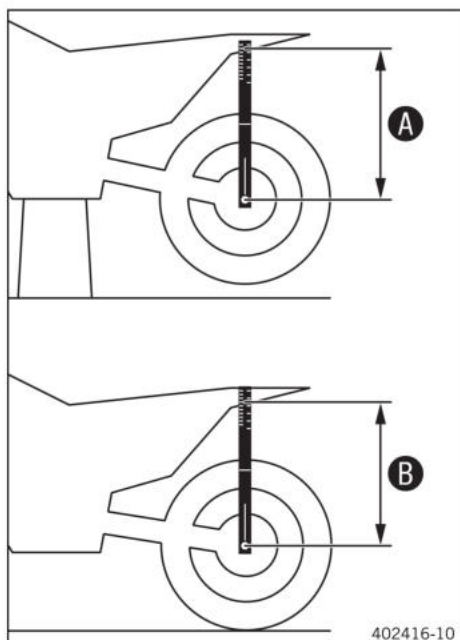
- Note down the value as dimension **A**.



Finishing work

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

9.5 Checking the static sag of the shock absorber



- Measure dimension **A** of rear wheel unloaded. (📖 p. 63)
- Hold the motorcycle upright with the aid of an assistant.
- Measure the distance again between the rear axle and marking **SAG** on the rear fender using the sag gage.
- Note down the value as dimension **B**.



Info

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

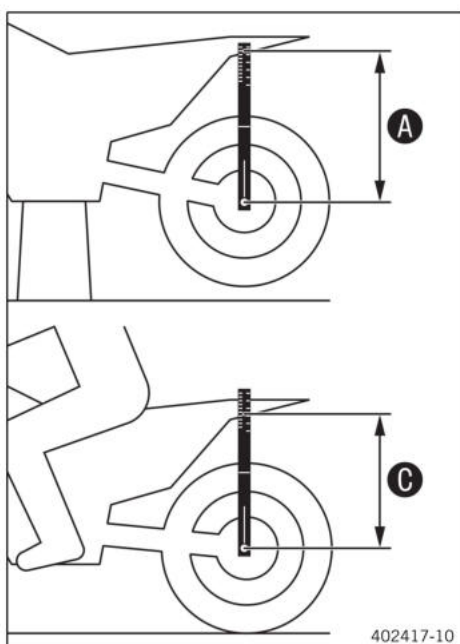
- Check the static sag.

Static sag (All EU models)	35 mm (1.38 in)
----------------------------	-----------------

Static sag (All US models)	35 mm (1.38 in)
----------------------------	-----------------

- » If the static sag is less or more than the specified value:
 - Adjust the spring preload of the shock absorber. (📖 p. 64)

9.6 Checking the riding sag of the shock absorber



- Measure dimension **A** of rear wheel unloaded. (📖 p. 63)
- 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 down the value as dimension **C**.



Info

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

- Check the riding sag.

Guideline

Riding sag (All EU models)	105 mm (4.13 in)
Riding sag (All US models)	105 mm (4.13 in)

- » If the riding sag differs from the specified measurement:
 - Adjust the riding sag. (📖 p. 65)

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.

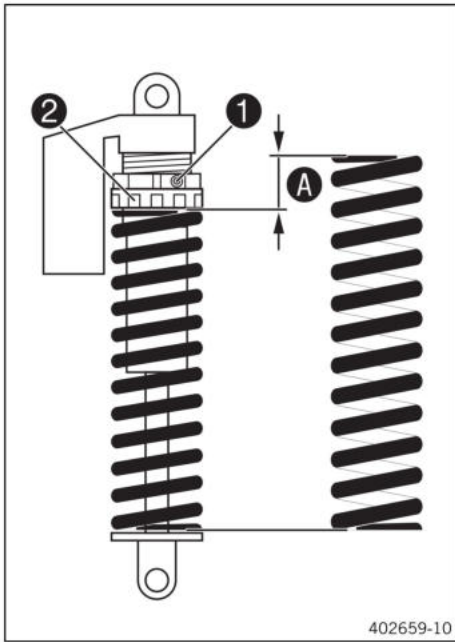


Info

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. 67)
- 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. 297)

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

Guideline

Spring preload (All EU models)	7 mm (0.28 in)
Spring preload (All US models)	6 mm (0.24 in)

i 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. 68)
- Remove the motorcycle from the lift stand. (📖 p. 12)



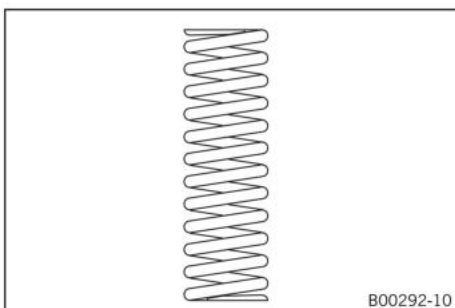
9.8 Adjusting the riding sag

Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 12)
- Remove the shock absorber. (📖 p. 67)
- After removing the shock absorber, clean it thoroughly.

Main work

- Choose and mount a suitable spring.



9 SHOCK ABSORBER, LINK FORK

Guideline

Spring rate (All EU models)	
Weight of rider: 65 ... 75 kg (143 ... 165 lb.)	36 N/mm (206 lb/in)
Weight of rider: 75 ... 85 kg (165 ... 187 lb.)	39 N/mm (223 lb/in)
Weight of rider: 85 ... 95 kg (187 ... 209 lb.)	42 N/mm (240 lb/in)
Spring rate (All US models)	
Weight of rider: 65 ... 75 kg (143 ... 165 lb.)	36 N/mm (206 lb/in)
Weight of rider: 75 ... 85 kg (165 ... 187 lb.)	39 N/mm (223 lb/in)
Weight of rider: 85 ... 95 kg (187 ... 209 lb.)	42 N/mm (240 lb/in)



Info

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

Finishing work

- Install the shock absorber. (📖 p. 68)
- Remove the motorcycle from the lift stand. (📖 p. 12)
- Check the static sag of the shock absorber. (📖 p. 63)
- Check the riding sag of the shock absorber. (📖 p. 64)
- Adjust the rebound damping of the shock absorber. (📖 p. 62)

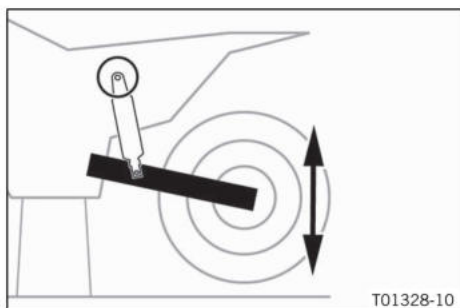
9.9 Checking the heim joint for play

Preparatory work

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

Main work

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



Finishing work

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

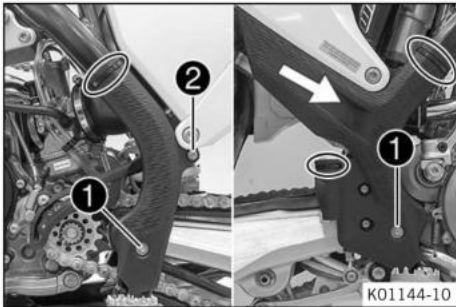
9.10 Removing the shock absorber

Preparatory work

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

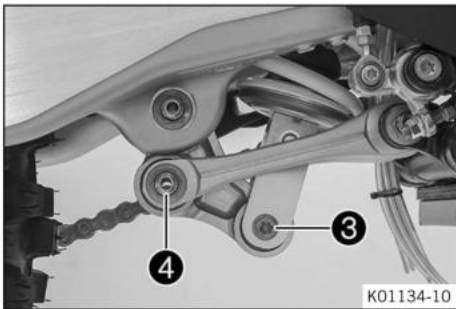
Main work

- Remove the cable ties.
- Remove screws ① with the washers.
- Remove screw ②.
- Take off the left frame protector.
- Push the right frame protector to the front and take off at the bottom.



K01144-10

- Remove screw ③.
- Remove fitting ④.



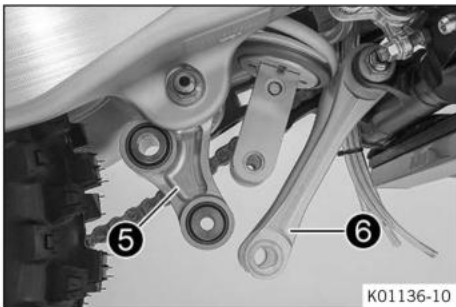
K01134-10



Info

Raise the wheel slightly to be able to remove the screws more easily.

- Press angle lever ⑤ toward the rear.
- Press linkage lever ⑥ downward.



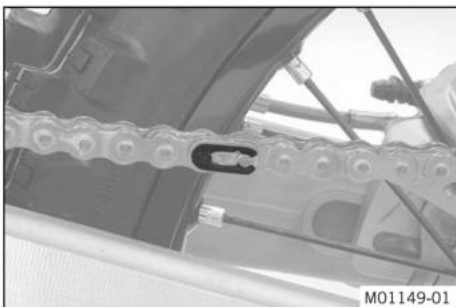
K01136-10

- Remove screws ⑦ and pull foot brake cylinder off the push rod.



K01137-10

- Remove the connecting link of the chain.
- Take off the chain.



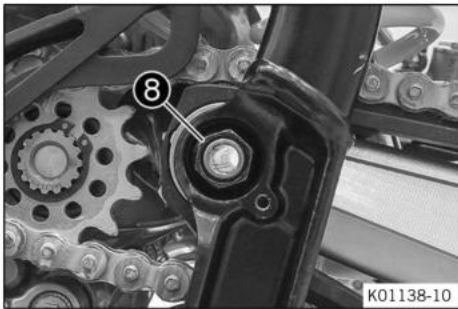
M01149-01



Info

Cover the components to protect them against damage.

9 SHOCK ABSORBER, LINK FORK



- Remove nut 8 and pull out the fork pivot.
- Push the link fork back and secure it against falling over.



- Hold the shock absorber and remove screw 9.

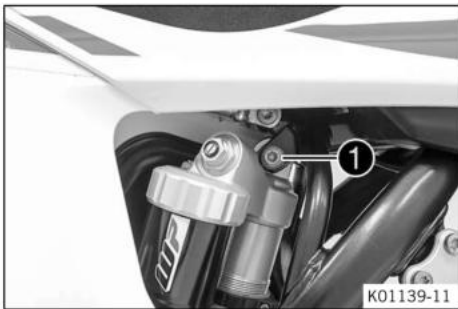


- Remove the shock absorber carefully at the bottom.

9.11 Installing the shock absorber

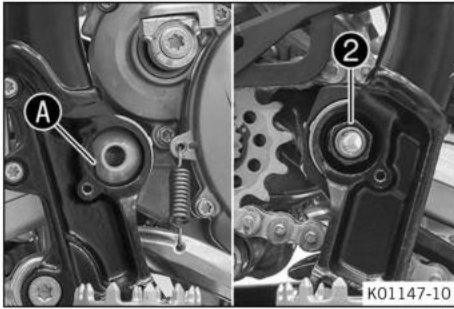


- Main work**
- Carefully position the shock absorber into the vehicle from the bottom.



- Mount and tighten screw 1.

Guideline		
Screw, top shock absorber	M10	60 Nm (44.3 lbf ft) Loctite®2701™



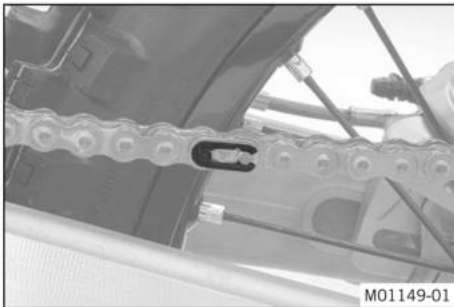
- Position link fork and mount fork pivot.

i Info
Pay attention to flat area **A**.

- Mount and tighten nut **2**.

Guideline

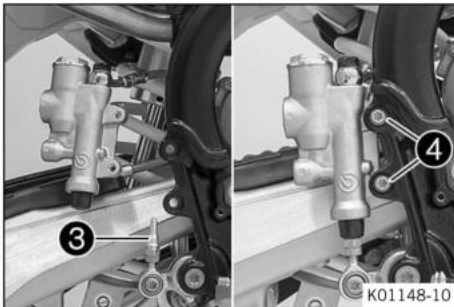
Nut, fork pivot	M16x1.5	100 Nm (73.8 lbf ft)
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- Mount the chain.
- Connect the chain with the connecting link.

Guideline

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

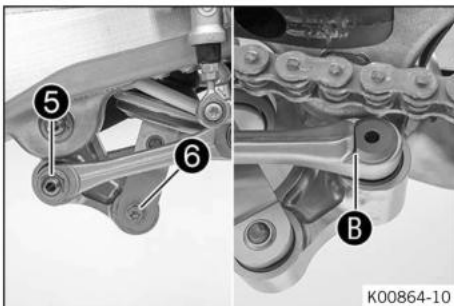


- Position the foot brake cylinder.
- ✓ Push rod **3** engages in the foot brake cylinder.
- ✓ The dust boot is correctly positioned.

- Mount and tighten screws **4**.

Guideline

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



- Position the angle lever and linkage lever.
- Mount and tighten fitting **5**.

Guideline

Nut, linkage lever on angle lever	M14x1.5	60 Nm (44.3 lbf ft)
-----------------------------------	---------	---------------------

i Info
Pay attention to flat area **B**.

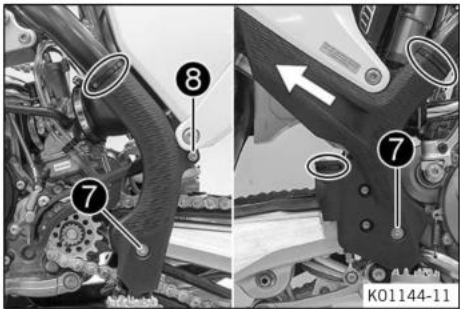
- Mount and tighten screw **6**.

Guideline

Screw, bottom shock absorber	M10	60 Nm (44.3 lbf ft) Loctite®2701™
------------------------------	-----	---

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

9 SHOCK ABSORBER, LINK FORK



- Position left frame protector.
- Insert right frame protector from below and push to the rear.
- Mount and tighten screws 7 with the washers.

Guideline

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

- Mount and tighten screw 8.

Guideline

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

- Mount the new cable ties.

Finishing work

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

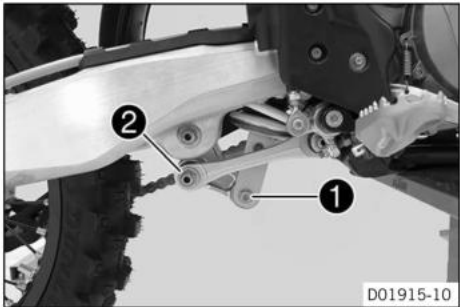
9.12 Checking the shock absorber linkage

Preparatory work

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

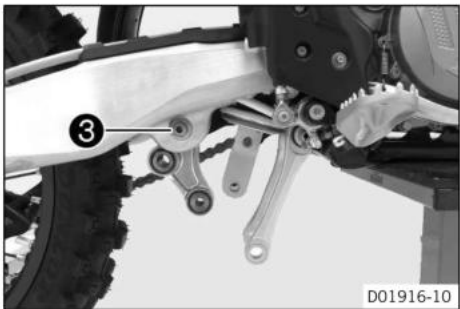
Main work

- Remove screw 1.
- Remove fitting 2.

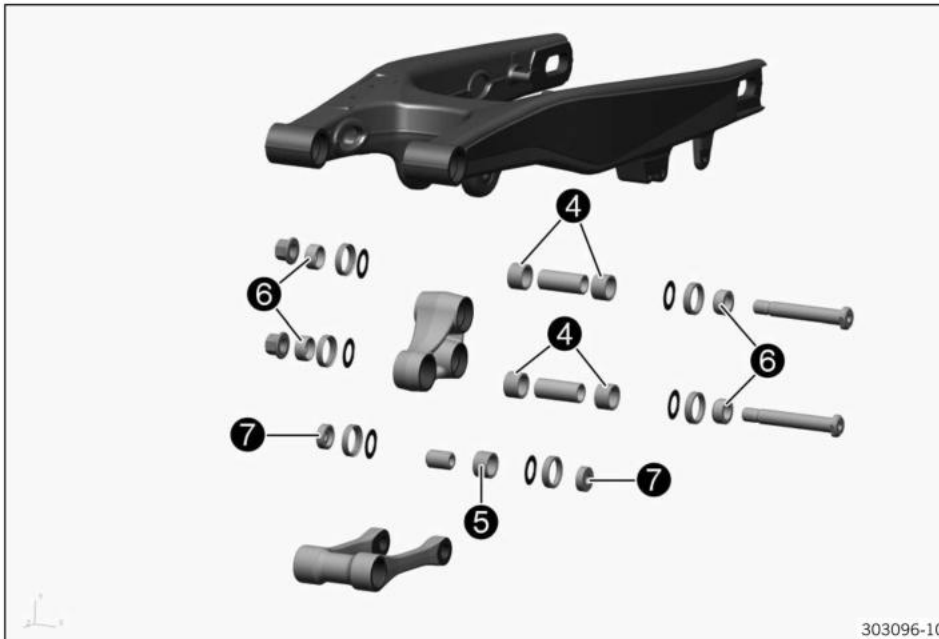


Info

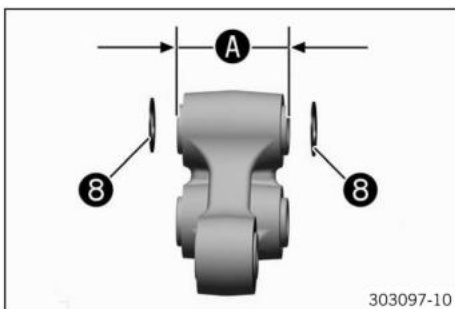
Raise the wheel slightly to be able to remove the screws more easily.



- Remove fitting 3.
- Take off the angle lever.



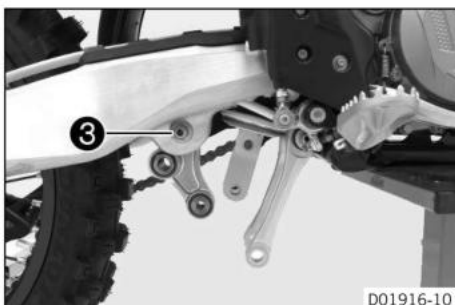
- Check needle bearings **4** and **5** for damage and wear.
 - » If there is damage or wear:
 - Change the needle bearings.
- Check spacers **6** and **7** for damage and wear.
 - » If there is damage or wear:
 - Change the spacers.
- Check the shaft seal rings for damage and wear.
 - » If there is damage or wear:
 - Change the shaft seal rings.



- Check dimension **A**.

54.91 ... 55.00 mm (2.1618 ... 2.1654 in)

- » If dimension **A** is below the specified value:
 - Add the necessary spacing washers **8**.



- Position the angle lever.
- Mount fitting **3** but do not tighten yet.

Guideline

Nut, angle lever to link fork	M14x1.5	60 Nm (44.3 lbf ft)
-------------------------------	---------	---------------------

9 SHOCK ABSORBER, LINK FORK



- Mount screw **1** but do not tighten yet.

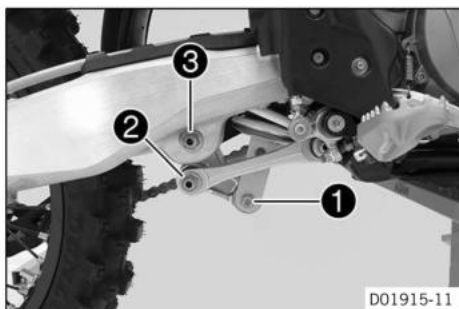
Guideline

Screw, bottom shock absorber	M10	60 Nm (44.3 lbf ft) Loctite®2701™
------------------------------	-----	---



Info

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



- Position the linkage lever.
- Mount and tighten fitting **2**.

Guideline

Nut, linkage lever on angle lever	M14x1.5	60 Nm (44.3 lbf ft)
-----------------------------------	---------	---------------------



Info

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

- Tighten screw **1**.

Guideline

Screw, bottom shock absorber	M10	60 Nm (44.3 lbf ft) Loctite®2701™
------------------------------	-----	---

- Tighten fitting **3**.

Guideline

Nut, angle lever to link fork	M14x1.5	60 Nm (44.3 lbf ft)
-------------------------------	---------	---------------------

9.13 Changing the heim joint

Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 12)
- Remove the shock absorber. (📖 p. 67)

Main work

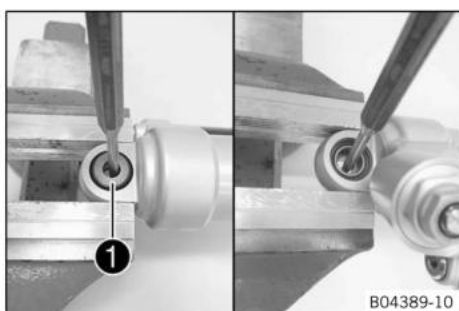
- Clamp the shock absorber into the vise.

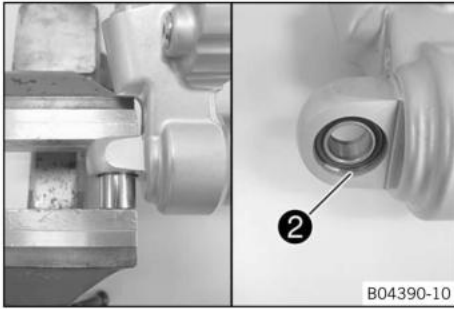
Guideline

Use soft jaws.

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

Drift (T120) (📖 p. 298)

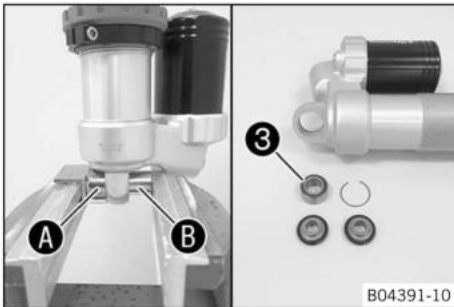




- Press the heim joint against a lock ring using the special tool.

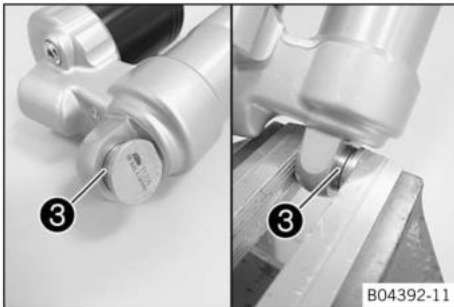
Pressing tool (T1207S) (📖 p. 299)

- Remove second lock ring ②.



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

Pressing tool (T1207S) (📖 p. 299)



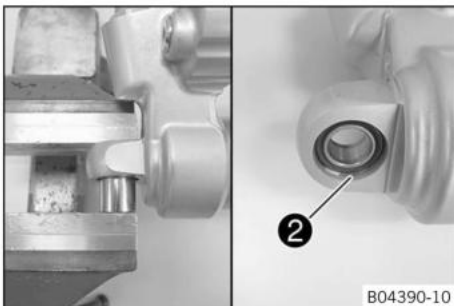
- Position the new heim joint ③ and the special tool.

Guideline

Use soft jaws.

Pressing tool (T1206) (📖 p. 298)

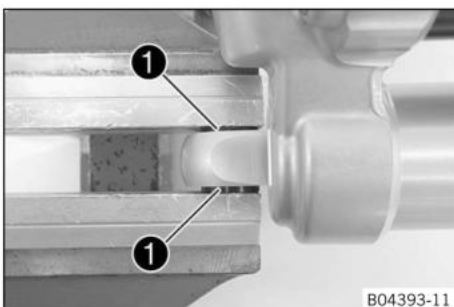
- Press the heim joint all the way in.



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

Pressing tool (T1207S) (📖 p. 299)

- Mount second lock ring ②.



- Position both collar bushings ① and press in.

Finishing work

- Install the shock absorber. (📖 p. 68)
- Remove the motorcycle from the lift stand. (📖 p. 12)

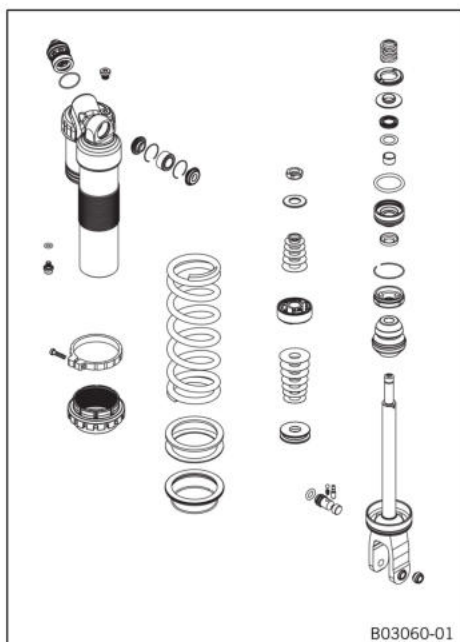
9.14 Servicing the shock absorber



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. 74)
- Disassemble the damper. (p. 75)
- Disassemble the piston rod. (p. 77)
- Disassemble the seal ring retainer. (p. 78)
- Check the damper. (p. 79)
- Remove the heim joint. (p. 80)
- Install the heim joint. (p. 81)
- Assemble the seal ring retainer. (p. 81)
- Assemble the piston rod. (p. 82)
- Assemble the damper. (p. 84)
- Install the spring. (p. 90)

9.15 Removing the spring



Condition

The shock absorber has been removed.

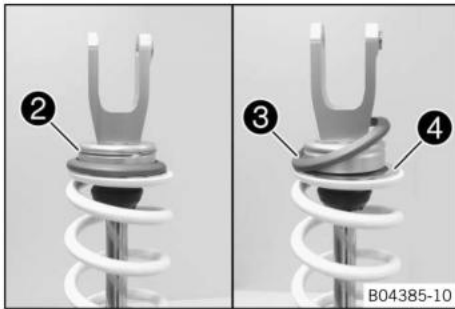
- Clamp the shock absorber into the vise.

Guideline

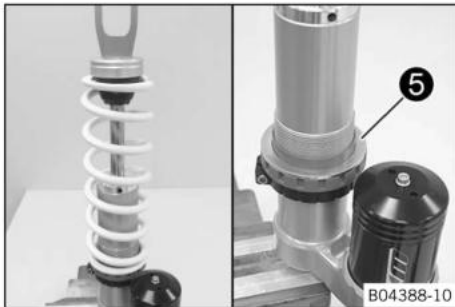
Use soft jaws.

- 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. 297)



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



- Remove the spring.
- Remove washer ⑤.

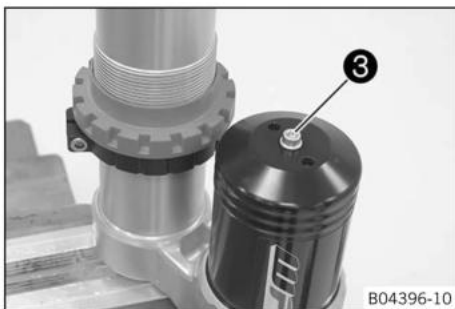
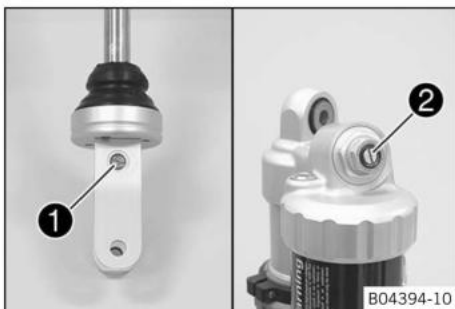
9.16 Disassembling the damper

Preparatory work

- Remove the spring. (p. 74)

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.

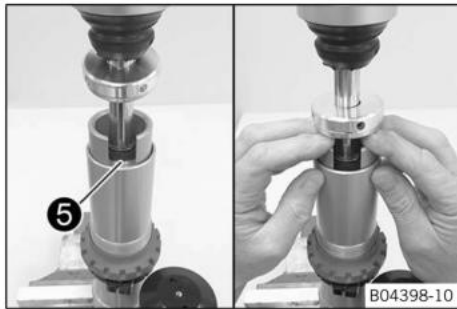


- Slowly open screw ③.
- ✓ The nitrogen pressure dissipates.
- Remove screw ③ with the O-ring.



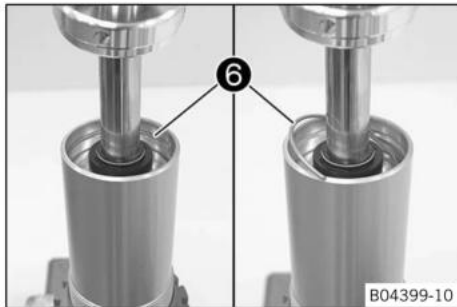
- Remove locking cap ④.

9 SHOCK ABSORBER, LINK FORK



- Press in seal ring retainer **5** using the special tool.

Pressing tool (T1216) (📖 p. 299)

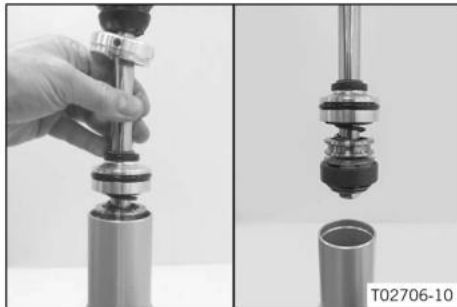


- Remove lock ring **6**.



Info

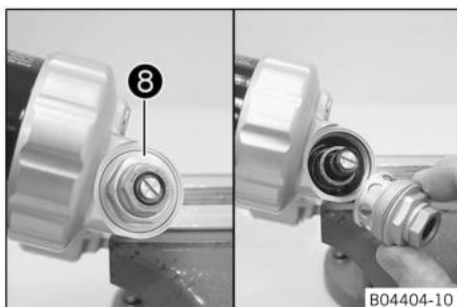
Check inner surface; do not scratch. If necessary, remove any burrs with sandpaper.



- Remove the piston rod.



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



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

9.17 Disassembling the piston rod

Preparatory work

- Remove the spring. (📖 p. 74)
- Disassemble the damper. (📖 p. 75)

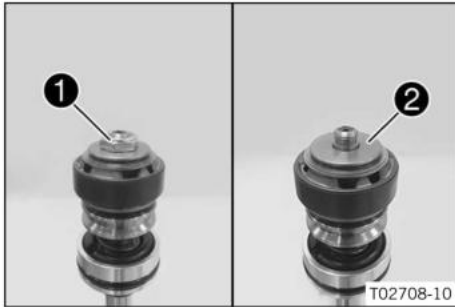
Main work

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

Guideline

Use soft jaws.

- Remove nut ①.
- Remove washer ②.

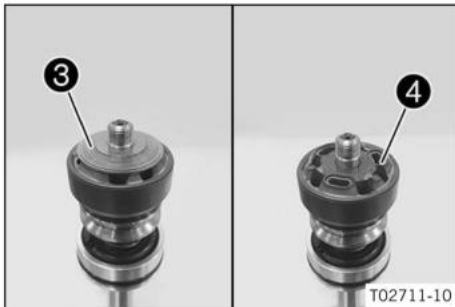


- Remove rebound shim stack ③.

**Info**

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

- Remove piston ④.



- Remove compression shim stack ⑤.

**Info**

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

- Remove rebound washer ⑥.



- Remove seal ring retainer ⑦.
- Remove locking cap ⑧ and rubber buffer ⑨.



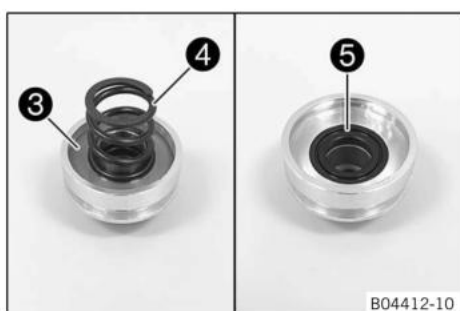
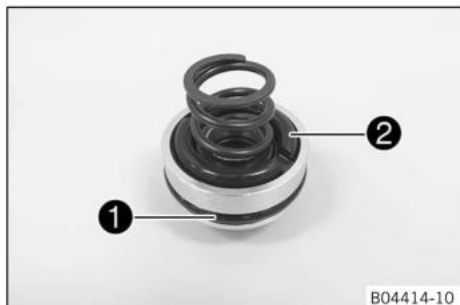
9.18 Disassembling the seal ring retainer

Preparatory work

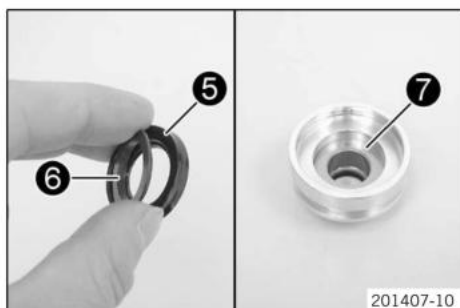
- Remove the spring. (📖 p. 74)
- Disassemble the damper. (📖 p. 75)
- Disassemble the piston rod. (📖 p. 77)

Main work

- Remove O-ring ❶.
- Remove rebound rubber ❷.



- Remove centering disk ❸ with spring ❹.
- Remove seal ring ❺.



- Remove washer ❻ from seal ring ❺.
- Remove washer ❼.
- Remove dust boot.

9.19 Changing the pilot bushing

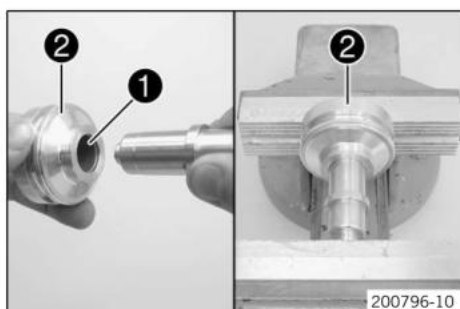
Preparatory work

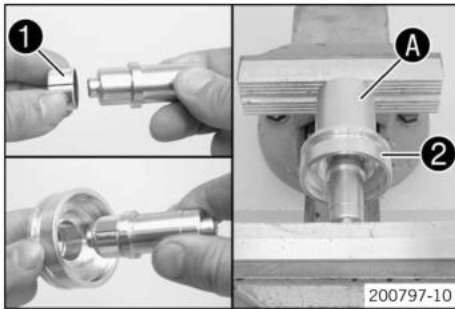
- Remove the spring. (📖 p. 74)
- Disassemble the damper. (📖 p. 75)
- Disassemble the piston rod. (📖 p. 77)
- Disassemble the seal ring retainer. (📖 p. 78)

Main work

- Press pilot bushing ❶ out of seal ring retainer ❷ with the special tool.

Pressing tool (T1504) (📖 p. 302)





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

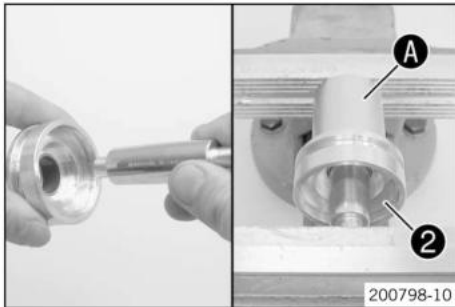
Pressing tool (T1504) (p. 302)

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

Pressing tool (T1504) (p. 302)

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

Mounting tool (T150S) (p. 302)



- Lubricate the special tool.

Shock absorber fluid (SAE 2.5) (50180751S1) (p. 287)

Calibrating unit (T1205) (p. 298)

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

Mounting tool (T150S) (p. 302)

- Press the special tool through the new pilot bushing.

Calibrating unit (T1205) (p. 298)

✓ The pilot bushing is calibrated.

Finishing work

- Assemble the seal ring retainer. (p. 81)

9.20 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	$\leq 50.08 \text{ mm } (\leq 1.9716 \text{ in})$
----------	---

- » If the measured value is greater than the specified value:
 - Change the damper cartridge.
- Check the damper cartridge for damage and wear.
 - » If there is damage or wear:
 - Change the damper cartridge.
- Check the heim joint for damage and wear.
 - » If there is damage or wear:
 - Change the heim joint.

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- 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 less than the specified value:
 - Change the piston rod.

- Measure the run-out of the piston rod.

Piston rod	
Run-out	$\leq 0.02 \text{ mm } (\leq 0.0008 \text{ in})$

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

- Check the piston rod for damage and wear.

- » If there is damage or wear:
 - Change the piston rod.

- Check the piston rings for damage and wear.

- » If damage or a bronze-colored surface is visible:
 - Change the piston.



9.21 Removing the heim joint

Condition

The shock absorber has been removed.

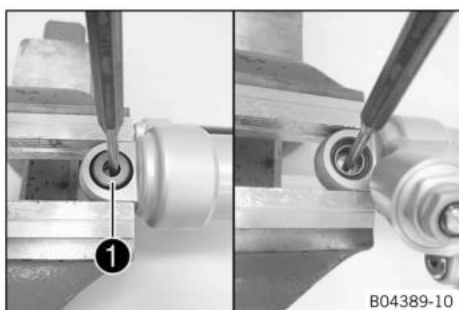
- Clamp the shock absorber into the vise.

Guideline

Use soft jaws.

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

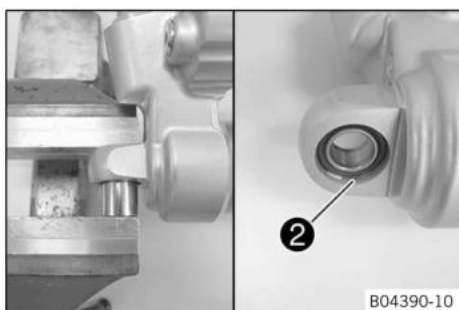
Drift (T120) (📖 p. 298)

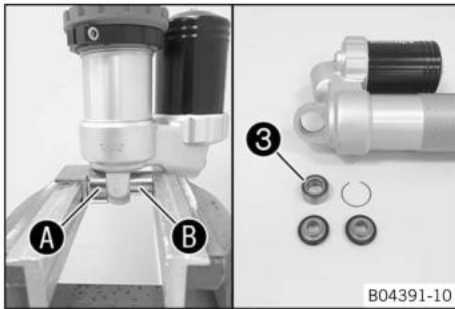


- Press the heim joint against a lock ring using the special tool.

Pressing tool (T1207S) (📖 p. 299)

- Remove second lock ring ②.

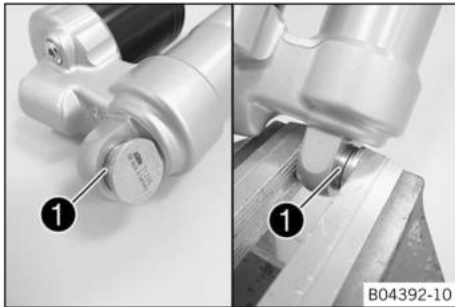




- Place special tool **A** underneath and press out heim joint **3** using special tool **B**.

Pressing tool (T1207S) (p. 299)

9.22 Installing the heim joint



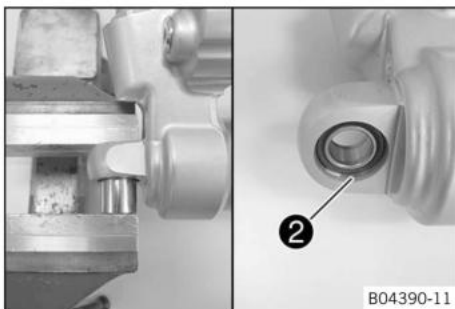
- Position new heim joint **1** and the special tool in the bench vise.

Guideline

Use soft jaws.

Pressing tool (T1206) (p. 298)

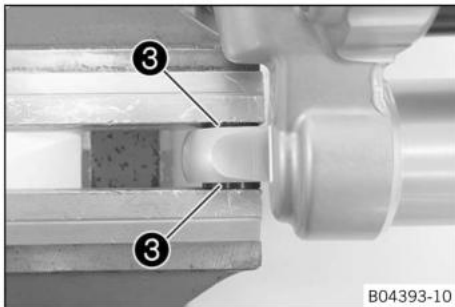
- Press the heim joint all the way in.



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

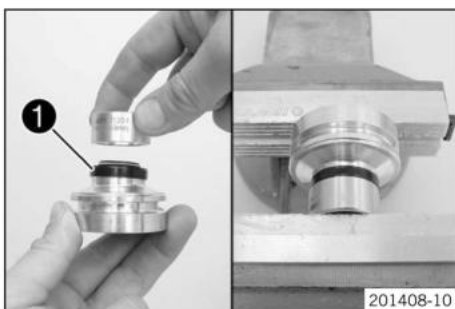
Pressing tool (T1207S) (p. 299)

- Mount second lock ring **2**.



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

9.23 Assembling seal ring retainer



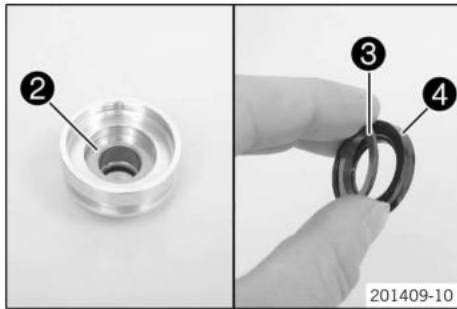
- Mount dust boot **1** with the special tool.

Mounting sleeve (T1204) (p. 298)

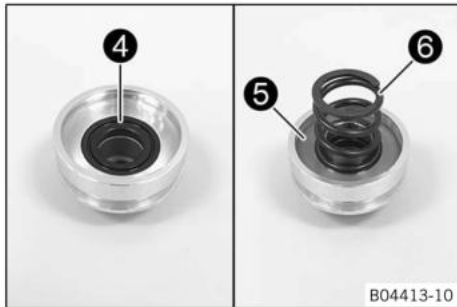
- Grease the sealing lip of the dust boot.

Lubricant (T625) (p. 288)

9 SHOCK ABSORBER, LINK FORK



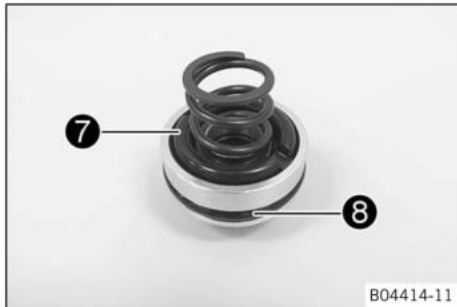
- Mount washer ②.
- Position washer ③ on seal ring ④.



- Grease seal ring ④ and mount with the washer facing downward.

Lubricant (T14034) (p. 288)

- Mount centering disk ⑤ with spring ⑥.



- Mount rebound rubber ⑦.
- Grease the O-ring groove.

Lubricant (T158) (p. 288)

- Mount O-ring ⑧.

9.24 Assembling the piston rod

Preparatory work

- Assemble the seal ring retainer. (p. 81)

Main work

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

Guideline

Use soft jaws.

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

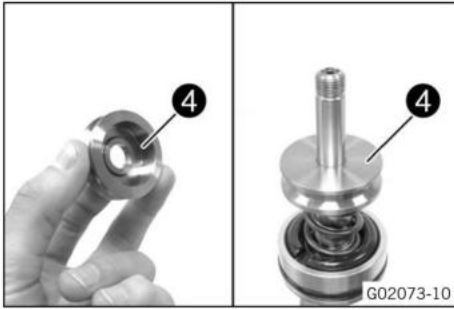
Mounting sleeve (T1515) (p. 302)

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

Lubricant (T625) (p. 288)

- Remove the special tool.





- Mount rebound washer ④ with cut-out facing down.



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



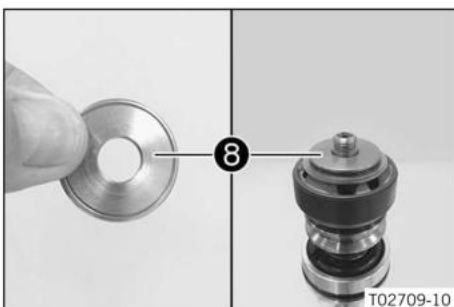
- Mount piston ⑥.

Guideline

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

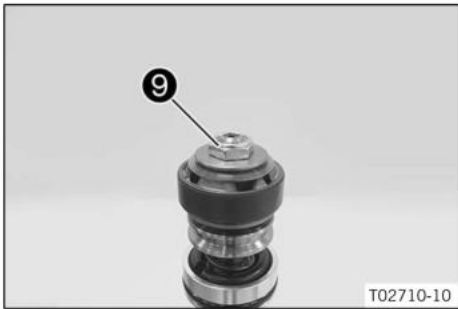


- Mount rebound shim stack ⑦ with the smaller washers facing upward.



- Mount washer ⑧ with the groove facing downward.

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- Lubricate the thread of the piston rod.

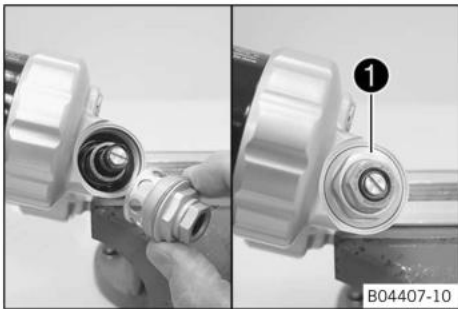
Lubricant (T152) (p. 288)

- Mount and tighten nut 9.

Guideline

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

9.25 Assembling the damper



Preparatory work

- Assemble the seal ring retainer. (p. 81)
- Assemble the piston rod. (p. 82)

Main work

- Lubricate the O-rings of the compression adjuster.

Lubricant (T158) (p. 288)

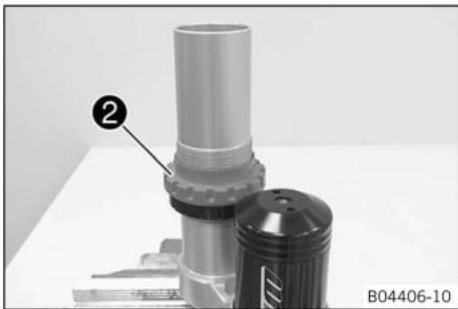
- Lubricate the thread.

Lubricant (T159) (p. 289)

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

Guideline

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



- Clamp the damper in a bench vise.

Guideline

Use soft jaws.

- Mount adjusting ring 2 with the clamping ring.



Info

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



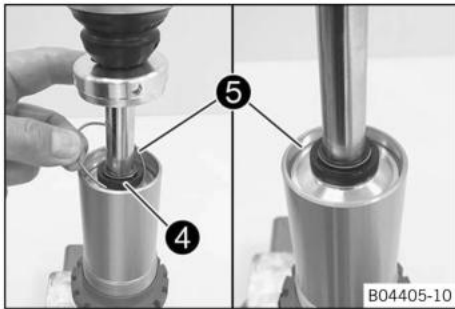
- Fill the damper cartridge about half full.

Shock absorber fluid (SAE 2.5) (50180751S1) (p. 287)

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

Lubricant (T158) (p. 288)

- Mount the piston rod carefully.



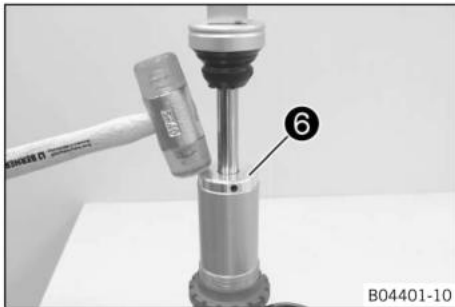
- Mount seal ring retainer **4** and slide it under the ring groove.
- Mount lock ring **5**.



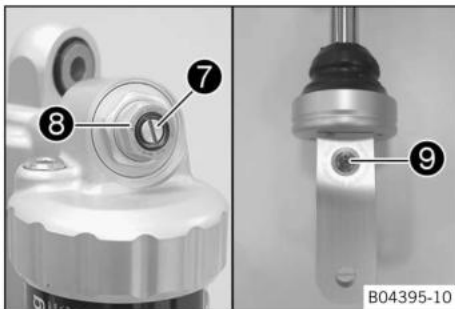
Info

Do not scratch the inside surface.

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



- Mount locking cap **6** of the damper cartridge.
- Bleed and fill the damper. (p. 86)
- Fill the damper with nitrogen. (p. 89)



Alternative 1

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

Guideline

Lowspeed compression damping	
Comfort	17 clicks
Standard	15 clicks
Sport	13 clicks

- Turn adjusting screw **8** all the way clockwise with a socket wrench.
- Turn counterclockwise by the number of turns corresponding to the shock absorber type.

Guideline

Highspeed compression damping	
Comfort	2 turns
Standard	1.5 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	17 clicks
Standard	15 clicks
Sport	13 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.

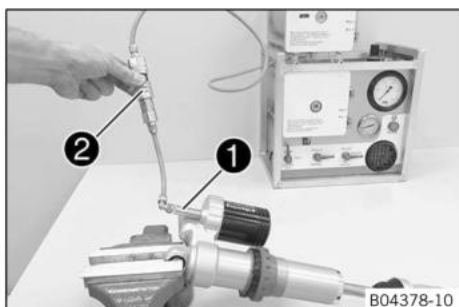
9.26 Bleeding and filling the damper



Info

Before working with the vacuum pump, carefully read the operating manual included with the vacuum pump.

Open the adjusters of the rebound and compression damping completely.



- Clamp the damper as shown.

Guideline

Use soft jaws.



Info

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

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

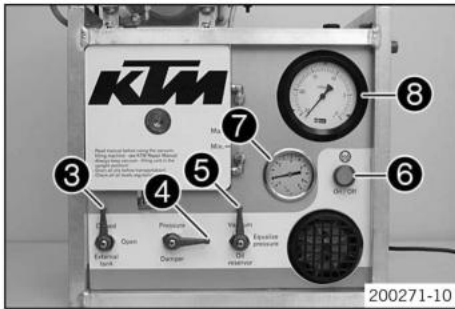


Info

Hand-tighten only without using a tool.

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

Vacuum pump (T1240S) (p. 299)



- 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

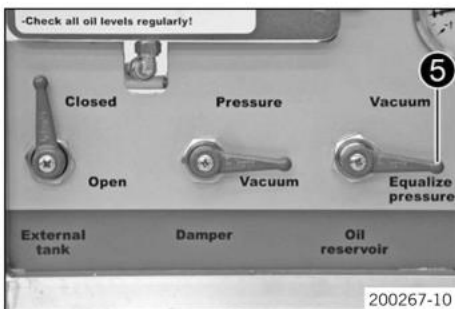
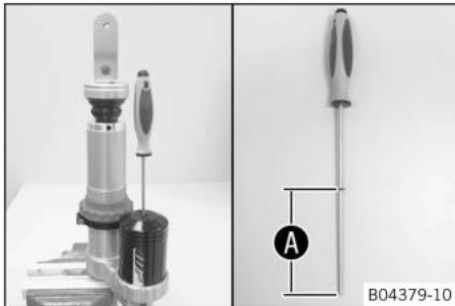
- ✓ Vacuum gauge ⑧ drops to the required value.

4 mbar

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

Depth micrometer (T107S) (p. 297)

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



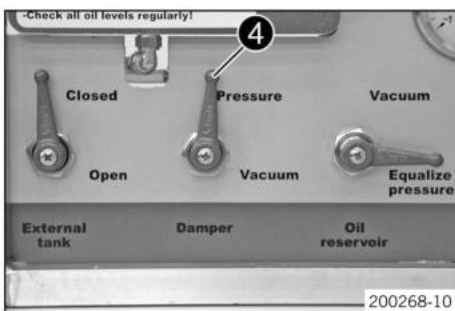
- When the vacuum gauge reaches the required value, turn control lever **Oil reservoir** ⑤ to **Equalize pressure**.

Guideline

4 mbar

- ✓ The pressure gauge increases to the required value.

0 bar



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

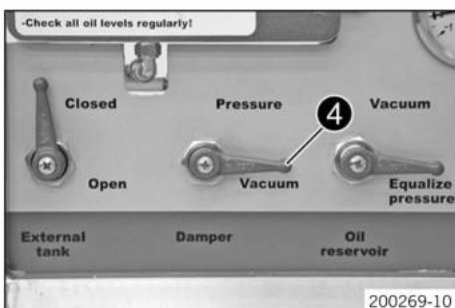
Guideline

0 bar

- ✓ Oil is pumped into the damper.

- ✓ The pressure gauge increases to the required value.

3 bar



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

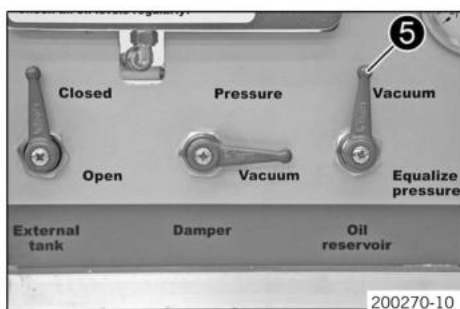
Guideline

3 bar

- ✓ The pressure gauge drops to the required value.

0 bar

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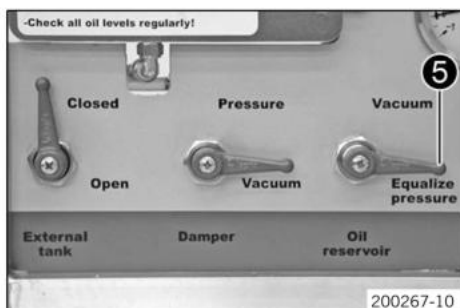
- When the pressure gauge reaches the specified value, turn control lever **Oil reservoir 5** to **Vacuum**.

Guideline

0 bar

- ✓ The vacuum gauge drops to the required value.

4 mbar



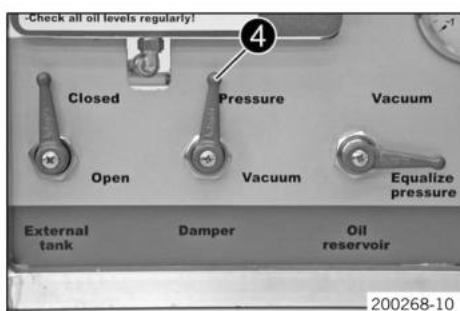
- When the vacuum gauge reaches the required value, turn control lever **Oil reservoir 5** to **Equalize Pressure**.

Guideline

4 mbar

- ✓ The pressure gauge drops to the required value.

0 bar



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

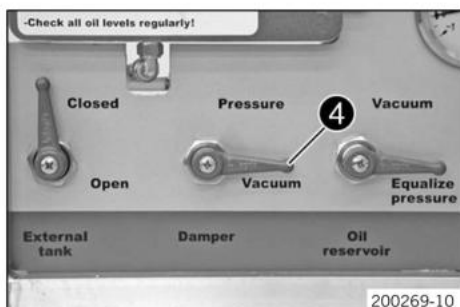
Guideline

0 bar

- ✓ Oil is pumped into the damper.

- ✓ The pressure gauge increases to the required value.

3 bar



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

Guideline

3 bar

- ✓ The pressure gauge drops to the required value.

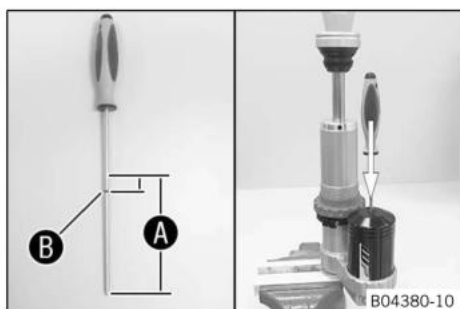
0 bar

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

Guideline

0 bar

- ✓ The vacuum pump is switched off.



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

Guideline

5 mm

Depth micrometer (T107S) (p. 297)

- 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 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.



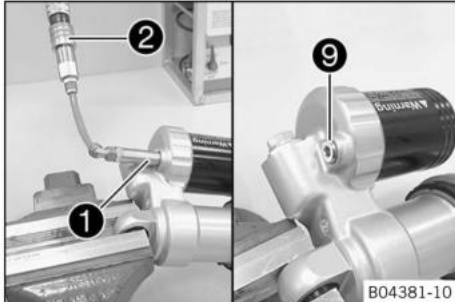
Info

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

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

Guideline

Screw, filling port	M10x1	14 Nm (10.3 lbf ft)
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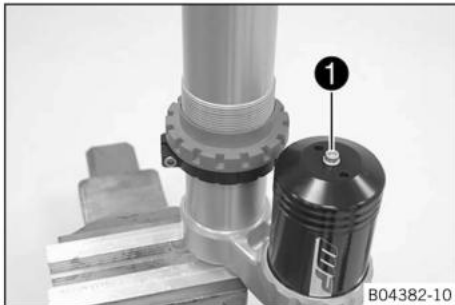
9.27 Filling damper with nitrogen

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



Info

The piston rod is fully extended.



- Fix the special tool in the vise.

Filling tool (T170S1) (📖 p. 303)
Filling adapter (T1296) (📖 p. 299)

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

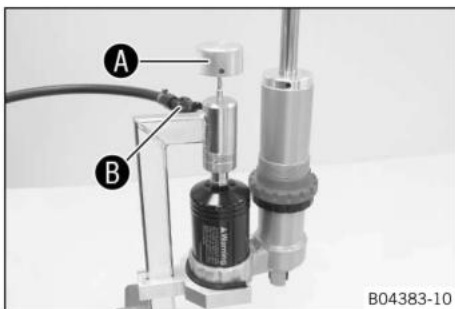
- Position the damper in the special tool.

✓ 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)
--------------	------------------



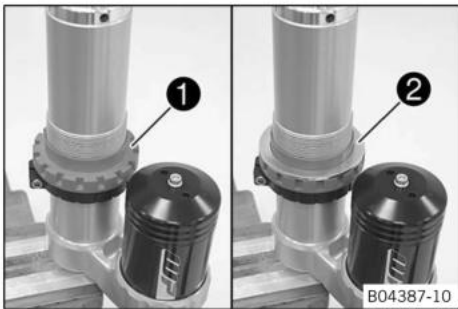
**Info**

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

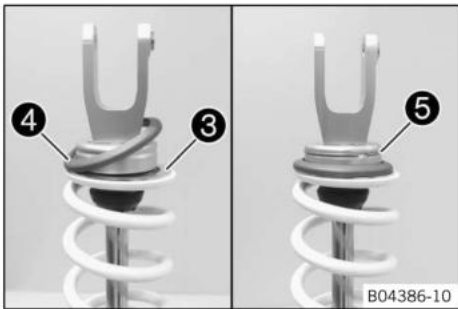
- Screw the filling port shut with tap handle **A**.
- Close spigot **B** and take the damper out of the special tool.
- Tighten the filling port screw.

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

9.28 Installing the spring (All EU models)



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



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

Guideline	
Spring rate	
Weight of rider: 65 ... 75 kg (143 ... 165 lb.)	36 N/mm (206 lb/in)
Weight of rider: 75 ... 85 kg (165 ... 187 lb.)	39 N/mm (223 lb/in)
Weight of rider: 85 ... 95 kg (187 ... 209 lb.)	42 N/mm (240 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	7 mm (0.28 in)
Hook wrench (90129051000) (📖 p. 297)	

Alternative 2



Warning

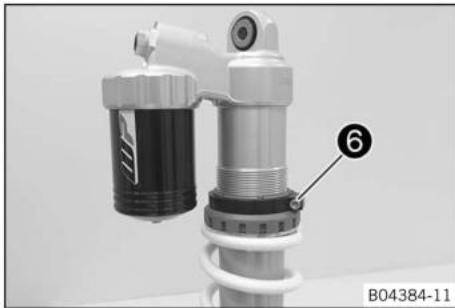
Danger of accident Modifications to the suspension setting may seriously alter the handling characteristic.

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. 297)

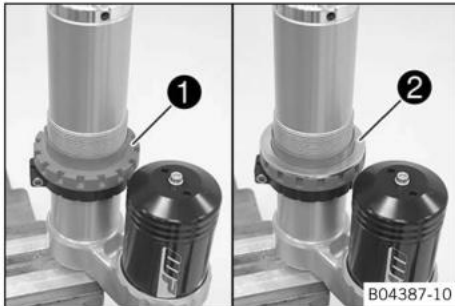


- Tighten screw (6).

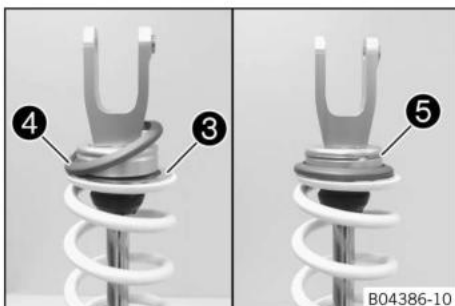
Guideline

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

9.29 Installing the spring (All US models)



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



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

Guideline

Spring rate	
Weight of rider: 65 ... 75 kg (143 ... 165 lb.)	36 N/mm (206 lb/in)
Weight of rider: 75 ... 85 kg (165 ... 187 lb.)	39 N/mm (223 lb/in)
Weight of rider: 85 ... 95 kg (187 ... 209 lb.)	42 N/mm (240 lb/in)

- Mount washer (3).

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- 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	6 mm (0.24 in)
Hook wrench (90129051000) (📖 p. 297)	

Alternative 2



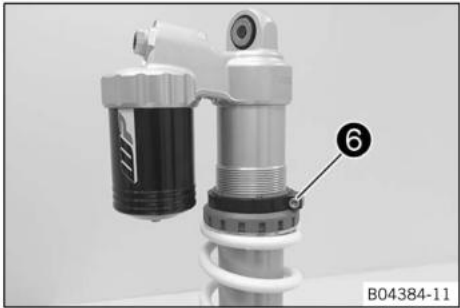
Warning

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. 297) | | |
|--------------------------------------|--|--|



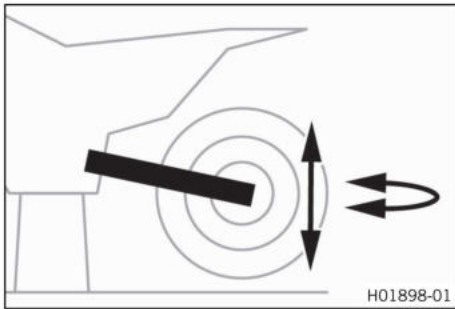
- Tighten screw ⑥.
- Guideline

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

9.30 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 fork bearing. (📖 p. 97)
- Move the link fork from one side to the other.
 - » If there is detectable play:
 - Change the fork bearing. (📖 p. 97)

Finishing work

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



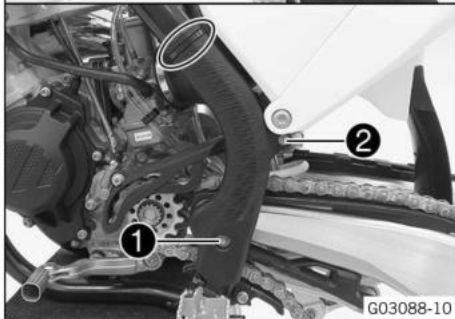
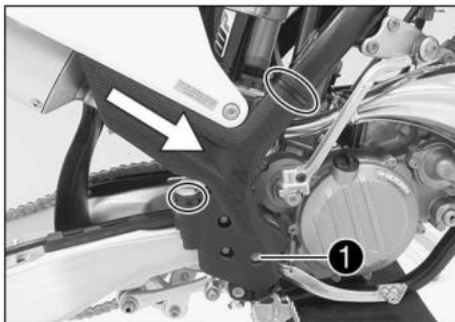
9.31 Removing the link fork

Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 12)
- Remove the rear wheel. (📖 p. 120)

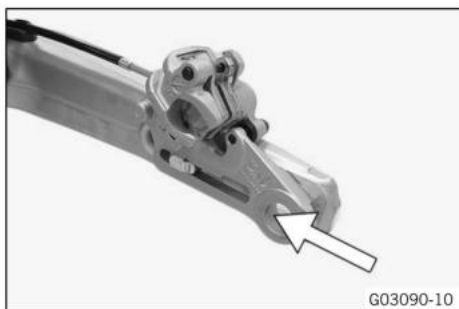
Main work

- Remove the cable ties.
- Remove screws ① with the washers.
- Remove screw ②.
- Push the right frame protector to the front and take off at the bottom.
- Take off the left frame protector.

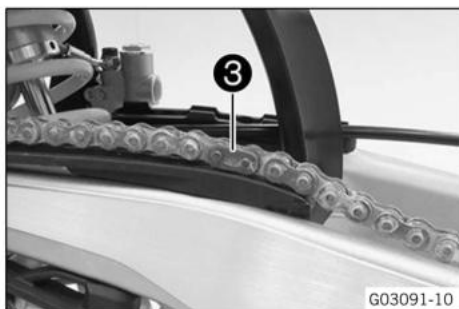


- Take the brake line out of the guide.

9 SHOCK ABSORBER, LINK FORK



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

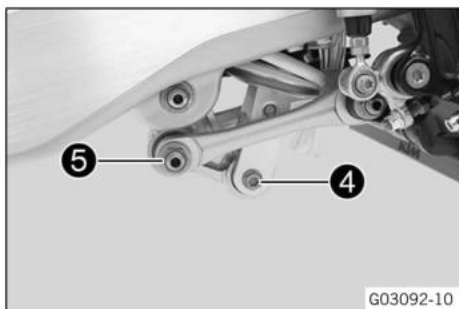


- Remove connecting link ③ of the chain.
- Take off the chain.



Info

Cover the components to protect them against damage.

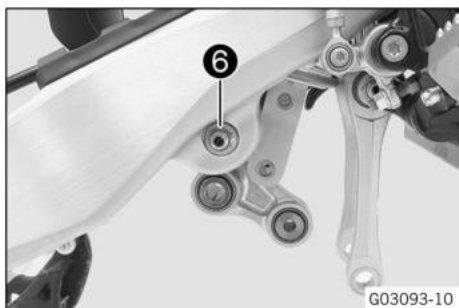


- Remove screw ④.
- Remove fitting ⑤.



Info

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



- Remove fitting ⑥.
- Take off the angle lever.

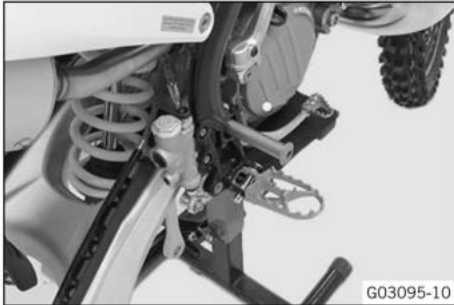


- Remove nut ⑦.



- Remove the fork pivot.
- Take off the link fork.

9.32 Installing the link fork



Main work

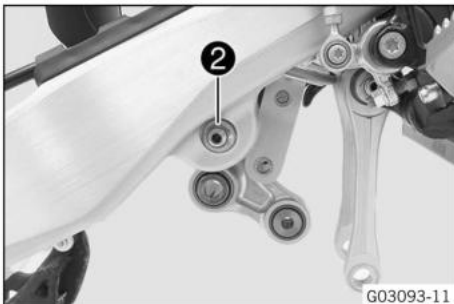
- Position the link fork.
- Mount the fork pivot.



- Mount and tighten nut ①.

Guideline

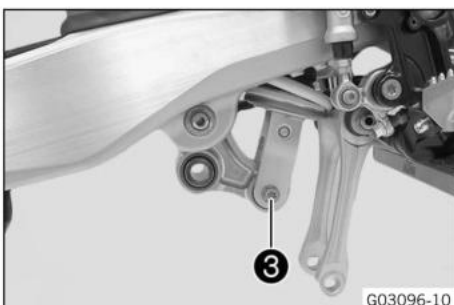
Nut, fork pivot	M16x1.5	100 Nm (73.8 lbf ft)
-----------------	---------	-------------------------



- Position the angle lever.
- Mount fitting ② but do not tighten yet.

Guideline

Nut, angle lever to link fork	M14x1.5	60 Nm (44.3 lbf ft)
-------------------------------	---------	---------------------



- Mount screw ③ but do not tighten yet.

Guideline

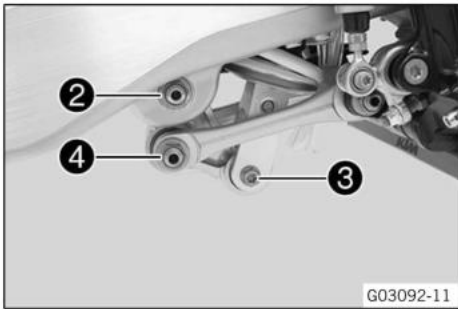
Screw, bottom shock absorber	M10	60 Nm (44.3 lbf ft) Loctite®2701™
------------------------------	-----	---



Info

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

9 SHOCK ABSORBER, LINK FORK



- Position the linkage lever.
- Mount and tighten fitting ④.

Guideline

Nut, linkage lever on angle lever	M14x1.5	60 Nm (44.3 lbf ft)
-----------------------------------	---------	---------------------



Info

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

- Tighten screw ③.

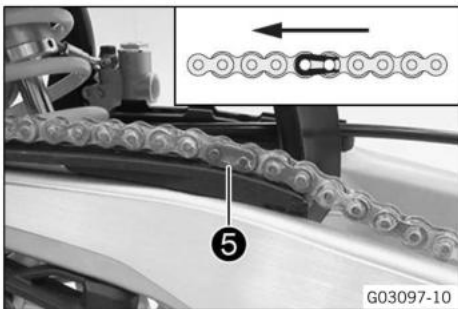
Guideline

Screw, bottom shock absorber	M10	60 Nm (44.3 lbf ft) Loctite®2701™
------------------------------	-----	---

- Tighten fitting ②.

Guideline

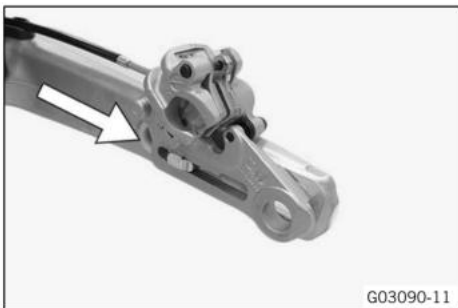
Nut, angle lever to link fork	M14x1.5	60 Nm (44.3 lbf ft)
-------------------------------	---------	---------------------



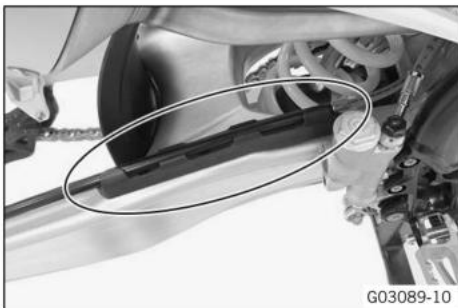
- Mount the chain.
- Connect the chain with connecting link ⑤.

Guideline

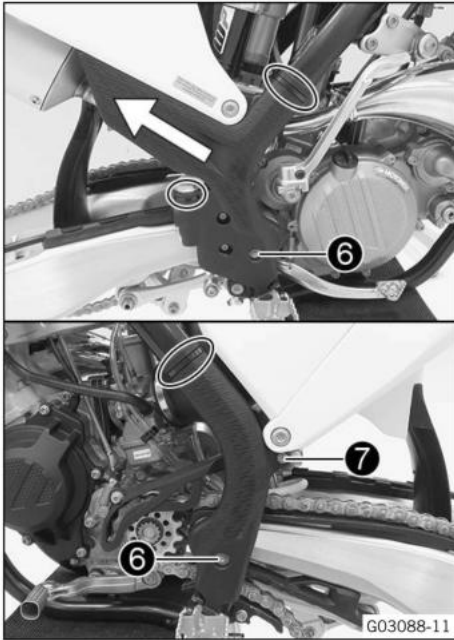
The closed side of the chain joint lock must face in the direction of travel.



- 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 **6** with the washers.

Guideline

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

- Mount and tighten screw **7**.

Guideline

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

- Mount the cable ties.

Finishing work

- Install the rear wheel. (📖 p. 121)
- Check the chain tension. (📖 p. 125)
- Remove the motorcycle from the lift stand. (📖 p. 12)

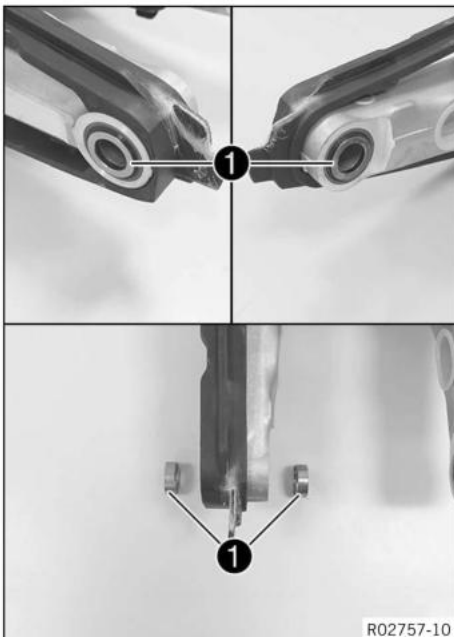
9.33 Changing the fork bearing

Preparatory work

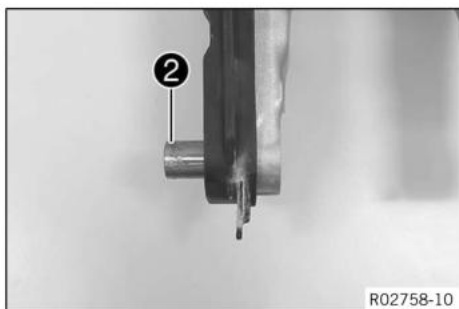
- Raise the motorcycle with a lift stand. (📖 p. 12)
- Remove the rear wheel. (📖 p. 120)
- Remove the link fork. (📖 p. 93)

Left fork bearing

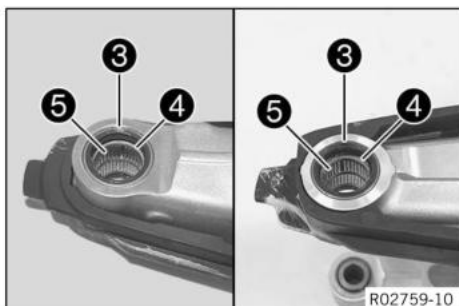
- Remove collar bushings **1**.



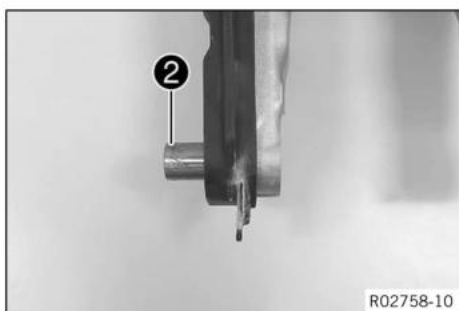
9 SHOCK ABSORBER, LINK FORK



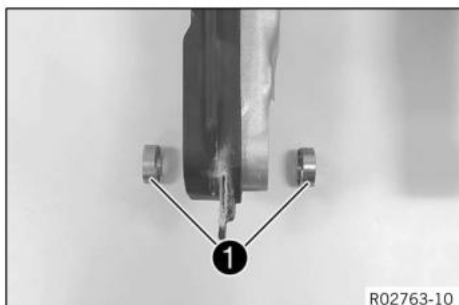
- Remove bushing ②.



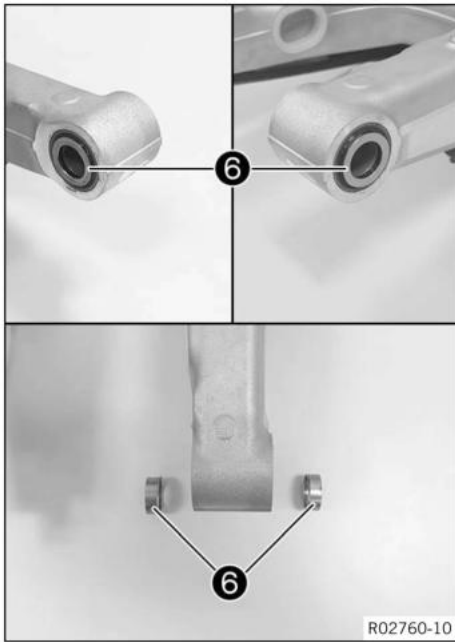
- Remove shaft seal rings ③ using a suitable tool.
- Remove stop disks ④.
- Press out bearing ⑤ using a suitable tool.
- Using a suitable tool, press in new bearing ⑤.
- Position the stop disks ④.
- Press in shaft seal rings ③.



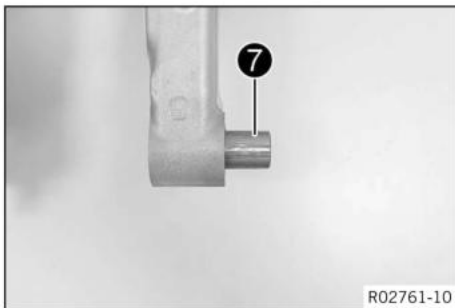
- Mount bushing ②.



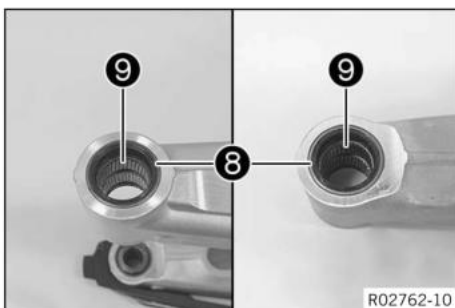
- Grease the shaft seal rings.
Long-life grease (📖 p. 288)
- Position the collar bushings ① with the shoulder facing inward.

**Right fork bearing**

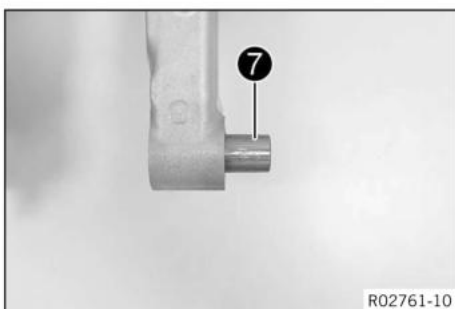
- Remove collar bushings ⑥.



- Remove bushing ⑦.

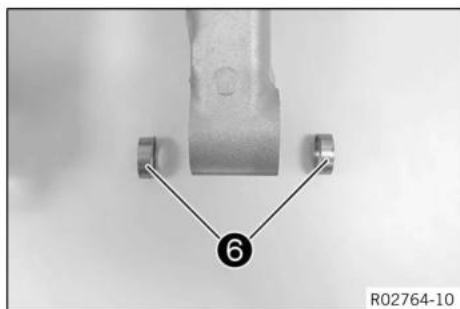


- Remove shaft seal rings ⑧ using a suitable tool.
- Press out bearing ⑨ using a suitable tool.
- Using a suitable tool, press in new bearing ⑨.
- Press in shaft seal rings ⑧.



- Mount bushing ⑦.

9 SHOCK ABSORBER, LINK FORK



- Grease the shaft seal rings.

Long-life grease (📖 p. 288)

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

Finishing work

- Install the link fork. (📖 p. 95)
- Install the rear wheel. (📖 p. 121)
- Check the chain tension. (📖 p. 125)
- Remove the motorcycle from the lift stand. (📖 p. 12)

9.34 Checking the link fork



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



Info

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

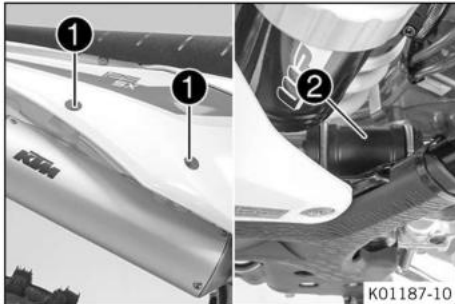
10.1 Removing the main silencer



Warning

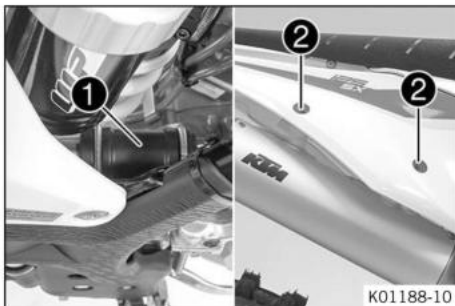
Danger of burns The exhaust system gets very hot when the vehicle is driven.

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



- Remove screws **1** with the washers.
- Pull off the main silencer from the manifold at rubber sleeve **2**.

10.2 Installing the main silencer



- Position the main silencer in rubber sleeve **1**.
- Mount and tighten screws **2** with the washers.

Guideline

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

10.3 Changing the glass fiber yarn filling in the main silencer



Warning

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

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

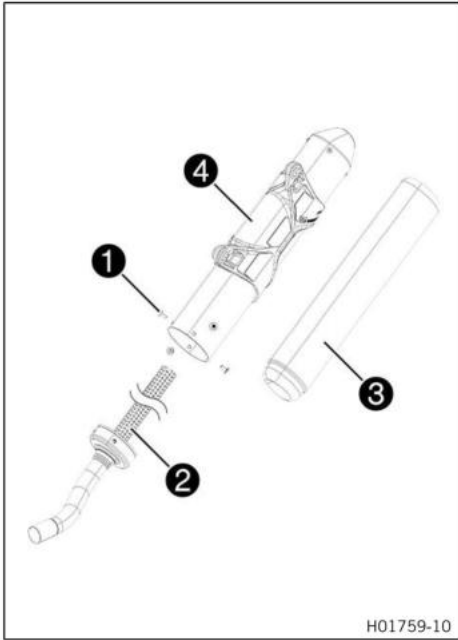


Info

Over time, the fibers of the rock wool escape into the air, and the main silencer "burns out". Not only is the noise level higher, the performance characteristic changes.

Preparatory work

- Remove the main silencer. (📖 p. 101)



Main work

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

Guideline

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

Finishing work

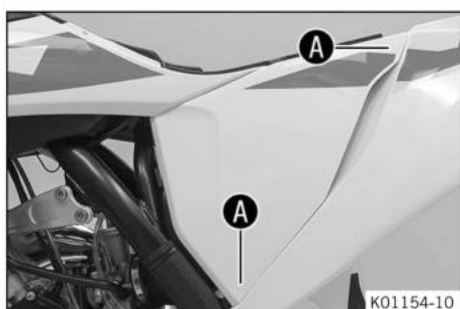
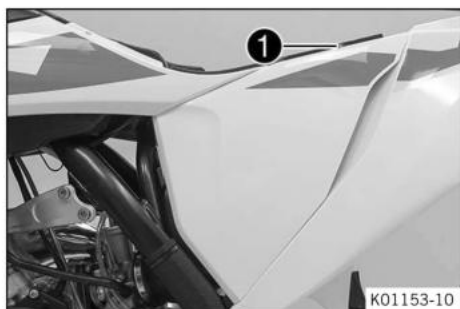
- Install the main silencer. (p. 101)

11.1 Removing the air filter box cover

Condition

The air filter box cover is secured.

- Remove the seat. (📖 p. 108)
- Remove screw ❶.



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

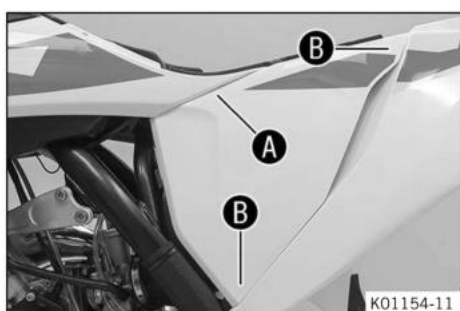


Condition

The air filter box cover is not secured.

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

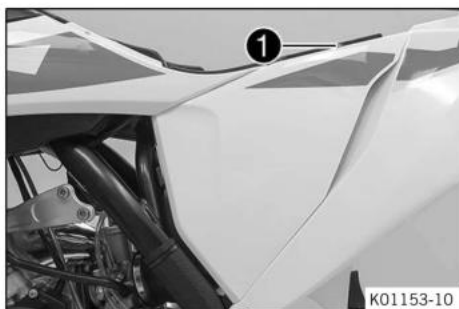
11.2 Installing the air filter box cover



Condition

The air filter box cover is secured.

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

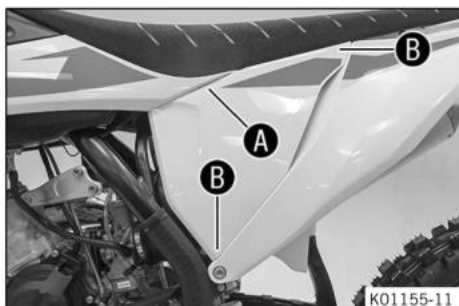


- Mount and tighten screw ①.

Guideline

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

- Mount the seat. (📖 p. 108)



Condition

The air filter box cover is not secured.

- Insert the air filter box cover in area ① and clip it into area ②.

11.3 Removing the air filter

Note

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

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



Note

Environmental hazard Hazardous substances cause environmental damage.

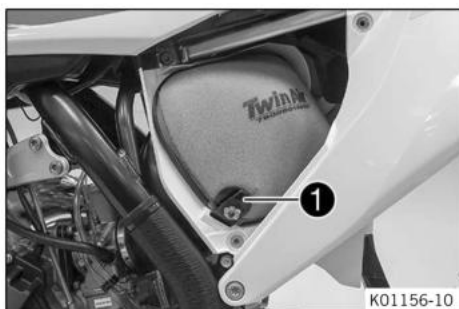
- Dispose of oils, grease, filters, fuel, cleaning agents, brake fluid, etc., correctly and in compliance with the applicable regulations.

Preparatory work

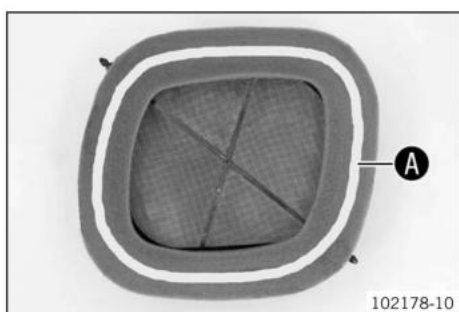
- Remove the air filter box cover. (📖 p. 103)

Main work

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



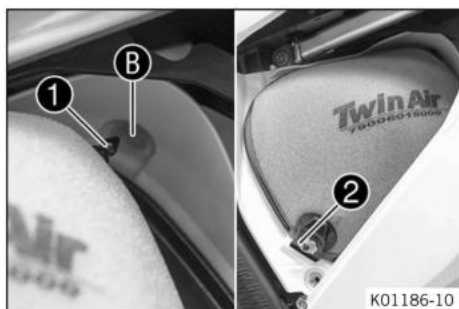
11.4 Installing the air filter



Main work

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

Long-life grease (📖 p. 288)



- Insert the air filter and position the top retaining pin **1** in bushing **B**.
- ✓ The air filter is correctly positioned.
- Secure the bottom retaining pin with holding 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. 103)

11.5 Cleaning the air filter and air filter box



Note

Environmental hazard Hazardous substances cause environmental damage.

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



Info

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

Preparatory work

- Remove the air filter box cover. (📖 p. 103)
- Remove the air filter. (📖 p. 104)

Main work

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

Air filter cleaner (📖 p. 288)

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. 289)

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



Finishing work

- Install the air filter. (📖 p. 105)
- Install the air filter box cover. (📖 p. 103)

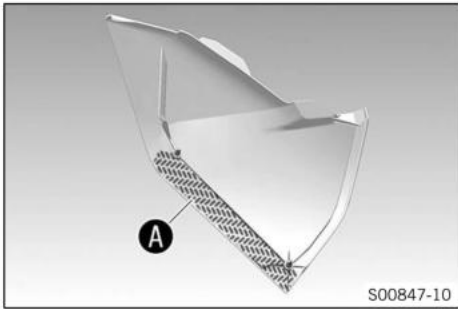
11.6 Sealing the air filter box

Preparatory work

- Remove the air filter box cover. (📖 p. 103)

Main work

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



Finishing work

- Install the air filter box cover. (📖 p. 103)

11.7 Preparing air filter box cover for securing

Preparatory work

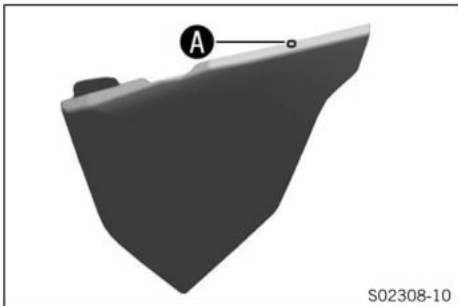
- Remove the air filter box cover. (📖 p. 103)

Main work

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

Guideline

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



Finishing work

- Install the air filter box cover. (📖 p. 103)

12.1 Opening fuel tank filler cap



Danger

Fire hazard Fuel is highly flammable.

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

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



Warning

Danger of poisoning Fuel is poisonous and a health hazard.

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



Note

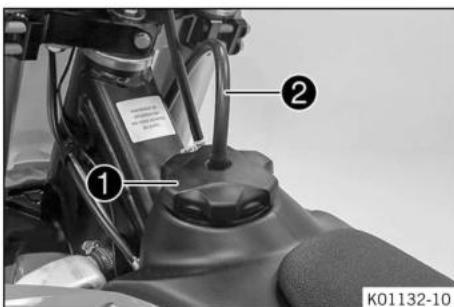
Environmental hazard Improper handling of fuel is a danger to the environment.

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



- Turn fuel tank filler cap ① counterclockwise and lift it off.

12.2 Closing the fuel tank filler cap



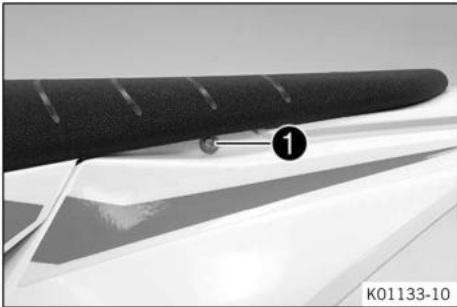
- Mount fuel tank filler cap ① and turn it clockwise until the fuel tank is tightly closed.



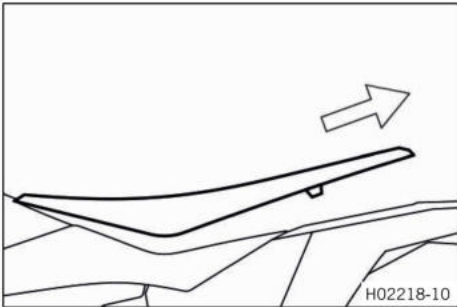
Info

Route fuel tank breather hose ② without kinks.

12.3 Removing the seat

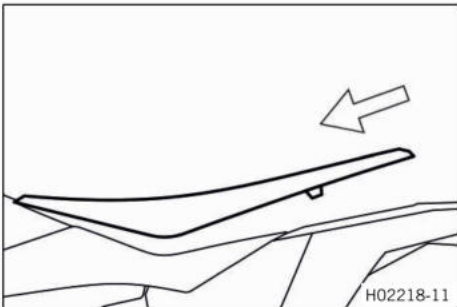


- Remove screw 1.

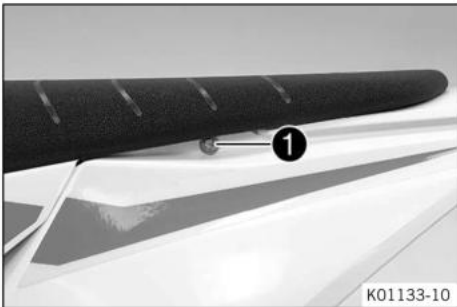


- Raise the rear of the seat, pull the seat back, and lift it off.

12.4 Mounting the seat



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



- Mount and tighten screw 1.

Guideline

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

12.5 Removing the fuel tank



Danger

Fire hazard Fuel is highly flammable.

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

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



Warning

Danger of poisoning Fuel is poisonous and a health hazard.

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

Preparatory work

- Remove the seat. (📖 p. 108)
- Turn tap handle of the fuel tap to the **OFF** position.

Main work

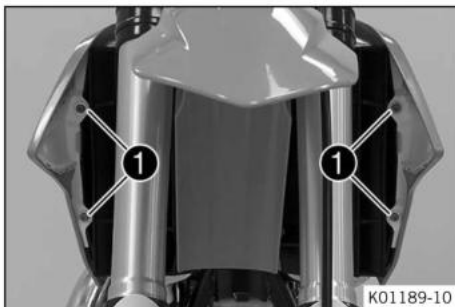
- Pull off the fuel hose.



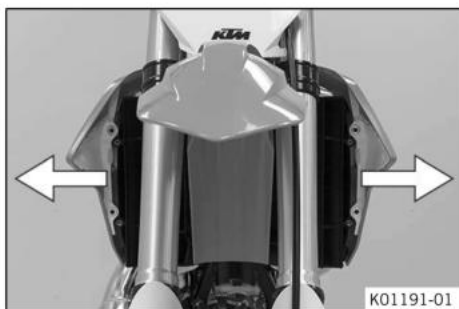
Info

Remaining fuel may flow out of the fuel hose.

- Remove screws ①.



- Remove screw ② with the rubber bushing.
- Pull the fuel tank breather hose off the fuel tank lid.



- Pull both spoilers laterally off the radiator and take off the fuel tank upwards.

12.6 Installing the fuel tank



Danger

Fire hazard Fuel is highly flammable.

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

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



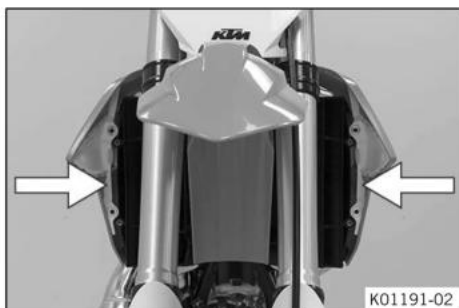
Warning

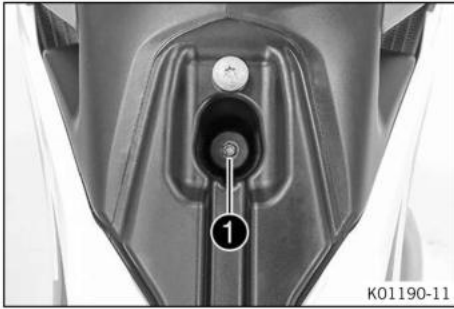
Danger of poisoning Fuel is poisonous and a health hazard.

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

Main work

- Check throttle cable routing. (📖 p. 55)
- Position the fuel tank and fit the two spoilers laterally to the radiator.
- Make sure that no cables or throttle cables are trapped or damaged.

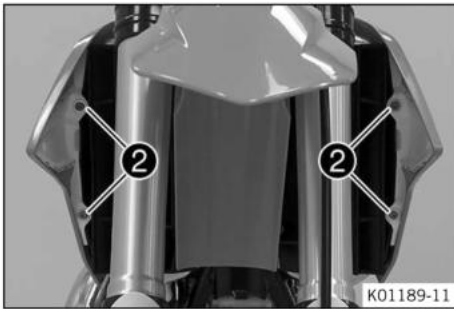




- Attach the fuel tank breather hose.
- Mount and tighten screw **1** with the rubber bushing.

Guideline

Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
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- Mount and tighten screws **2**.

Guideline

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

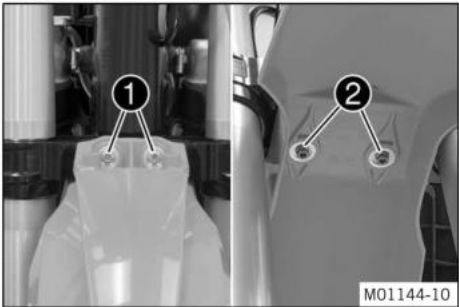
- Connect the fuel hose.

Finishing work

- Mount the seat. (📖 p. 108)

13.1 Removing front fender

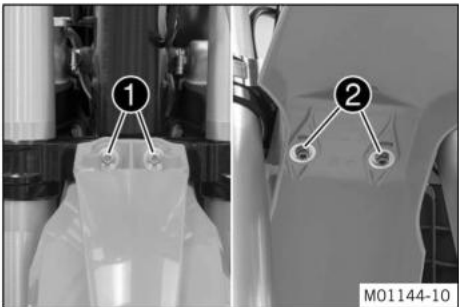
- Preparatory work**
- Remove the start number plate. (📖 p. 112)
- Main work**
- Remove screws ❶ and ❷. Remove front fender.



13.2 Installing front fender

- Main work**
- Position front fender. Mount and tighten screws ❶ and ❷.
- Guideline

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



- Finishing work**
- Install the start number plate. (📖 p. 112)

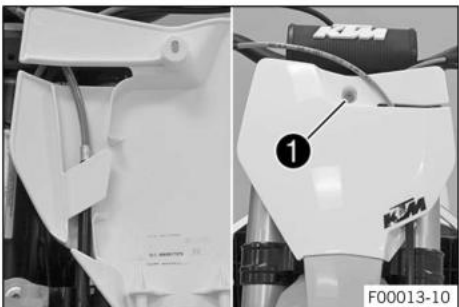
13.3 Removing the start number plate

- Remove screw ❶.
- Disconnect the brake line at the start number plate. Take off the start number plate.



13.4 Installing the start number plate

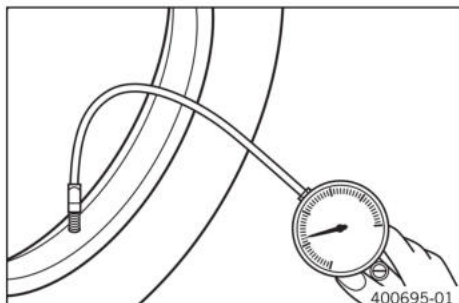
- Connect the brake line at the start number plate.
- Position the start number plate.
 - ✓ The holding lugs engage in the fender.
- Mount and tighten screw ❶.



14.1 Checking tire pressure

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

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

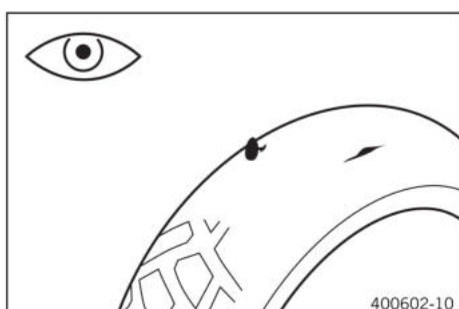
- » If the tire pressure does not meet specifications:
 - Correct the tire pressure.
- Mount the protection cap.



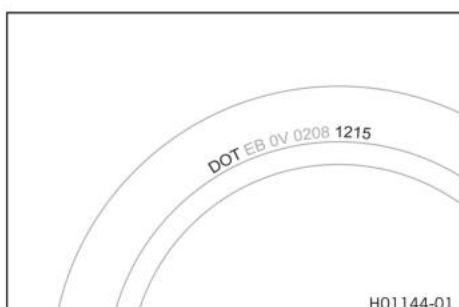
14.2 Checking the tire condition

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.
The tires mounted on the front and rear wheels must have a similar profile.
Worn tires have a negative effect on handling characteristics, especially on wet surfaces.



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



- Check the tire age.

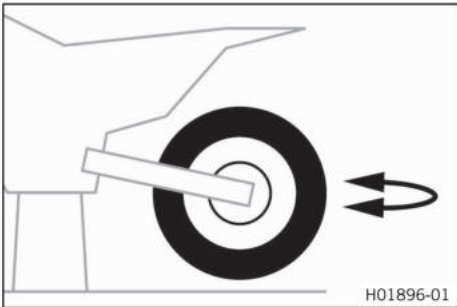
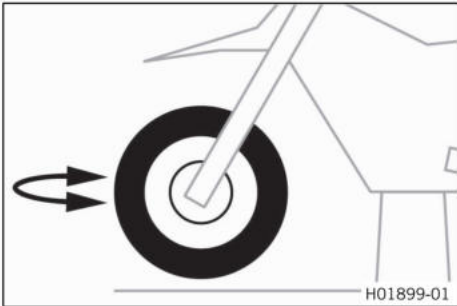
Info

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.

i Info
Hold the fork leg to check it.

- » If there is detectable play:
 - Change front wheel bearing. (📖 p. 118)

- Place a load on the front of the vehicle.
- ✓ The rear wheel is not in contact with the ground.
- Move the rear wheel from side to side.

i Info
Hold the link fork to check it.

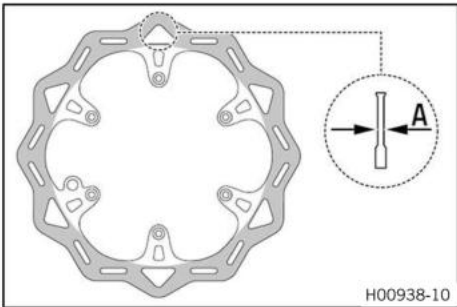
- » If there is detectable play:
 - Change the rear wheel bearing. (📖 p. 122)

- 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**.

i Info
Wear reduces the thickness of the brake disc around the contact surface of the brake linings.

Brake discs - wear limit	
front	2.5 mm (0.098 in)
rear	3.5 mm (0.138 in)

- » If the brake disc thickness is less than the specified value:
 - Change the front brake disc. (📖 p. 118)
 - Change the rear brake disc. (📖 p. 122)
- 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. 118)
 - Change the rear brake disc. (📖 p. 122)



14.5 Checking spoke tension

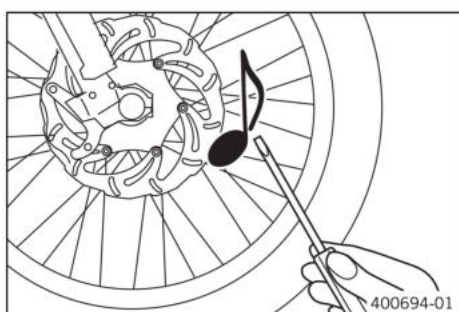


Warning

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. 295)



14.6 Checking the rim run-out



Warning

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

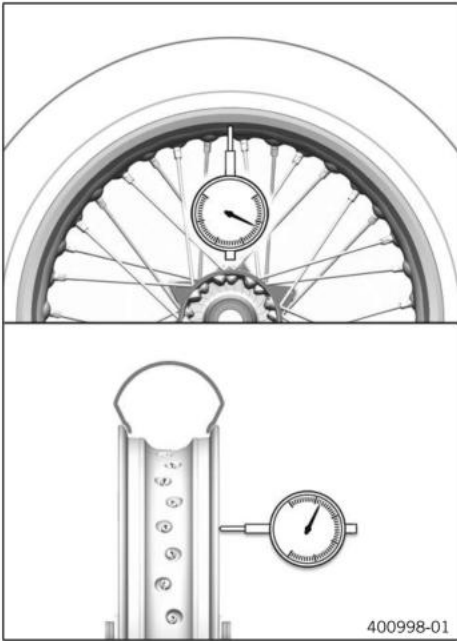
The spokes break due to being overloaded if they are too tightly tensioned. If the tension in the spokes is too low, then lateral and radial run-out will form in the wheel. Other spokes will become looser as a result.

- Check spoke tension regularly, and in particular on a new vehicle.

i

Info

A loose spoke can unbalance the wheel and other spokes may loosen within a short period. If the spokes are too tight, they can break due to local overload. Check the spoke tension regularly, especially on a new motorcycle.



- Check for lateral and radial run-out of the rims.

Lateral runout	
Outside the rim joint	< 1.8 mm (< 0.071 in)

Radial runout	
Outside the rim joint	< 1.8 mm (< 0.071 in)

- » If the measured value is greater than the specified value:
 - Center the rim.

i

Info

Center the rim by pulling the spoke nipple on the other side of the rim run-out. If there is significant deformation, change the rim.

- Correct the spoke tension.

14.7 Front wheel

14.7.1 Removing the front wheel

Preparatory work

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

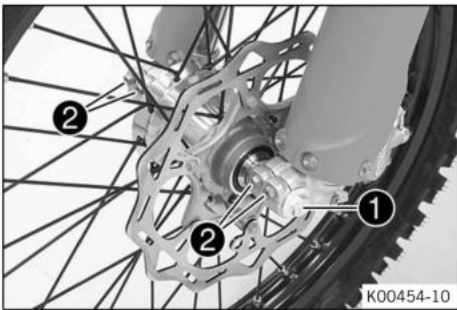
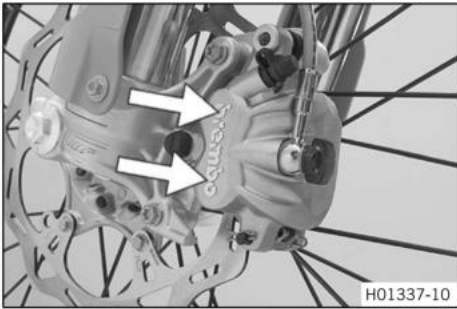
Main work

- Press the brake caliper onto the brake disc by hand in order to push back the brake pistons.

i

Info

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



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



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.

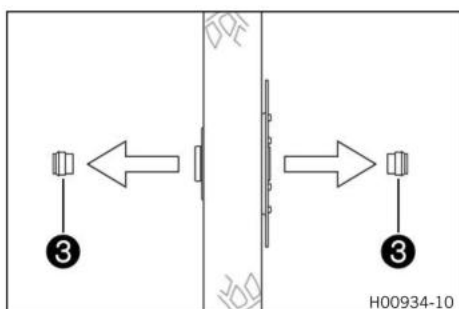
- Hold the front wheel and remove the wheel spindle. Take the front wheel out of the fork.



Info

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

- Remove spacers ③.



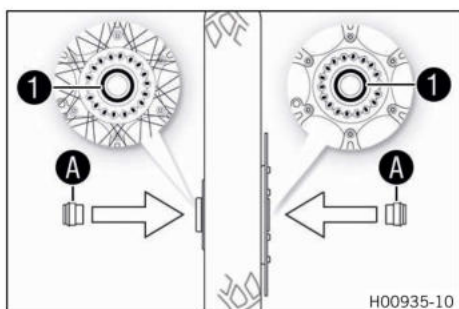
14.7.2 Installing the front wheel



Warning

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

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



- Check the wheel bearing for damage and wear.
 - » If the wheel bearing is damaged or worn:
 - Change front wheel bearing. (p. 118)
- Clean and grease shaft seal rings ① and contact surface A of the spacers.

Long-life grease (p. 288)

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

Long-life grease (p. 288)



- Lift the front wheel into the fork, position it, and insert the wheel spindle.
- ✓ The brake linings are correctly positioned.
- Mount and tighten screw ②.

Guideline

Screw, front wheel spindle	M20x1.5	35 Nm (25.8 lbf ft)
----------------------------	---------	---------------------

- Operate the hand brake lever several times until the brake linings are seated correctly against the brake disc.
- Remove the motorcycle from the lift stand. (p. 12)

- Operate the front brake and compress the fork a few times firmly.
✓ The fork legs straighten.
- Tighten screws ③.

Guideline

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

14.7.3 Changing the front brake disc

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. 116)

Main work

- Remove screws ①. Take off the brake disc.
- Clean the contact surface of the brake disc.
- Position new 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™
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Finishing work

- Install the front wheel. (📖 p. 117)

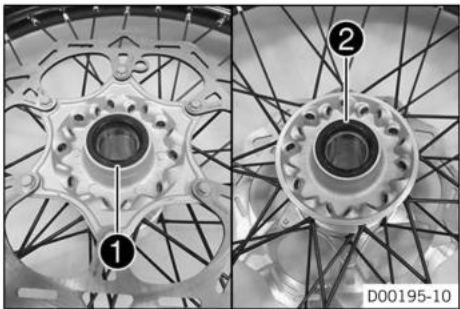
14.7.4 Changing the front wheel bearing

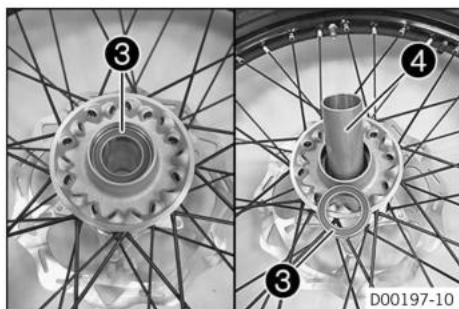
Preparatory work

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

Main work

- Remove shaft seal rings ① and ②.





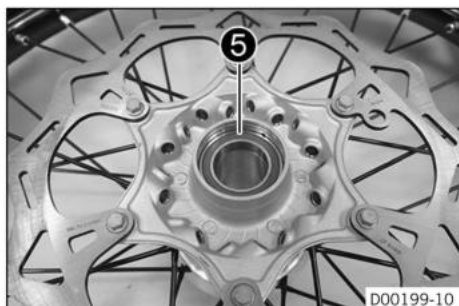
- Press out bearing ③ using a suitable tool.



Info

Spacing tube ④ can be pushed aside.

- Remove spacing tube ④.

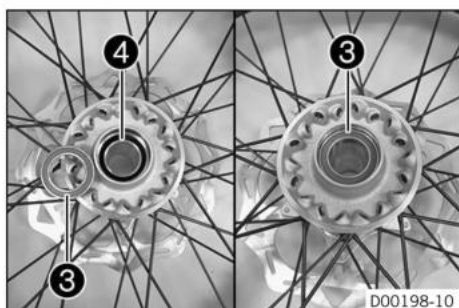


- Press out bearing ⑤ using a suitable tool.
- Press in new bearing ⑤ all the way using a suitable tool.



Info

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



- Clean, grease, and mount spacing tube ④.

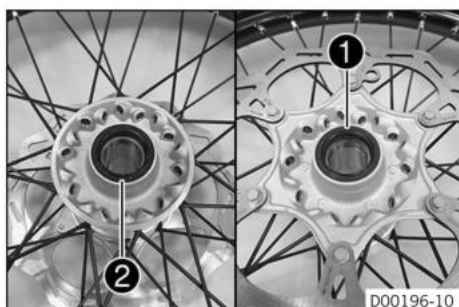
Long-life grease (p. 288)

- 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.



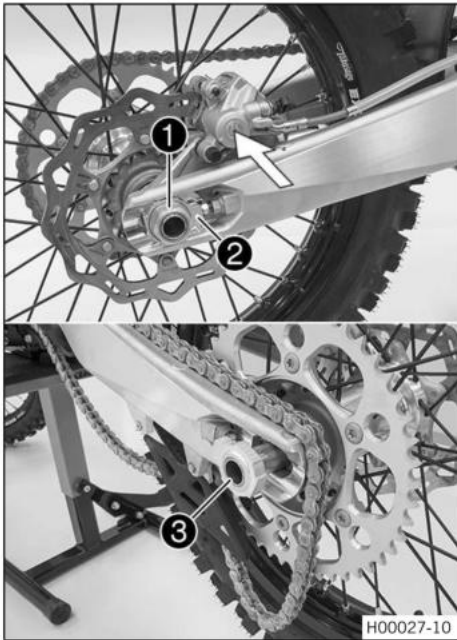
- Grease new shaft seal rings ② and ① and press in until they are flush.

Finishing work

- Install the front wheel. (p. 117)

14.8 Rear wheel

14.8.1 Removing the rear wheel



Preparatory work

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

Main work

- Press the brake caliper onto the brake disc by hand in order to push back the brake piston.



Info

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

- Remove nut ①.
- Remove chain adjuster ②. Pull out wheel spindle ③ far enough to allow the rear wheel to be pushed forward.
- Push the rear wheel forward as far as possible. Remove the chain from the rear sprocket.



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.

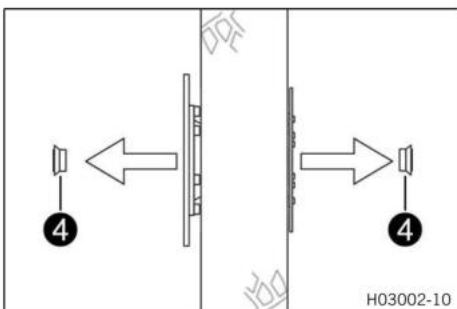
- Hold the rear wheel and remove the wheel spindle. Take rear wheel out of the link fork.



Info

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

- Remove spacers ④.



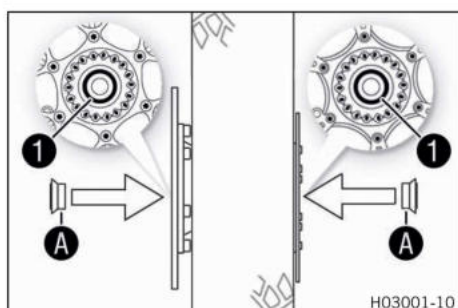
14.8.2 Installing the rear wheel



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

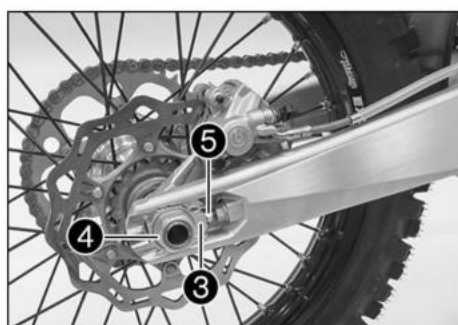
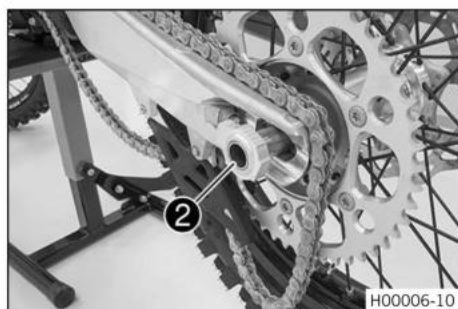
- Check the wheel bearing for damage and wear.
 - » If the wheel bearing is damaged or worn:
 - Change the rear wheel bearing. (p. 122)
- Clean and grease shaft seal rings (1) and contact surface (A) of the spacers.

Long-life grease (p. 288)

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

Long-life grease (p. 288)

- Position the rear wheel and insert wheel spindle (2).
- ✓ The brake linings are correctly positioned.
- Mount the chain.



- 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. 125)
- Tighten nut (4).

Guideline

Nut, rear wheel spindle	M25x1.5	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. 120)



- Main work**
- Remove screws **1**. Remove the brake disc.
 - Clean the contact surface of the brake disc.
 - Position the new brake disc with the label facing outward.
 - Mount and tighten screws **1**.

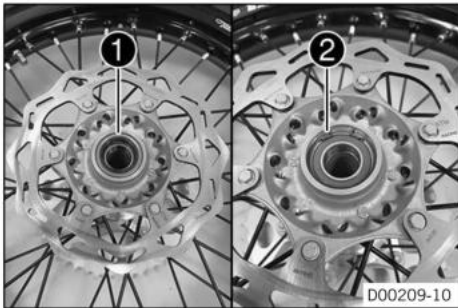
Guideline

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

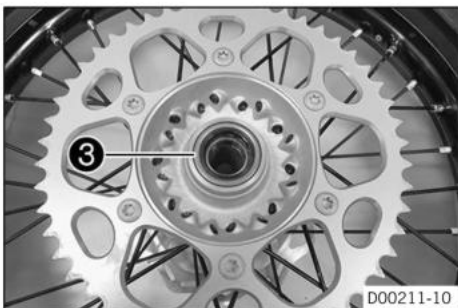
- Finishing work**
- Install the rear wheel. (📖 p. 121)
 - Remove the motorcycle from the lift stand. (📖 p. 12)

14.8.4 Changing the rear wheel bearing

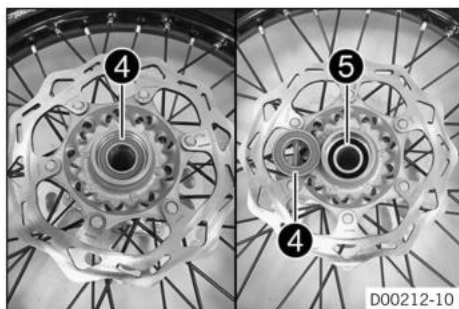
- Preparatory work**
- Raise the motorcycle with a lift stand. (📖 p. 12)
 - Remove the rear wheel. (📖 p. 120)



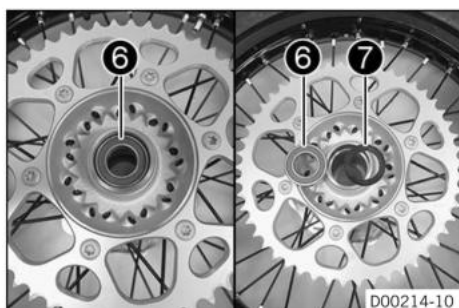
- Main work**
- Remove shaft seal ring **1**.
 - Remove lock ring **2**.



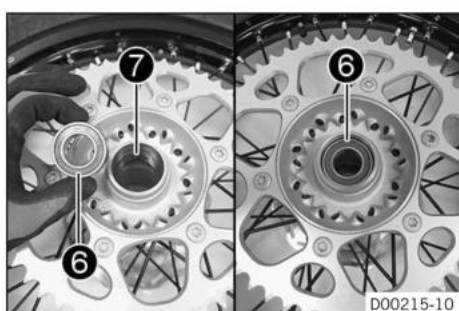
- Remove shaft seal ring **3**.



- Using a suitable tool, press bearing **4** out from the inside to the outside.
- Remove spacing tube **5**.



- Using a suitable tool, press bearing **6** out from the inside to the outside.
- Check spacer washer **7** for damage and wear.
 - » If the spacer washer is damaged or worn:
 - Replace the spacer washer.

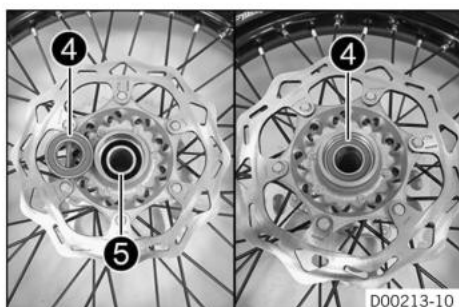


- Position spacer washer **7**.
- Press new bearing **6** all the way in from the outside to the inside.



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 **5**.

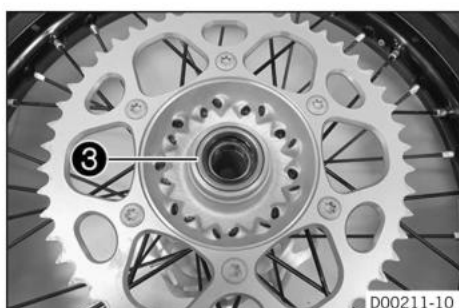
Long-life grease (📖 p. 288)

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

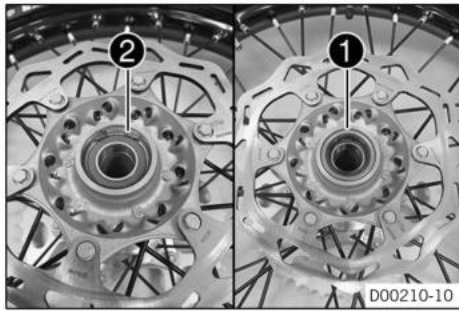


Info

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



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

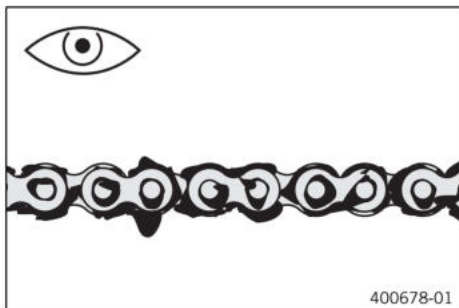


- Mount lock ring ②.
- ✓ The lock ring engages audibly.
- Grease new shaft seal ring ① and press it in until it is flush.

Finishing work

- Install the rear wheel. (📖 p. 121)
- 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. 124)

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.

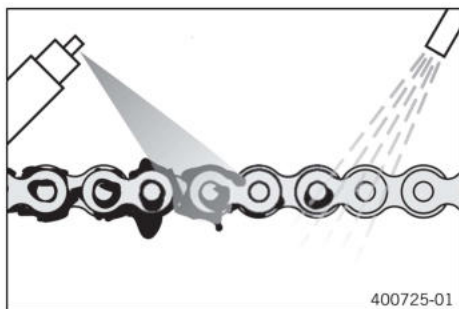


Info

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. 288)

- After drying, apply chain spray.

Off-road chain spray (📖 p. 289)

Finishing work

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

14.8.7 Checking the chain tension



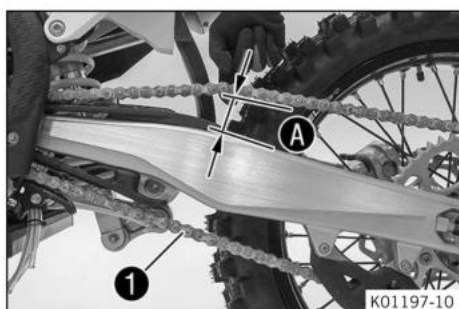
Warning

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**.

Guideline

Lower chain section **1** must be taut.



Info

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

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

- » If the chain tension does not meet the specification:
 - Adjust the chain tension. (📖 p. 128)

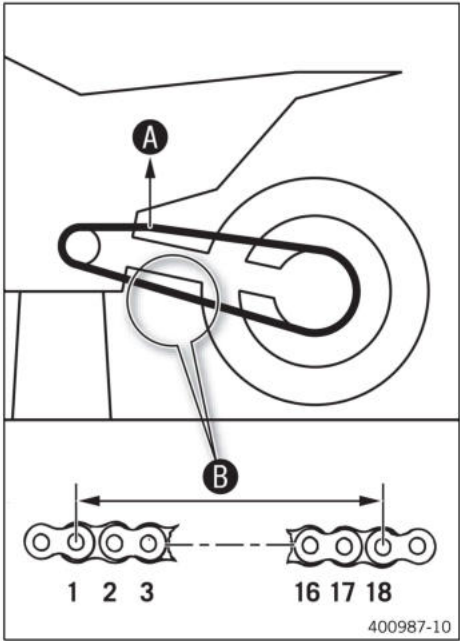
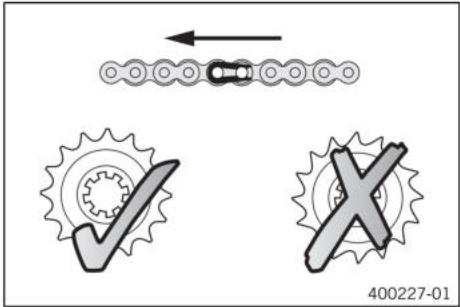
Finishing work

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

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

Preparatory work

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



Main work

- Shift the transmission to the neutral position.
- 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. 129)

**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**

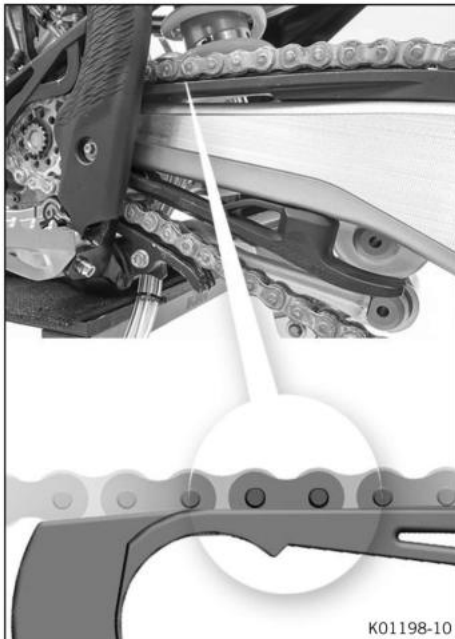
Chain wear is not always even, so you should repeat this measurement at different chain positions.

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. 129)

**Info**

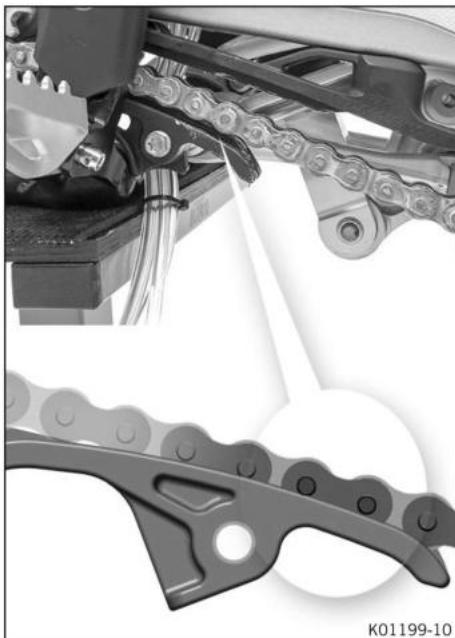
When a new chain is mounted, the rear sprocket and engine sprocket should also be changed. New chains wear out faster on old, worn sprockets.



- 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 the screws on the chain sliding guard.

Guideline

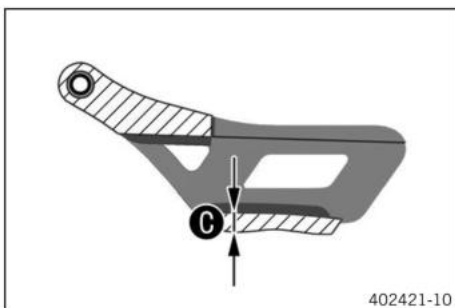
Screw, chain sliding guard	M6	6 Nm (4.4 lbf ft) Loctite®243™
----------------------------	----	--



- Check the chain sliding piece for wear.
 - » If the lower edge of the chain pins is in line with or below the chain sliding piece:
 - Change the chain sliding piece.
- Check that the chain sliding piece is firmly seated.
 - » If the chain sliding piece is loose:
 - Tighten the screw on the chain sliding piece.

Guideline

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



- Check the chain guide with a slide gauge for dimension **C**.

Minimum thickness C of the chain guide	6 mm (0.24 in)
---	----------------

- » If the measured value is less than the specification:
 - 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)
Remaining nuts, 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. 125)

Main work

- Loosen nut ❶.
- Loosen nuts ❷.
- Adjust the chain tension by turning adjusting screws ❸ left and right.

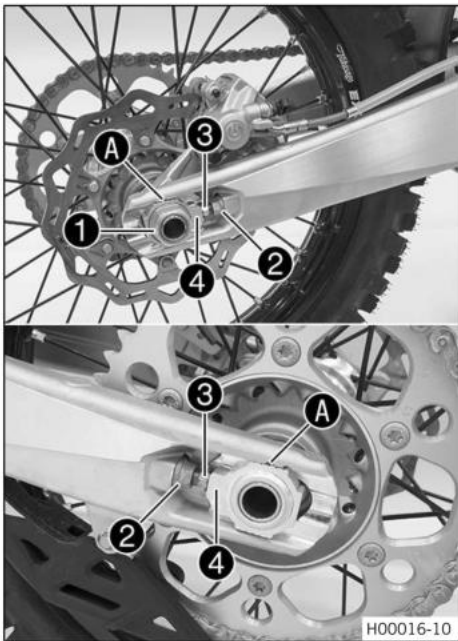
Guideline

Chain tension	55 ... 58 mm (2.17 ... 2.28 in)
Turn adjusting screws ❸ 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 ❷.
- Make sure that chain adjusters ❹ are fitted correctly on adjusting screws ❸.
- Tighten nut ❶.

Guideline

Nut, rear wheel spindle	M25x1.5	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)



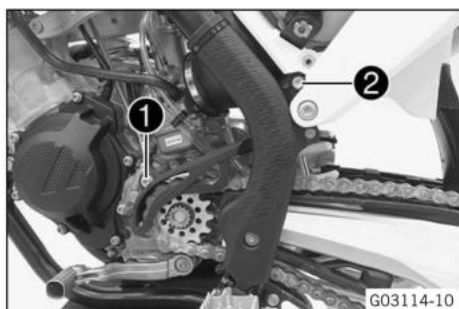
14.8.10 Changing the drivetrain kit

Preparatory work

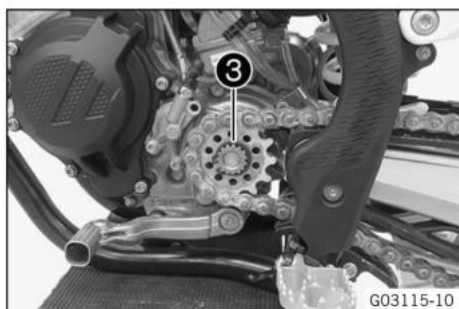
- Raise the motorcycle with a lift stand. (p. 12)
- Remove the air filter box cover. (p. 103)

Main work

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



- Remove lock ring ③.

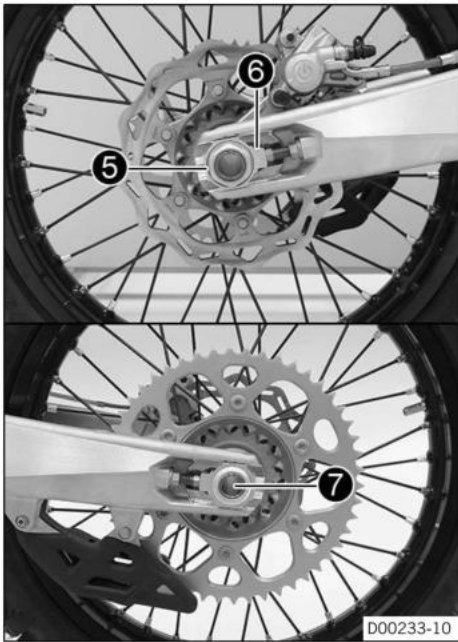


- Remove connecting link ④ of the chain.
- Take off the chain.



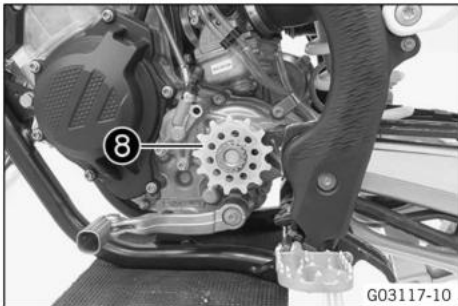
Info

Cover the components to protect them against damage.



- Remove nut 5.
- Remove chain adjuster 6.
- Hold the rear wheel and remove the wheel spindle 7.
- Take the rear wheel out of the link fork.

i Info
Do not operate the rear brake lever when the rear wheel is removed.
Always lay the wheel down in such a way that the brake disc is not damaged.

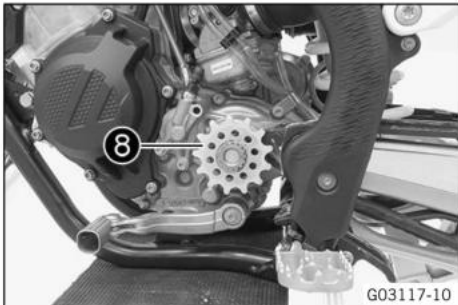


- Remove engine sprocket 8.

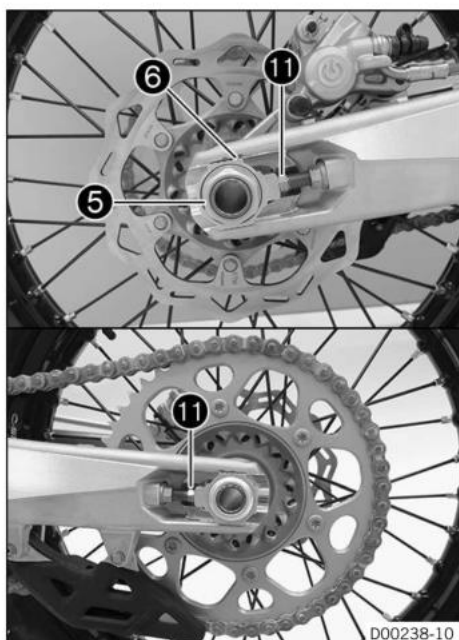
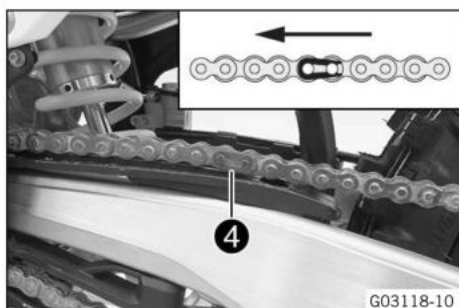
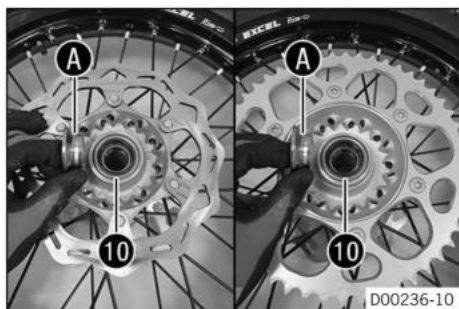


- Remove fittings 9. Take off the rear sprocket.
- Position the new rear sprocket. Mount and tighten the fittings.

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



- Slide new engine sprocket 8 onto the countershaft.



- Check the wheel bearing for damage and wear.
 - » If the wheel bearing is damaged or worn:
 - Change the rear wheel bearing. (📖 p. 122)

- Remove the spacers.

- Clean and grease shaft seal rings **10** and contact surface **A** of the spacers.

Long-life grease (📖 p. 288)

- Insert the spacers.

- Position the rear wheel.

✓ The brake linings are correctly positioned.

- Insert wheel spindle **7**.

- 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.

- Position chain adjuster **6**. Mount nut **5**, but do not tighten it yet.

- Make sure that chain adjusters **6** are fitted correctly on adjusting screws **11**.

- Check the chain tension. (📖 p. 125)

- Tighten nut **5**.

Guideline

Nut, rear wheel spindle	M25x1.5	80 Nm (59 lbf ft)
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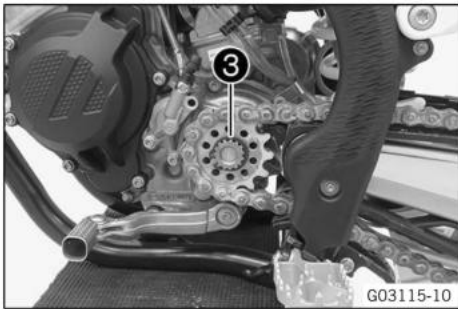


Info

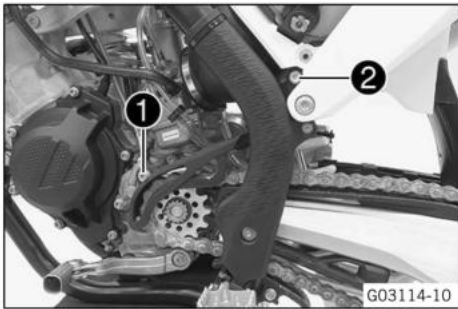
The wide adjustment range of the chain adjusters enables different secondary ratios with the same chain length.

Chain adjusters **6** can be turned by 180°.

- Operate the rear brake lever several times until the brake linings are in contact with the brake disc and there is a pressure point.



- Mount lock ring 3.



- Position engine sprocket cover and mount in holder.
- Mount and tighten screw 1 with the washer.

Guideline

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

- Mount and tighten screw 2.

Guideline

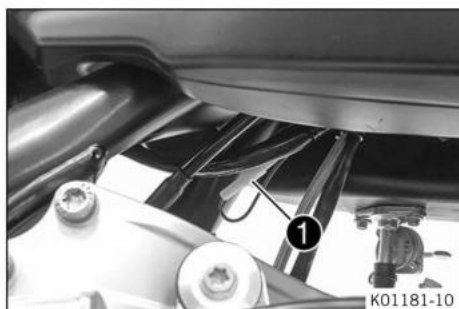
Screw, engine sprocket cover	M8	20 Nm (14.8 lbf ft)
------------------------------	----	---------------------

Finishing work

- Install the air filter box cover. (📖 p. 103)
- Remove the motorcycle from the lift stand. (📖 p. 12)



15.1 Plug-in connector of ignition timing map adjustment

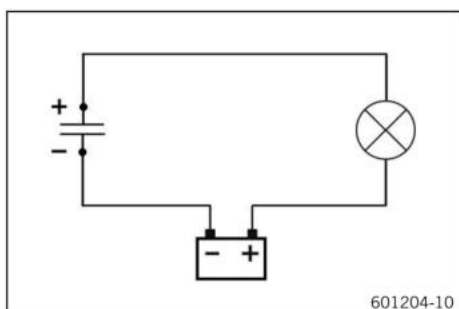


Plug-in connector ① of the ignition timing map adjustment is located on the frame under the fuel tank.

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 Checking the capacitor



- Remove the capacitor.
- Discharge the capacitor by bridging the two contacts.
- Connect the capacitor to a 12 V test lamp to a connection and connect to the 12 V battery as shown in the figure.



Info

As the capacitor charge increases, the test lamp becomes dimmer.

- » The bulb lights up for: 0.5 ... 2.0 s
The capacitor is OK.
- » The bulb lights up for: < 0.5 s
Change the capacitor.
- » The bulb lights up for: > 2.0 s
Change the capacitor.

- Discharge the capacitor with a 12 V test lamp, as shown in the figure.

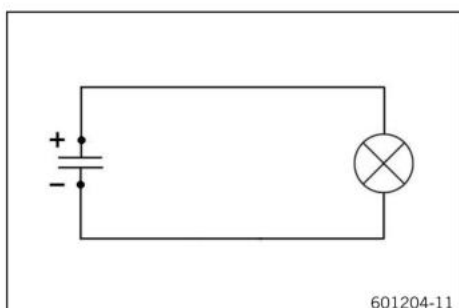


Info

As the capacitor charge decreases, the test lamp becomes dimmer.

- » The bulb lights up for: 0.5 ... 2.0 s
The capacitor is OK.
- » The bulb lights up for: < 0.5 s
Change the capacitor.
- » The bulb lights up for: > 2.0 s
Change the capacitor.

- Install the capacitor.



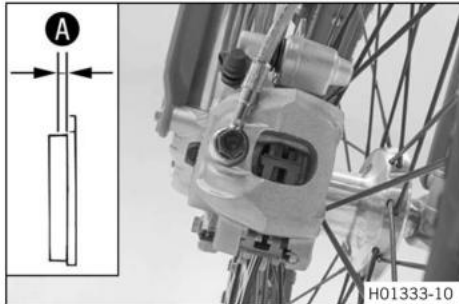
16.1 Checking the front brake linings



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 front brake linings. (📖 p. 134)
- Check the brake linings for damage and cracking.
 - » If damage or wear is encountered:
 - Change the front brake linings. (📖 p. 134)

16.2 Changing the front brake linings



Warning

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

- Ensure that service work and repairs are performed professionally.



Warning

Skin irritation Brake fluid causes skin irritation.

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



Warning

Danger of accidents Old brake fluid reduces the braking effect.

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



Warning

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

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



Warning

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

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

- Only use brake linings approved and recommended by KTM.



Note

Environmental hazard Hazardous substances cause environmental damage.

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

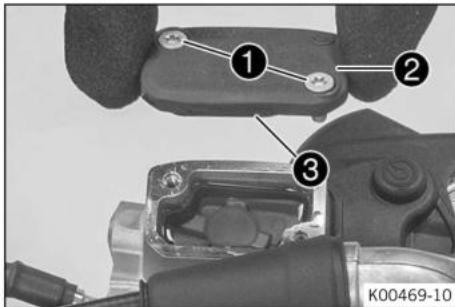


Info

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

Avoid contact between brake fluid and painted parts. Brake fluid attacks paint.

Only use clean brake fluid from a sealed container.

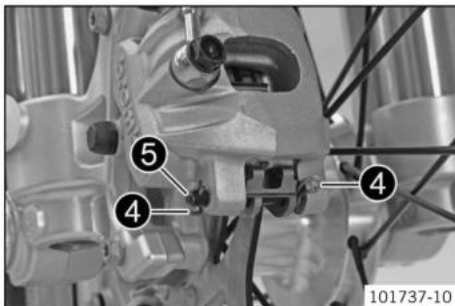


- Move the brake reservoir mounted on the handlebar to a horizontal position.
- Remove screws ①.
- Take off cover ② with membrane ③.
- Manually press the brake caliper toward the brake disc to push back the brake pistons. Ensure that brake fluid does not flow out of the brake fluid reservoir, if necessary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

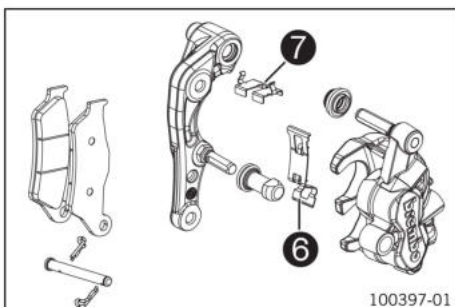


Info

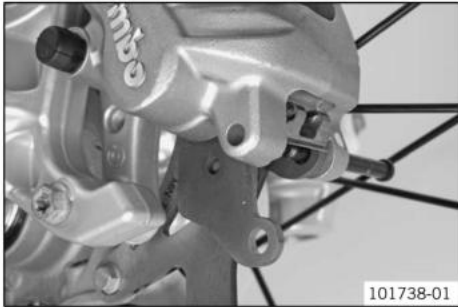
Make sure that you do not press the brake caliper against the spokes when pushing back the brake pistons.



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



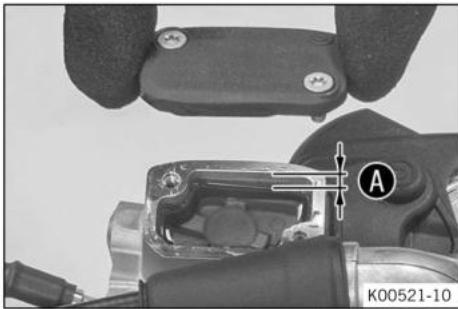
- Check that spring plate ⑥ in the brake caliper and sliding plate ⑦ in the brake caliper bracket are seated correctly.



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

i Info
Always change the brake linings in pairs.

- Operate the hand brake lever repeatedly until the brake linings are in contact with the brake disc and there is a pressure point.



- Correct the brake fluid quantity to level **A**.

Guideline

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

Brake fluid DOT 4 / DOT 5.1 (📖 p. 286)	
--	--

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

i Info
Clean up overflowed or spilled brake fluid immediately with water.

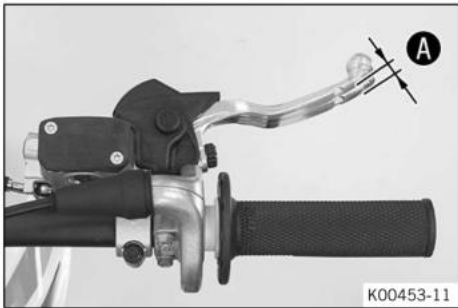
16.3 Checking the free travel of the hand brake lever

Warning

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

If there is no free travel on the hand brake lever, pressure builds up on the front brake circuit.

- Set the free travel on the hand brake lever in accordance with the specification.

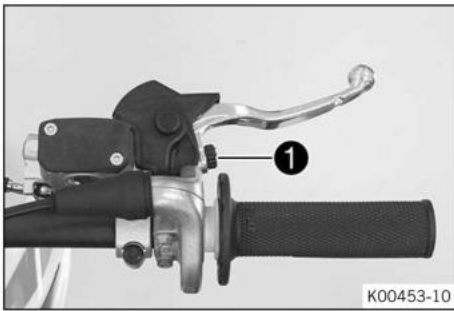


- Push the hand brake lever forward and check free travel **A**.

Free travel of hand brake lever	≥ 3 mm (≥ 0.12 in)
---------------------------------	--------------------

- » If the free travel does not match the specification:
 - Adjust the basic position of the hand brake lever. (📖 p. 137)

16.4 Adjusting the basic position of the hand brake lever



- Check the free travel of the hand brake lever. (📖 p. 136)
- 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.
Only turn the adjusting screw by hand, and do not use force.
Do not make any adjustments while riding.

16.5 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.

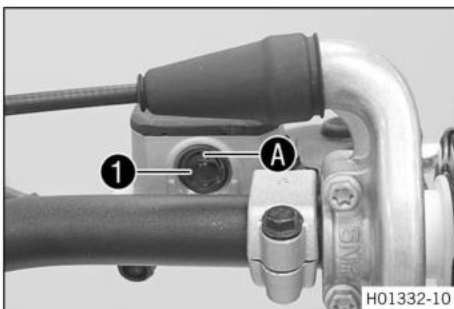
- Make sure that brake fluid for the front and rear brake is changed in accordance with the service schedule.

Preparatory work

- Check the front brake linings. (📖 p. 134)

Main work

- Move the brake 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 the marking **A**:
 - Add front brake fluid. (📖 p. 138)



16.6 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

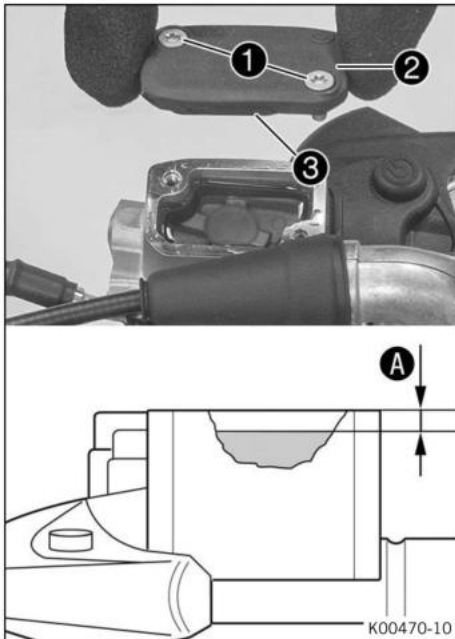
Never use DOT 5 brake fluid. It is silicone-based and purple in color. Oil seals and brake lines are not designed for DOT 5 brake fluid.

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. 134)



Main work

- Move the brake 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. 286)

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



Info

Clean up overflowed or spilled brake fluid immediately with water.

16.7 Changing the front brake fluid



Warning

Skin irritation Brake fluid causes skin irritation.

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



Note

Environmental hazard Hazardous substances cause environmental damage.

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

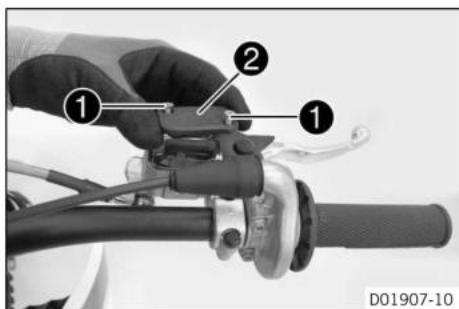


Info

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

Avoid contact between brake fluid and painted parts. Brake fluid attacks paint.

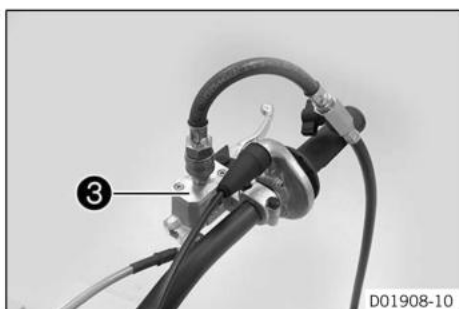
Only use clean brake fluid from a sealed container.



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

Syringe (50329050000) (p. 291)

Brake fluid DOT 4 / DOT 5.1 (p. 286)

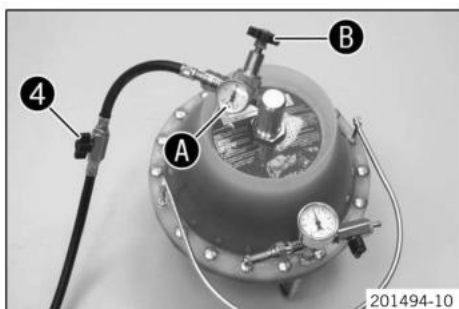


- Mount bleeder cover ③.

Bleeder cover (00029013005) (p. 290)

- Connect the bleeding device.

Bleeding device (00029013100) (p. 290)



- Open shut-off valve ④.



Info

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

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

Guideline

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

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

Bleeding device (00029013100) (p. 290)

- 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.

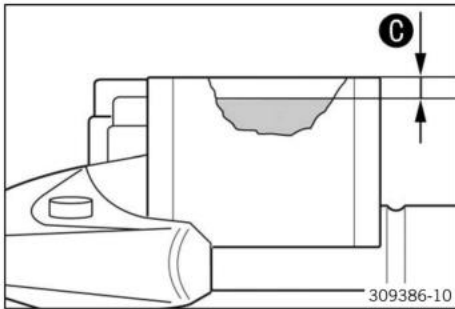


Info

Overfilling the brake fluid reservoir is prevented.

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





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

Guideline

Dimension C	5 mm (0.2 in)
--------------------	---------------

Brake fluid DOT 4 / DOT 5.1 (📖 p. 286)
--

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

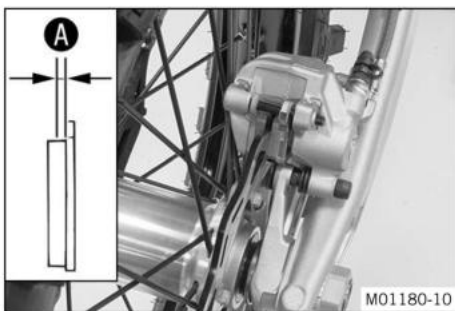
i Info
Clean up overflowed or spilled brake fluid immediately with water.

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



16.8 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. 141)
- Check the brake linings for damage and cracking.
 - » If damage or wear is encountered:
 - Change the rear brake linings. (📖 p. 141)



16.9 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.



Note

Environmental hazard Hazardous substances cause environmental damage.

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

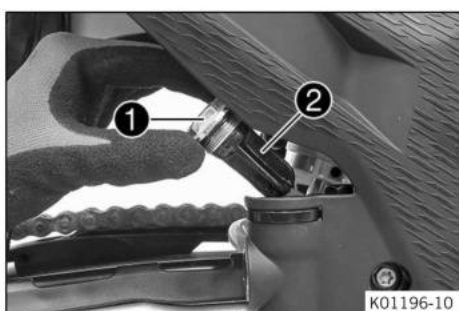


Info

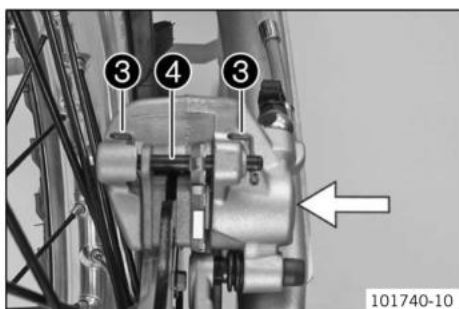
Never use DOT 5 brake fluid. It is silicone-based and purple in color. Oil seals and brake lines are not designed for DOT 5 brake fluid.

Avoid contact between brake fluid and painted parts. Brake fluid attacks paint.

Only use clean brake fluid from a sealed container.



- Stand the vehicle upright.
- Remove screw cap ① with membrane ② and the O-ring.



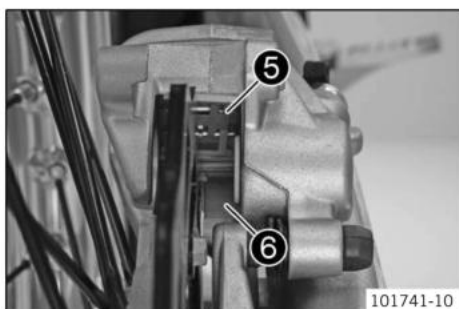
- Manually press the brake caliper toward the brake disc to push back the brake piston. Ensure that brake fluid does not flow out of the brake fluid reservoir, if necessary extract excess.



Info

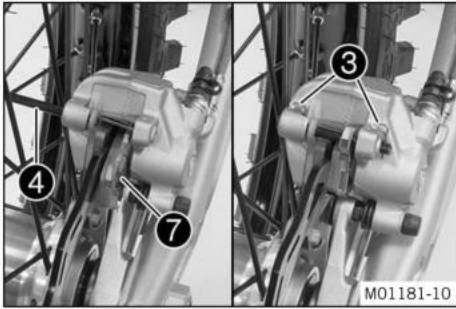
Make sure that you do not press the brake caliper against the spokes when pushing back the brake piston.

- Remove cotter pins ③, pull out pin ④, and remove the brake linings.
- Clean the brake caliper and brake caliper bracket.
- Check that spring plate ⑤ in the brake caliper and sliding plate ⑥ in the brake caliper bracket are seated properly.



Info

The arrow on the spring plate points in the direction of rotation of the brake disc.



- Insert the new brake linings, insert pin ④, and mount the cotter pins ③.



Info

Always change the brake linings in pairs.
Make sure that decoupling plate ⑦ is mounted on the piston side brake lining.

- Operate the foot brake lever repeatedly until the brake linings are in contact with the brake disc and there is a pressure point.

- Add brake fluid to level A.

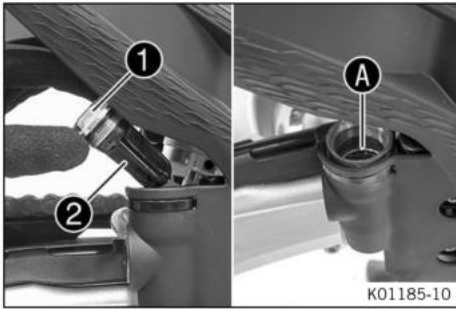
Brake fluid DOT 4 / DOT 5.1 (📖 p. 286)

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



Info

Clean up overflowed or spilled brake fluid immediately with water.



16.10 Checking the free travel of foot brake lever

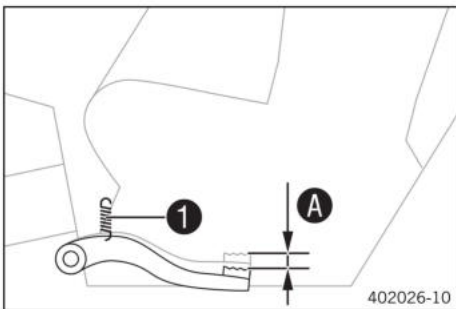


Warning

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. 144)

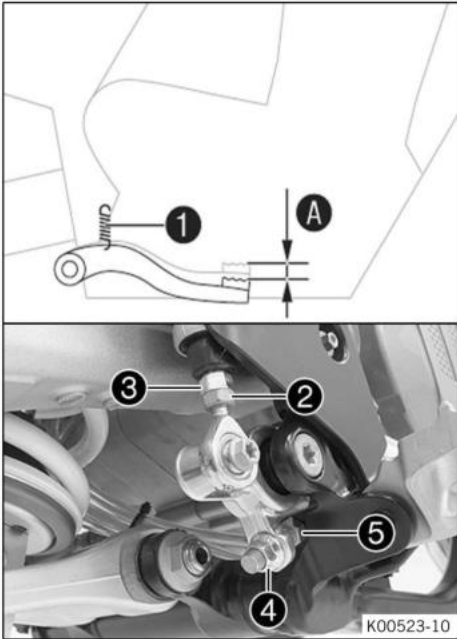
- Reconnect spring ①.

16.11 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.

16.12 Checking the rear brake fluid level

**Warning**

Danger of accidents An insufficient brake fluid level will cause the brake system to fail.
If the brake fluid level drops below the specified marking or the specified value, the brake system is leaking or the brake linings are worn down.

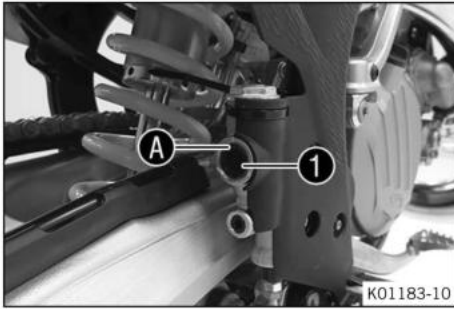
- Check the brake system and do not continue riding until the problem is eliminated.

**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.

- Preparatory work**
- Check the brake linings of the rear brake. (📖 p. 141)

**Main work**

- Stand the vehicle upright.
- Check the brake fluid level in level viewer **1**.
 - » If the brake fluid has dropped below marking **A**:
 - Add rear brake fluid. (📖 p. 145)

16.13 Adding rear brake fluid**Warning**

Danger of accidents An insufficient brake fluid level will cause the brake system to fail.

If the brake fluid level drops below the 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**

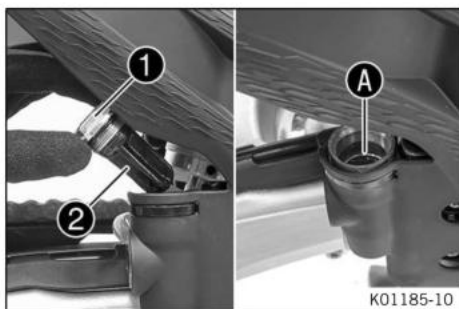
Never use DOT 5 brake fluid. It is silicone-based and purple in color. Oil seals and brake lines are not designed for DOT 5 brake fluid.

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. 141)



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. 286)

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



Info

Clean up overflowed or spilled brake fluid immediately with water.

16.14 Changing the rear brake fluid



Warning

Skin irritation Brake fluid causes skin irritation.

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



Note

Environmental hazard Hazardous substances cause environmental damage.

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

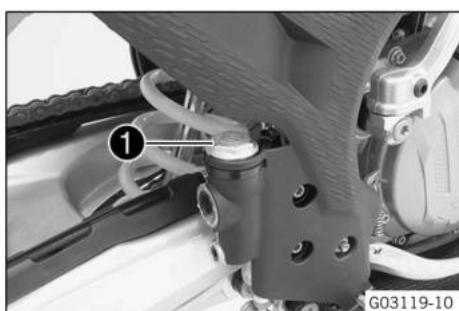


Info

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

Avoid contact between brake fluid and painted parts. Brake fluid attacks paint.

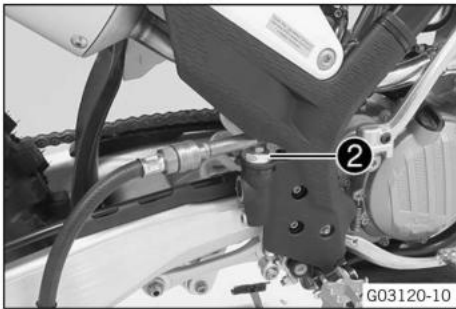
Only use clean brake fluid from a sealed container.



- Cover 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. 291)

Brake fluid DOT 4 / DOT 5.1 (📖 p. 286)

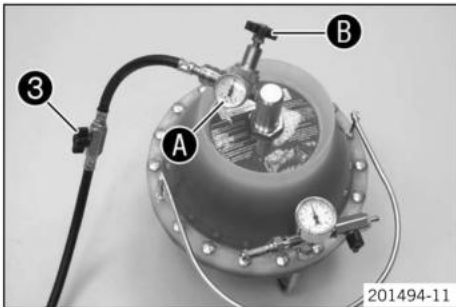


- Mount bleeder cover **2**.

Bleeder cover (00029013006) (📖 p. 290)

- Connect the bleeding device.

Bleeding device (00029013100) (📖 p. 290)



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



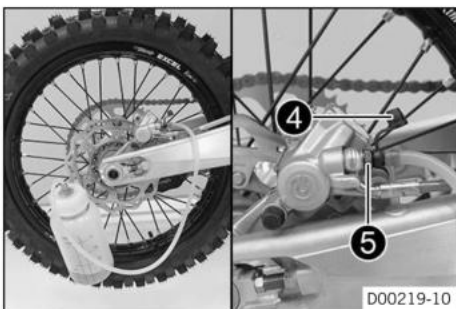
Info

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

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

Guideline

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



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

Bleeding device (00029013100) (📖 p. 290)

- Open bleeder screw **5** 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 **3**.
- 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. Attach the protection cap.
- Disconnect the bleeding device. Remove the bleeder cover.
- Stand the vehicle upright.
- Correct the brake fluid to marking **C**.

Brake fluid DOT 4 / DOT 5.1 (📖 p. 286)

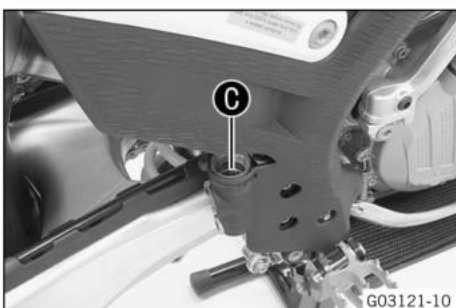
- Mount and tighten the screw cap with the membrane and O-ring.



Info

Clean up overflowed or spilled brake fluid immediately with water.

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



17.1 Removing the engine

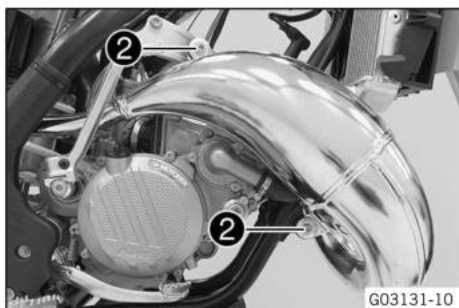
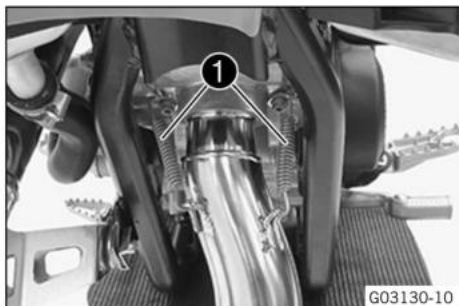
Preparatory work

- Raise the motorcycle with a lift stand. (p. 12)
- Remove the seat. (p. 108)
- Turn tap handle of the fuel tap to the **OFF** position.
- Remove the fuel tank. (p. 109)
- Drain the coolant. (p. 247)
- Remove the main silencer. (p. 101)

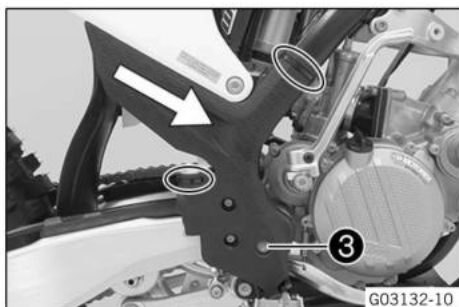
Main work

- Remove springs ①.

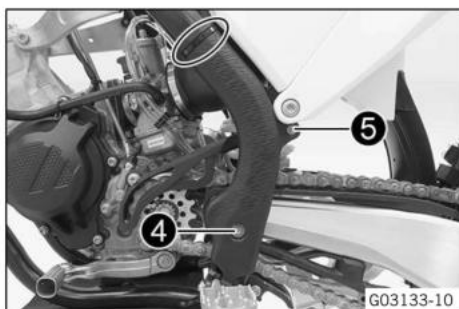
Spring hook (5030501700004) (p. 297)



- Remove screws ②.
- Take off the manifold.



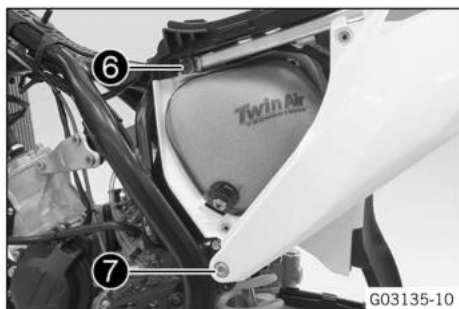
- Remove the cable ties.
- Remove screw ③ with the washer.
- Push the frame protector to the front and take off at the bottom.



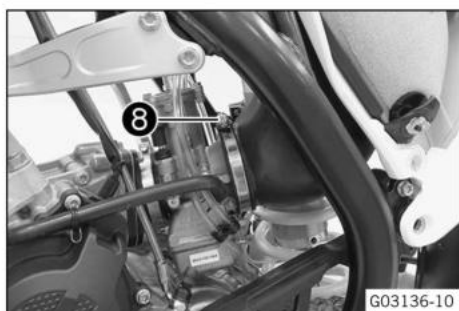
- Remove the cable tie.
- Remove screw ④ with the washer.
- Remove screw ⑤.
- Take off the frame protector.



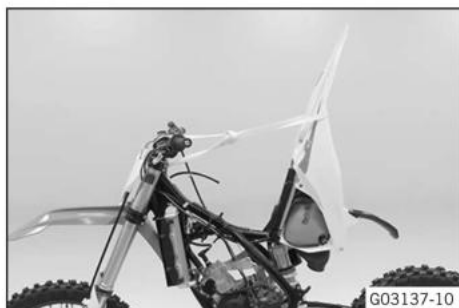
- Pull off the air filter box cover in area **A** laterally and take it off at the front.



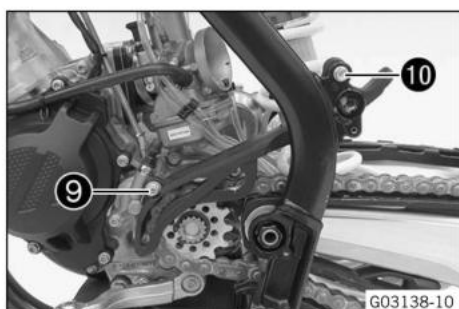
- Loosen screw **6**.
- Remove screw **7**.
- Repeat these steps on the opposite side.



- Remove hose clip **8**.



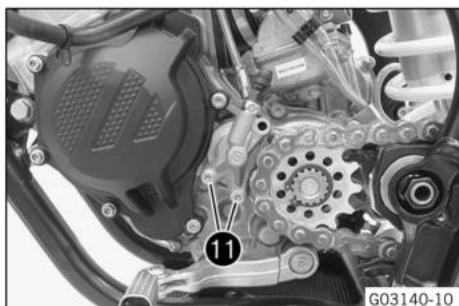
- Pivot the subframe up and secure it.



- Remove screw **9** with the washer.
- Remove screw **10**.
- Take off the engine sprocket cover.



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

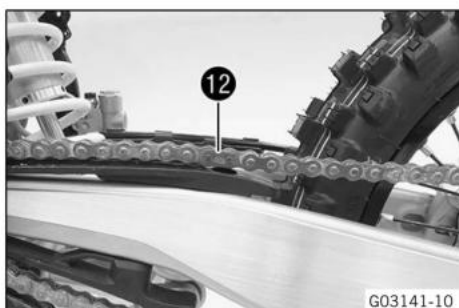


- Remove screws 11.
- Take off the slave cylinder of the clutch and hang it to one side.



Info

Do not kink the clutch line.
Do not activate the clutch lever while the slave cylinder of the clutch is removed.

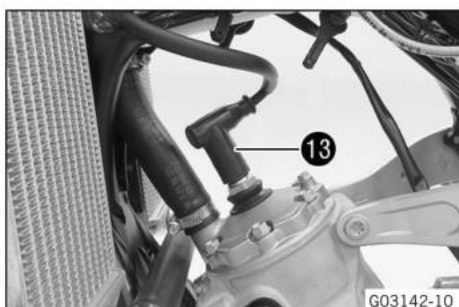


- Remove connecting link 12 of the chain.
- Take off the chain.

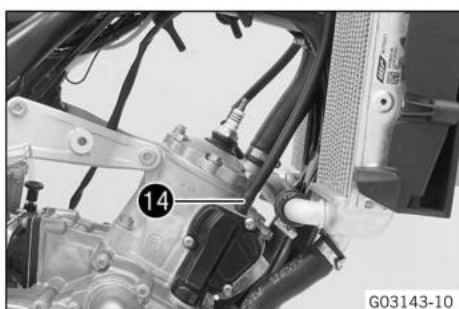


Info

Cover the components to protect them against damage.



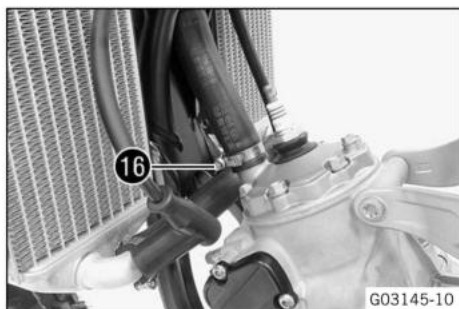
- Disconnect spark plug connector 13.



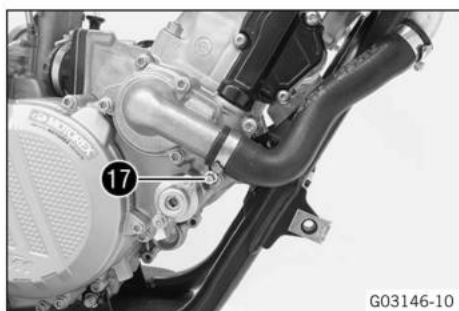
- Pull off air release hose 14.



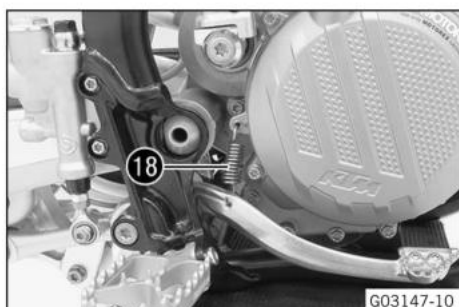
- Disconnect plug-in connector **15**.



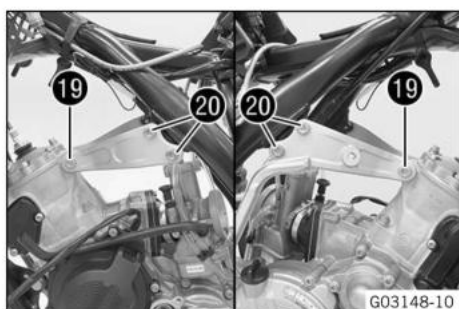
- Loosen hose clip **16**.
- Pull off the radiator hose.



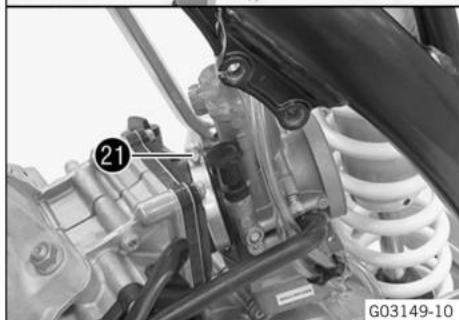
- Loosen hose clip **17**.
- Pull off the radiator hose.



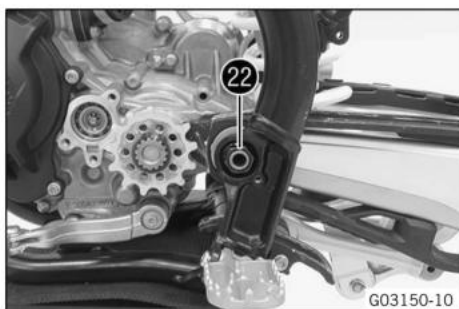
- Remove spring **18**.



- Remove screws **19**.
- Remove screws **20**.
- Take off the engine braces.



- Remove the cable tie(s) and expose the hoses.
- Loosen hose clip **21**.
- Pull the carburetor rearward out of the intake flange and hang it to one side.

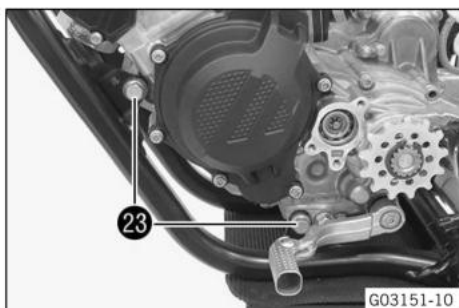


- Remove nut **22**.
- Remove the fork pivot.
- Carefully pull the link fork back, and secure it.



Info

Do not kink the brake line.



- Remove screws **23**.



- Lift out the engine sideways.



Info

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

17.2 Installing the engine



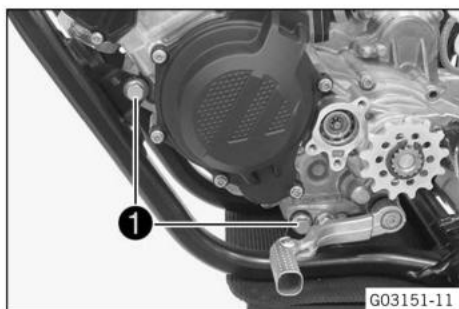
Main work

- Position the engine in the frame.



Info

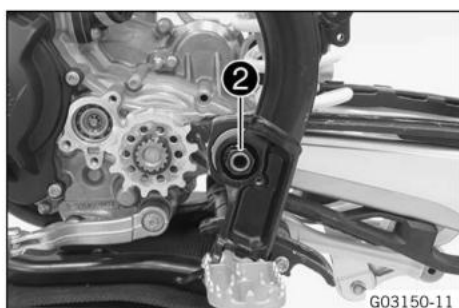
The help of an assistant is useful in this step. Make sure that the engine is sufficiently secured against falling over. Cover the components to protect them against damage.



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

Guideline

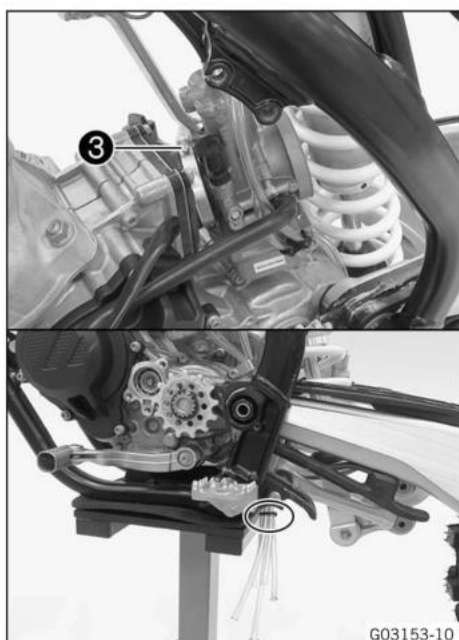
Engine bracket screw	M10	60 Nm (44.3 lbf ft)
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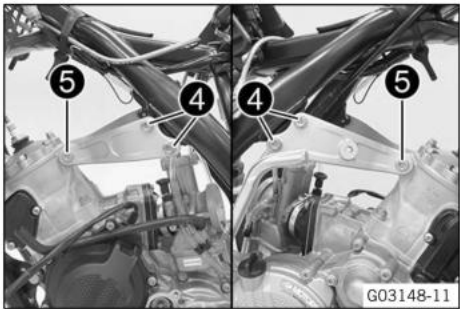
- Position the link fork.
- Mount the fork pivot.
- Mount nut **2**, but do not tighten it yet.

Guideline

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



- Mount the carburetor in the intake flange.
- Position and tighten hose clip **3**.
- Route the hoses without kinks and mount the cable tie.



- Position the engine braces.
- Mount and tighten screws 4.

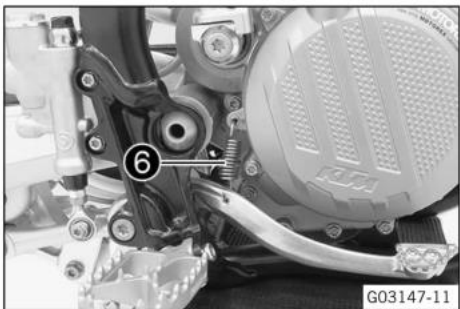
Guideline		
Screw, engine brace on frame	M8x15	25 Nm (18.4 lbf ft) Loctite®2701™

- Mount and tighten screws 5.

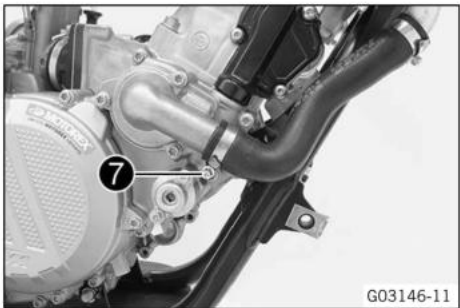
Guideline		
Screw, engine brace on engine	M8x20	25 Nm (18.4 lbf ft) Loctite®243™

- Tighten screws 1 and nut 2.

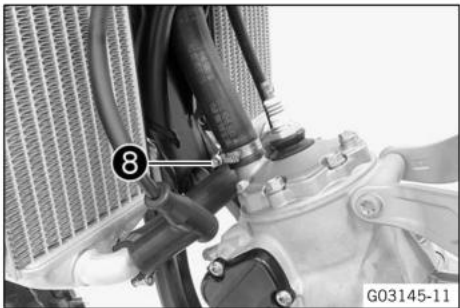
Guideline		
Engine bracket screw	M10	60 Nm (44.3 lbf ft)
Nut, fork pivot	M16x1.5	100 Nm (73.8 lbf ft)



- Mount spring 6.



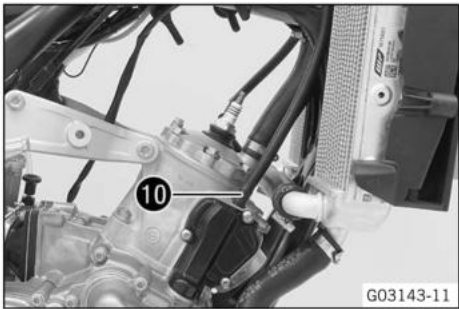
- Mount the radiator hose.
- Position and tighten hose clip 7.



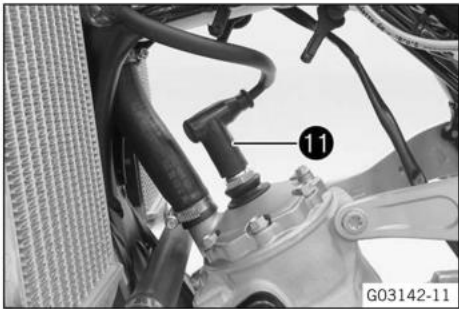
- Mount the radiator hose.
- Position and tighten hose clip 8.



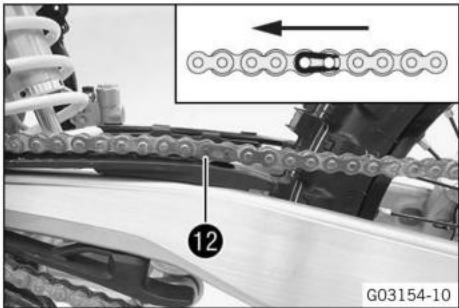
- Join plug-in connector 9.



- Mount vent hose 10.



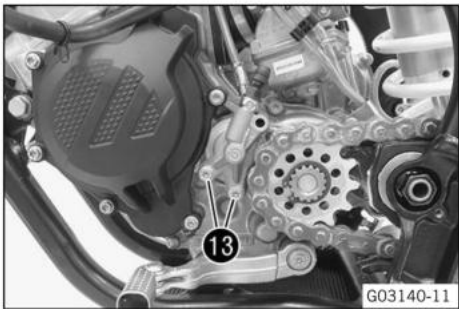
- Plug in spark plug connector 11.



- Mount the chain.
- Connect the chain with connecting link 12.

Guideline

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



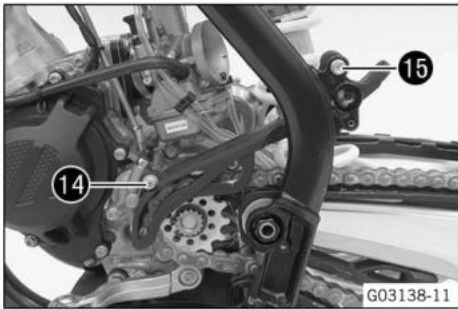
- Position the clutch slave cylinder with the gasket.
- Mount and tighten screws 13.

Guideline

Screw, clutch slave cylinder	M6	10 Nm (7.4 lbf ft)
------------------------------	----	--------------------



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



- Position the engine sprocket cover.
- Mount and tighten screw 14 with the washer.

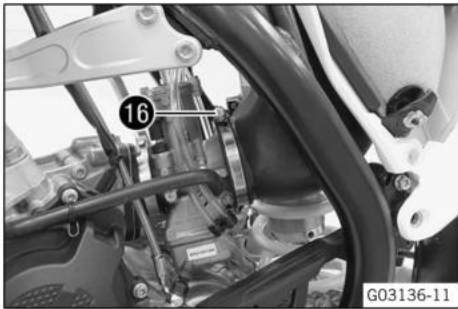
Guideline

Screw, clutch slave cylinder	M6	10 Nm (7.4 lbf ft)
------------------------------	----	--------------------

- Mount and tighten screw 15.

Guideline

Screw, engine sprocket cover	M8	20 Nm (14.8 lbf ft)
------------------------------	----	---------------------



- Remove the locking piece and position the subframe.



Info

Pay attention to the intake snorkel.

- Mount hose clip 16.



- Mount and tighten screw 17.

Guideline

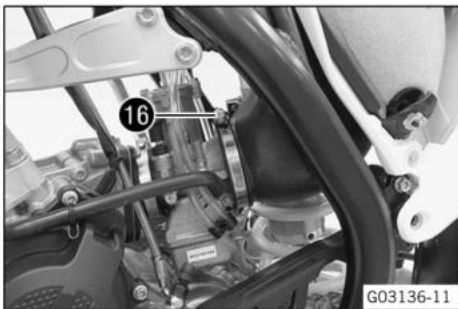
Screw, sub-frame	M8	35 Nm (25.8 lbf ft) Loctite®2701™
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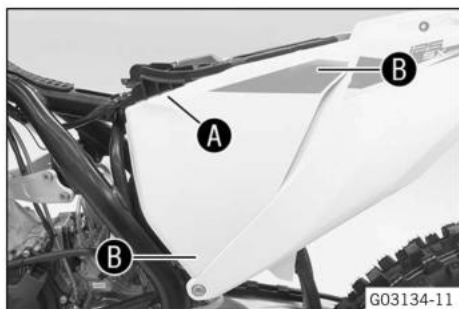
- Remove screw 18.
- Mount and tighten screw 18.

Guideline

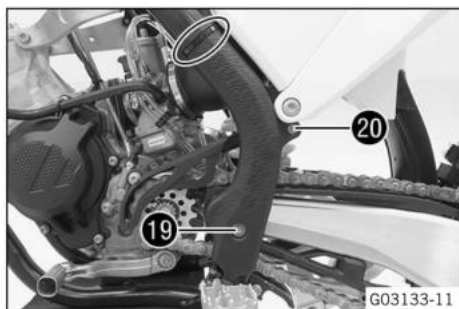
Screw, sub-frame	M8	35 Nm (25.8 lbf ft) Loctite®2701™
------------------	----	---

- Repeat these steps on the opposite side.
- Position and tighten hose clip 16.





- Insert the air filter box cover into rear area **A** and clip it into front area **B**.



- Position the frame protector.
- Mount and tighten screw **19** with the washer.

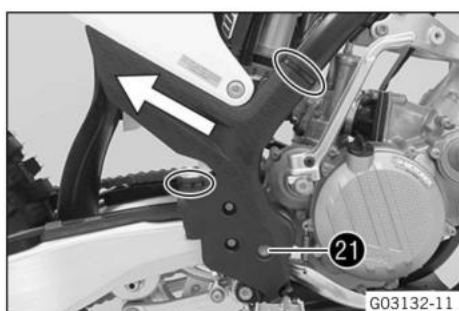
Guideline

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

- Mount and tighten screw **20**.

Guideline

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

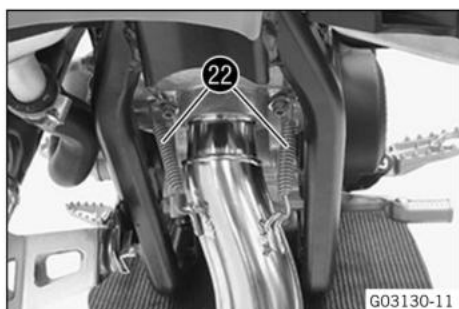


- Mount the cable tie.
- Insert the frame protector from below and push it to the rear.
- Mount and tighten screw **21** with the washer.

Guideline

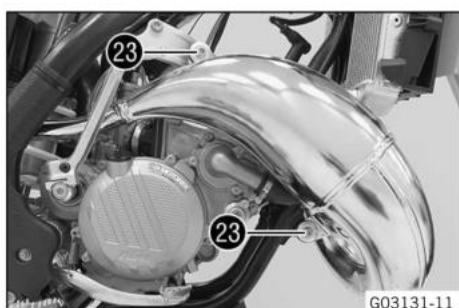
Screw, frame protector	M5	3 Nm (2.2 lbf ft)
------------------------	----	-------------------

- Mount the cable ties.



- Position the manifold.
- Mount springs **22**.

Spring hook (5030501700004) (p. 297)

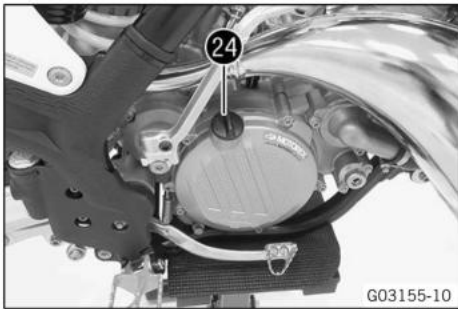


- Mount and tighten screws **23**.

Guideline

Screw, manifold	M8	15 Nm (11.1 lbf ft)
-----------------	----	---------------------

- Install the main silencer. (p. 101)
- Install the fuel tank. (p. 110)



- Remove filler plug 24 with the O-ring, and fill up with gear oil.

Gear oil	0.80 l (0.85 qt.)	Engine oil (15W/50) (p. 286)
----------	----------------------	------------------------------------

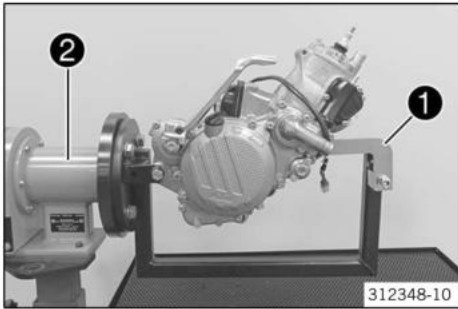
- Mount and tighten filler plug 24 with the O-ring.

Finishing work

- Remove the motorcycle from the lift stand. (p. 12)
- Refill with coolant. (p. 248)
- Go for a short test ride.
- Check the engine for leak tightness.
- Check the gear oil level. (p. 257)
- Check the coolant level. (p. 247)

17.3 Engine disassembly

17.3.1 Clamping the engine into the engine assembly stand

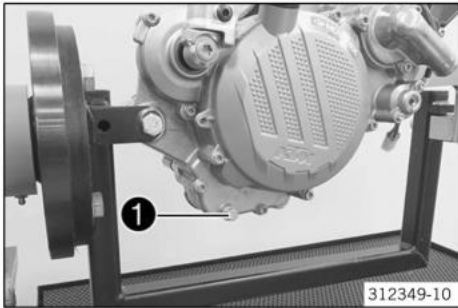


- Mount special tool 1 on engine assembly stand 2.

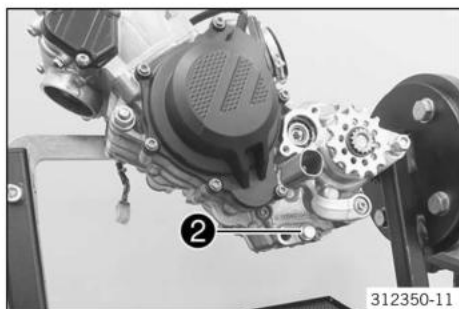
Engine assembly stand (61229001000) (p. 296)
Holder for engine motor stand (50429002020) (p. 292)

- Mount the motor on special tool 1.

17.3.2 Draining the gear oil



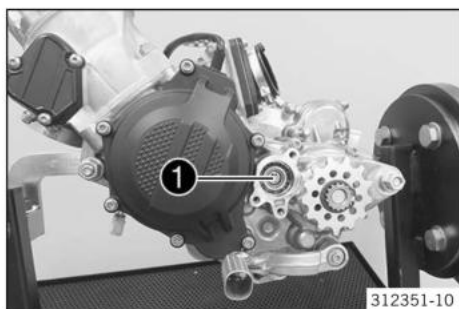
- Remove gear oil drain plug 1 with seal ring.



- Remove gear oil drain plug ② with the magnet and seal ring.
- Allow the gear oil drain completely.



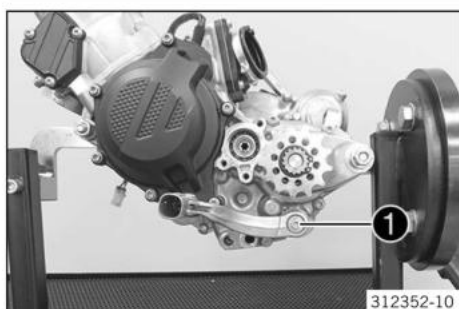
17.3.3 Removing the clutch push rod



- Remove clutch push rod ①.



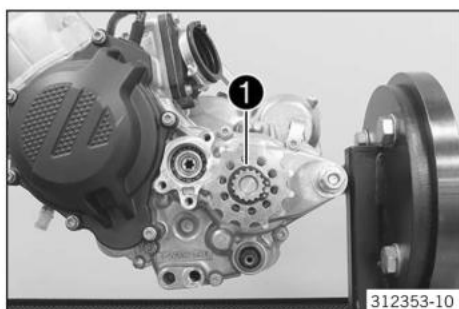
17.3.4 Removing the shift lever



- Remove screw ① with the washers. Take off the shift lever.



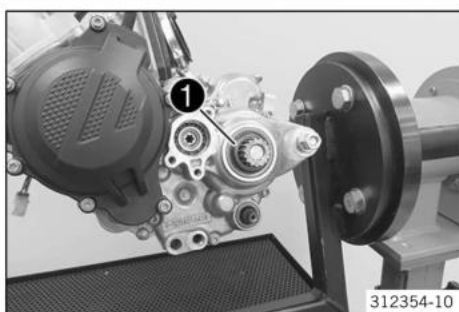
17.3.5 Removing the engine sprocket



- Remove lock ring ①. Take off the engine sprocket.

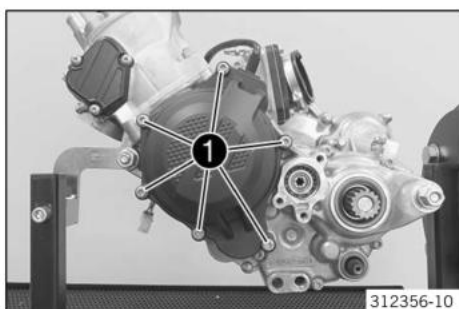


17.3.6 Removing the spacer



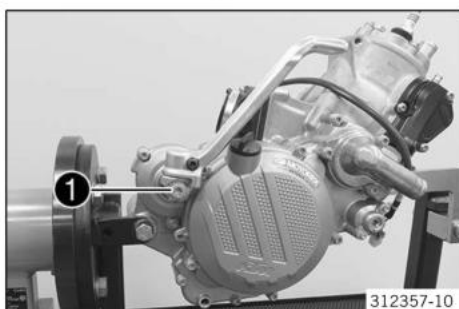
- Remove spacer **1**.

17.3.7 Removing the alternator cover



- Remove screws **1**. Take off the alternator cover.

17.3.8 Removing the kick starter lever



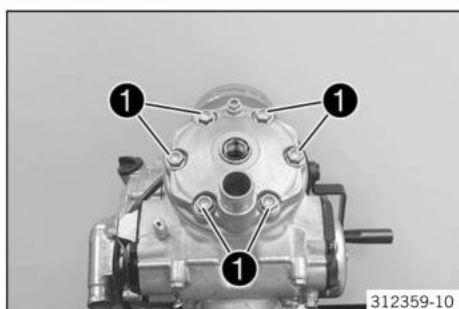
- Remove screw **1** with the washer.
- Take off the kick starter lever.

17.3.9 Removing the spark plug

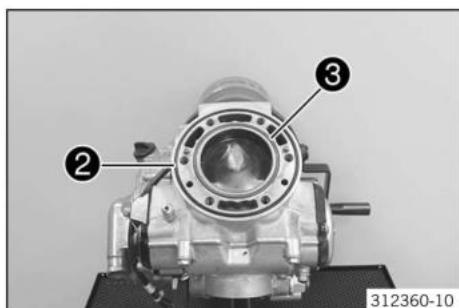


- Remove spark plug **1**.

17.3.10 Removing the cylinder head

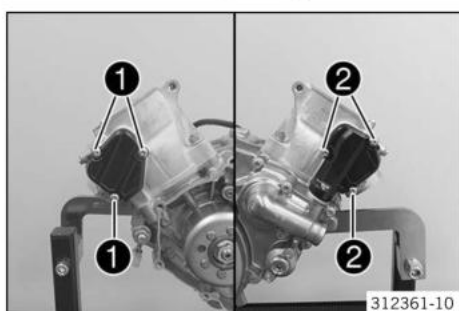


- Loosen screws **1** in a crisscross pattern and remove them.
- Take off the cylinder head and combustion chamber liner.

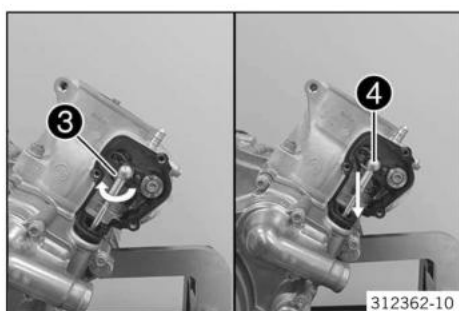


- Remove O-rings **2** and **3**.

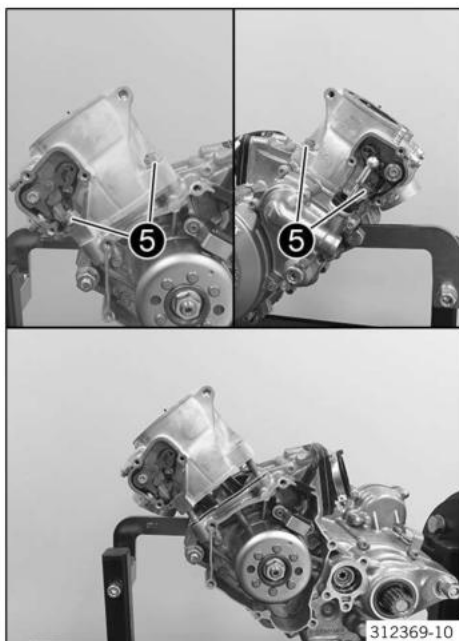
17.3.11 Removing the cylinder



- 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.



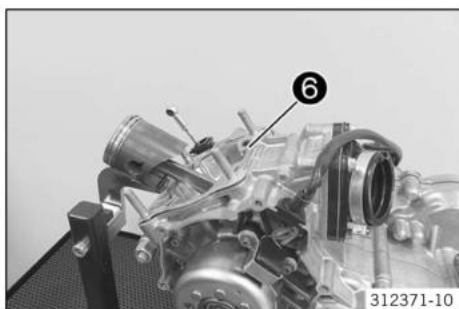
- Remove nuts **5**.



Info

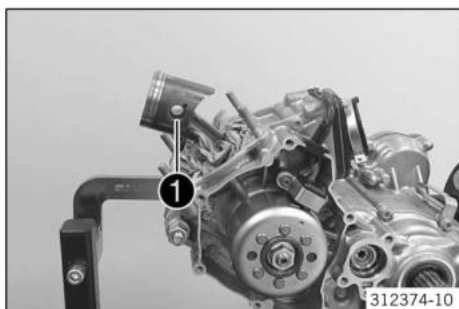
Raise the cylinder slightly to be able to remove the front nuts.

- Carefully slide the cylinder up and take it off.

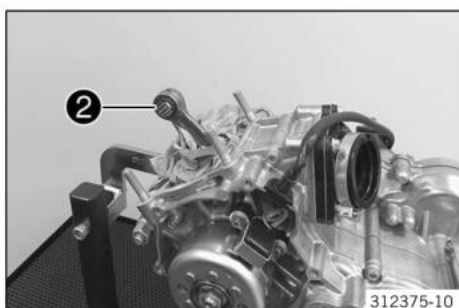


- Take off gasket **6**.

17.3.12 Removing the piston

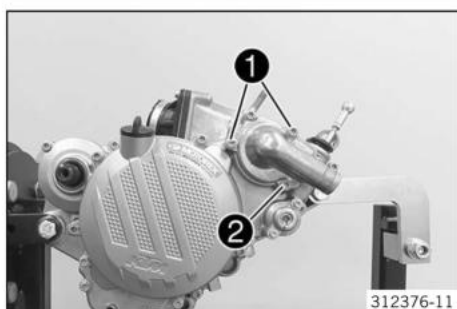


- Uncover the crankcase.
- Remove piston ring lock **1**.
- Remove the piston pin.
- Take off the piston.



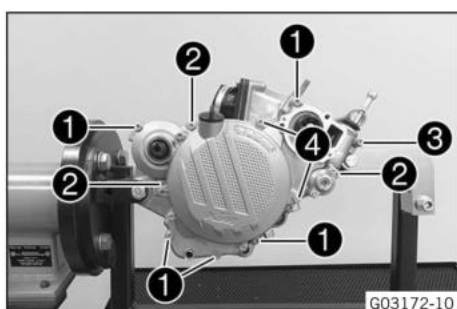
- Remove upper conrod bearing **2**.

17.3.13 Removing the water pump cover



- Remove screws ①.
- Remove screw ② with the washer.
- Take off the water pump cover.
- Remove the form ring.

17.3.14 Removing the clutch cover

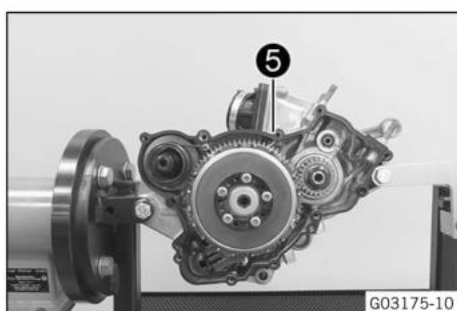


- Remove screws ①, ②, ③ and ④. Take off the clutch cover.



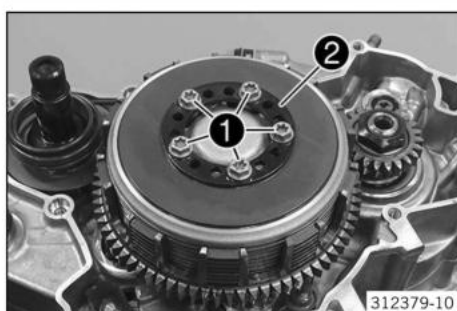
Info

Ensure that the kick starter shaft remains in the engine case.

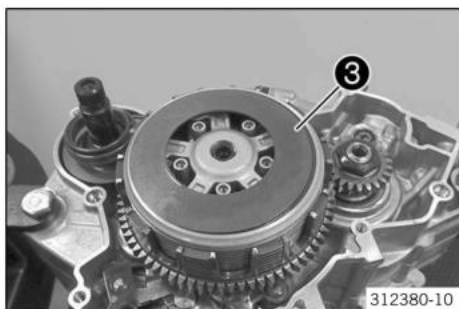


- Remove the dowels and clutch cover gasket ⑤.

17.3.15 Removing the clutch discs



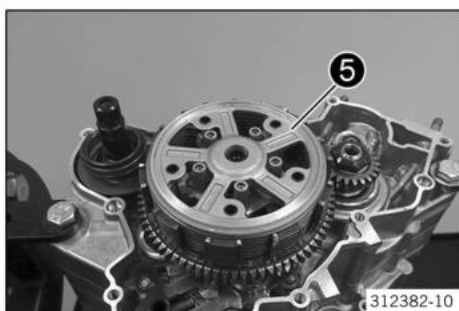
- Remove screws ①.
- Take off spring retainer ②.



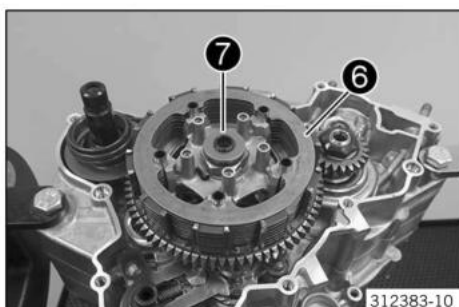
- Take off spring washer ③.



- Take off pretension ring ④.

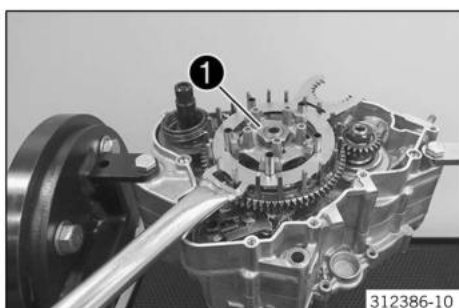


- Take off clutch pressure cap ⑤.



- Take out clutch disc pack ⑥ entirely.
- Remove clutch throw-out ⑦.

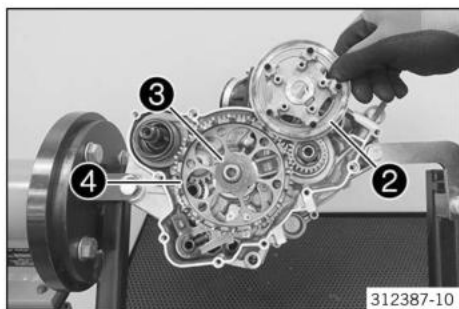
17.3.16 Removing the clutch basket



- Bend up the lock washer.
- Hold the inner clutch hub with the special tool. Loosen nut ①.

Holding wrench (50529003000) (p. 293)

- Remove the nut with the lock washer.



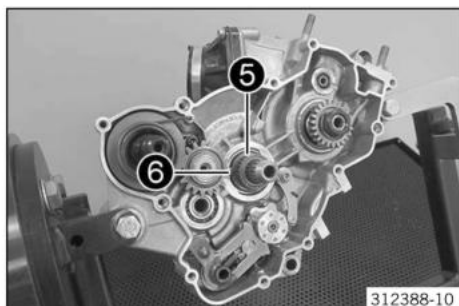
- Take off inner clutch hub ② and washer ③.



Info

The washer usually sticks to the inner clutch hub.

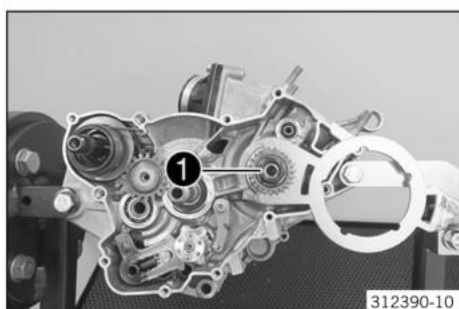
- Take off clutch basket ④.



- Take off needle bearing ⑤ and collar bushing ⑥.



17.3.17 Removing the primary gear wheel



- Position the special tool.
- Hold the primary gear wheel using the special tool.

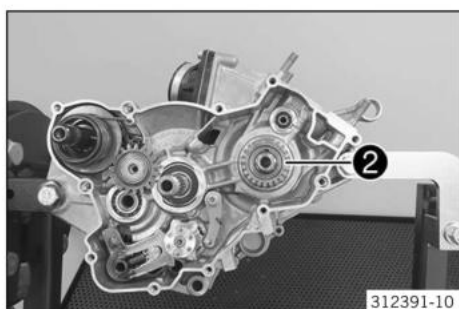
Holding wrench (50529003000) (p. 293)

- Remove nut ① with the washer.

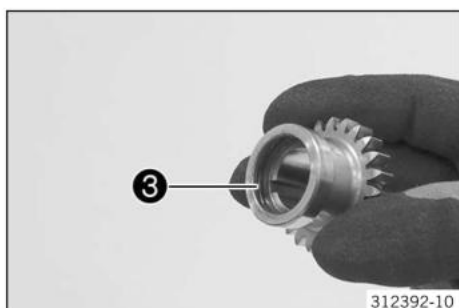


Info

LH thread!



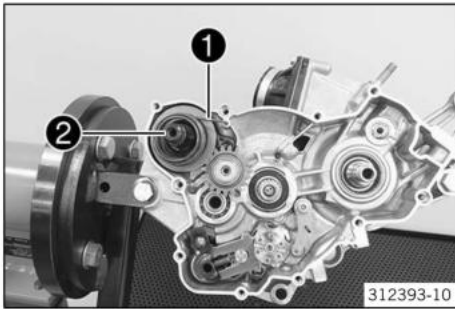
- Remove primary gear wheel ②.
- Remove the woodruff key.



- Remove O-ring ③.



17.3.18 Removing the kick starter shaft



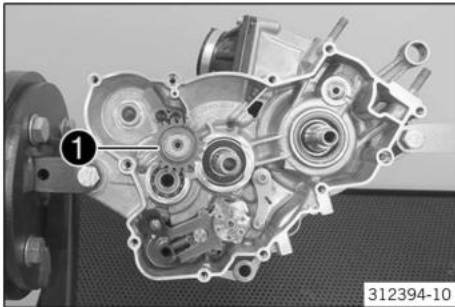
- Detach kick starter spring ①.
- Remove kick starter shaft ②.



Info

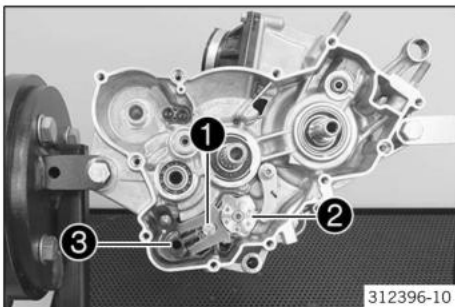
Turn the kick starter shaft slightly to the left.

17.3.19 Removing the kick starter intermediate gear



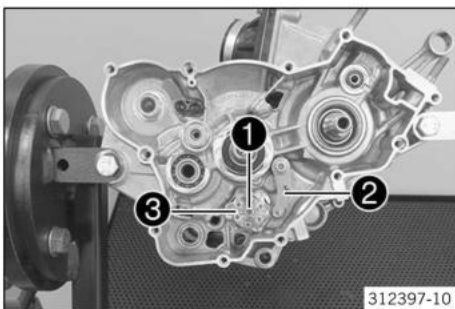
- Take off kick starter intermediate gear ①.

17.3.20 Removing the shift shaft



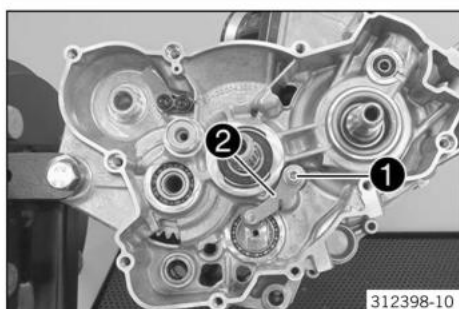
- Push sliding plate ① away from shift drum locating unit ②.
Remove shift shaft ③ with washer.

17.3.21 Removing the shift drum locating unit



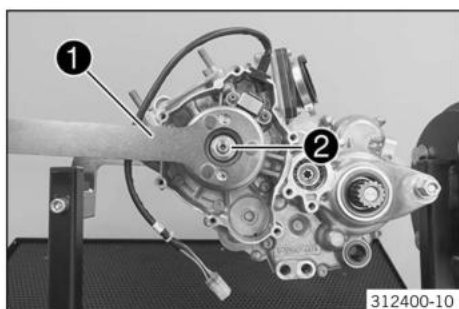
- Remove screw ①.
- Push away locking lever ② from shift drum locating unit ③ and remove the shift drum locating unit.
- Relieve tension from the locking lever.

17.3.22 Removing the locking lever



- Remove screw ①.
- Take off locking lever ② with the sleeve and spring.

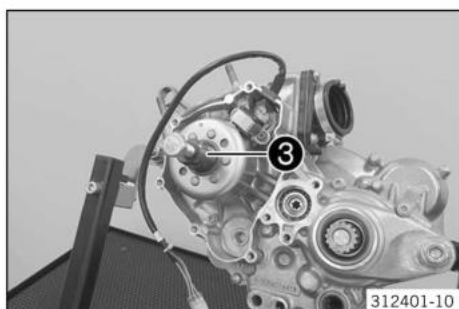
17.3.23 Removing the rotor



- Hold the rotor with special tool ①.

Holding wrench (54629012200) (p. 294)

- Remove nut ② and washer.

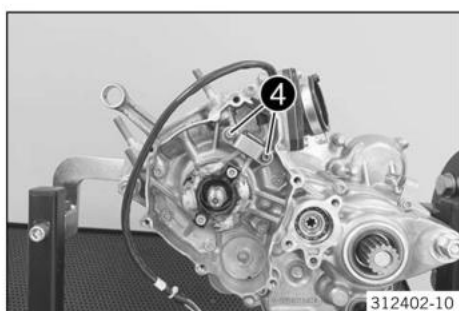


- Mount special tool ③, hold, and pull off the rotor by screwing in the screw.

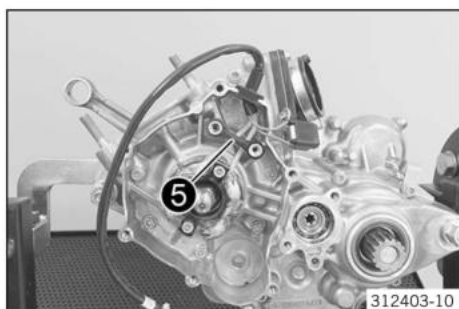
Puller (54629009044) (p. 293)



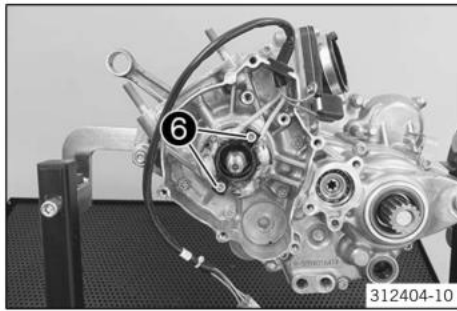
Info
LH thread!



- Remove screws ④.
- Take off the holding bracket.
- Hang crankshaft speed sensor to the side.

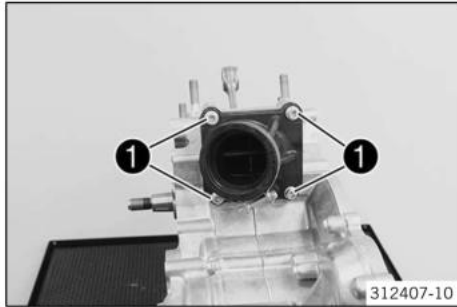


- Take off spacer element ⑤.

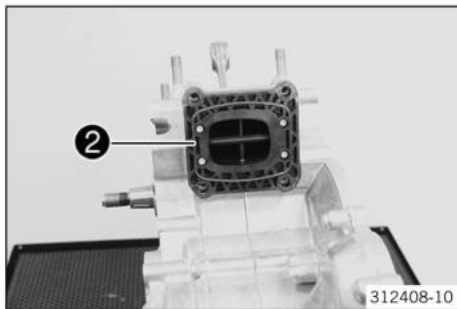


- Remove screws **6**.
- Pull the rubber grommet out of the engine case.
- Take off the stator with the crankshaft speed sensor.

17.3.24 Removing the reed valve housing

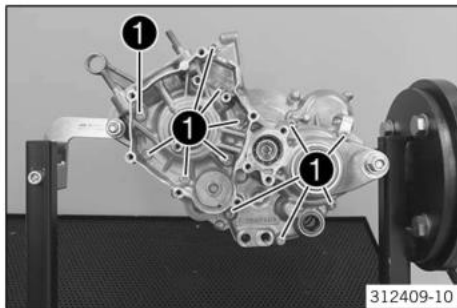


- Remove screws **1**.
- Take off intake flange and gasket.



- Remove reed valve housing **2**.
- Take off the gasket.

17.3.25 Removing the left engine case section

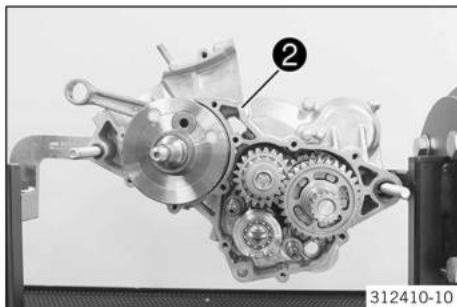


- Remove screws **1**.
- Tilt the left section of the engine case upward and remove the fitting of the engine fixing arm.
- Loosen the left section of the engine case by striking it lightly with a plastic hammer and remove it.



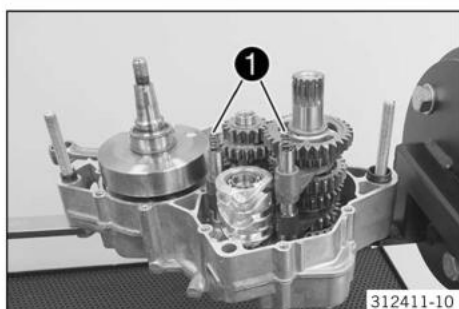
Info

Do not pry it apart with screwdrivers since the sealing areas are easily damaged.



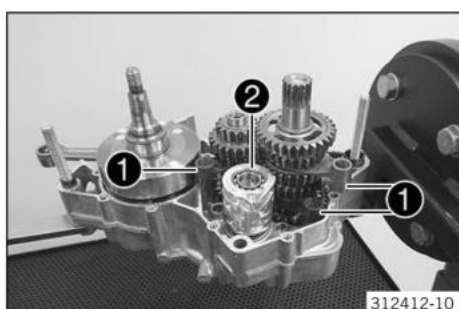
- Remove engine case gasket **2**.

17.3.26 Removing the shift rails



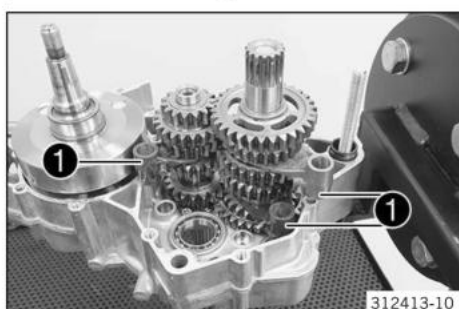
- Remove shift rails **1** with the springs.

17.3.27 Removing the shift drum



- Tilt shift forks **1** to the side.
- Remove shift drum **2**.

17.3.28 Removing the shift forks



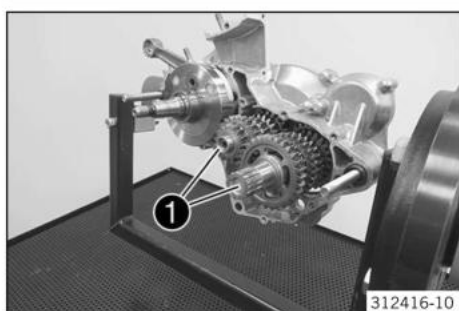
- Remove shift forks **1**.



Info

Do not misplace the shift rollers.

17.3.29 Removing the transmission shafts



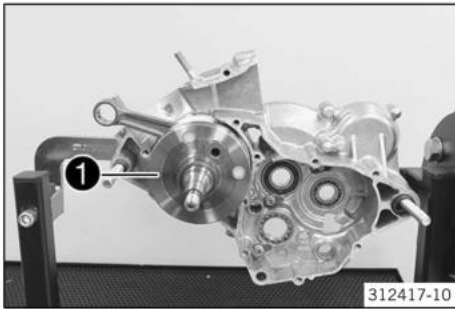
- Pull both transmission shafts **1** out of the bearing seats together.



Info

The stop disks of the transmission shafts usually stick to the bearings.

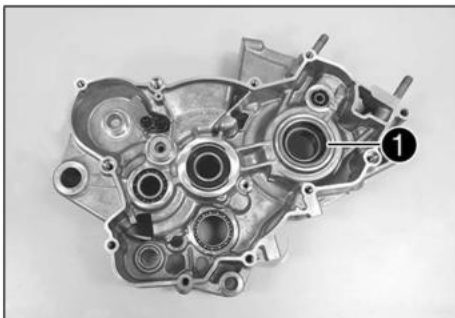
17.3.30 Removing the crankshaft



- Remove crankshaft **1**.

17.4 Working on individual parts

17.4.1 Working on the right section of the engine case



- Remove all dowels.
- Remove shaft seal ring **1** of the crankshaft.
- Remove screws **2**. Remove the bearing retainers.
- Clean the section of the engine case thoroughly.



Info

The main shaft bearing is a lifetime bearing. When cleaning the right housing half, the main shaft bearing must be replaced as lubrication cannot be guaranteed due to cleaning agent ingress.

- Warm the section of the engine case in an oven.

Guideline

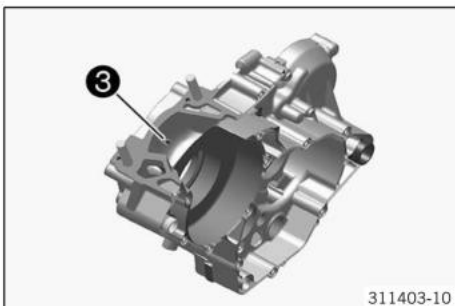
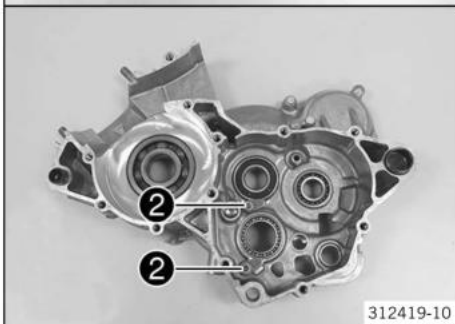
180 °C (356 °F)

- 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 **3** with compressed air and check that it is clear.
- Insert the new cold bearings in the bearing seat of the heated section of the engine case; if necessary, use a suitable press drift to push them all the way in and make them flush.



Info

When pressing in, ensure that the section of the engine case lies flat in order prevent damage. Only press the bearings in 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 shaft seal ring **1** for the crankshaft so it is flush, with the open side facing inward.
- Mount and tighten screws **2** with the bearing retainers.

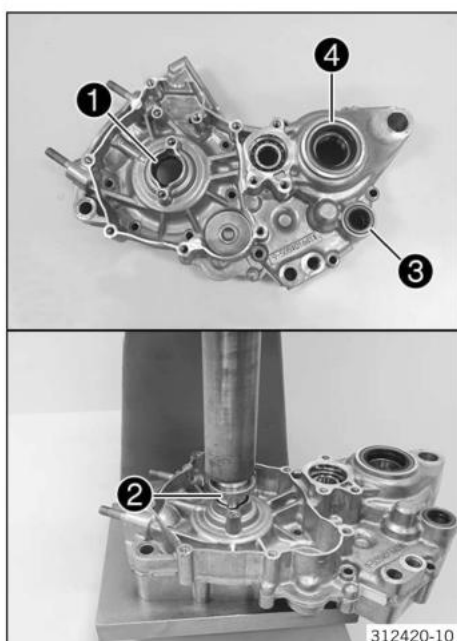
Guideline

Screw, bearing retainer	M6	10 Nm (7.4 lbf ft) Loctite®243™
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- Mount the dowels.



17.4.2 Working on the left section of the engine case



- Remove all dowels.
- Press shaft seal ring **1** of the crankshaft from the outside to the inside using special tool **2**.

Pressing tool (50429005000) (📖 p. 292)

- Remove shaft seal ring **3** of the shift shaft and **4** of the countershaft.
- Clean the section of the engine case thoroughly.
- Warm the section of the engine case in an oven.

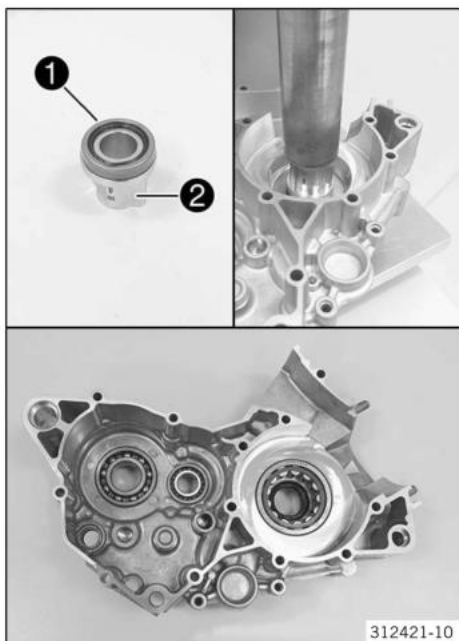
Guideline

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.



- Insert the new cold bearings in the bearing seat of the heated section of the engine case; if necessary, use a suitable press drift to push them all the way in and make them flush.



Info

When pressing in, ensure that the section of the engine case lies flat in order 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.



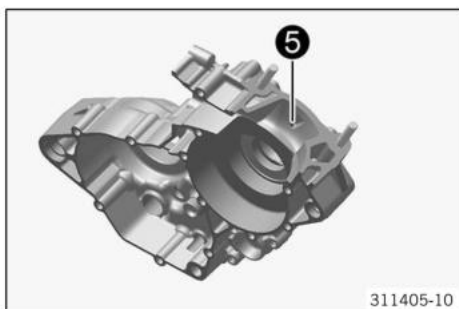
Info

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.

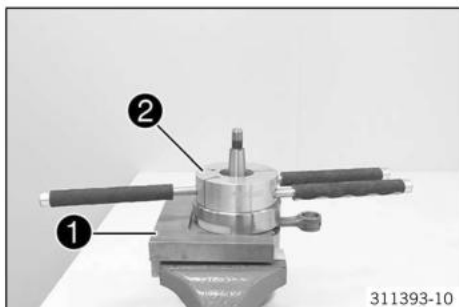
- Position shaft seal ring (1) for the crankshaft on special tool (2).

Pressing tool (50429005000) (p. 292)

- Press the shaft seal ring on the crankshaft from the inside toward the outside, with the open side facing inward.
- Press in shaft seal ring (3) of the shift shaft so it is flush with the open side facing inward.
- Press in shaft seal ring (4) of the countershaft so it is flush with the open side facing in.
- Blow out lubrication bore (5) with compressed air and check that it is clear.
- Mount the dowels.



17.4.3 Removing the crankshaft bearing inner race



- Fixate the crankshaft in the vice with special tool (1).

Guideline

Use soft jaws.

Separator plate (50329047050) (p. 291)

- Warm up special tool (2).

Guideline

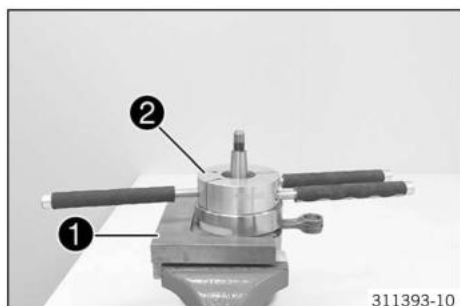
180 °C (356 °F)

Puller (58429037037) (p. 294)

- Push the warmed up special tool ② onto the crankshaft bearing inner race, press firmly together, and pull jointly from the crankshaft.



17.4.4 Installing the crankshaft bearing inner race



- Fixate the crankshaft in the vice with special tool ①.

Guideline

Use soft jaws.

Separator plate (50329047050) (p. 291)

- Heat the crankshaft bearing inner race in special tool ② and mount together.

Guideline

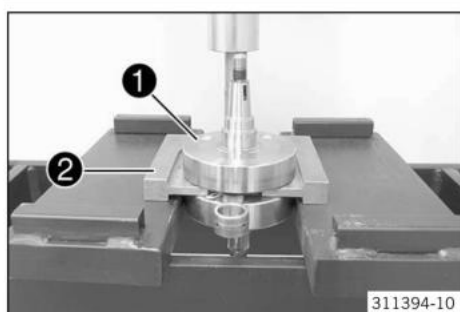
120 °C (248 °F)

Puller (58429037037) (p. 294)

- Ensure that the new crankshaft bearing inner race is flush.



17.4.5 Changing the connecting rod, conrod bearing, and crank pin



Main work

- Position crankshaft ① in the press using special tool ②.

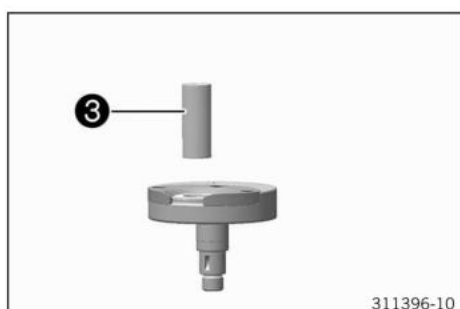
Separator plate (50329047050) (p. 291)

- Press the crank pin out of the upper crankweb with a suitable tool.

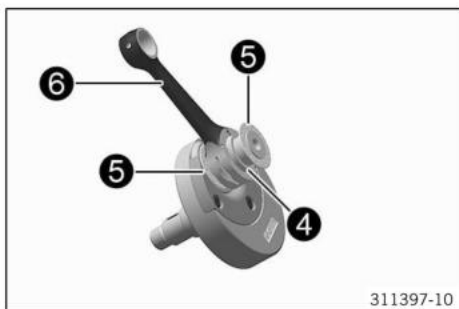
i Info

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.

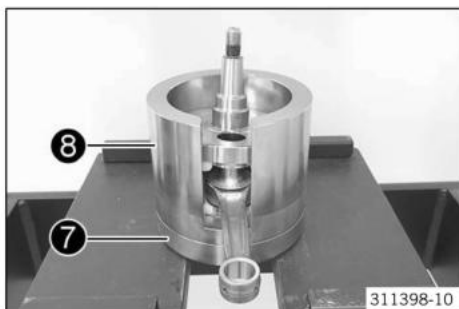


- Mount new bearing ④ with washers ⑤ and connecting rod ⑥.



Info

Thoroughly oil the bearing.

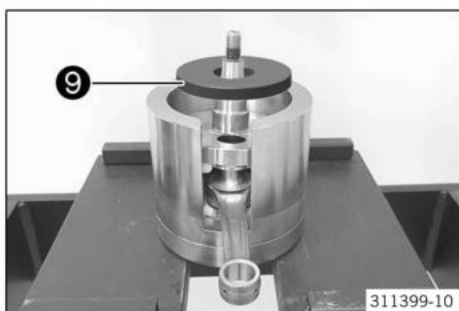


- Mount anchor plate ⑦ on special tool ⑧, and position on the press.

Crankshaft pressing tool (50329047000) (p. 291)

Sleeve for crankshaft pressing tool (50429047001)
(p. 293)

- Insert the crankweb with the connecting rod and bearing. Position the second crankweb.



- Position special tool ⑨ with the heel pointing down.

Cover for crankshaft pressing tool (50429047003)
(p. 293)

- Press in the upper crankweb as far as possible.



Info

The press mandrel must be positioned over the crank pin.

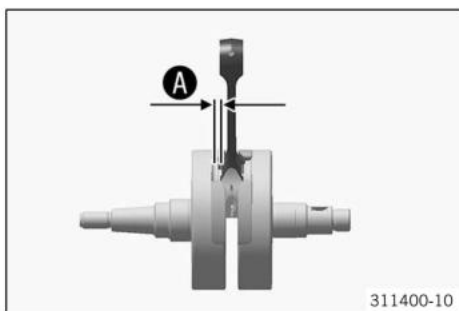
- Take the crankshaft out of the special tool and check that the connecting rod can move freely.

- Measure axial play A between the connecting rod and the crankwebs using the special tool.

Feeler gauge (59029041100) (p. 295)

Connecting rod - axial play of lower conrod bearing	0.45 ... 0.75 mm (0.0177 ... 0.0295 in)
---	---

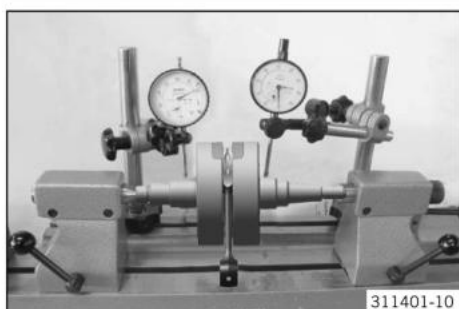
- » If the measured value is less than the specification:
 - Correct it so the dimension is equal to the specified value.



Finishing work

- Check the crankshaft run-out at the bearing pin. (p. 175)

17.4.6 Checking the crankshaft run-out at the bearing pin



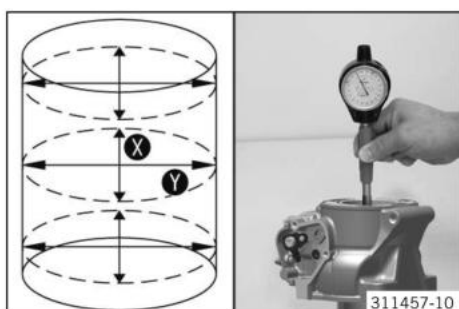
- Position the crankshaft on a roller block.
- Turn the crankshaft slowly.
- Check the crankshaft run-out on both bearing pins.

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.



17.4.7 Checking/measuring the cylinder



- Check the cylinder bearing surface for damage.
 - » If the cylinder bearing surface is damaged:
 - Change the cylinder and piston.
- Measure the bore diameter at several locations on the **X**- and **Y**-axes using a micrometer to identify oval wear.

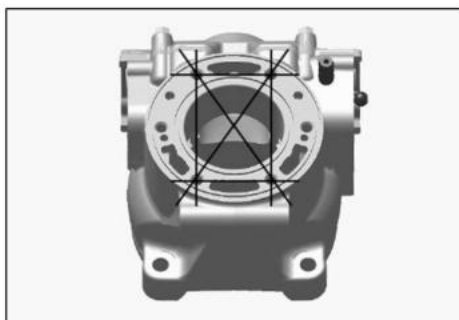
Guideline

Cylinder - drill hole diameter (All 125 models)	
Size I	54.000 ... 54.012 mm (2.12598 ... 2.12645 in)
Size II	54.012 ... 54.025 mm (2.12645 ... 2.12696 in)
Cylinder - drill hole diameter (All 150 models)	
Size I	58.000 ... 58.012 mm (2.28346 ... 2.28393 in)
Size II	58.012 ... 58.025 mm (2.28393 ... 2.28444 in)



Info

The cylinder size **1** is labeled on the right side of the cylinder.

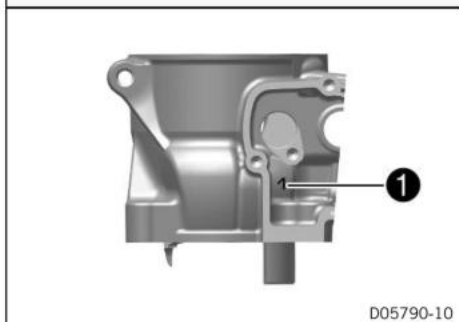


- Using a straightedge and the special tool, check the sealing surface of the cylinder head for distortion.

Feeler gauge (59029041100) (p. 295)

Cylinder/cylinder head - distortion of sealing area	$\leq 0.10 \text{ mm}$ ($\leq 0.0039 \text{ in}$)
---	---

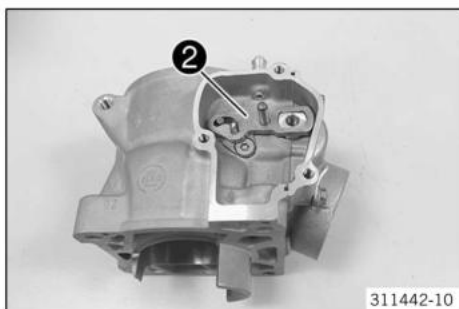
- » If the measured value does not meet specifications:
 - Change the cylinder.



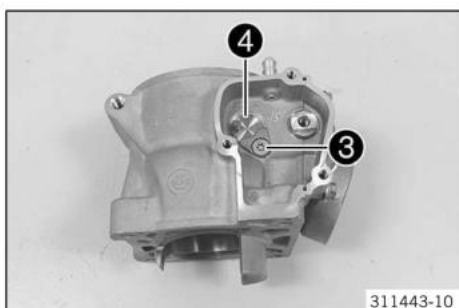
17.4.8 Removing the exhaust control



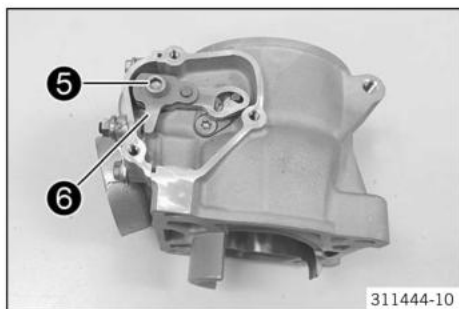
- Remove screw **1** with bushing, spring, and washer.
- Take off the adjusting lever.



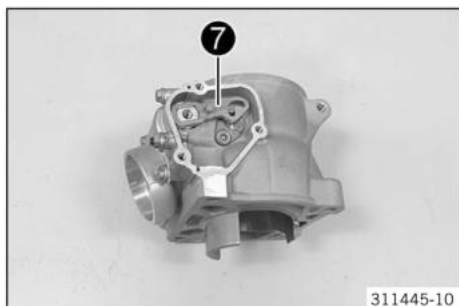
- Remove control gate **2**.



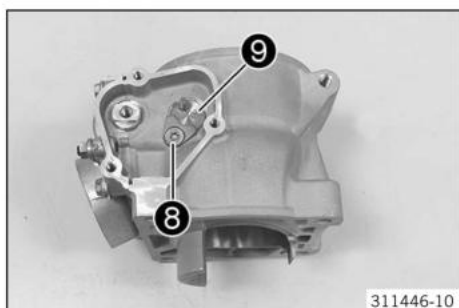
- Remove screw **3** and take off retaining bracket.
- Remove control shaft **4**.



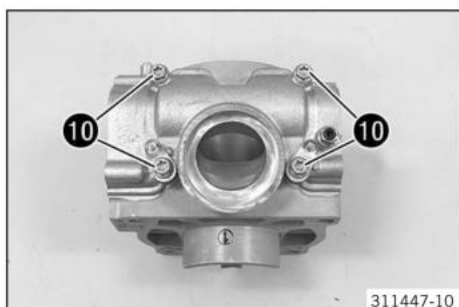
- Remove screw **5**.
- Take off stop plate **6**.



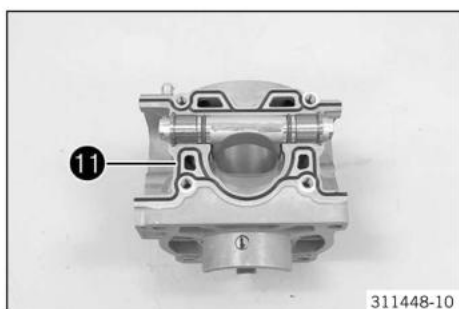
- Take off control gate **7**.



- Remove screws **8**.
- Remove control shaft **9**.

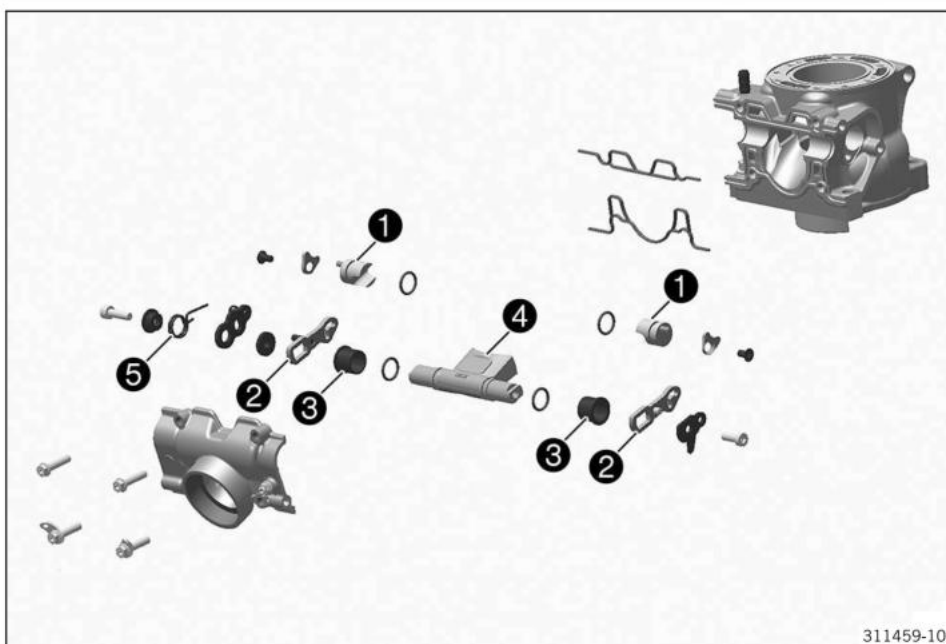


- Remove screws **10**.
- Take off the exhaust flange.



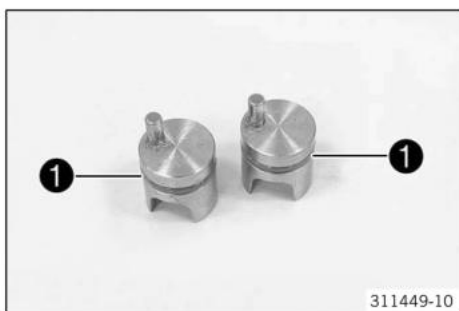
- Remove form ring **11**.
- Take off the control flap.

17.4.9 Checking the exhaust control



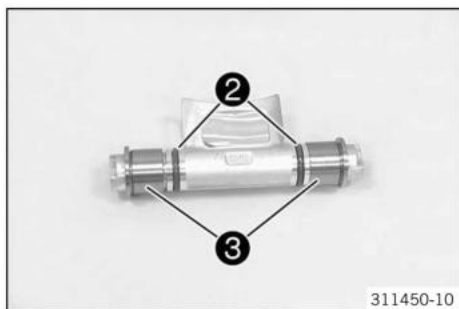
- Check control shafts **1** for damage and wear.
 - » If there is damage or wear:
 - Change the control shaft.
- Check control gate **2** for damage and wear.
 - » If there is damage or wear:
 - Change control gate.
- Check bearing sleeves **3** for damage and wear.
 - » If there is damage or wear:
 - 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.

17.4.10 Installing the exhaust control



- Mount and grease O-rings **1**.

Long-life grease (p. 288)



- Mount and grease O-rings ②.

Long-life grease (📖 p. 288)

- Mount and grease bearing sleeves ③.

Long-life grease (📖 p. 288)



- Position control flap ④.



- Mount form ring ⑤.

✓ The **TOP** marking **A** faces the front.



- Position the exhaust flange.
- Mount and tighten screws ⑥.

Guideline

Screw, exhaust flange	M6	10 Nm (7.4 lbf ft)
-----------------------	----	--------------------



Info

Do not forget the spring hangers.



- Cut off the form ring at the sealing surfaces.

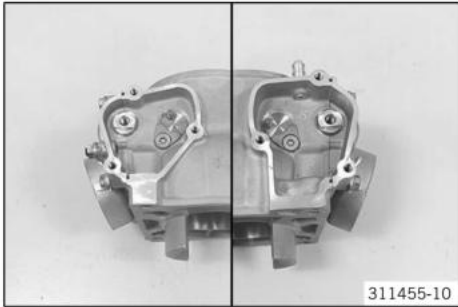


Info

Do not pull on the form ring as the form ring will otherwise be too short.

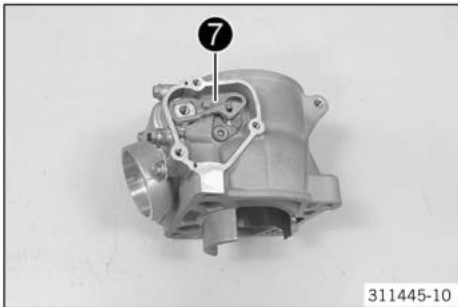
The form ring should protrude by approx. 1 millimeter after cutting.

Use cable cutters for cutting.

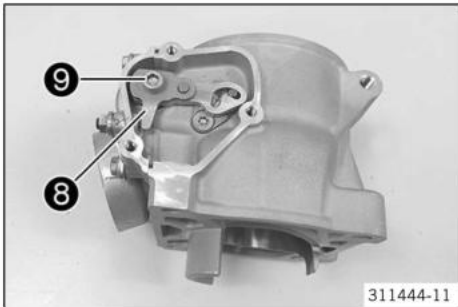


- Mount the control shafts.
- Position the retaining brackets; mount and tighten the screws.

Guideline		
Screw, retaining bracket, rotary valve	M5	6 Nm (4.4 lbf ft) Loctite®243™

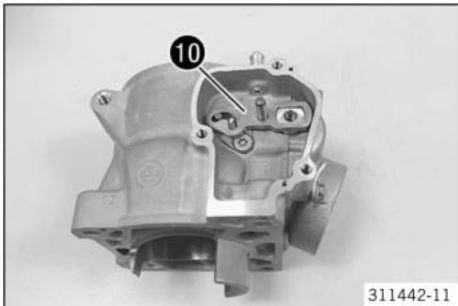


- Position control gate 7.



- Position stop plate 8.
- Mount and tighten screw 9.

Guideline		
Screw, stop plate of exhaust control	M6	10 Nm (7.4 lbf ft) Loctite®243™



- Position control gate 10.



- Position the adjusting lever.
- Position the spring with the short leg toward the outside.
- Mount screw 11 with the bushing, spring, and washer, but do not tighten yet.

Guideline		
Screw, control flap, exhaust control	M6	10 Nm (7.4 lbf ft) Loctite®243™

- Attach the spring to the cylinder pin.
- Tighten the screw.

Guideline

Screw, control flap, exhaust control	M6	10 Nm (7.4 lbf ft) Loctite®243™
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17.4.11 cylinder - Nikasil® coating



Nikasil® is a surface protection layer for a coating procedure developed by Mahle. The name is derived from the two materials used in this procedure – a layer of nickel into which is embedded the particularly hard silicone carbide. The most important advantages of the **Nikasil®** coating are very good heat conductivity, resulting in much improved performance, low wear, and a lightweight cylinder.

17.4.12 Checking/measuring the piston



- Check the piston bearing surface for damage.
 - » If the piston bearing surface is damaged:
 - Replace the piston and, if necessary, the cylinder.
- Check that the piston rings move easily in the piston ring grooves.
 - » If the piston ring is stiff:
 - Clean the piston ring groove.



Tip

An old piston ring can be used to clean the piston ring groove.

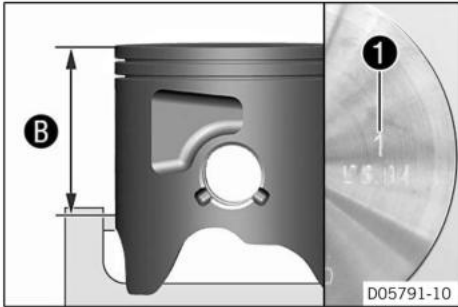
- Check the piston rings for damage.
 - » If the piston ring is damaged:
 - Change the piston ring.



Info

Mount the piston ring with the marking facing upward.

- Check the piston pins for discoloration or signs of wear.
 - » If the piston pin shows severe discoloration/signs of wear:
 - Change the piston pin.
- Place the upper conrod bearing and piston pin in the connecting rod and check the seating for play.
 - » If the piston pin seating has excessive play:
 - Change the connecting rod, conrod bearing, and crank pin.



- Measure the piston at the piston skirt, at right angles to the piston pin, at a distance **B**.

Guideline

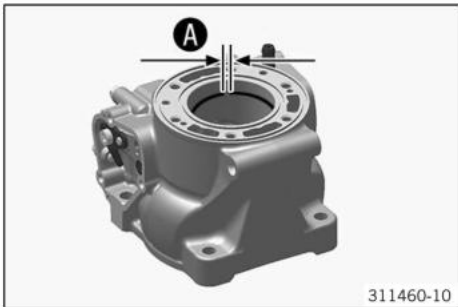
Distance B	50 mm (1.97 in)
Piston - diameter (All 125 models)	
Size I	53.935 ... 53.945 mm (2.12342 ... 2.12381 in)
Size II	53.945 ... 53.955 mm (2.12381 ... 2.12421 in)
Piston - diameter (All 150 models)	
Size I	57.935 ... 57.945 mm (2.2809 ... 2.28129 in)
Size II	57.945 ... 57.955 mm (2.28129 ... 2.28169 in)



Info

Piston dimensions **1** are marked on the piston head.

17.4.13 Checking the piston ring end gap



- Remove the piston ring from the piston.
- Place the piston ring in the cylinder and align with the piston.

Guideline

Below the upper edge of the cylinder	20 mm (0.79 in)
--------------------------------------	-----------------

- Measure end gap **A** with a feeler gauge.

Guideline

Piston ring end gap	
Ring 1	≤ 0.40 mm (≤ 0.0157 in)
Ring 2	≤ 0.40 mm (≤ 0.0157 in)

- » If the end gap is greater than the specified value:
 - Check/measure the cylinder. (📖 p. 175)
- » If cylinder wear lies within the specified tolerance:
 - Change the piston ring.
- Mount the piston ring with the marking facing toward the piston head.

17.4.14 Measuring the piston/cylinder mounting clearance



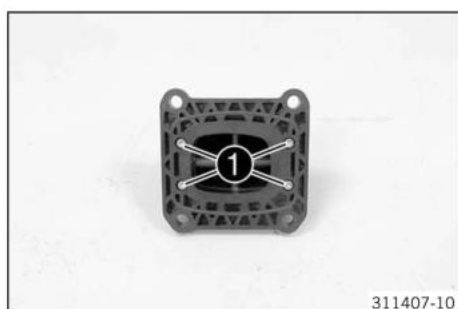
- Check/measure the cylinder. (📖 p. 175)
- Check/measure the piston. (📖 p. 181)
- The smallest piston/cylinder mounting clearance equals the smallest cylinder bore diameter minus the largest piston diameter. The largest piston/cylinder mounting clearance equals the largest cylinder bore diameter minus the smallest piston diameter.

Guideline

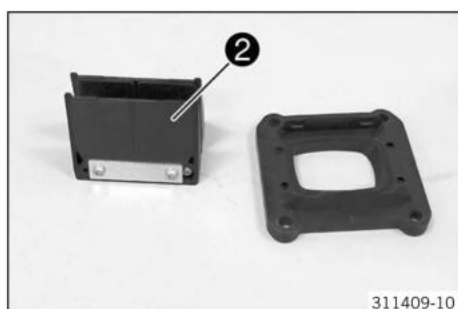
Piston/cylinder - mounting clearance (All 125 models)	
New condition	0.055 ... 0.080 mm (0.00217 ... 0.00315 in)
Wear limit	0.10 mm (0.0039 in)
Piston/cylinder - mounting clearance (All 150 models)	
New condition	0.055 ... 0.080 mm (0.00217 ... 0.00315 in)
Wear limit	0.10 mm (0.0039 in)



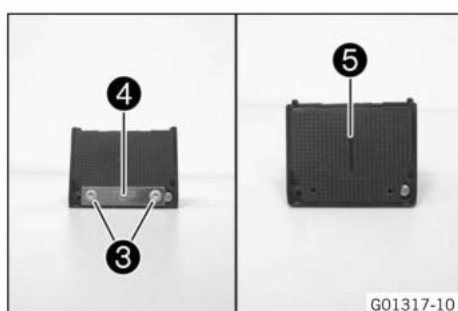
17.4.15 Disassembling the reed valve housing



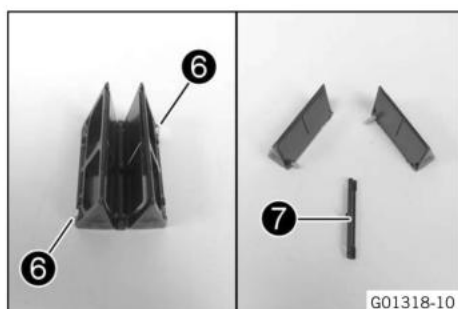
- Remove screws ①.



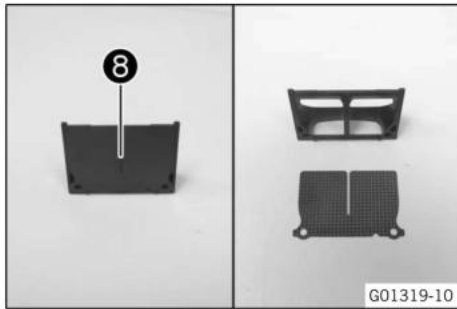
- Remove the reed valve housing ② from the support plate.



- 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.

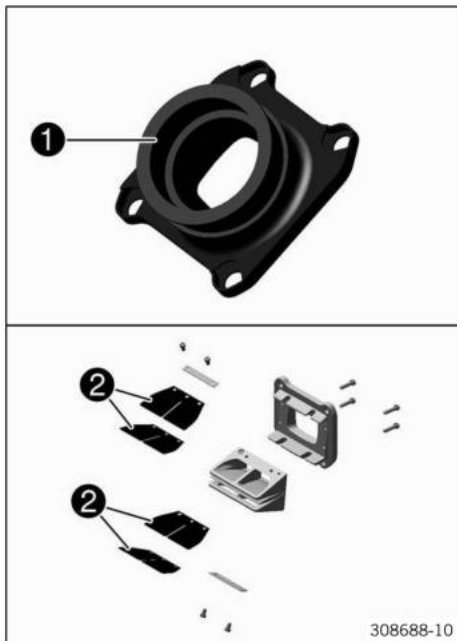


- Take off the inner reed valve **8** from both reed valve holders.

17.4.16 Checking the reed valve housing, reed valve and intake flange

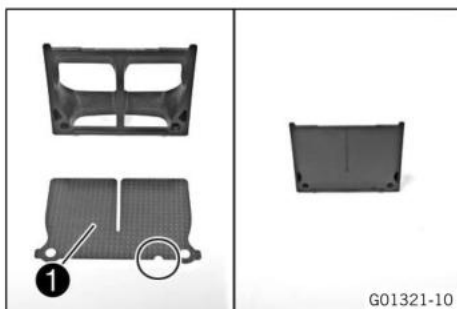
Condition

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.

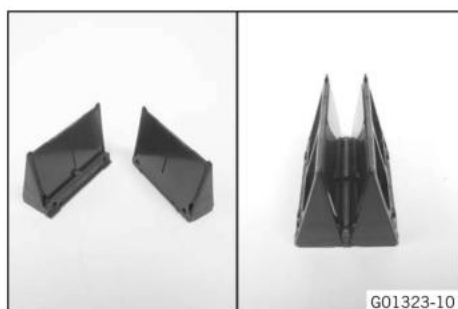
17.4.17 Assembling the reed valve housing



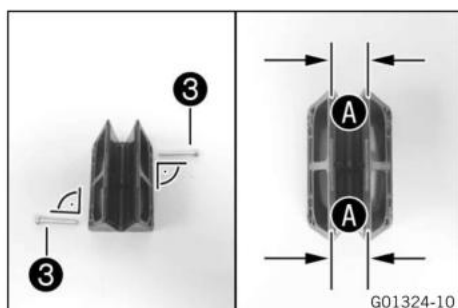
- Position the inner reed valve **1** on both reed valve holders.
 - ✓ The recesses are located on the right side.



- Position holding strip **2**.
- ✓ The holding lugs engage in the drilled holes.



- Position the reed valve holders.



- Mount screws **3** and screw in all the way.

i Info
Mount the screws at right angles to prevent damage.

- Loosen screws **3** and tighten again.

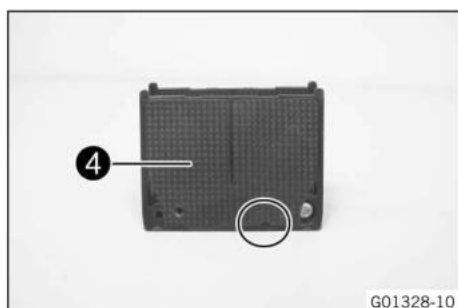
Guideline

Screw, inner membrane sheets	EJOTDELTA PT® 35x25	1 Nm (0.7 lbf ft)
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- ✓ 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)
------------------------------	------------------------------	-------------------



- 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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17.4.18 Working on the clutch cover

i **Info**
Remove the outer clutch cover to avoid damage.



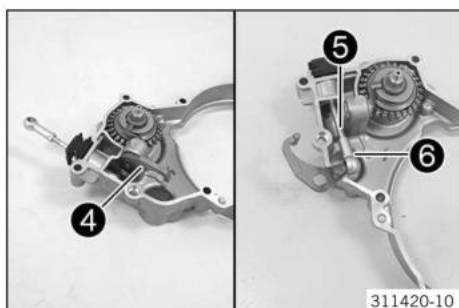
- Remove screws **1**.
- Remove the cap.



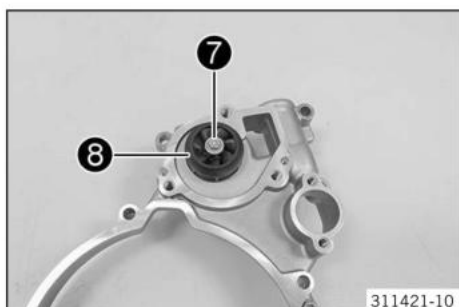
- Remove adjusting spring (2), the auxiliary spring and spring insert.



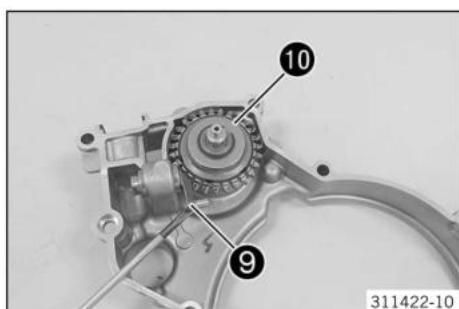
- Remove screw (3) with the washer.



- Pull off angle lever (4).
- Push linkage (5) downward.
- Remove lock (6) and pull off ball socket.
- Remove the linkage and angle lever.



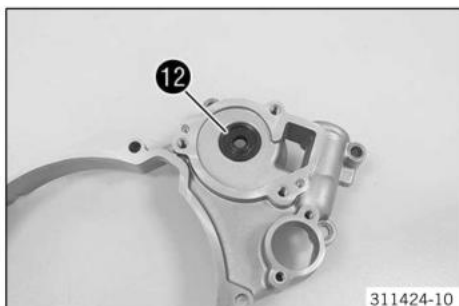
- Remove screw (7).
- Take off water pump impeller (8).



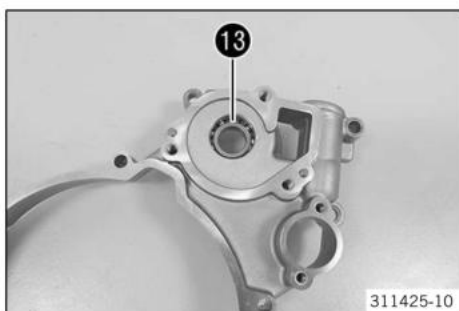
- Position control lever (9) as shown.
- Remove centrifugal force controller (10).
- Take off the control lever.



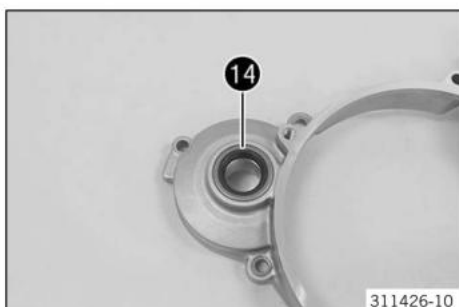
- Press out both needle bearings 11.



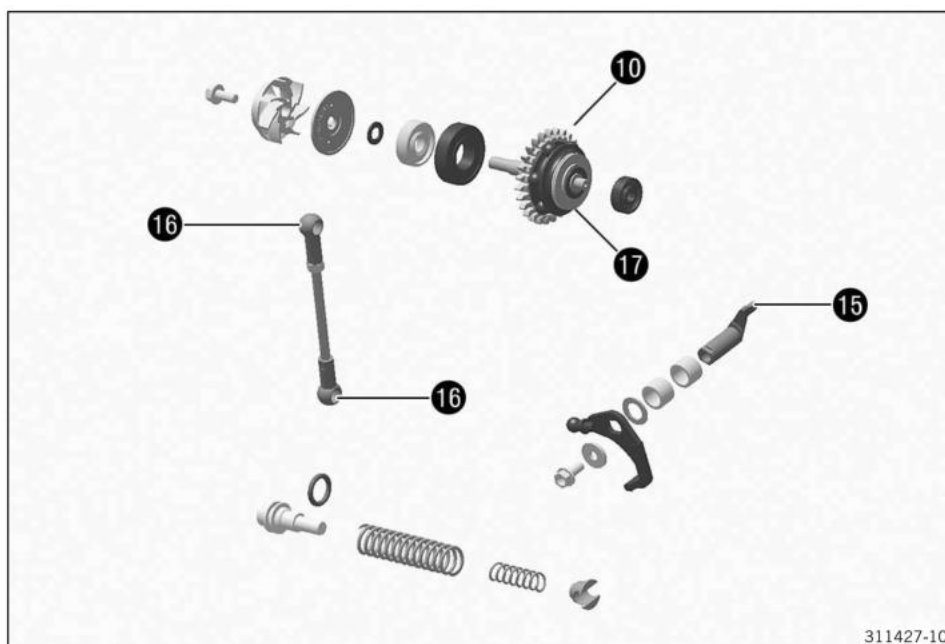
- Remove shaft seal ring 12.



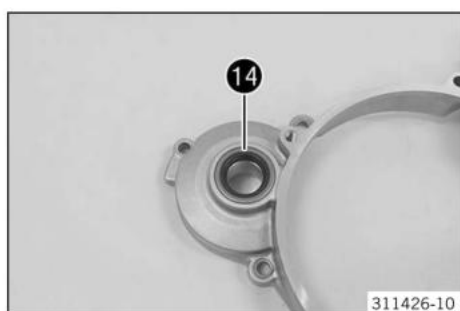
- Press out bearing 13 toward the inside.



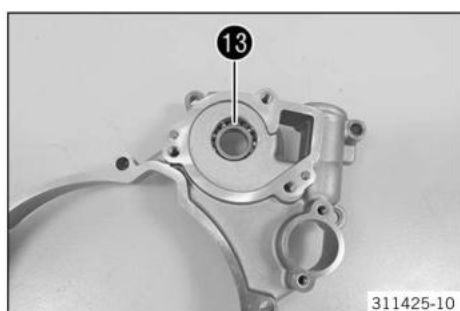
- Remove shaft seal ring 14.



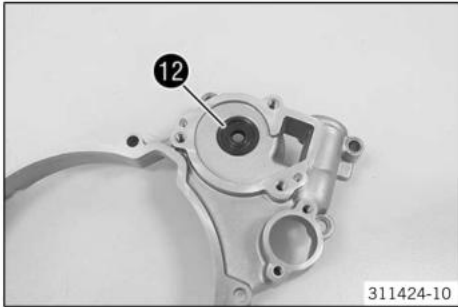
- Check pins **15** of the control lever for damage and wear.
 - » If there is damage or wear:
 - Change the control lever.
- Check ball head **16** on the linkage for damage and wear.
 - » If there is damage or wear:
 - Change the linkage.
- Check centrifugal force controller **10** for damage and wear.
 - » If there is damage or wear:
 - Change centrifugal force controller.
- Check axial bearing **17** for damage and wear.
 - » If there is damage or wear:
 - Change the axial bearing.



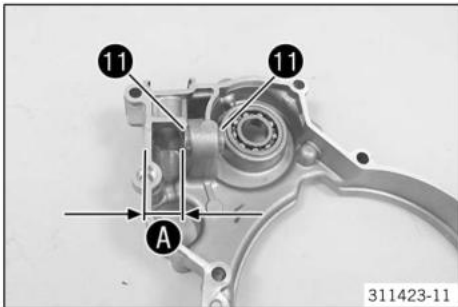
- Press shaft seal ring **14** all the way in.



- Press bearing **13** all the way in to the stop from the inside.



- Press shaft seal ring 12 so it is flush.
- Ensure that the bearing can turn freely and does not touch the shaft seal ring.



- Press in both needle bearings 11.

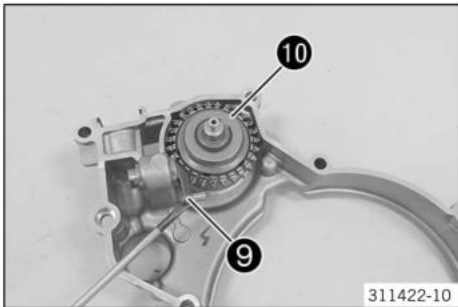
Guideline

Distance A to clutch cover outer edge	19 mm (0.75 in)
---------------------------------------	-----------------

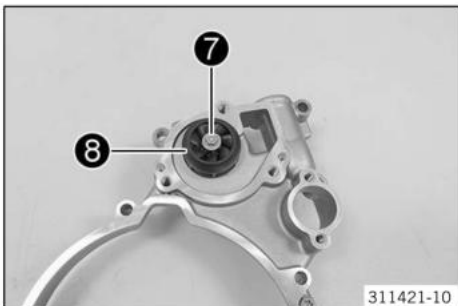


Info

The needle bearing on the angle lever must be precisely measured and set to avoid collision between the centrifugal force controller and the control lever.



- Mount control lever 9 with the washer; position as shown.
- Mount centrifugal force controller 10.

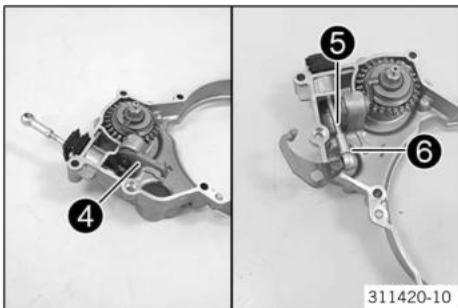


- Mount washer and water pump impeller 8.
- Mount and tighten screw 7.

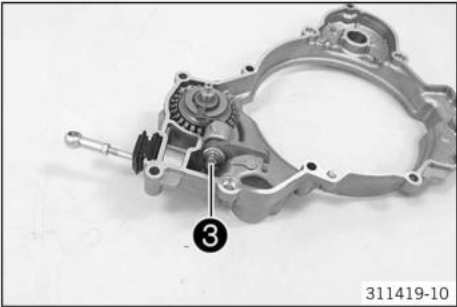
Guideline

Screw, water pump wheel	M5	6 Nm (4.4 lbf ft) Loctite®243™
-------------------------	----	--

- Turn the water pump impeller all the way around to ensure that it can move easily.



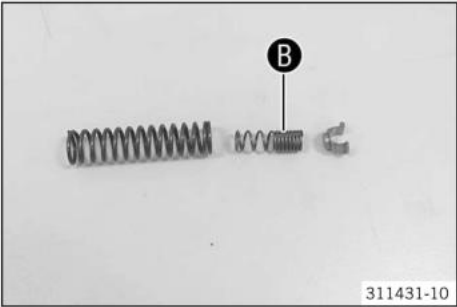
- Position linkage 5.
- Mount angle lever 4 in the ball socket.
- Mount retainer 6.
- Mount angle lever 4 on the control lever.



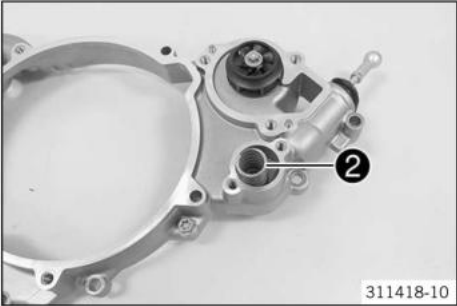
- Mount and tighten screw 3 with the washer.

Guideline

Screw, control lever, exhaust control	M6	10 Nm (7.4 lbf ft) Loctite®243™
---------------------------------------	----	---



- Mount the spring insert in the auxiliary spring.
✓ The tight coil B points toward the spring insert.



- Mount adjusting spring 2 with the auxiliary spring and spring insert.

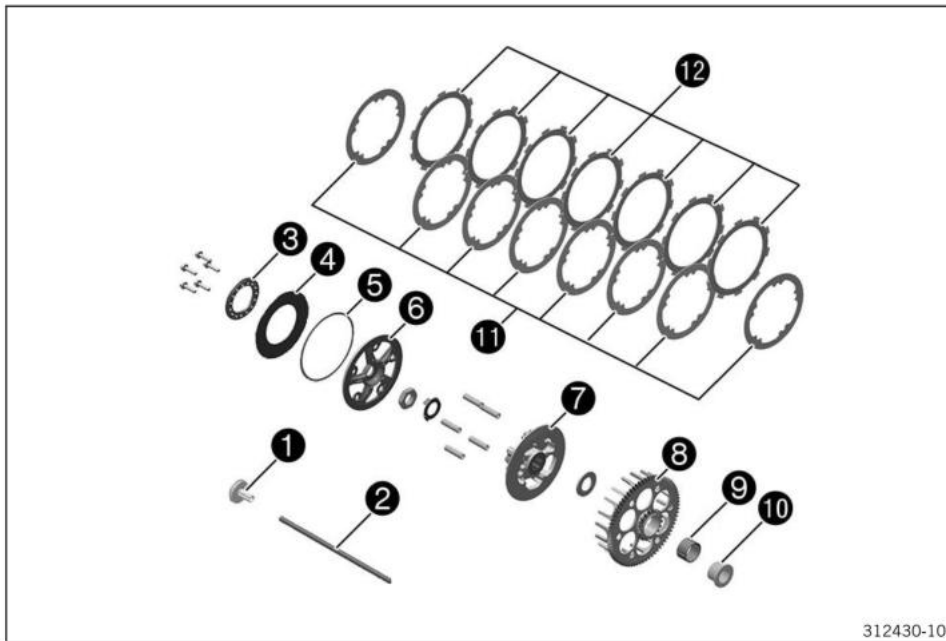


- Position the cap.
- Mount and tighten screws 1.

Guideline

Screw, exhaust control cover	M5	5 Nm (3.7 lbf ft)
------------------------------	----	-------------------

17.4.19 Checking the clutch



312430-10

- Check clutch push rod **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 spring washer **4** for damage and wear.
 - » If there is damage or wear:
 - Change the spring washer.
- Check pretension ring **5** for damage and wear.
 - » If there is damage or wear:
 - Change the pretension ring.
- 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 inner clutch hub **7** 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 **8** for damage and wear.
 - » If there is damage or wear:
 - Change the clutch facing discs and the clutch basket.
- Check needle bearing **9** and collar sleeve **10** for damage and wear.
 - » If there is damage or wear:
 - Change the needle bearing and collar sleeve.
- Check intermediate clutch discs **11** for damage and wear.

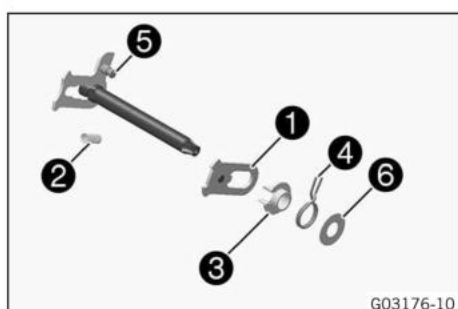
- » If the intermediate clutch discs are not level and are pitted:
 - Change all intermediate clutch discs.
- Check clutch facing discs **12** for discoloration and scoring.
 - » If there is discoloration or scoring:
 - Change all clutch facing discs.
- Check the thickness of the clutch disc pack.

Clutch disc pack - thickness	
Wear limit	$\geq 23.3 \text{ mm } (\geq 0.917 \text{ in})$

- » If the clutch disc pack does not meet the specified value:
 - Change the clutch disc pack.



17.4.20 Preassembling the shift shaft



- Secure the short end of the shift shaft in the bench vise.

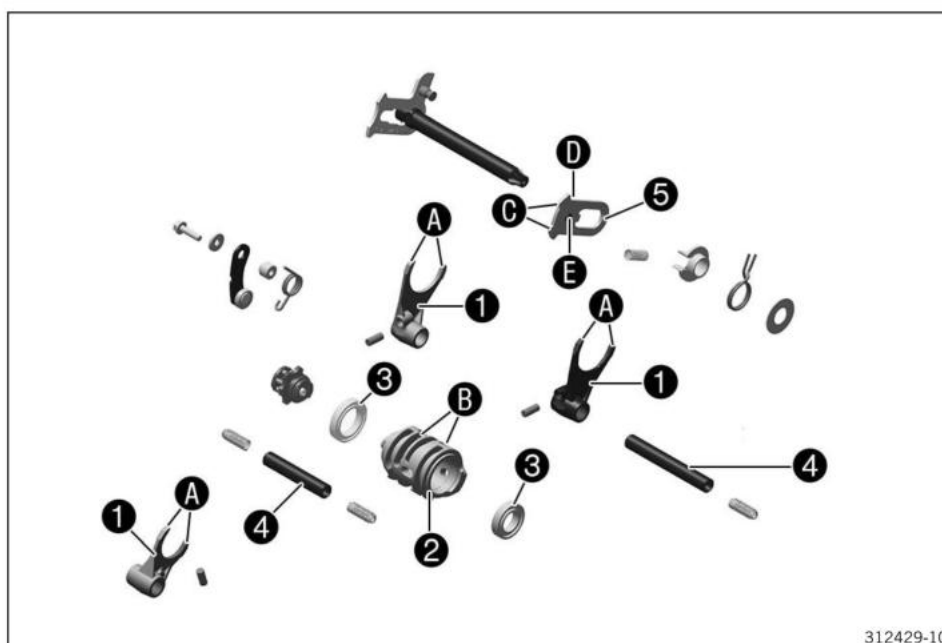
Guideline

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**.

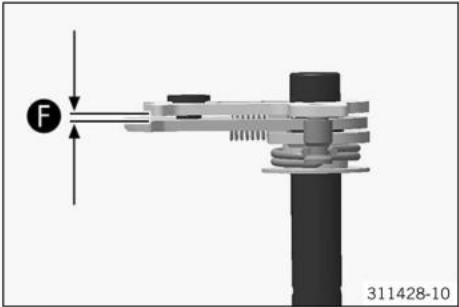


17.4.21 Checking the shift mechanism



- Check shift forks **1** on plate **A** for damage and wear (visual check).
 - » If there is damage or wear:
 - Change the shift fork and gear wheel pair.
- Check shift grooves **B** of shift drum **2** for wear.

- » If the shift groove is worn:
 - Change the shift drum.
- Check the seat of the shift drum in bearings ③.
 - » If the shift drum is not seated correctly:
 - Change the shift drum and/or the bearing.
- Check 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 the springs of shift rails ④ for damage and wear.
 - » If the spring is broken or worn:
 - Change the spring of the shift rail.
- Check shift rails ④ for run-out on a flat surface.
 - » If there is run-out:
 - Change the shift rail.
- Check the shift rails for scoring, wear and smooth operation in the shift forks.
 - » If there is scoring or corrosion, or if the shift fork is stiff:
 - Change the shift rail.
- Check sliding plate ⑤ in contact areas ⑥ for wear.
 - » If the sliding plate is worn:
 - Change the sliding plate.
- Check return surface ⑦ on the sliding plate for wear.
 - » If deep notches are present:
 - Change the sliding plate.
- Check guide pin ⑧ for looseness and wear.
 - » If the guide pin is loose and/or worn:
 - Change the sliding plate.

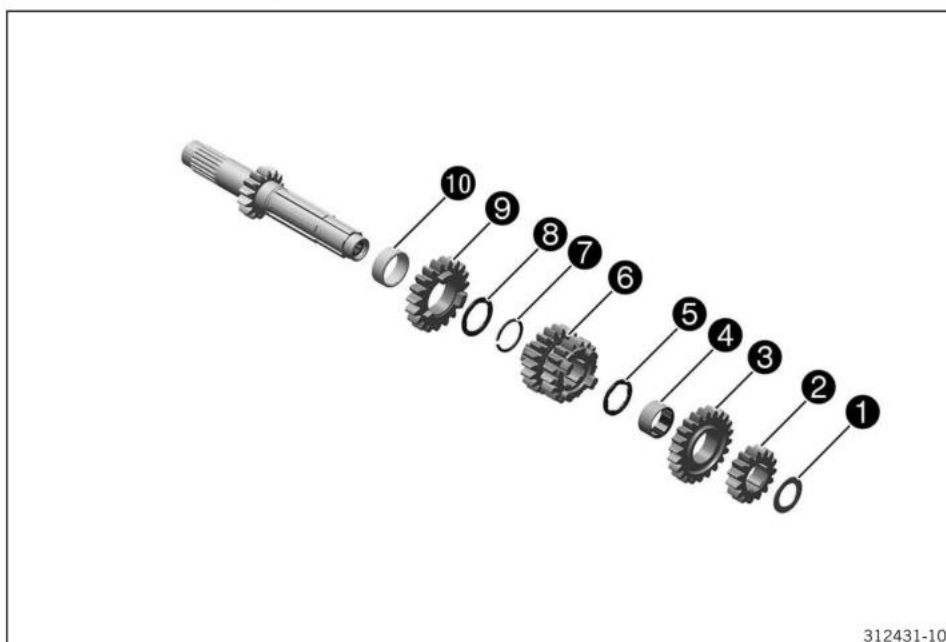


- Preassemble the shift shaft. (📖 p. 193)
- Check clearance ⑦ between the sliding plate and the shift quadrant.

Shift shaft - sliding plate/shift quadrant clearance	0.40 ... 0.80 mm (0.0157 ... 0.0315 in)
--	---

- » If the measured value does not meet specifications:
 - Change the sliding plate.

17.4.22 Disassembling the main shaft



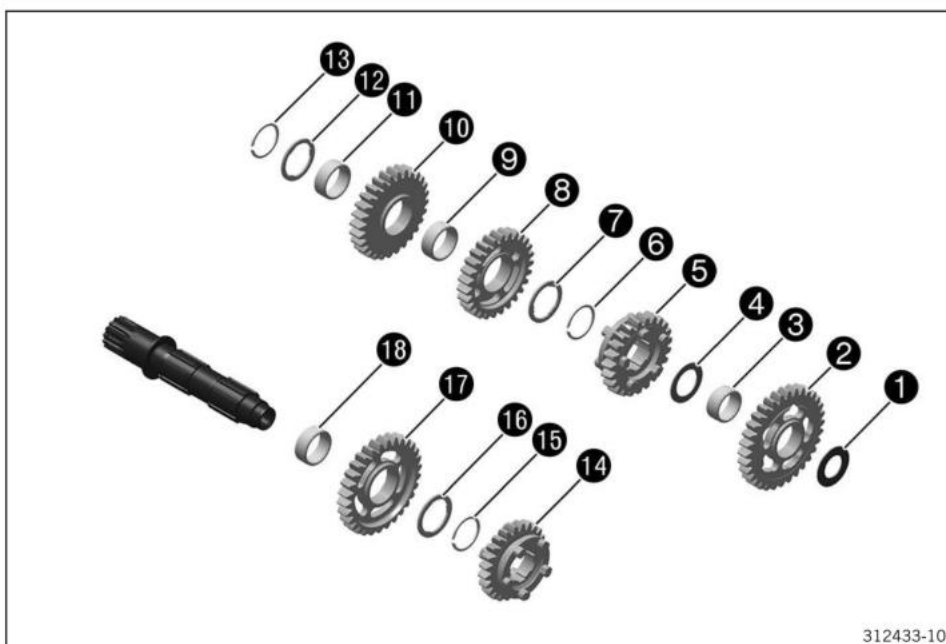
- Secure the main shaft in the vise with the gear teeth facing downward.

Guideline

Use soft jaws.

- Remove stop disk ① and second-gear fixed gear ②.
- Remove fifth-gear idler gear ③ and sliding bushing ④.
- Remove stop disk ⑤.
- Remove third/fourth-gear sliding gear ⑥.
- Remove lock ring ⑦.
- Remove stop disk ⑧.
- Remove sixth-gear idler gear ⑨.
- Remove needle bearing ⑩.

17.4.23 Disassembling the countershaft



- Secure the countershaft in the bench vise with the toothed end facing downward.

Guideline

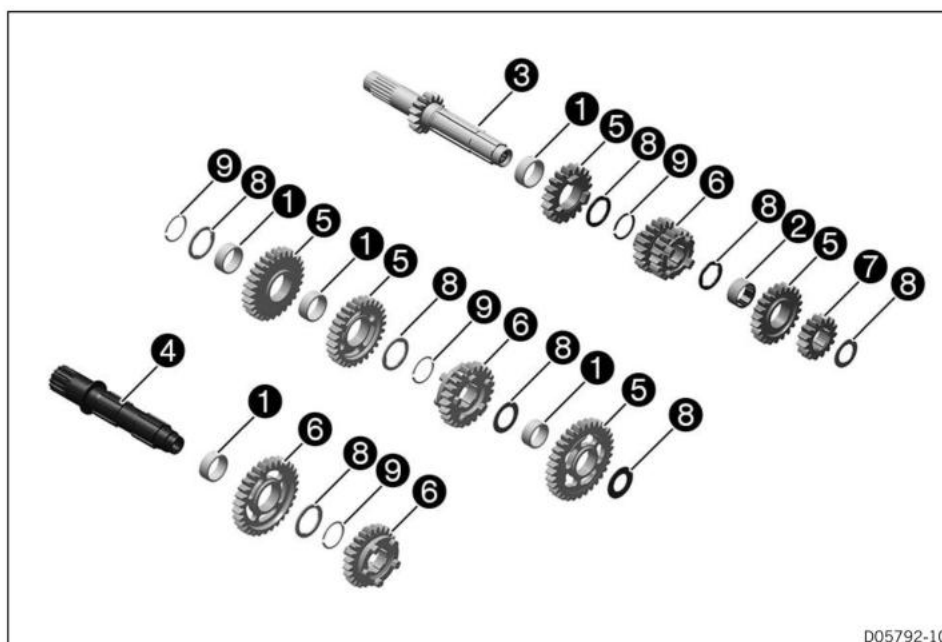
Use soft jaws.

- 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.

17.4.24 Checking the transmission

Condition

The transmission has been disassembled.



D05792-10

- Check needle bearings **1** for damage and wear.
 - » If there is damage or wear:
 - Change the needle bearing.
- Check sliding bushing **2** for damage and wear.
 - » If there is damage or wear:
 - Change the sliding bushing.
- Check the pivot points of main shaft **3** and countershaft **4** for damage and wear.
 - » If there is damage or wear:
 - Change the main shaft and/or countershaft.
- Check the tooth profiles of main shaft **3** and countershaft **4** for damage and wear.
 - » If there is damage or wear:
 - Change the main shaft and/or countershaft.
- Check the pivot points of idler gears **5** for damage and wear.
 - » If there is damage or wear:
 - Change the gear wheel pair.
- Check the shift dogs of idler gears **5** and sliding gears **6** for damage and wear.
 - » If there is damage or wear:
 - Change the gear wheel pair.
- Check the tooth faces of idler gears **5**, sliding gears **6**, and fixed gear **7** for damage and wear.
 - » If there is damage or wear:
 - Change the gear wheel pair.
- Check the tooth profiles of sliding gears **6** for damage and wear.
 - » If there is damage or wear:
 - Change the gear wheel pair.
- Check sliding gears **6** for smooth operation in the profile of main shaft **3**.
 - » If the sliding gear does not move freely:
 - Change the sliding gear or the main shaft.
- Check sliding gears **6** for smooth operation in the profile of countershaft **4**.
 - » If the sliding gear does not move freely:
 - Change the sliding gear or the countershaft.

- Check stop disks **8** for damage and wear.
 - » If there is damage or wear:
 - Change the stop disks.
- Use new lock rings **9** in every repair.

17.4.25 Assembling the main shaft

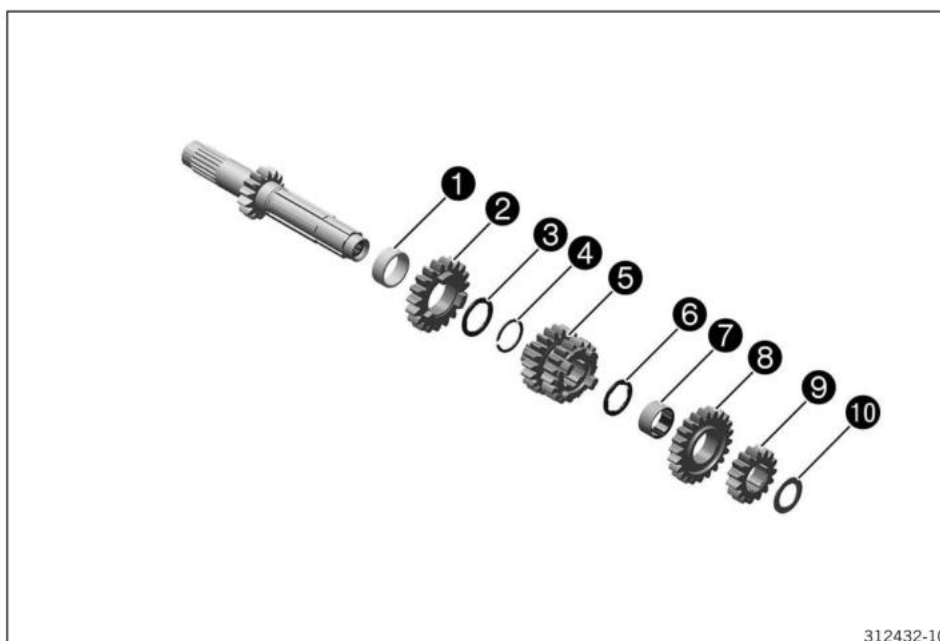


Info

Use new lock rings with every repair.

Preparatory work

- Carefully lubricate all parts before assembling.
- Check the transmission. (📖 p. 196)



312432-10

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** with the small gear wheel facing up.
- Mount stop disk **6**.
- Mount sliding bushing **7**.
- Mount fifth-gear idler gear **8**.
- Mount second-gear fixed gear **9** and stop disk **10**.
- Finally, check all the gear wheels for smooth operation.

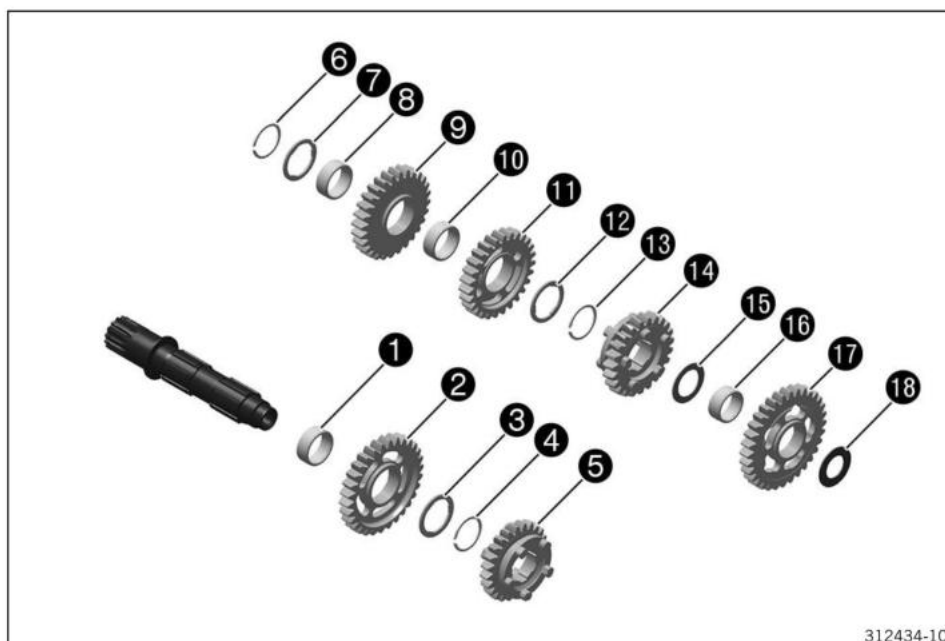
17.4.26 Assembling the countershaft

**Info**

Use new lock rings with every repair.

Preparatory work

- Carefully lubricate all parts before assembling.
- Check the transmission. (📖 p. 196)

**Main work**

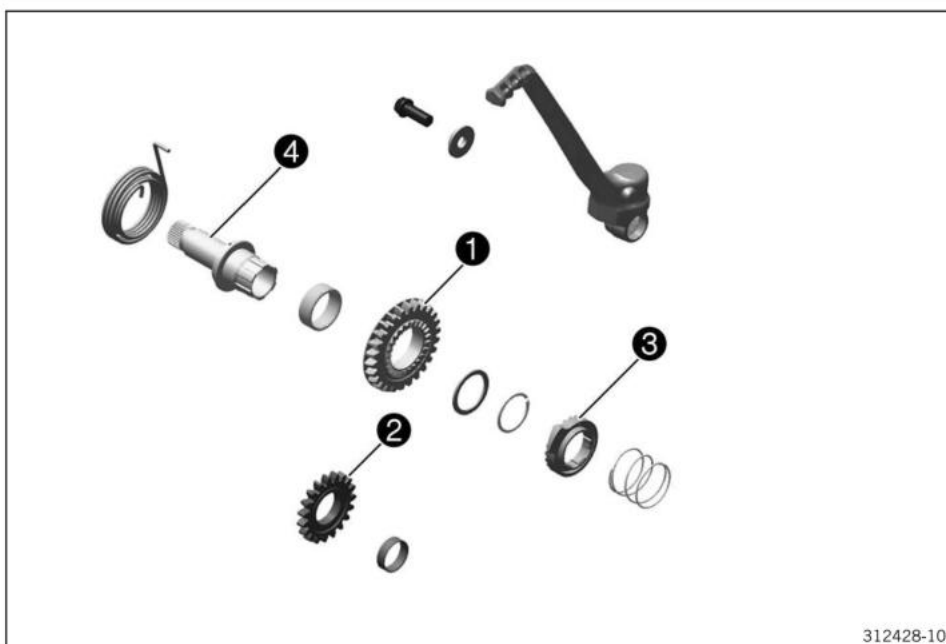
- Secure the countershaft in the bench vise with the toothed end facing downward.

Guideline

Use soft jaws.

- Mount needle bearing ❶ and second-gear idler gear ❷ onto the countershaft with the protruding collar facing downward.
- Mount stop disk ❸ and lock ring ❹.
- Mount fifth-gear sliding gear ❺ with the shift groove facing up.
- Mount lock ring ❻ and stop disk ❼.
- Mount needle bearing ❽ and fourth-gear idler gear ❾.
- Mount needle bearing ❿.
- Mount third-gear idler gear ⓫.
- Mount stop disk ⓬ and lock ring ⓭.
- Mount sixth-gear sliding gear ⓮ with the shift groove facing downward.
- Mount stop disk ⓯.
- Mount needle bearing ⓰ and first-gear idler gear ⓱.
- Mount stop disk ⓲.
- Finally, check all the gear wheels for smooth operation.

17.4.27 Checking the kick starter



312428-10

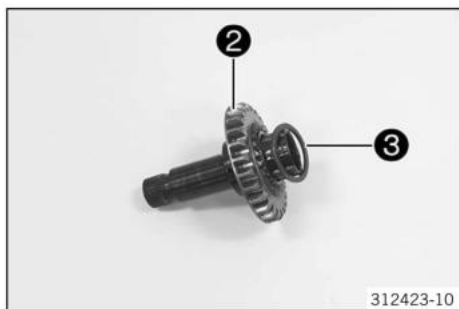
- Check the gear teeth and bearing of kick starter gear wheel **1** for damage and wear.
 - » If there is damage or wear:
 - Change the kick starter gear wheel.
- Check the gear teeth and bearing of kick starter intermediate gear **2** for damage and wear.
 - » If there is damage or wear:
 - Change the kick starter intermediate gear.
- Check the gear teeth and contact surface of kick starter ratchet wheel **3** for damage and wear.
 - » If there is damage or wear:
 - Change the kick starter ratchet wheel.
- Check the gear teeth and bearing of kick starter shaft **4** for damage and wear.
 - » If there is damage or wear:
 - Change the kick starter shaft.

17.4.28 Preassembling the kick starter shaft

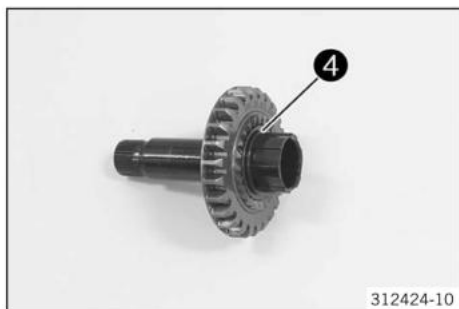


312422-10

- Mount bearing **1**.



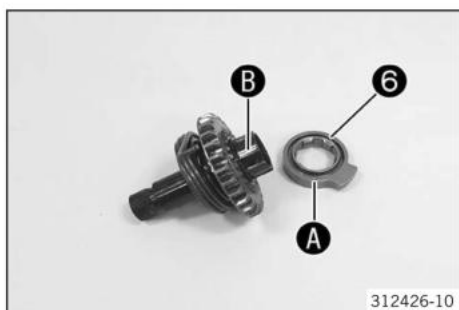
- Mount kick starter gear wheel **2** with washer **3**.



- Mount lock ring **4**.



- Mount kick starter spring **5**.
✓ The end of the kick starter spring engages in the hole.



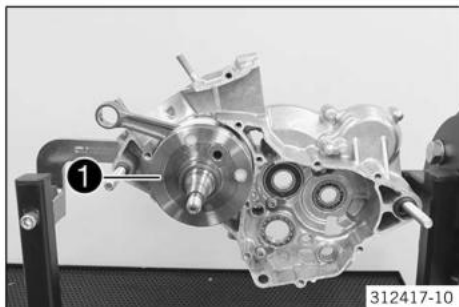
- Mount kick starter ratchet wheel **6**.
✓ Align markings **A** and **B**.



- Mount spring **7**.

17.5 Engine assembly

17.5.1 Installing the crankshaft



- Position the right section of the engine case in the engine assembly stand.

Engine assembly stand (61229001000) (📖 p. 296)

Holder for engine motor stand (50429002020) (📖 p. 292)

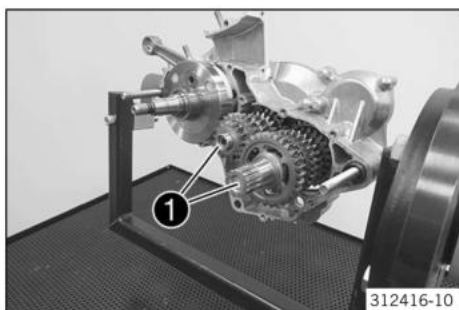
- Warm up the crankshaft bearing.

Guideline

100 °C (212 °F)

- Slide crankshaft **1** all the way into the bearing seat of the right section of the engine case.

17.5.2 Installing the transmission shafts



- Oil all bearings.

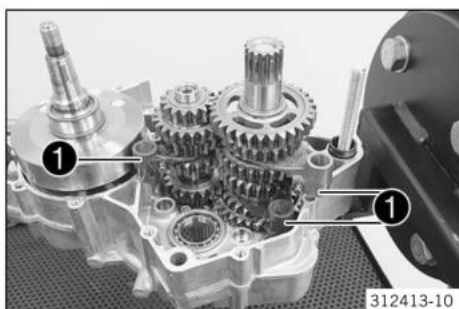
Engine oil (15W/50) (📖 p. 286)

- Assemble the two transmission shafts **1** and slide them into the bearing seats together.

17.5.3 Installing the shift forks

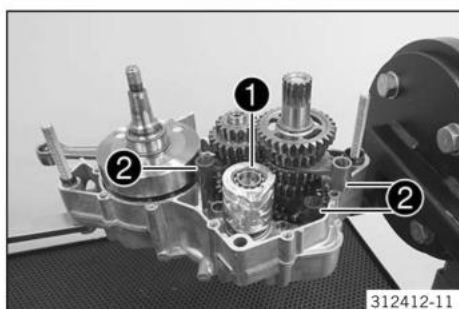


- Arrange the shift forks as shown.



- Position shift forks **1** in the shift grooves.

17.5.4 Installing the shift drum



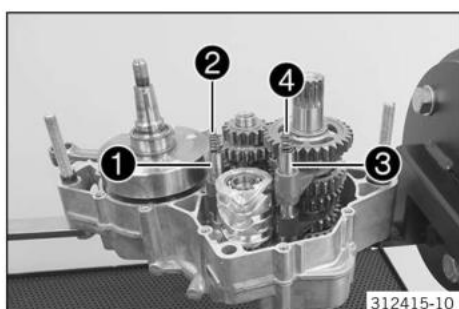
- Push shift drum **1** into the bearing seat.
- Attach shift forks **2** to the shift drum.



Info

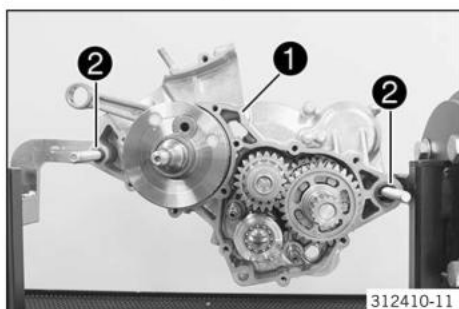
Do not misplace the shift rollers.

17.5.5 Installing the shift rails

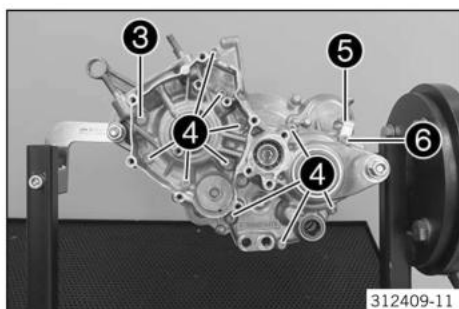


- Install shift rail **1** together with upper spring **2** and the lower spring.
- Install shift rail **3** together with upper spring **4**.

17.5.6 Installing the left section of the engine case



- Coat the sealing area thinly with grease.
- Mount engine case gasket **1**.
- Check that dowels **2** are seated correctly.



- Mount the left section of the engine case.



Info

Do not use the screws to pull the two sections of the engine case together.

- Mount screw **3** but do not tighten yet.

Guideline

Screw, engine case	M6x60	10 Nm (7.4 lbf ft)
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- Mount screws **4** but do not tighten yet.

Guideline

Screw, engine case	M6x50	10 Nm (7.4 lbf ft)
--------------------	-------	--------------------

- Position hose holder **5**.

- Mount screw **6** and tighten all screws in a crisscross pattern.

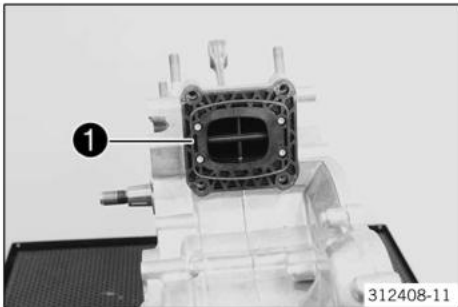
Guideline

Screw, engine case	M6x50	10 Nm (7.4 lbf ft)
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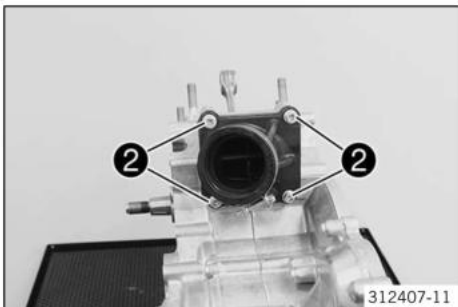
- Secure the engine in the engine assembly stand.

- Remove the excess lengths of the engine case gasket in the area of the cylinder support and the reed valve housing.

17.5.7 Installing the reed valve housing



- Position the gasket.
- Position reed valve housing 1 in the engine case opening.

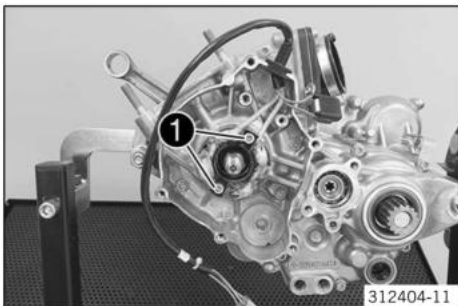


- Position the intake flange with the gasket.
- Mount and tighten screws 2.

Guideline

Screw, intake flange/reed valve housing	M6	6 Nm (4.4 lbf ft)
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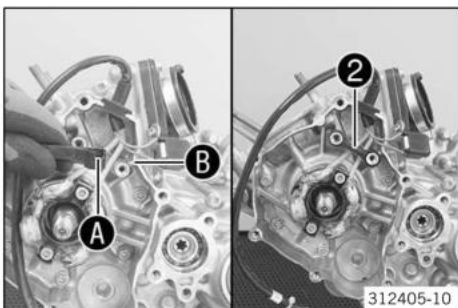
17.5.8 Installing the rotor



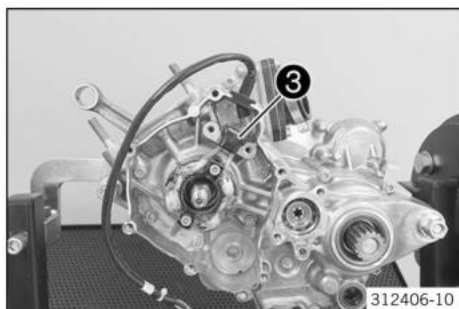
- Position the stator with the crankshaft speed sensor.
- Position the rubber grommet in the engine case.
- Mount and tighten screws 1.

Guideline

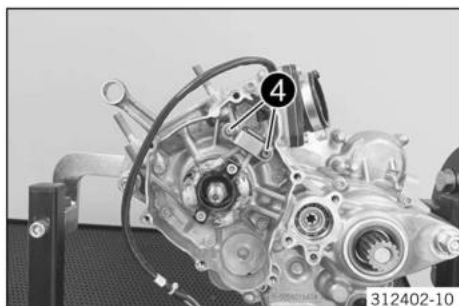
Screw, stator	M6	8 Nm (5.9 lbf ft) Loctite®243™
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- Position spacer element 2.
- ✓ The holding lug A engages in housing web B.

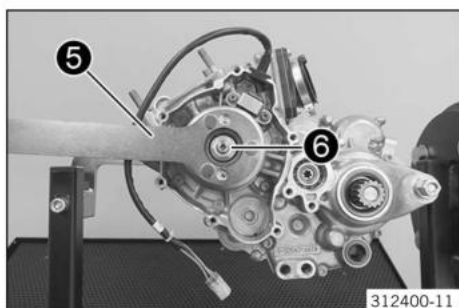


- Position crankshaft speed sensor **3**.



- Position the holding bracket; mount and tighten screws **4**.
Guideline

Screw, crankshaft speed sensor	M5	6 Nm (4.4 lbf ft) Loctite®243™
--------------------------------	----	--



- Ensure that the woodruff key is seated properly.
- Degrease the cone.
- Mount the rotor and hold it with special tool **5**.

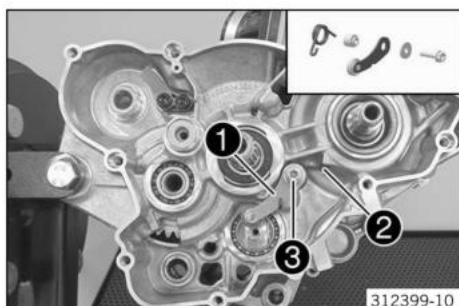
Holding wrench (54629012200) (p. 294)

- Mount washer and nut **6**. Tighten the nut.

Guideline

Nut, rotor	M12x1	60 Nm (44.3 lbf ft)
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17.5.9 Installing the locking lever

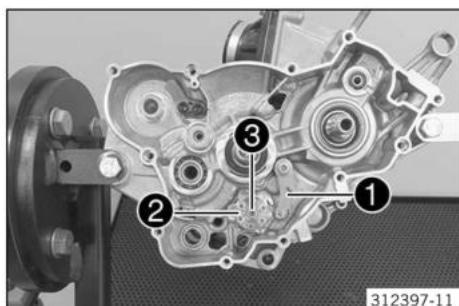


- Position locking lever **1** with the sleeve and spring **2**.
- Mount and tighten screw **3**.

Guideline

Screw, locking lever	M5	6 Nm (4.4 lbf ft) Loctite®243™
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17.5.10 Installing the shift drum locating unit



- Press locking lever **1** to the right and position shift drum locating unit **2**.



Info

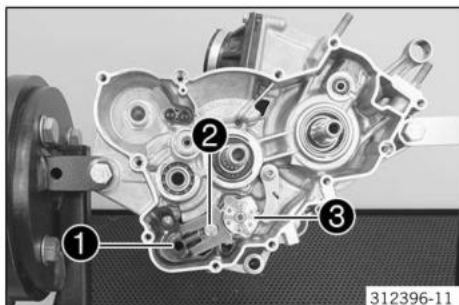
The flat surfaces of the shift drum locating unit are not symmetric.

- Relieve tension from the locking lever.
- Mount and tighten screw **3**.

Guideline

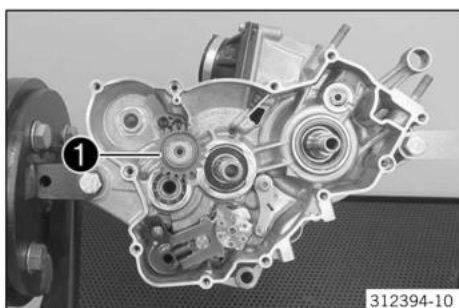
Screw, shift drum locating	M6	10 Nm (7.4 lbf ft) Loctite®243™
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17.5.11 Installing the shift shaft



- Slide shift shaft **1** with the washer into the bearing seat.
- Push sliding plate **2** away from the 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.

17.5.12 Installing the kick starter intermediate gear



- Mount the kick starter intermediate gear **1** with the high collar facing out.

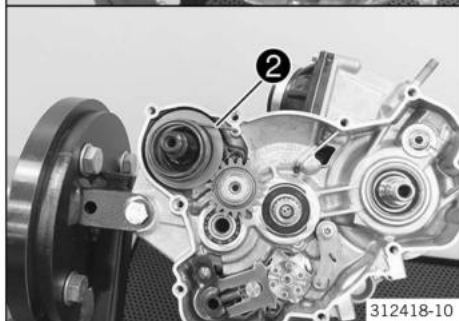
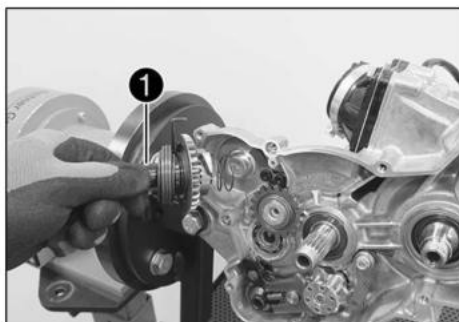
17.5.13 Installing the kick starter shaft

Preparatory work

- Preassemble the kick starter shaft. (📖 p. 200)

Main work

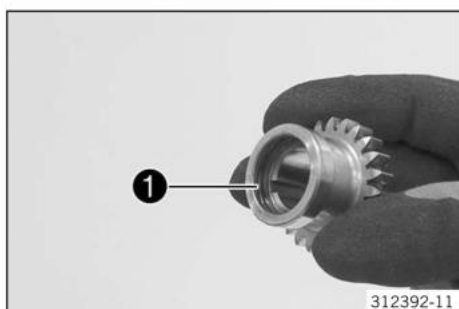
- Mount preassembled kick starter shaft **1**.
- Tension and attach kick starter spring **2**.



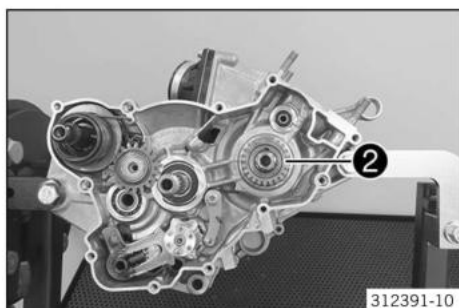
Info

Ensure that the distance from the kick starter spring to the kick starter shaft is the same all around.

17.5.14 Installing the primary gear wheel



- Mount and lightly grease O-ring ①.

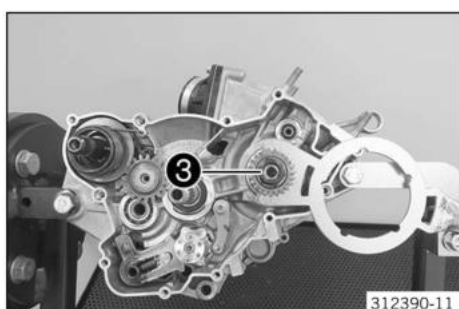


- Mount the woodruff key.
- Mount primary gear wheel ②.



Info

Do not damage the shaft seal ring.



- Hold the primary gear wheel using the special tool.

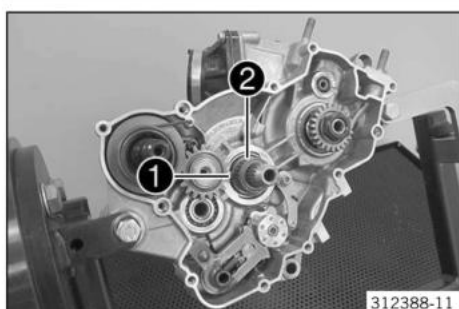
Holding wrench (50529003000) (📖 p. 293)

- Mount and tighten nut ③ with the washer.

Guideline

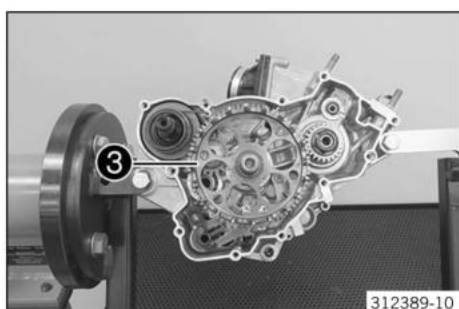
Nut, primary gear wheel	M16LHx1.5	130 Nm (95.9 lbf ft) Loctite®243™
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17.5.15 Installing the clutch basket

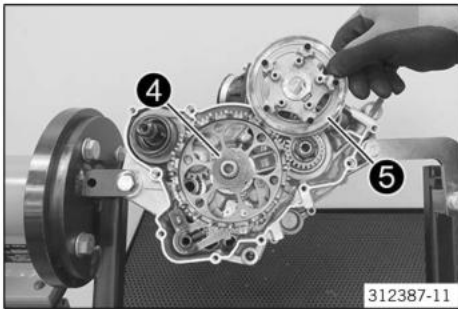


- Mount collar bushing ①.
- Oil and mount needle bearing ②.

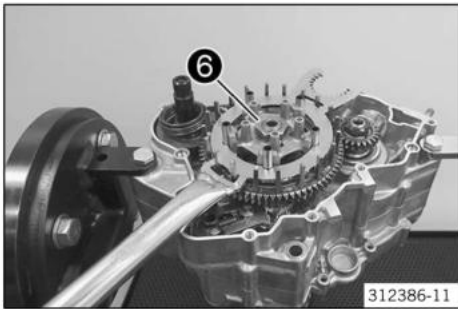
Engine oil (15W/50) (📖 p. 286)



- 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.

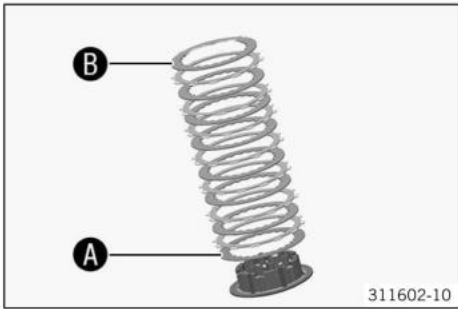
Guideline

Nut, inner clutch hub	M18x1.5	100 Nm (73.8 lbf ft) Loctite®243™
-----------------------	---------	---

Holding wrench (50529003000) (p. 293)

- Secure the nut with the lock washer.

17.5.16 Installing the clutch discs



- Thoroughly oil the clutch facing discs.
- Mount intermediate clutch disc A.

Guideline

Thickness of intermediate clutch disc A	1.0 mm (0.039 in)
---	-------------------

- Alternately place the clutch facing and 7 intermediate discs into the clutch basket.

Guideline

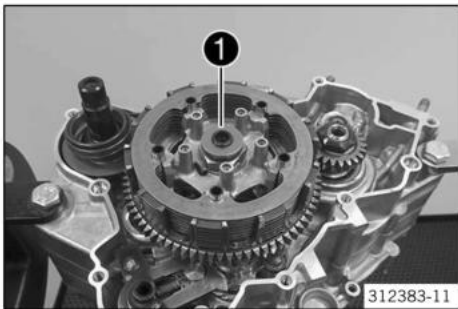
Thickness of intermediate clutch discs	1.4 mm (0.055 in)
--	-------------------

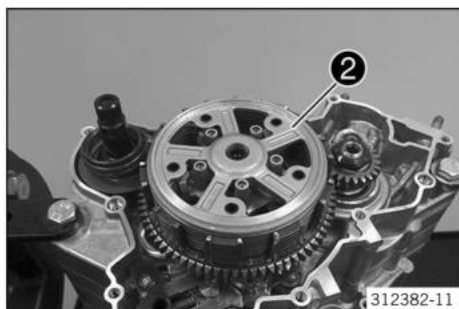
- Place intermediate clutch disc B into the clutch basket.

Guideline

Thickness of intermediate clutch disc B	1.0 mm (0.039 in)
---	-------------------

- Mount clutch throw-out 1.

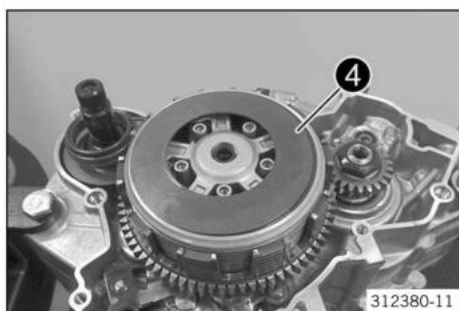




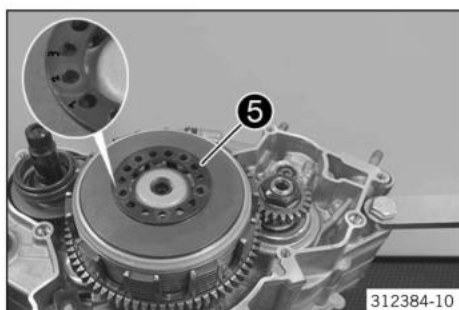
- Position clutch pressure cap **2**.



- Mount pretension ring **3** with marking **Top** facing up.



- Position spring washer **4**.



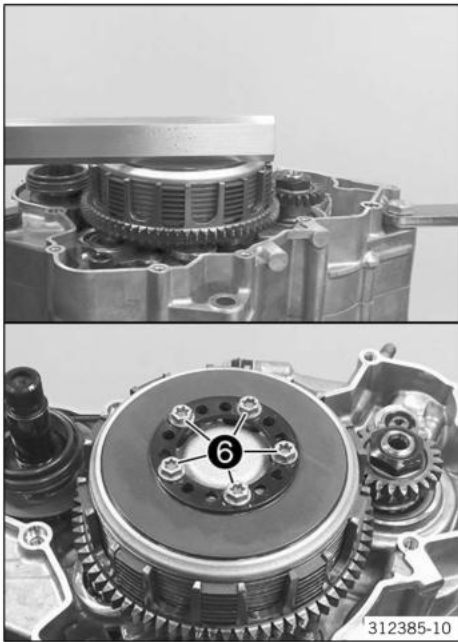
- Position spring retainer **5** with marking **1**.



- Mount screws **6** and tighten in a crisscross pattern.

Guideline

Screw, clutch spring retainer	M5	6 Nm (4.4 lbf ft)
-------------------------------	----	-------------------



- Using a straightedge and the special tool, check the spring washer for distortion.

Feeler gauge (59029041100) (p. 295)

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 **2**.
- Using a straightedge and the special tool, check the spring washer for distortion.

Feeler gauge (59029041100) (p. 295)

Spring washer distortion	0 ... 0.10 mm (0 ... 0.0039 in)
--------------------------	---------------------------------

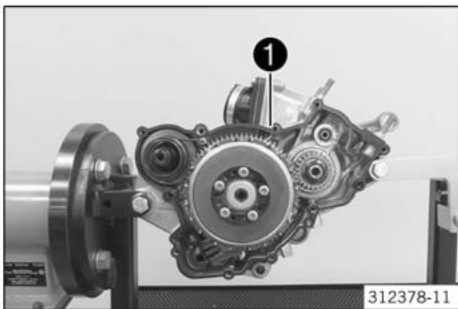
- » If the specified value is not reached:
 - Remove screws **6** and mount the spring retainer with marking **3**.
- Using a straightedge and the special tool, check the spring washer for distortion.

Feeler gauge (59029041100) (p. 295)

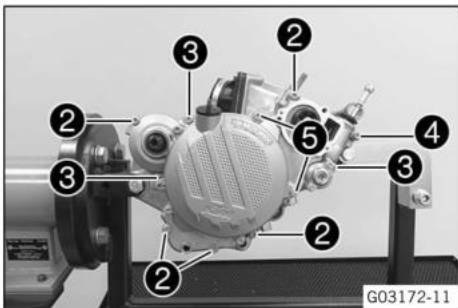
Spring washer distortion	0 ... 0.10 mm (0 ... 0.0039 in)
--------------------------	---------------------------------

- » If the specified value is not reached:
 - Change the clutch facing discs.

17.5.17 Installing the clutch cover



- Mount the dowels.
- Mount clutch cover gasket **1**.



- Position the clutch cover.
- Mount and tighten screws **2**.

Screw, intermediate clutch cover	M6x20	10 Nm (7.4 lbf ft)
----------------------------------	-------	--------------------

- Mount and tighten screws **3**.

Screw, intermediate clutch cover	M6x25	10 Nm (7.4 lbf ft)
----------------------------------	-------	--------------------

- Mount and tighten screw **4**.

Guideline

Screw, intermediate clutch cover	M6x30	10 Nm (7.4 lbf ft)
----------------------------------	-------	--------------------

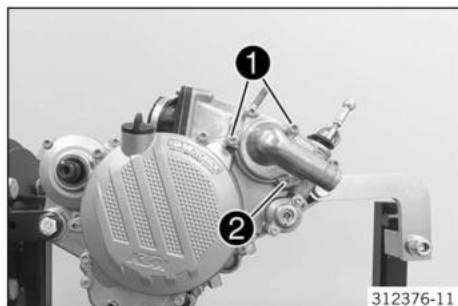
- Mount and tighten screws **5**.

Guideline

Screw, outer clutch cover	M6x50	8 Nm (5.9 lbf ft)
---------------------------	-------	-------------------



17.5.18 Installing the water pump cover



- Mount the molded ring.



Info

Ensure that the dowels are seated properly.

- 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 washer.

Guideline

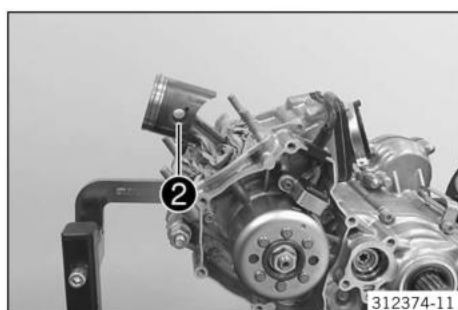
Screw, water pump cover	M6	10 Nm (7.4 lbf ft)
-------------------------	----	--------------------



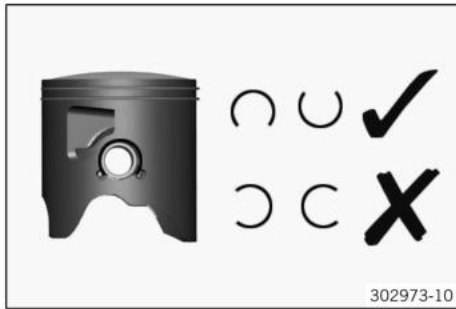
17.5.19 Installing the piston



- Oil the upper conrod bearing and position it in the connecting rod.
- Position the piston.
- ✓ Piston marking **1** must face the exhaust side.

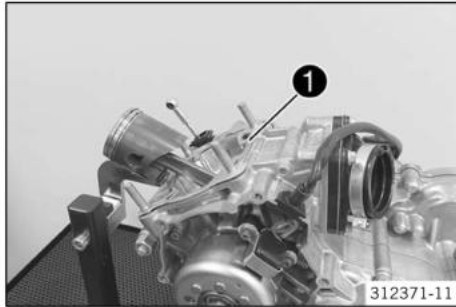


- Slide piston pin **2** into the connecting rod by hand.



- Cover the engine case opening with a cloth.
- 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.

17.5.20 Installing the cylinder



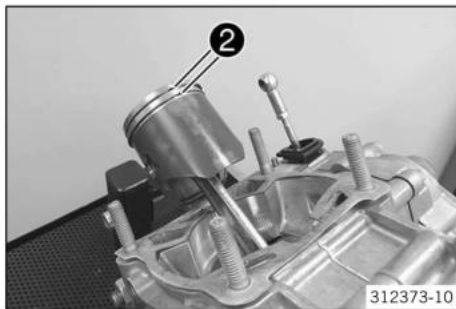
- Place new cylinder base gasket **1** in position.



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 rings.
- ✓ The anti-rotation lock engages in piston ring end **2**.

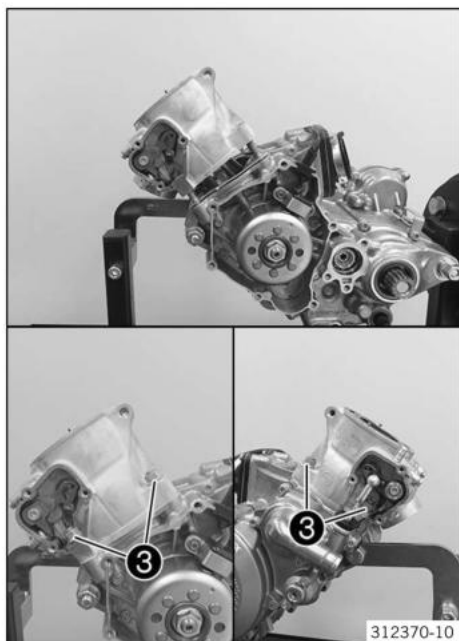


- Slide the cylinder over the piston.
- Push the cylinder down carefully.



Info

Ensure that the locating pins are seated properly.



- Mount nuts **3** on both sides and tighten in a crisscross pattern.

Guideline

Nut, cylinder base	M8	23 Nm (17 lbf ft)
--------------------	----	-------------------

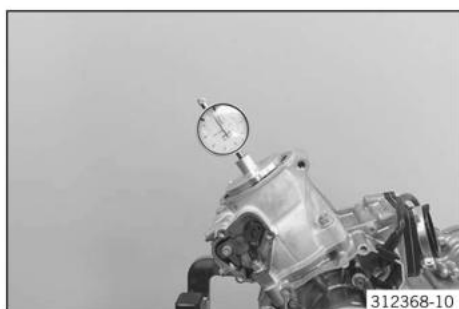


17.5.21 Checking the X-distance

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.



- Reset the special tool to zero on a flat surface and position on the cylinder.

Measurement cap (50429031000) (📖 p. 292)
--

Dial gauge support (50112030000) (📖 p. 291)

Dial gauge (50112013000) (📖 p. 290)

i Info

Ensure that the pins are seated correctly.

- Position the piston at top dead center.
- Check the X-distance.

X (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. 213)



17.5.22 Adjusting the X-distance

i Info

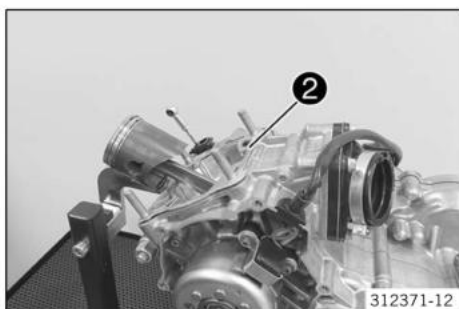
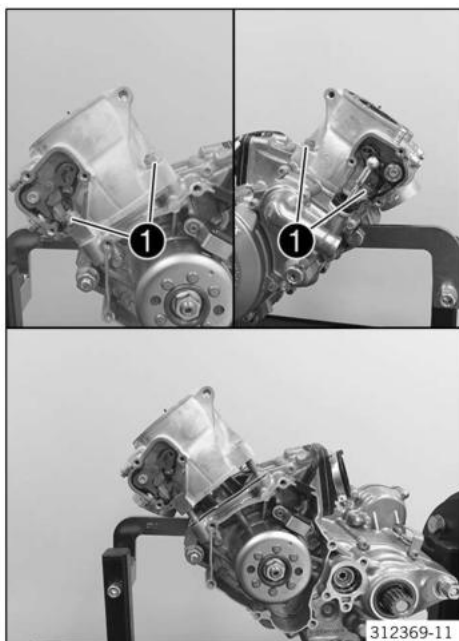
The X-distance is adjusted by inserting cylinder base gaskets of various thicknesses.

Preparatory work

- Check the X-distance. (📖 p. 213)

Main work

- Remove nuts ❶.
- Carefully slide the cylinder up and take it off.



- Replace cylinder base gasket ❷ with a cylinder base gasket of the required X-distance.



Info

Multiple cylinder base gaskets can be combined.

Finishing work

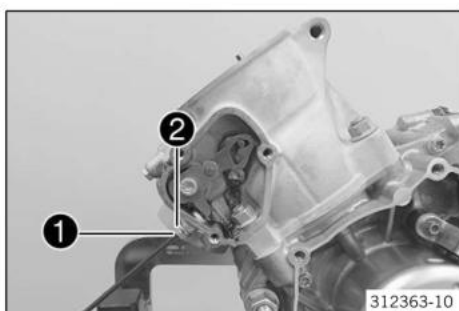
- Install the cylinder. (📖 p. 212)

17.5.23 Adjusting the Z-distance

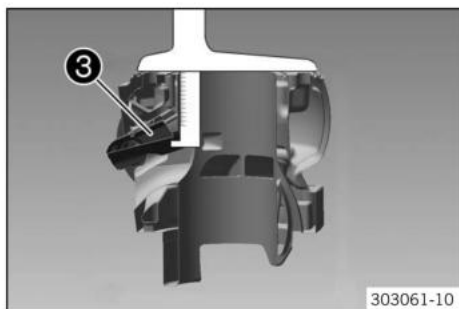


Info

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 ❶ and loosen nut ❷.

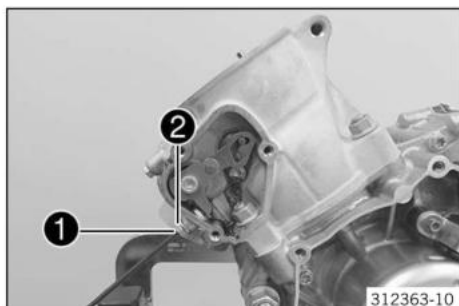


- Adjust the Z-distance using the depth micrometer.

Guideline

Z (height of control flap)	36.5 mm (1.437 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.

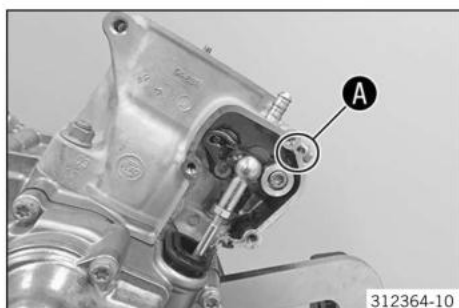
Guideline

Nut, adjusting screw, power valve	M6	8 Nm (5.9 lbf ft)
-----------------------------------	----	-------------------

- Check the Z dimension.

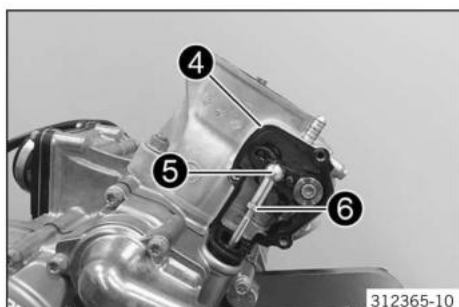
Guideline

Z (height of control flap)	36.5 mm (1.437 in)
----------------------------	--------------------



- Thinly apply sealing compound to area A.

Loctite® 5910



- Mount gasket ④.

- Push the control flap down all the way to the stop.

- Grease and mount ball socket ⑤.

Long-life grease (p. 288)

i Info

The linkage may only be pulled upward slightly.
The control flap must not be swung upward.

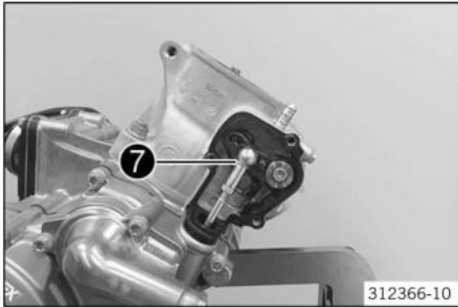
- Check the movement of the linkage.

Guideline

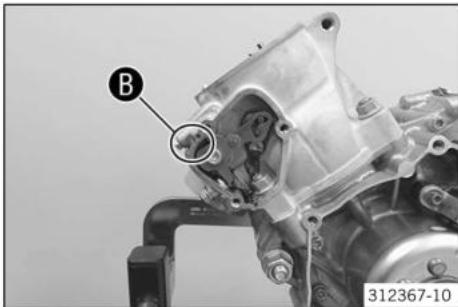
≤ 1 mm (≤ 0.04 in)

» If the linkage is pulled up further:

- Loosen lock nut ⑥.
- Turn the ball socket until the linkage reaches the right length.
- Tighten the lock nut.

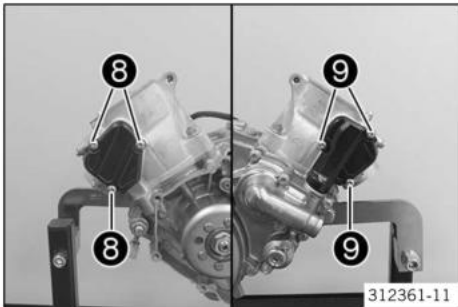


- Mount retainer 7.



- Thinly apply sealing compound to area B.

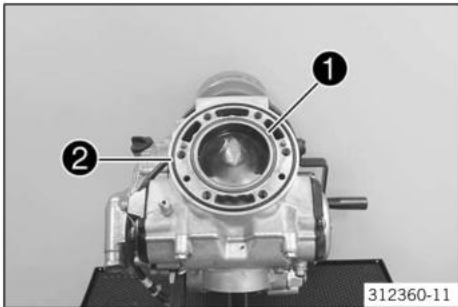
Loctite® 5910



- Position the gasket.
- Position both covers.
- Mount and tighten screws 8 and 9.

Guideline		
Screw, exhaust control cover	M5	5 Nm (3.7 lbf ft)

17.5.24 Installing the cylinder head

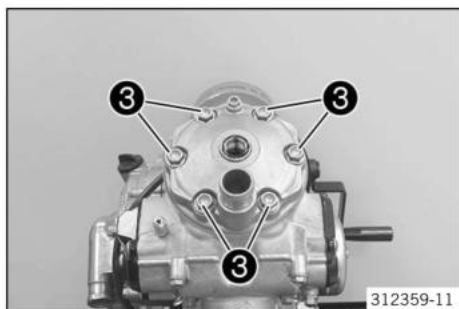


- Mount O-rings 1 and 2.

i Info
Ensure that the pins are seated correctly.



- Mount the O-ring on the combustion chamber liner.



- Position the combustion chamber liner and cylinder head.
- Mount screws **3** with the washers and tighten them in a crisscross pattern.

Guideline

Screw, cylinder head	M7	18 Nm (13.3 lbf ft)
----------------------	----	---------------------

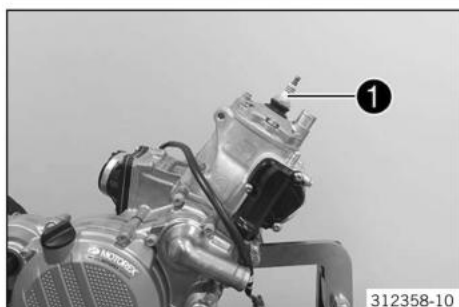


Info

Use new washers.



17.5.25 Installing the spark plug



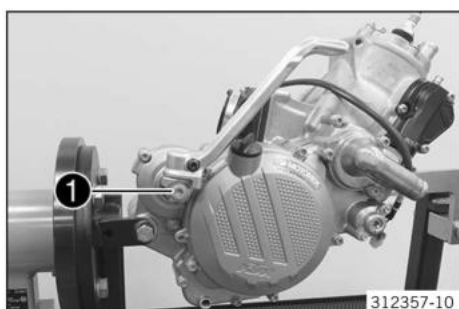
- Mount and tighten spark plug **1**.

Guideline

Spark plug	M14x1.25	25 Nm (18.4 lbf ft)
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17.5.26 Installing the kick starter lever



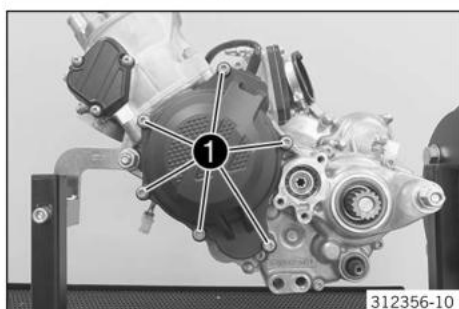
- Position the kick starter lever. Mount and tighten screw **1**.

Guideline

Screw, kick starter lever	M8	25 Nm (18.4 lbf ft) Loctite®243™
---------------------------	----	--



17.5.27 Installing the alternator cover



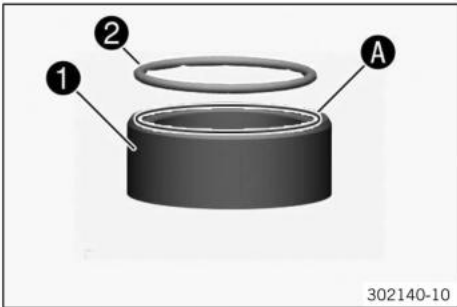
- Position the alternator cover.
- Mount and tighten screws **1**.

Guideline

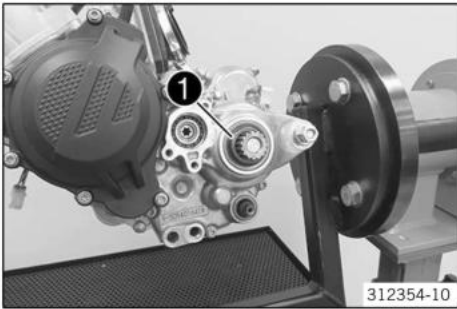
Screw, alternator cover	M5	5 Nm (3.7 lbf ft)
-------------------------	----	-------------------



17.5.28 Installing the spacer

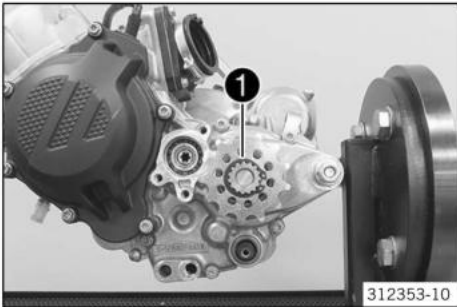


- Before mounting, grease spacer 1 in area A and O-ring 2.
Long-life grease (📖 p. 288)
- Position the O-ring in the cut-out of the spacer.



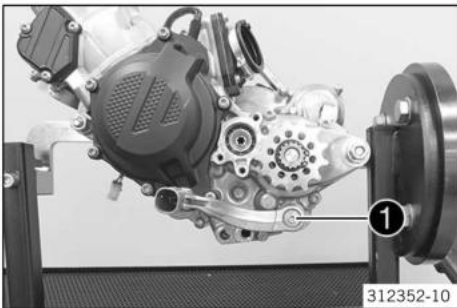
- Grease the shaft seal ring.
Long-life grease (📖 p. 288)
- Push spacer 1 with the O-ring onto the countershaft with a twisting motion.
 - ✓ The cut-out with the O-ring must face inward.
 - ✓ The shaft seal ring rests against the spacer along its entire circumference.

17.5.29 Installing the engine sprocket



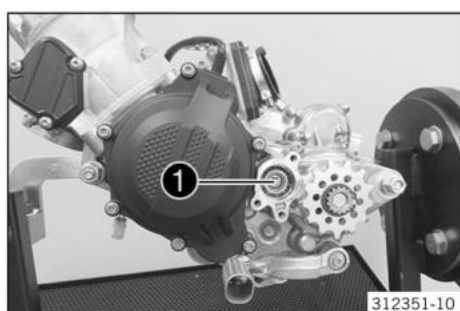
- Slide on the engine sprocket with the collar facing the engine. Mount lock ring 1.

17.5.30 Installing the shift lever



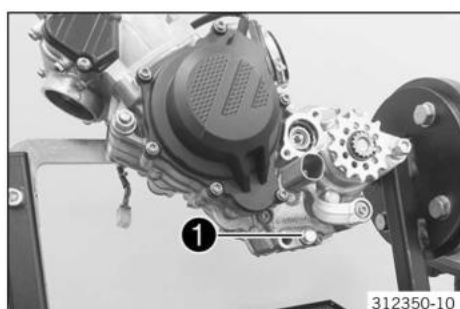
- Position the shift lever. Mount and tighten screw 1 with washers.
Guideline
- | | | |
|--------------------|----|--|
| Screw, shift lever | M6 | 14 Nm (10.3 lbf ft)
Loctite®243™ |
|--------------------|----|--|

17.5.31 Installing the clutch push rod



- Mount clutch push rod **1**.

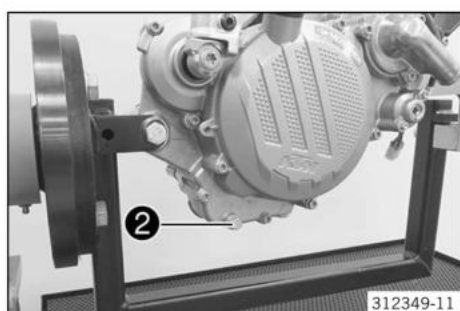
17.5.32 Installing the gear oil drain plug



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



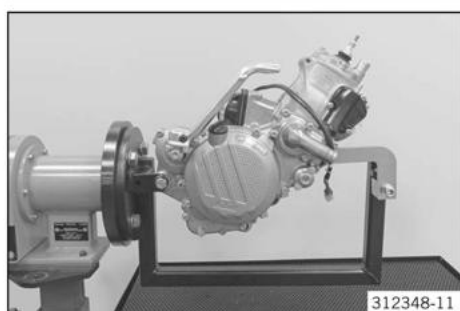
- Mount and tighten gear oil drain plug **2** with a new seal ring.

Guideline

Gear oil drain plug	M10x1	15 Nm (11.1 lbf ft)
---------------------	-------	---------------------

- Actuate the kick starter lever several times to check whether the engine cranks freely.

17.5.33 Removing the engine from the engine assembly stand

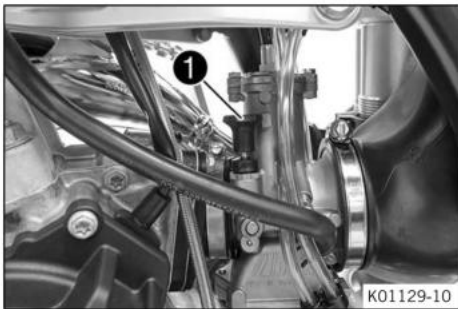


- Remove the fitting from the special tool.

Holder for engine motor stand (50429002020) (p. 292)

- Remove the engine from the engine assembly stand.

18.1 Choke



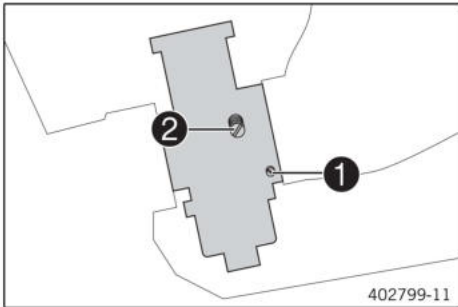
Choke ① is fitted on the left side of the carburetor. Activating the choke function frees a drill hole in the carburetor through which the engine can draw extra fuel. This results in a richer fuel-air mixture, which is needed for a cold start.

 **Info**

If the engine is warm, the choke function must be deactivated.

- Possible states**
- Choke function activated – The choke lever is pulled out to the stop.
 - Choke function deactivated – The choke lever is pushed in to the stop.

18.2 Carburetor - adjusting the idle speed



- Screw in idle air adjusting screw ① all the way and turn it to the specified basic setting.

 **Info**

The basic adjustment is shown under the respective model.

- Run the engine until warm.

Guideline	
Warming-up phase	≥ 5 min

 **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 with adjusting screw ②.

Guideline	
Choke function deactivated – The choke lever is pushed in to the stop. (📖 p. 220)	
Idle speed	1,400 ... 1,500 rpm

- Turn idle air adjusting screw ① slowly in a clockwise direction until the idle speed begins to fall.
- Note the position and turn the idle air adjusting screw slowly counterclockwise until the idle speed again begins to fall.
- Adjust to the point between these two positions with the highest idle speed.


Info

If there is a big engine speed rise, reduce the idle speed to a normal level and repeat the above steps. If the procedure described here does not lead to satisfactory results, the cause may be a wrongly dimensioned idling jet.

If you can turn the idle air adjusting screw to the end without any change of engine speed, mount a smaller idling jet.

After changing the jet, start from the beginning with the adjusting steps.

Following extreme air temperature or altitude changes, adjust the idle speed again.



18.3 Emptying the carburetor float chamber


Danger

Fire hazard Fuel is highly flammable.

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

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


Warning

Danger of poisoning Fuel is poisonous and a health hazard.

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


Note

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

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

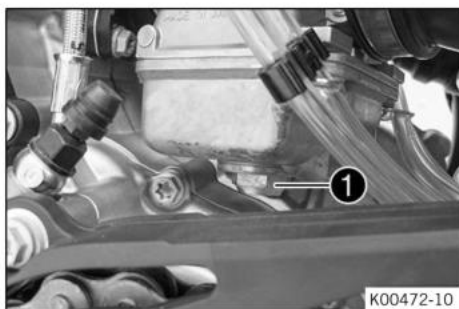

Info

Carry out this work with a cold engine.

Water in the float chamber results in malfunctioning.

Preparatory work

- Turn tap handle of the fuel tap to the **OFF** position.
- ✓ Fuel no longer flows from the fuel tank to the carburetor.



Main work

- Place a cloth under the carburetor to capture the draining fuel.
- Remove screw plug **1**.
- Fully drain the fuel.
- Mount and tighten the screw plug.

18.4 Removing the carburetor



Danger

Fire hazard Fuel is highly flammable.

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

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



Warning

Danger of poisoning Fuel is poisonous and a health hazard.

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



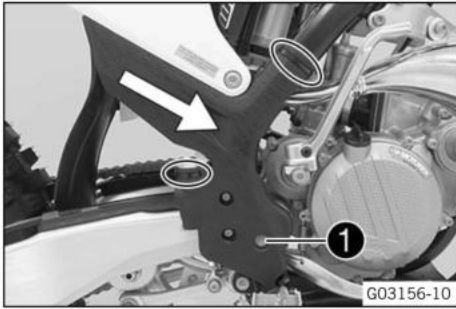
Note

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

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

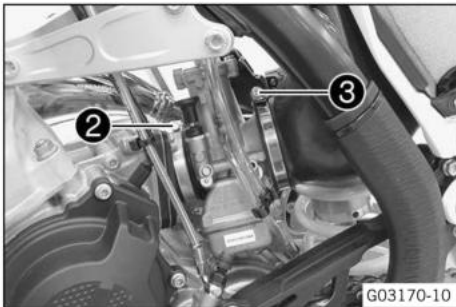
Preparatory work

- Remove the air filter box cover. (📖 p. 103)
- Remove the seat. (📖 p. 108)
- Turn tap handle of the fuel tap to the **OFF** position.
- Remove the fuel tank. (📖 p. 109)
- Remove the main silencer. (📖 p. 101)

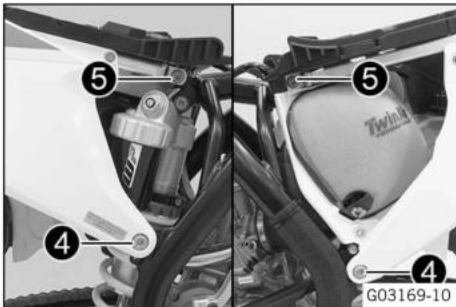


Main work

- Remove the cable ties.
- Remove screw **1** with the washer.
- Push the frame protector to the front and take off at the bottom.



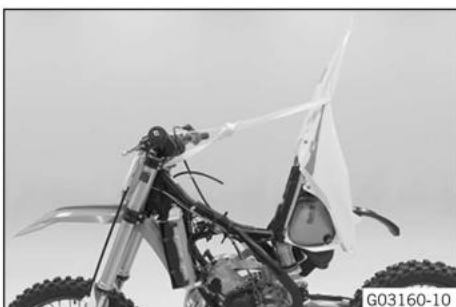
- Loosen hose clip **2**.
- Loosen hose clip **3**.



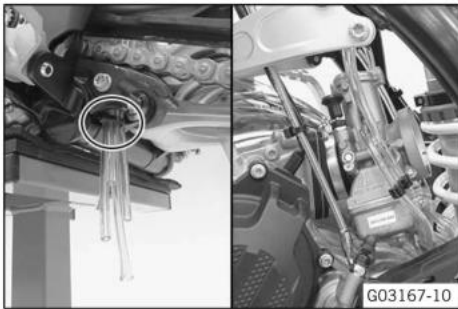
- Remove screws **4**.
- Loosen screws **5**.



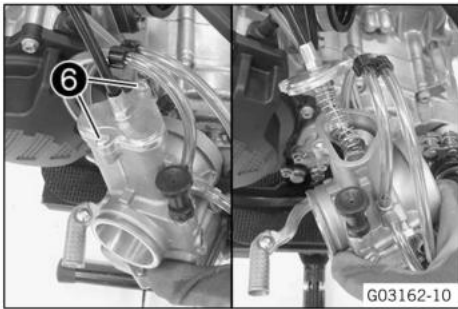
- Remove hose clip **3**.



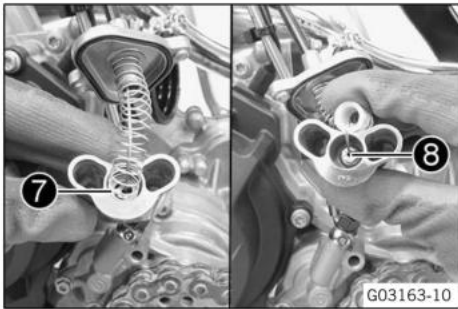
- Pivot the subframe up and secure it.



- Remove the cable tie(s) and expose the hoses.
- Pull the carburetor out of the intake flange toward the rear.

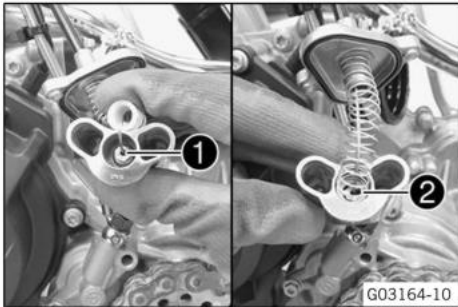


- Remove screws ⑥.
- Take off the throttle slide cover and pull the throttle slide out of the carburetor.
- Drain the remaining fuel.

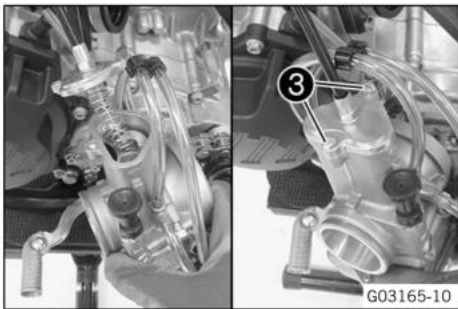


- Pull back the throttle slide spring and plastic retainer ⑦.
- Detach throttle cable wire ⑧.
- Take off the throttle slide.

18.5 Installing the carburetor

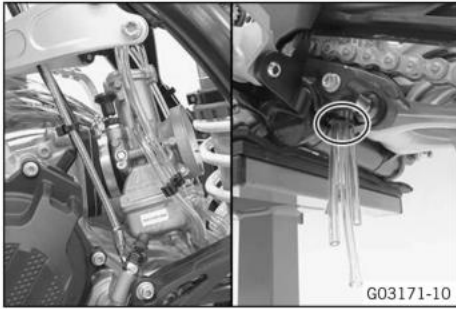


- Main work**
- Attach throttle cable wire ①.
 - Position plastic retainer ②.
 - ✓ The holding lug of the plastic retainer engages in the cut-out of the jet needle screw.



- Position the throttle slide and throttle slide cover.
- Mount and tighten screws ③.

Guideline		
Screw, carburetor cover	M4	2 Nm (1.5 lbf ft)



- Mount the carburetor in the intake flange.
- Route the hoses without kinks and mount the cable tie.



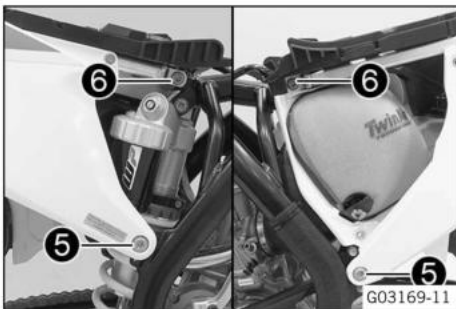
- Remove the locking piece and position the subframe.



Info

Pay attention to the intake snorkel.

- Mount hose clip ④.



- Mount and tighten screws ⑤.

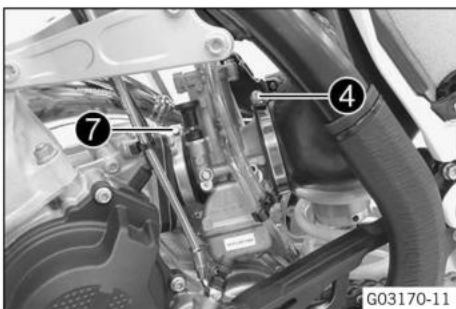
Guideline

Screw, sub-frame	M8	35 Nm (25.8 lbf ft) Loctite®2701™
------------------	----	---

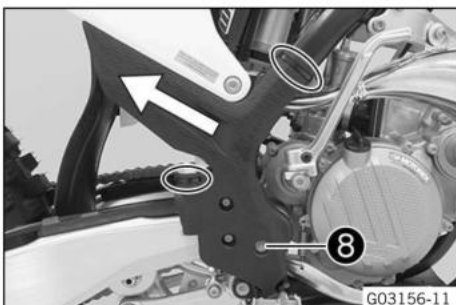
- Remove screws ⑥.
- Mount and tighten screws ⑥.

Guideline

Screw, sub-frame	M8	35 Nm (25.8 lbf ft) Loctite®2701™
------------------	----	---



- Position and tighten hose clip ⑦.
- Tighten hose clip ④.



- Insert the frame protector from below and push it to the rear.
- Mount and tighten screw ⑧ with the washer.

Guideline

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

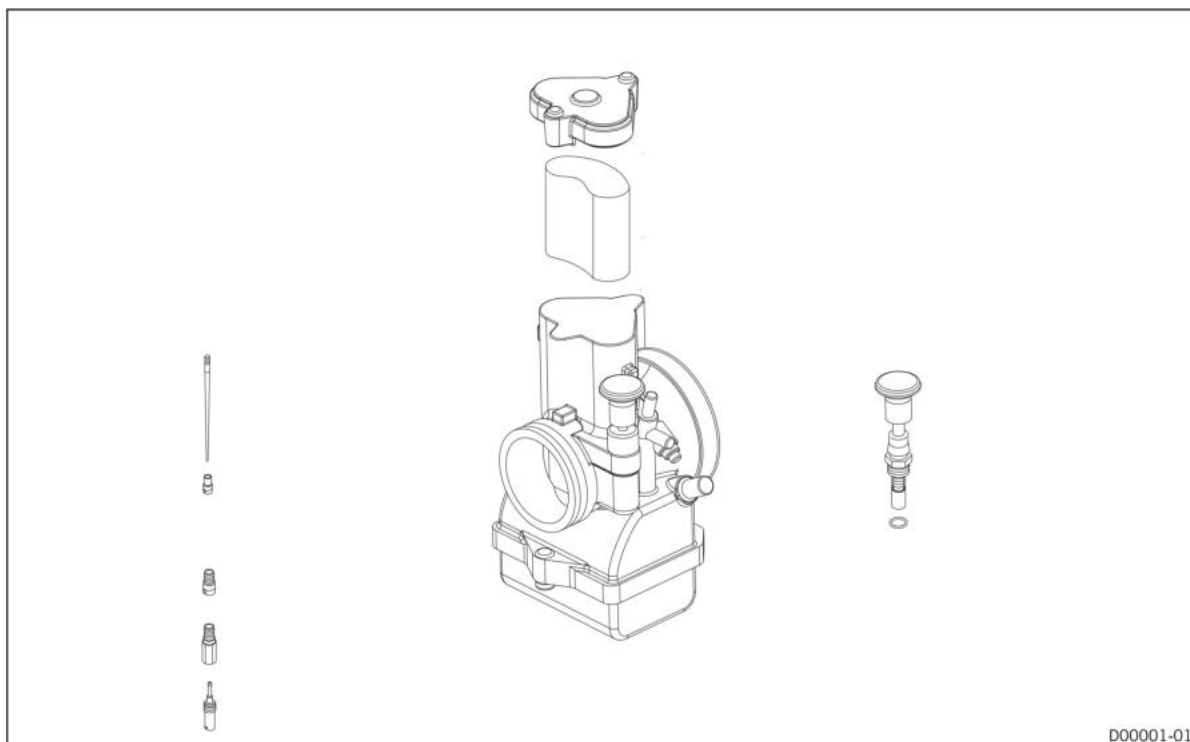
- Mount the cable ties.

Finishing work

- Install the fuel tank. (📖 p. 110)
- Mount the seat. (📖 p. 108)
- Install the main silencer. (📖 p. 101)

- Install the air filter box cover. (p. 103)
- Check throttle cable play. (p. 56)
- Carburetor - adjust the idle speed. (p. 220)

18.6 Checking/setting the carburetor components



- Disassemble the carburetor. (p. 226)
- Check the jet needle. (p. 230)
- Check the throttle slide. (p. 230)
- Check the float needle valve. (p. 230)
- Check the choke slide. (p. 229)
- Assemble the carburetor. (p. 231)

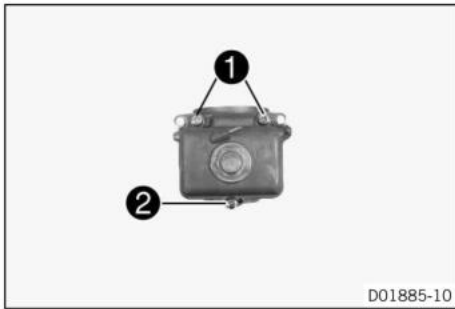
18.7 Disassembling the carburetor

Condition

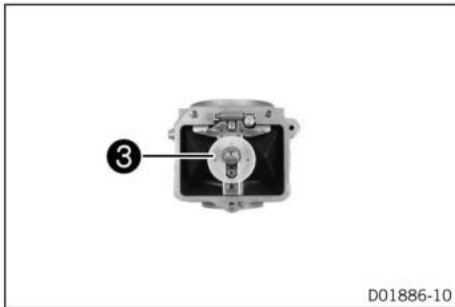
The carburetor has been removed.

- Pull the hoses off the carburetor.

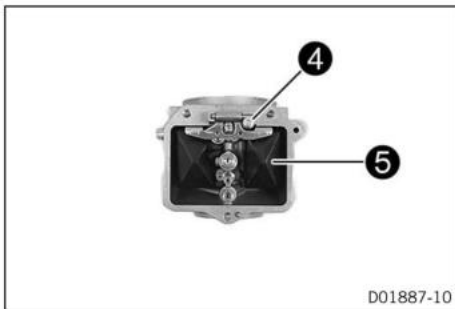




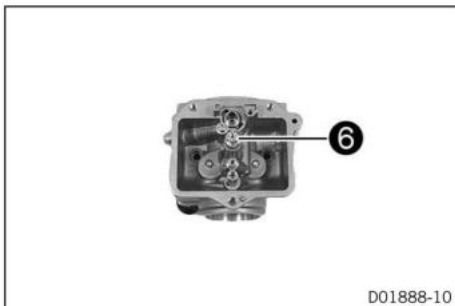
- Remove screws 1 with the hose guides.
- Remove screw 2.
- Take off the float chamber.
- Remove the gasket.



- Remove plastic cap 3.



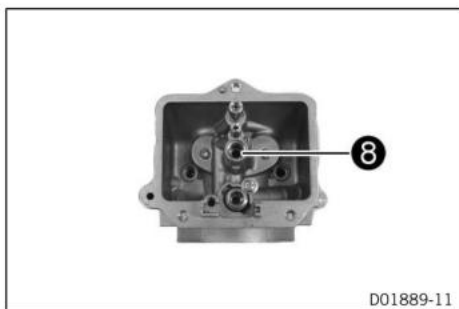
- Remove screw 4.
- Remove the fulcrum pin.
- Remove float 5 and float needle valve.



- Remove main jet 6.



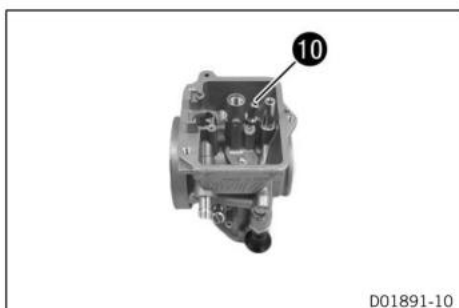
- Remove needle jet holder 7.



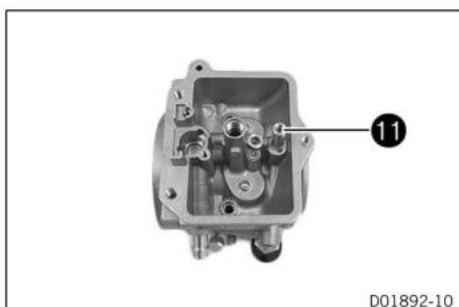
- Press needle jet **8** out of the carburetor at the bottom.



- Remove screw **9**.
- Take off the valve seat for the float needle valve.



- Remove idling jet **10**.



- Remove choke jet **11**.

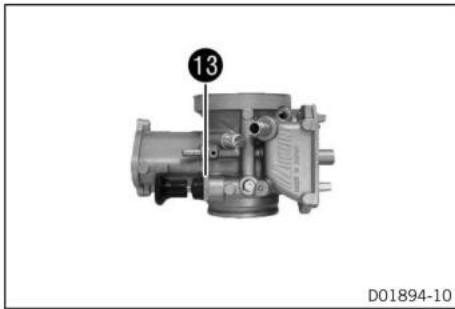


- Note down the setting of idle air adjusting screw **12**.
- Remove the idle air adjusting screw.

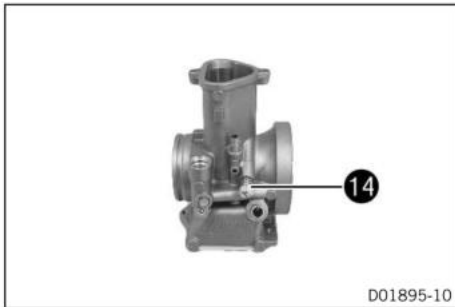


Info

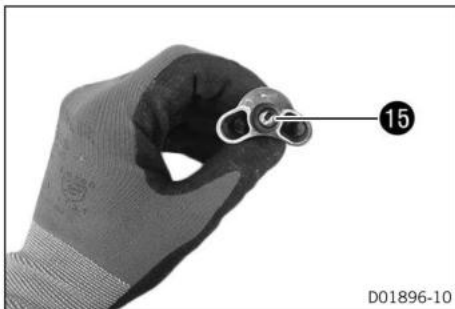
Do not misplace the spring.



- Remove choke slide **13** with the O-ring.



- Remove idle speed adjusting screw **14** with the spring.



- Remove needle screw cap **15**.
- Pull the jet needle out of the throttle slide.

18.8 Checking the choke slide

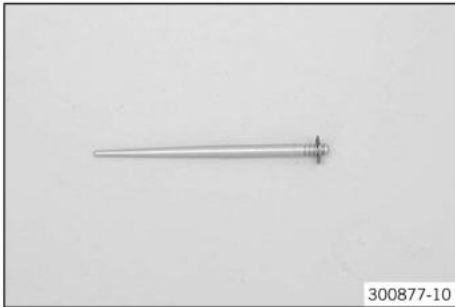
Condition

The choke slide has been removed.



- Check the choke slide for smooth operation.
 - » If the choke slide is stiff and soiled:
 - Clean the choke slide and check its actuation.
- Check the piston of the choke slide for damage and wear.
 - » If the piston of the choke slide is damaged or worn:
 - Change the choke slide.
- Check the collar and locking mechanism.
 - » If the collar is damaged or brittle, or if the locking mechanism is not functional:
 - Change the choke slide.

18.9 Checking the jet needle



Condition

The jet needle has been removed.

- Check whether the jet needle is bent and check the coating for wear.
 - » If the jet needle is bent or if the coating is damaged or worn:
 - Change the jet needle.
- Check that the needle clip is firmly seated.
 - » If the needle clip is not firmly seated:
 - Change the needle clip or jet needle.

18.10 Checking the throttle slide

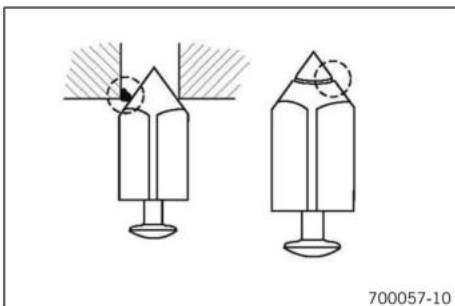


Condition

The throttle slide has been removed.

- Check the throttle slide for damage and wear.
 - » If the throttle slide is damaged or worn:
 - Change the throttle slide.
- Check the coating of the throttle slide for damage and wear.
 - » If the coating is damaged or worn:
 - Change the throttle slide.

18.11 Checking the float needle valve

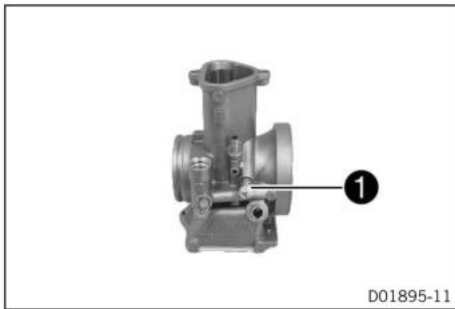


Condition

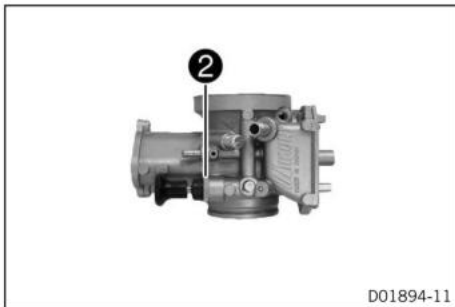
The float needle valve has been removed.

- Check the float needle valve and valve seat for deposits.
 - » If there are deposits:
 - Clean or change the valve seat and float needle valve.
- Check the float needle valve for wear and the sealing surfaces for notches.
 - » If the sealing surface is damaged or worn:
 - Change the float needle valve.

18.12 Assembling the carburetor



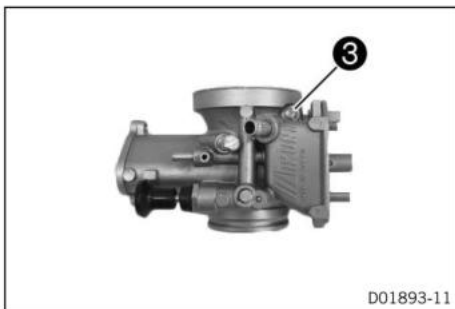
- Mount idle speed adjusting screw **1** with the spring.



- Mount and tighten choke slide **2**.

Guideline

Choke slide	M10	3.5 Nm (2.58 lbf ft)
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- Mount idle air adjusting screw **3** with the spring.

Alternative 1

- Set the idle air adjusting screw to the specified value.

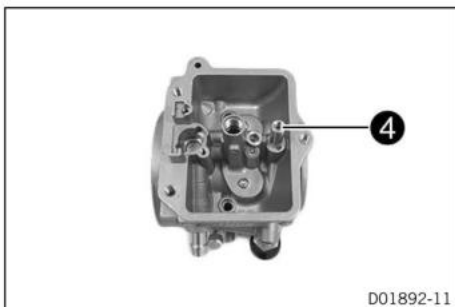


Info

The basic adjustment is shown under the respective model.

Alternative 2

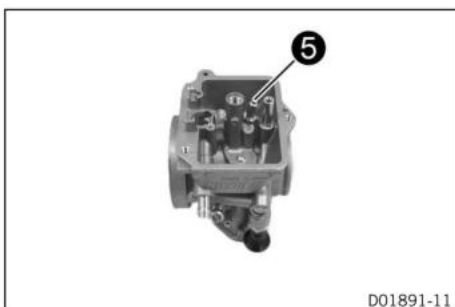
- Set the idle air adjusting screw to the value noted down during disassembly.



- Mount and tighten choke jet **4**.

Guideline

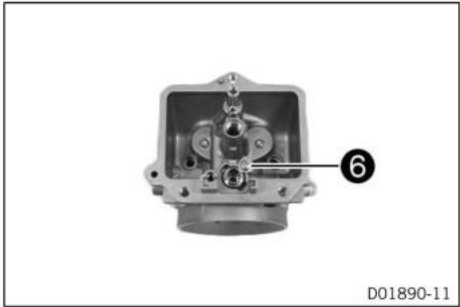
Choke nozzle	M4	0.7 Nm (0.52 lbf ft)
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- Mount and tighten idling jet **5**.

Guideline

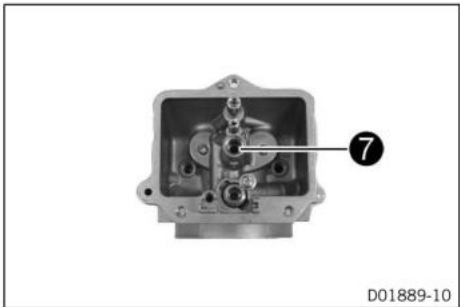
Idling jet	M4	1 Nm (0.7 lbf ft)
------------	----	-------------------



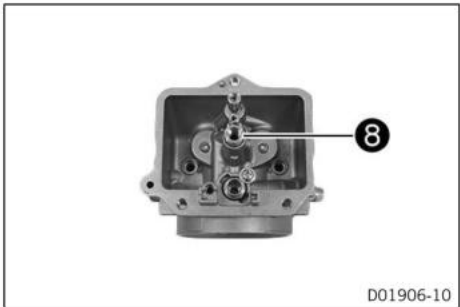
- Position the valve seat for the float needle valve.
- Mount and tighten screw 6.

Guideline

Screw, valve seat locking piece	M3	2 Nm (1.5 lbf ft)
---------------------------------	----	-------------------



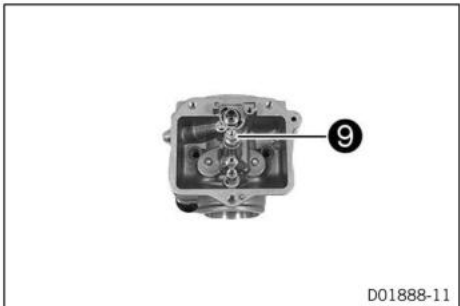
- Position needle jet 7 in the carburetor.
- Push the nozzle into the end position.
- ✓ The pin engages in the cut-out.



- Mount and tighten needle jet holder 8.

Guideline

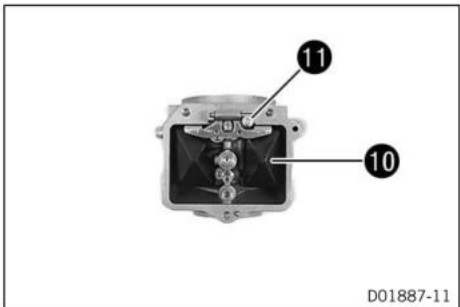
Needle jet holder	M8	3 Nm (2.2 lbf ft)
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- Mount and tighten main jet 9.

Guideline

Main jet	M5	2 Nm (1.5 lbf ft)
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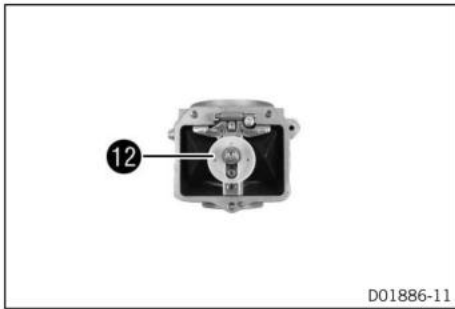


- Position float needle valve and float 10.
- Position the fulcrum pin.
- Mount and tighten screw 11.

Guideline

Screw, fulcrum pin locking piece	M4	2 Nm (1.5 lbf ft)
----------------------------------	----	-------------------

- Check/adjust the float level. (📖 p. 233)



- Position plastic cap 12.



- Insert the gasket into the float chamber.
- Position the float chamber.
- Mount and tighten screws 13 with the hose guides.

Guideline

Screws, float chamber cover	M5	3.5 Nm (2.58 lbf ft)
-----------------------------	----	-------------------------

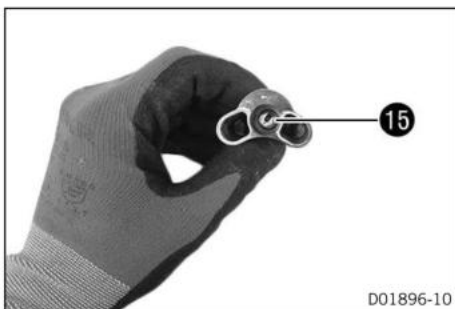
- Mount and tighten screw 14.

Guideline

Screws, float chamber cover	M5	3.5 Nm (2.58 lbf ft)
-----------------------------	----	-------------------------



- Mount the hoses on the carburetor.



- Position the jet needle in the throttle slide.
- Mount and tighten needle screw cap 15.

Guideline

Needle screw cap	M8	2.5 Nm (1.84 lbf ft)
------------------	----	-------------------------

18.13 Checking/adjusting the float level

Condition

The carburetor and float chamber have been removed.



- Tilt the carburetor until the float is resting against the float needle valve, but the float needle valve is not being pressed together.

60°

- » If, when in this position, the edge of the float is not parallel (max. 1° deviation in an upward direction) with the sealing surface of the float chamber:
 - Adjust the float level by bending float lever **1**.

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.



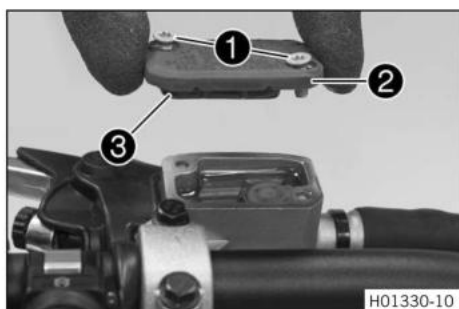
Info

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 fluid level does not meet specifications:

- Correct the fluid level of the hydraulic clutch.

Brake fluid DOT 4 / DOT 5.1 (📖 p. 286)

- 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.

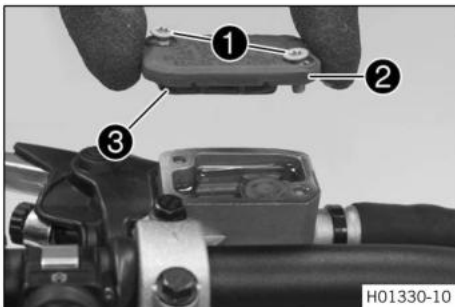


Info

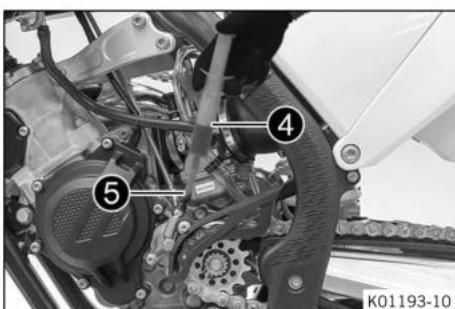
Never use DOT 5 brake fluid. It is silicone-based and purple in color. Oil seals and clutch lines are not designed for DOT 5 brake fluid.

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.
- Remove cover ② with membrane ③.

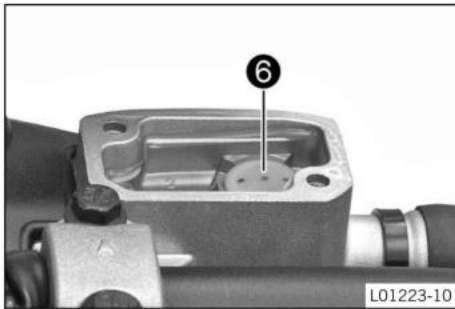


- Fill bleeding syringe ④ with the appropriate hydraulic fluid.

Syringe (50329050000) (📖 p. 291)

Brake fluid DOT 4 / DOT 5.1 (📖 p. 286)
--

- On the clutch slave cylinder, remove bleeder screw ⑤ and mount bleeding syringe ④.



- Now inject the liquid into the system until it emerges from the drill 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. Mount and tighten screws bleeder screw.
- Correct the fluid level of the hydraulic clutch.

Guideline

Fluid level below container rim	4 mm (0.16 in)
---------------------------------	----------------

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



Warning

Danger of poisoning Fuel is poisonous and a health hazard.

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



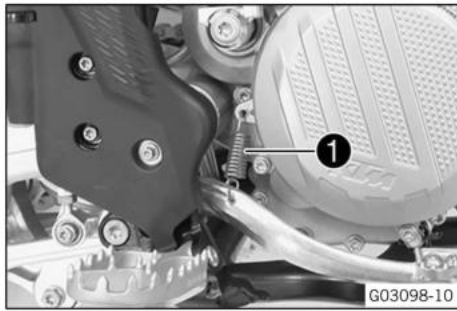
Main work

- Drain the fuel from the fuel tank into a suitable container.
- Lay the vehicle on its side on the work stand.

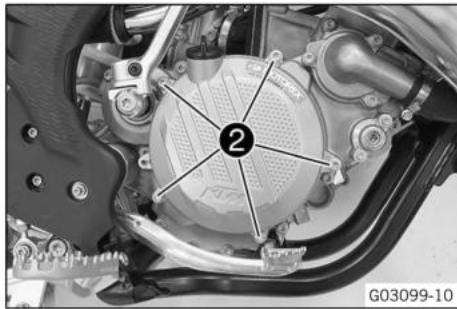


Info

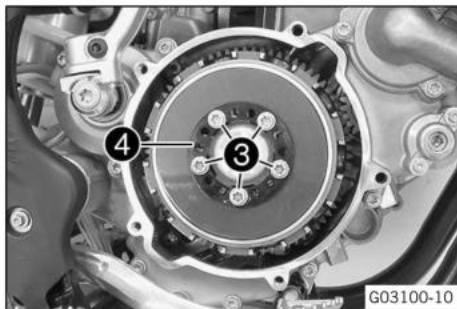
Cover the components to protect them against damage. Remaining fuel may flow out of the fuel tank.



- Detach spring **1**.



- Remove screws **2**.
- Take off the clutch cover with the gasket.



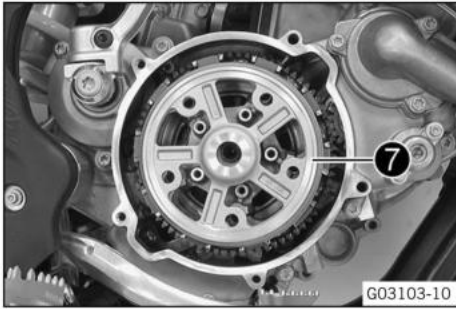
- Loosen screws **3** in a crisscross pattern and remove them.
- Take off spring retainer **4**.



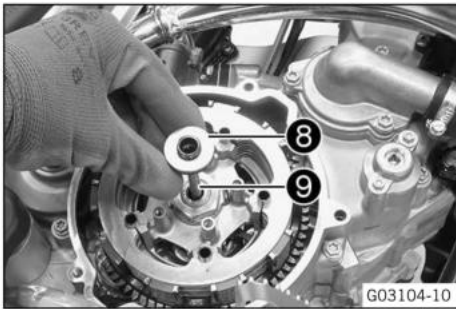
- Take off spring washer **5**.



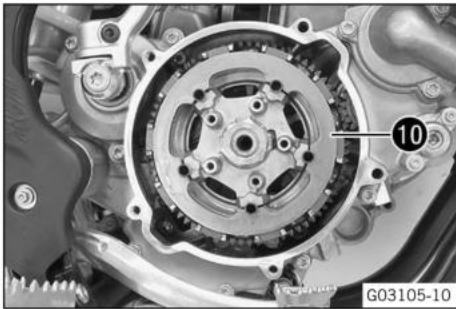
- Take off pretension ring **6**.



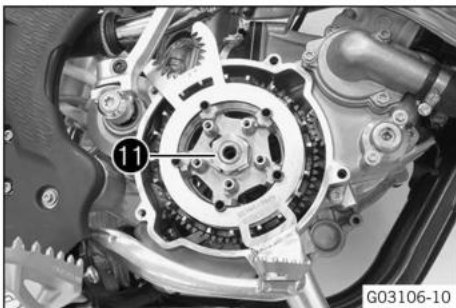
- Take off clutch pressure cap **7**.



- Take off clutch throw-out **8** with clutch push rod **9**.



- Remove clutch disc pack **10** completely.



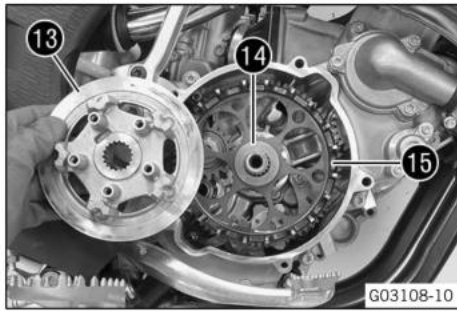
- Bend up the lock washer.
- Hold the inner clutch hub with the special tool.

Holding wrench (50529003000) (p. 293)

- Loosen nut **11**.
- Remove the nut with the lock washer.



- Remove sleeves **12**.



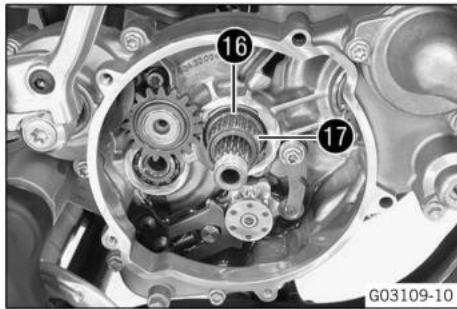
- Take off inner clutch hub **13** and washer **14**.



Info

The washer usually sticks to the inner clutch hub.

- Take off clutch basket **15**.

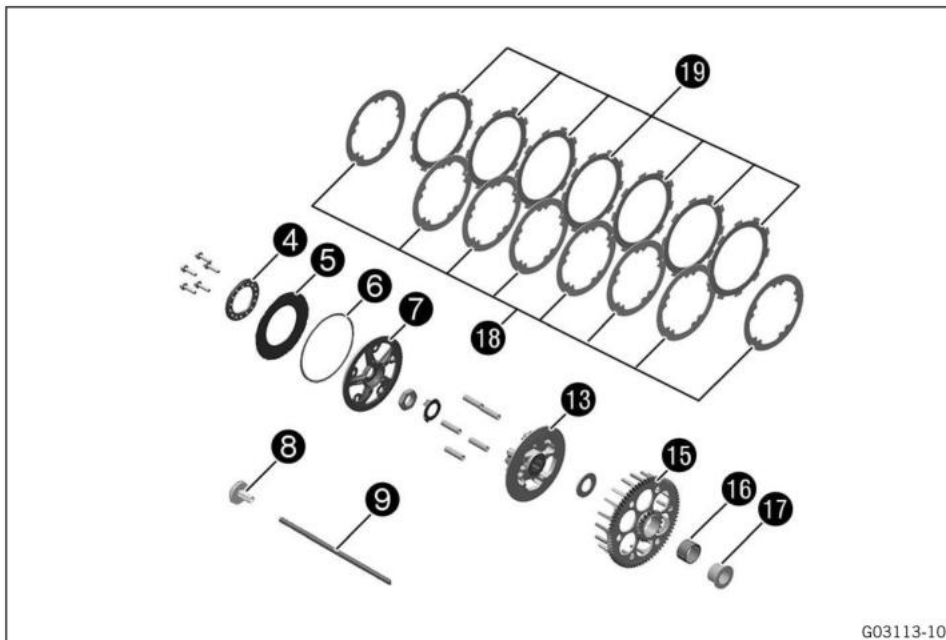


- Take off needle bearing **16** and collar bushing **17**.



Info

The needle bearing and collar bushing may be in the clutch basket.

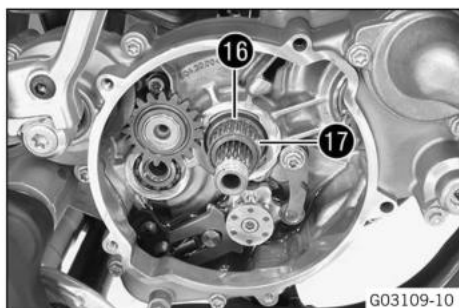


- Check clutch push rod **8** for damage and wear.
 - » If there is damage or wear:
 - Change the clutch push rod.
- Place the clutch push rod **9** on a flat surface and check for run-out.
 - » If there is run-out:
 - Change the clutch push rod.
- Check spring retainer **4** for damage and wear.
 - » If there is damage or wear:
 - Change the spring retainer.
- Check spring washer **5** for damage and wear.
 - » If there is damage or wear:
 - Change the spring washer.
- Check pretension ring **6** for damage and wear.

- » If there is damage or wear:
 - Change the pretension ring.
- 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 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 bearing and collar bushing.
- Check intermediate clutch discs **18** for damage and wear.
 - » If the intermediate clutch discs are not level and are pitted:
 - Change all intermediate clutch discs.
- Check clutch facing discs **19** for discoloration and scoring.
 - » If there is discoloration or scoring:
 - Change all clutch facing discs.
- Check the thickness of the clutch disc pack.

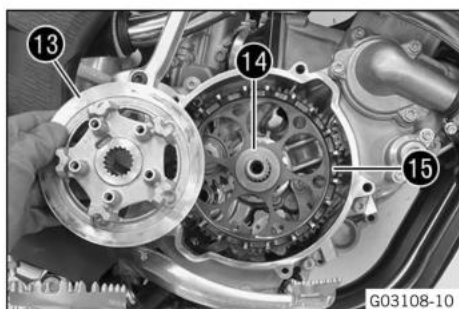
Clutch disc pack - thickness	
Wear limit	≥ 23.3 mm (≥ 0.917 in)

- » If the clutch disc pack does not meet the specified value:
 - Change the clutch disc pack.

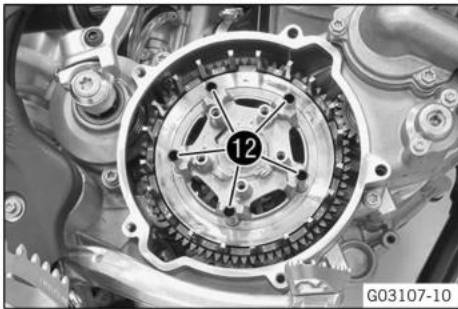


- Mount collar bushing **17**.
- Oil and mount needle bearing **16**.

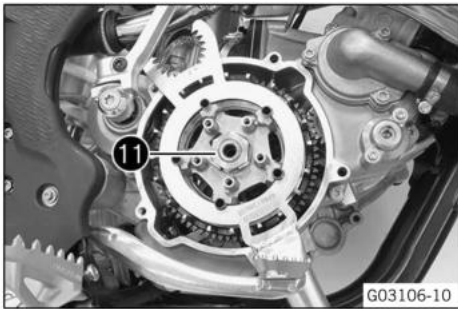
Engine oil (15W/50) (p. 286)



- Slide clutch basket **15** onto the gearbox main shaft.
 - ✓ Turn the clutch basket until the gear teeth of the kick starter intermediate gear mesh.
- Mount washer **14** and inner clutch hub **13**.



- Mount sleeves 12.



- Position the new lock washer.
- Mount nut 11.
- 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™
-----------------------	---------	---

Holding wrench (50429003000) (p. 292)

- Secure the nut with the lock washer.
- Thoroughly oil the clutch facing discs.

Engine oil (15W/50) (p. 286)

- Mount intermediate clutch disc A.

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

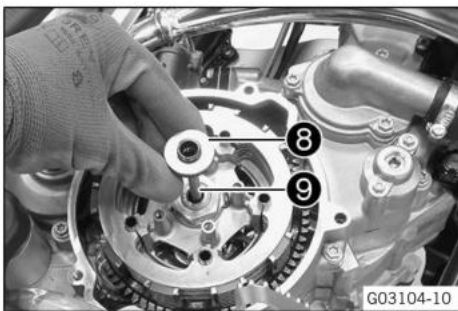
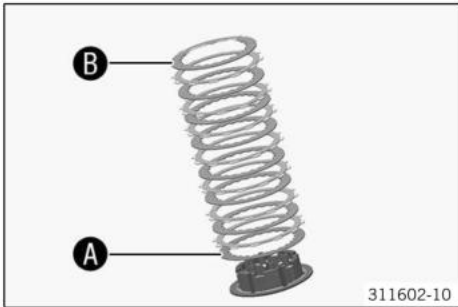
Thickness of intermediate clutch discs	1.4 mm (0.055 in)
--	-------------------

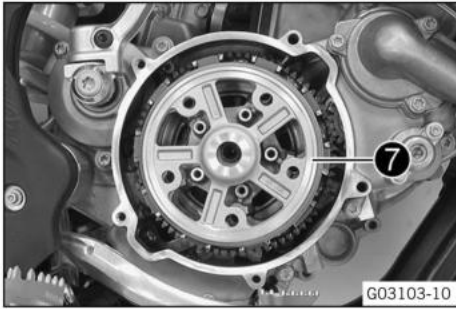
- Place intermediate clutch disc B into the clutch basket.

Guideline

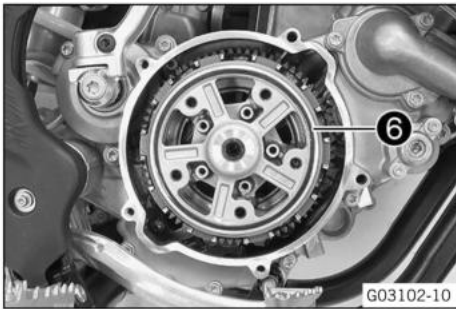
Thickness of intermediate clutch disc B	1.0 mm (0.039 in)
---	-------------------

- Mount clutch throw-out 8 with clutch push rod 9.

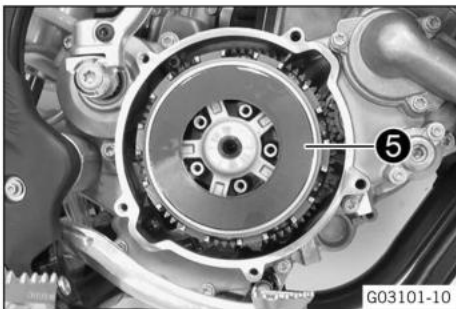




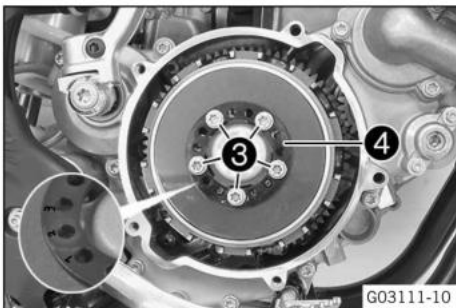
- Position clutch pressure cap **7**.



- Mount pretension ring **6** with marking **Top** facing up.



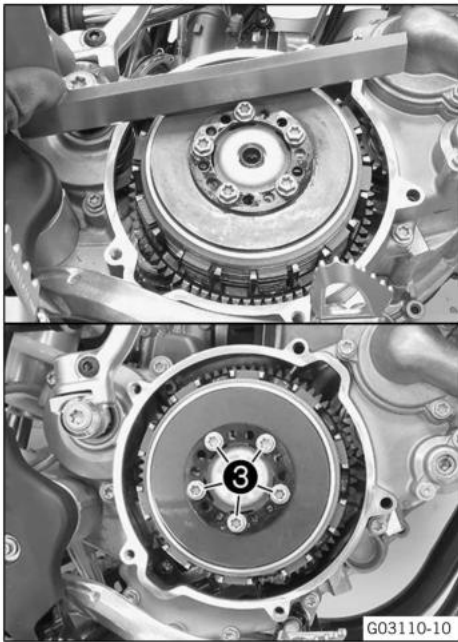
- Position spring washer **5**.



- Position spring retainer **4** with marking **1**.
- 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. 295)

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 **2**.
- Using a straightedge and the special tool, check the spring washer for distortion.

Feeler gauge (59029041100) (📖 p. 295)

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 **3**.
- Using a straightedge and the special tool, check the spring washer for distortion.

Feeler gauge (59029041100) (📖 p. 295)

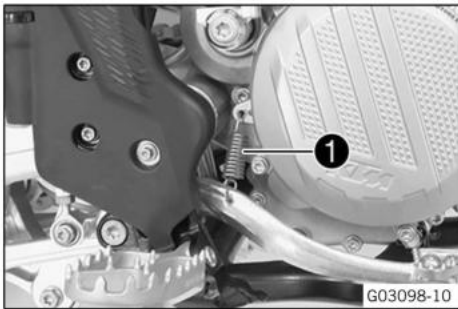
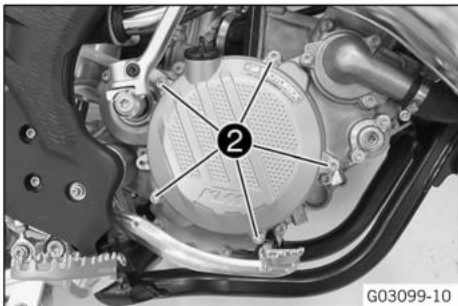
Spring washer distortion	0 ... 0.10 mm (0 ... 0.0039 in)
--------------------------	---------------------------------

- » 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	M6x20	8 Nm (5.9 lbf ft)
Screw, outer clutch cover	M6x50	8 Nm (5.9 lbf ft)



- Attach spring **1**.



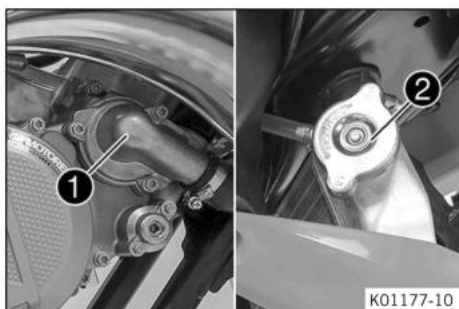
- Place vehicle in upright position and rest on the plug-in stand.

Finishing work

- Check the gear oil level. (📖 p. 257)



20.1 Cooling system



Water pump **1** in the engine ensures forced circulation of the coolant.

The pressure resulting from the warming of the cooling system is regulated by a valve in radiator cap **2**. This ensures that operating the vehicle at the specified coolant temperature will not result in a risk of malfunctions.

120 °C (248 °F)

Cooling is effected by the air stream.

The lower the speed, the less the cooling effect. Dirty cooling fins also reduce the cooling effect.

20.2 Checking the antifreeze and coolant level



Warning

Danger of scalding During motorcycle operation, the coolant gets very hot and is under pressure.

- Do not open the radiator, the radiator hoses or other cooling system components if the engine or the cooling system are at operating temperature.
- Allow the cooling system and the engine to cool down before you open the radiator, the radiator hoses or other components of the cooling system.
- In the event of scalding, rinse the area affected immediately with lukewarm water.



Warning

Danger of poisoning Coolant is toxic and a health hazard.

- Keep coolant out of the reach of children.
- Do not allow coolant to come into contact with the skin, the eyes and clothing.
- Consult a doctor immediately if coolant is swallowed.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly with water and consult a doctor immediately if coolant gets into the eyes.
- Change clothing if coolant spills onto your clothing.

Condition

The engine is cold.

- Stand the motorcycle upright on a horizontal surface.
- Remove the radiator cap.
- Check the coolant antifreeze.

-25 ... -45 °C (-13 ... -49 °F)

» If the antifreeze in the coolant does not match the specified value:

- Correct the coolant antifreeze.

- Check the coolant level in the radiator.

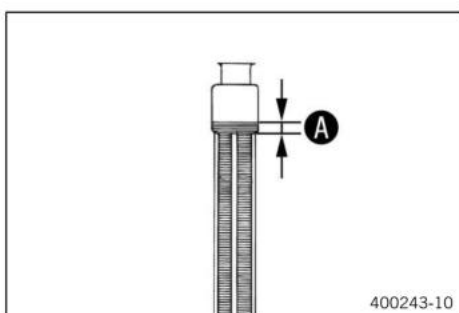
Coolant level A above the radiator fins	10 mm (0.39 in)
--	-----------------

» If the coolant level does not match the specified value:

- Correct the coolant level.

Coolant (📖 p. 286)

- 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.



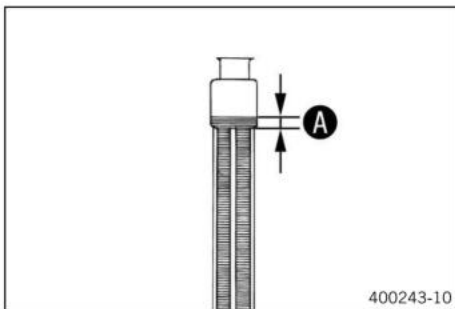
Warning

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. 286)

- 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.

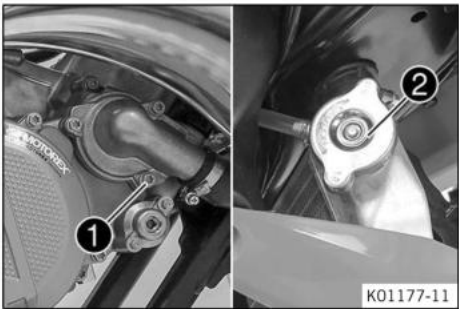
Condition

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

Drain plug, water pump cover	M6	8 Nm (5.9 lbf ft)
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20.5 Refilling with coolant



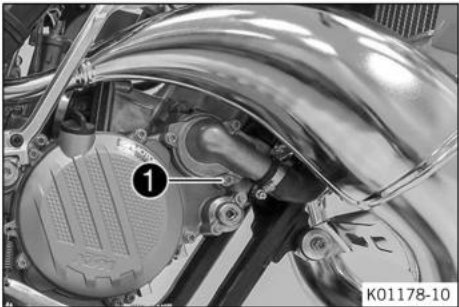
Warning

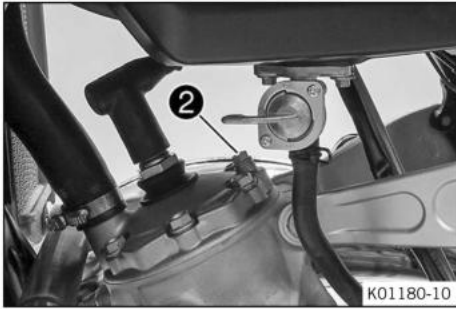
Danger of poisoning Coolant is toxic and a health hazard.

- 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.

- Make sure that screw ❶ is tightened.
- Position the motorcycle upright.
- Completely fill the radiator with coolant.

Coolant (📖 p. 286)





- Loosen screw **2** until coolant escapes without bubbles.
- Mount and tighten screw **2**.

Guideline

Bleeder screw, cylinder head	M6	8 Nm (5.9 lbf ft)
------------------------------	----	-------------------

- Completely fill the radiator with coolant.

Coolant (📖 p. 286)



- Mount radiator cap **3**.



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 coolant level. (📖 p. 247)

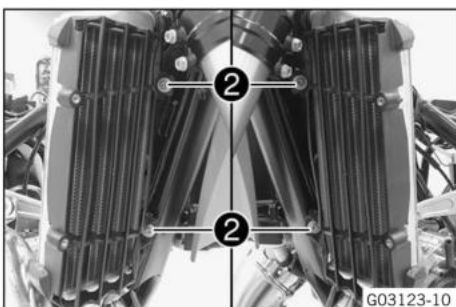
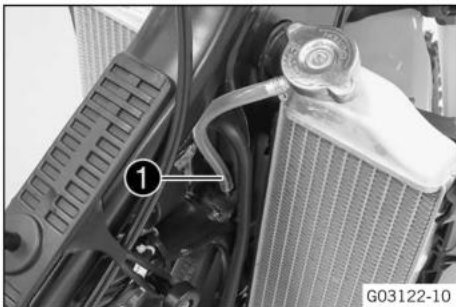
20.6 Changing the coolant pipe

Preparatory work

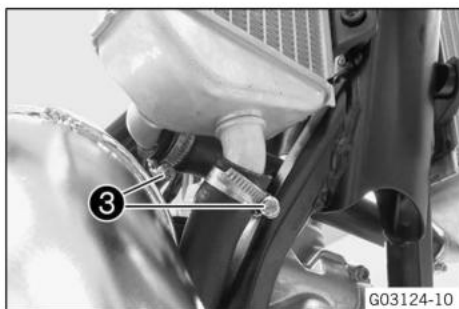
- Drain the coolant. (📖 p. 247)
- Remove the seat. (📖 p. 108)
- Turn tap handle of the fuel tap to the **OFF** position.
- Remove the fuel tank. (📖 p. 109)

Main work

- Pull off overflow hose **1**.



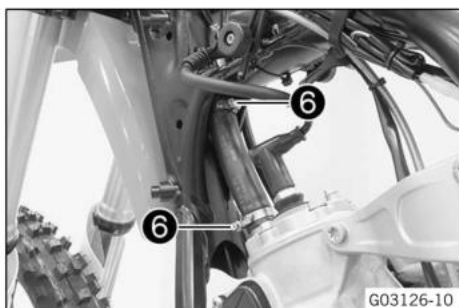
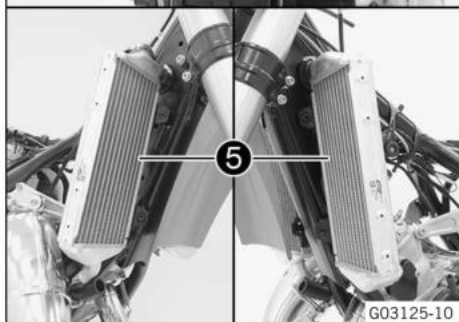
- Remove screws **2**.
- Remove radiator shield on both sides.



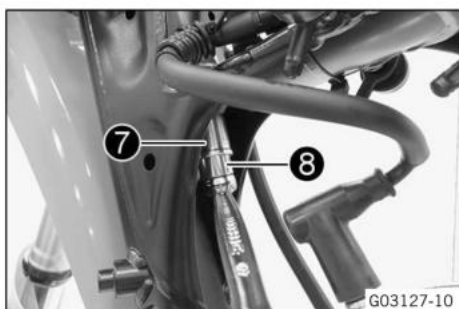
- Loosen hose clips **3**.
- Pull off the radiator hoses.



- Remove the hose clips **4**.
- Detach radiator **5** and remove to the side.

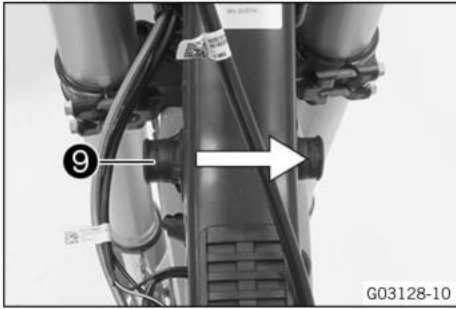


- Loosen hose clips **6**.
- Pull off the radiator hose.

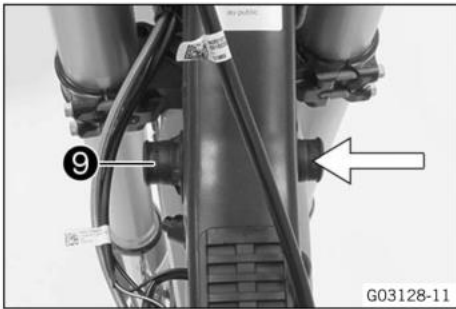


- Remove coolant pipe **7** using special tool **8**.

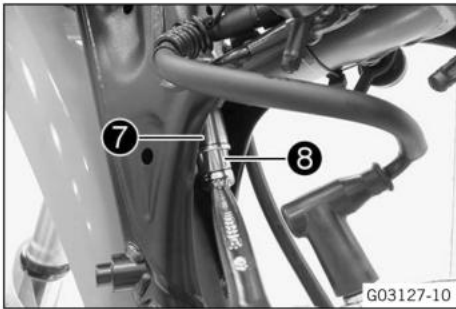
Mounting tool (79129081000) (📖 p. 296)



- Pull off connecting piece 9 to the side and remove.



- Mount new connecting piece 9 in the frame.

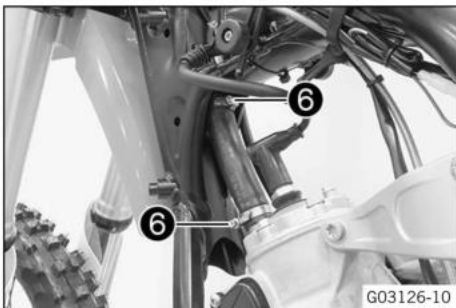


- Mount new coolant pipe 7 with special tool 8 and tighten.

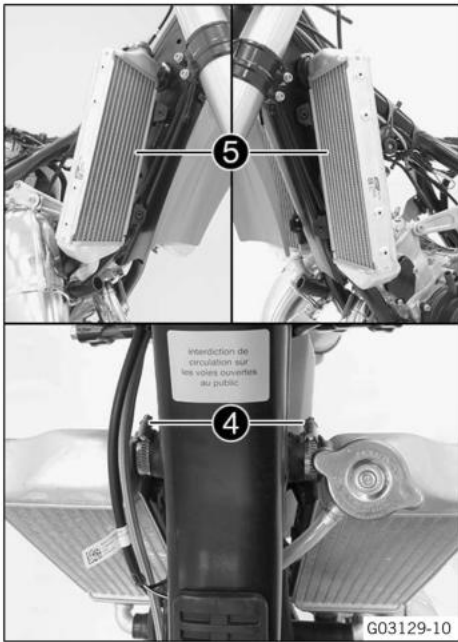
Guideline

Screw-in fitting, cooling system	M24x1.5	12 Nm (8.9 lbf ft) Loctite®243™
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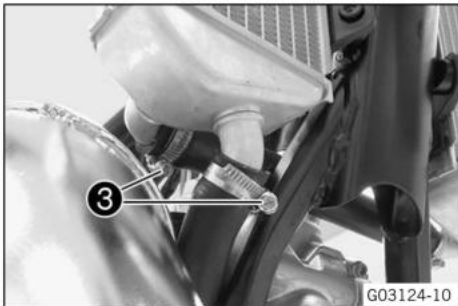
Mounting tool (79129081000) (p. 296)



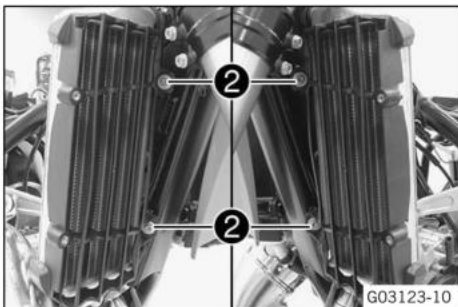
- Mount the radiator hose.
- Position and tighten hose clips 6.



- Detach the radiator 5 and position.
- Position and tighten hose clips 4.



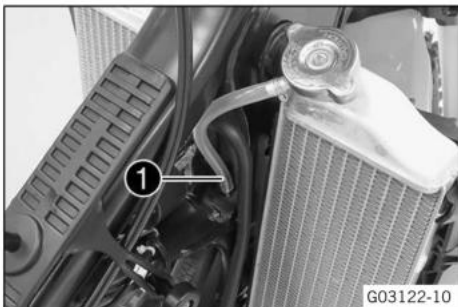
- Mount the radiator hoses.
- Position and tighten hose clips 3.



- 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. 110)
- Mount the seat. (📖 p. 108)

- Refill with coolant. (📖 p. 248)



21.1 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

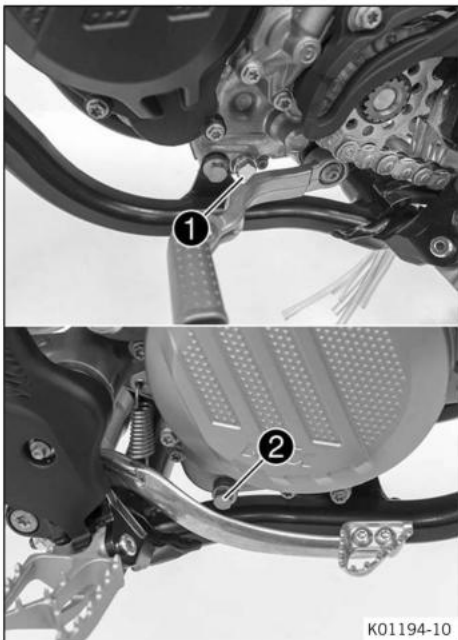
Environmental hazard Hazardous substances cause environmental damage.

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

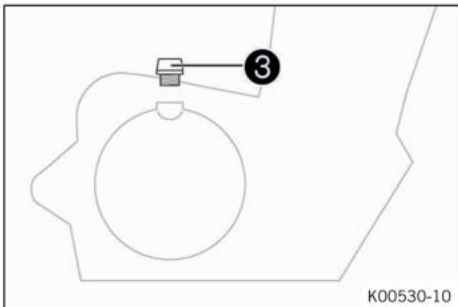


Info

Drain the gear oil while the engine is at operating temperature.



K01194-10



K00530-10

- Preparatory work**
- Park the motorcycle on a level surface.
 - Place an appropriate container under the engine.

- Main work**
- Remove gear oil drain plug ❶ with magnet.
 - Remove gear oil drain plug ❷.
 - Allow the gear oil drain completely.
 - Thoroughly clean the gear oil drain plug.
 - Clean the sealing surface on the engine.
 - Mount and tighten gear oil drain plug ❶ with the magnet and a new seal ring.

Guideline		
Gear oil drain plug with magnet	M12x1.5	20 Nm (14.8 lbf ft)

- Mount and tighten gear oil drain plug ❷ with a new seal ring.
- Guideline

Gear oil drain plug	M10x1	15 Nm (11.1 lbf ft)
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- Remove filler plug ❸ with the O-ring, and fill up with gear oil.

Gear oil	0.80 l (0.85 qt.)	Engine oil (15W/50) (📖 p. 286)
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- 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 for tightness.

Finishing work

- Check the gear oil level. (📖 p. 257)



21.2 Draining 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.

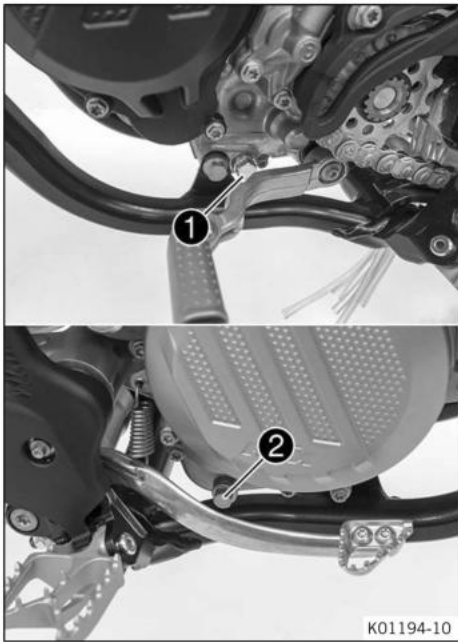
- Dispose of oils, grease, filters, fuel, cleaning agents, brake fluid, etc., correctly and in compliance with the applicable regulations.

**Info**

Drain the gear oil while the engine is at operating temperature.

Preparatory work

- Park the motorcycle on a level surface.
- Place an appropriate container under the engine.



Main work

- Remove gear oil drain plug 1 with magnet.
- Remove gear oil drain plug 2.
- Let the gear oil drain fully.
- Thoroughly clean the gear oil drain plug.
- 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)
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- Mount and tighten gear oil drain plug 2 with a new seal ring.

Guideline

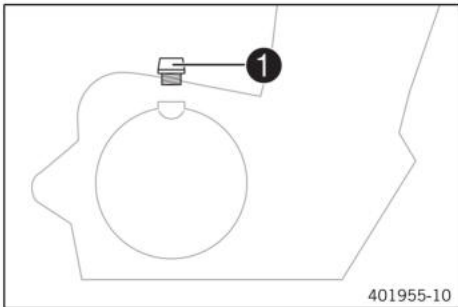
Gear oil drain plug	M10x1	15 Nm (11.1 lbf ft)
---------------------	-------	---------------------

21.3 Filling in gear oil



Info

Too little gear oil or poor-quality gear oil results in premature wear to the transmission.



Main work

- Remove filler plug 1 with the O-ring, and fill up with gear oil.

Gear oil	0.80 l (0.85 qt.)	Engine oil (15W/50) (p. 286)
----------	----------------------	------------------------------------

- 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 for tightness.

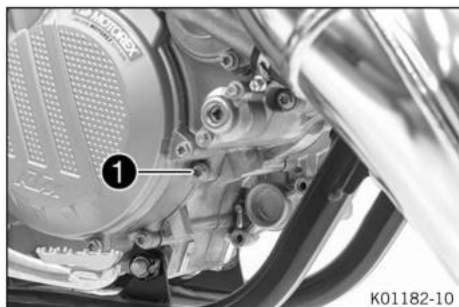
Finishing work

- Check the gear oil level. (p. 257)

21.4 Checking the gear oil level

Info

The gear oil level must be checked when the engine is cold.



Preparatory work

- Stand the motorcycle upright on a horizontal surface.

Main work

- 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 gear oil. (📖 p. 257)

- Mount and tighten the gear oil level monitoring screw.

Guideline

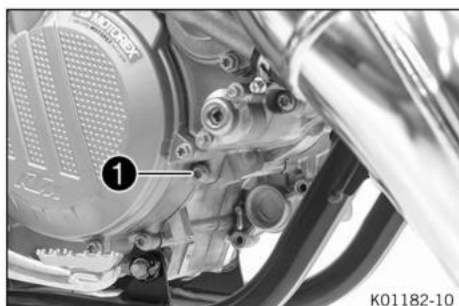
Screw, gear oil level monitoring	M6	8 Nm (5.9 lbf ft)
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21.5 Adding gear oil

Info

Too little gear oil or poor-quality gear oil results in premature wear to the transmission. Gear oil must only be topped up when the engine is cold.

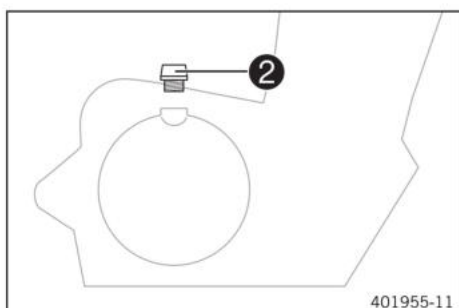


Preparatory work

- Park the motorcycle on a level surface.

Main work

- 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. 286)

- 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.

Finishing work



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 for tightness.



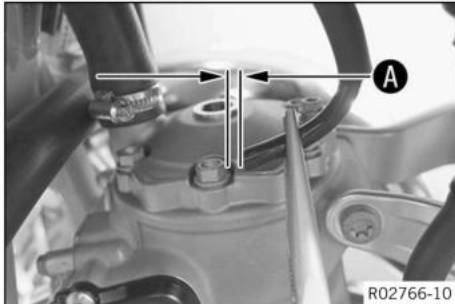
22.1 Checking the ignition system



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.
- Hold the free end of the ignition wire at a distance **A** from ground.

Guideline

Distance A	5 mm (0.2 in)
-------------------	---------------

- Press the kick starter lever robustly through its full range.



Info

Do not open the throttle.

- Check the ignition spark.
 - » If no ignition spark is visible:
 - Check the kill switch.
 - Check the ground connection of the CDI controller and ignition coil.
 - Check the cable from the CDI control unit to the ignition coil.



Info

The CDI control unit cannot be tested using simple methods but only using an ignition test bench.

- Ignition coil - check the primary winding. (📖 p. 260)
- Ignition coil - check the secondary winding. (📖 p. 261)
- Check the crankshaft speed sensor. (📖 p. 262)
- Alternator - check the charging coil of the ignition. (📖 p. 261)



- Fit spark the plug connector on the ignition wire again. Mount the spark plug in the spark plug connector. Hold the spark plug to ground.
- Press the kick starter lever robustly through its full range.



Info

Do not open the throttle.

- Check the ignition spark.
 - » If no ignition spark is visible:
 - Check the spark plug connector. (📖 p. 261)

- Change the spark plug.

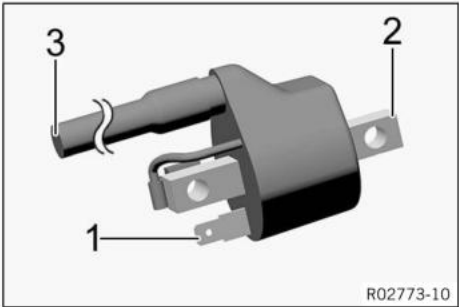
22.2 Ignition coil - checking the primary winding



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)	0.255 ... 0.345 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. 294)



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 1 and the red measuring lead to pin 2 of the ignition coil.

Ignition coil	
Voltage, primary winding	120 ... 160 V

- » If the displayed value does not correspond to the nominal value:
 - Change the ignition coil.

22.3 Ignition coil - checking the secondary winding

Condition

Ignition coil cylinder 1 is disconnected.

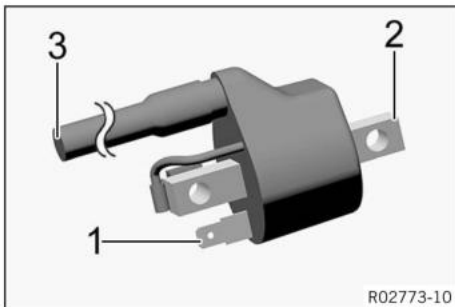
Spark plug connector cylinder 1 has been removed.

Ignition coil cylinder 1 - check the secondary winding resistance

- Ω Measure the resistance between the specified points.
Ignition coil pin 2 (-) – Ignition coil pin 3

Ignition coil	
Secondary winding resistance at: 20 °C (68 °F)	5.04 ... 7.56 k Ω

- » If the displayed value does not correspond to the nominal value:
 - Change the ignition coil.



22.4 Checking the spark plug connector

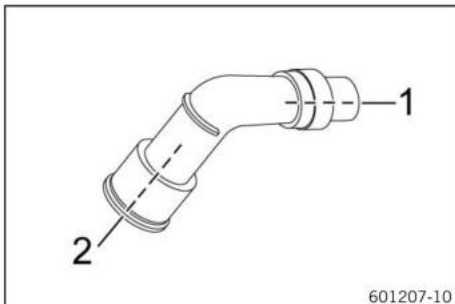
Condition

Spark plug connector cylinder 1 has been removed.

- Ω 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 k Ω

- » If the specification is not reached:
 - Change the spark plug connector.



22.5 Alternator - checking the charging coil of the ignition

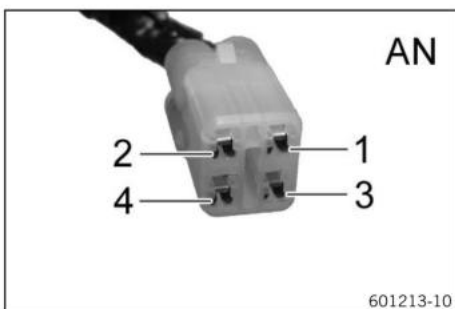
Condition

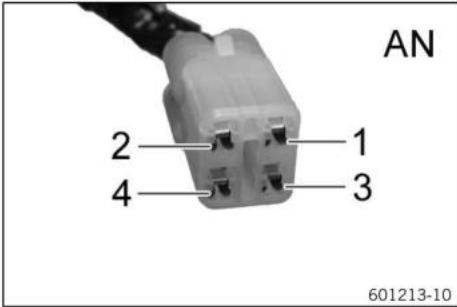
The alternator has been disconnected.

- Ω Measure the resistance between the specified points.
Alternator, charging coil/crankshaft speed sensor connector **AN** pin 1 – Alternator, charging coil/crankshaft speed sensor connector **AN** pin 2

Alternator	
Resistance of the ignition stator at: 20 °C (68 °F)	20 ... 28 Ω

- » If the specification is not reached:
 - Change the stator.





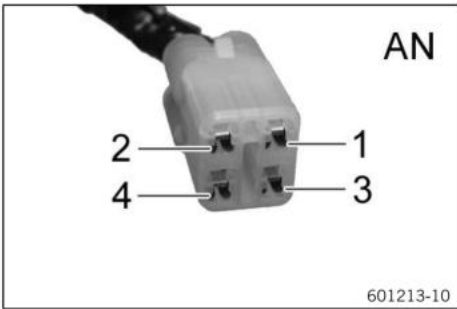
-  Measure the resistance between the specified points.
Alternator, charging coil/crankshaft speed sensor connector **AN** pin **1** – Measuring point Ground, wiring harness/frame

Resistance	$\infty \Omega$
------------	-----------------

- » If the specification is not reached:
 - Change the stator.

22.6 Checking the crankshaft speed sensor

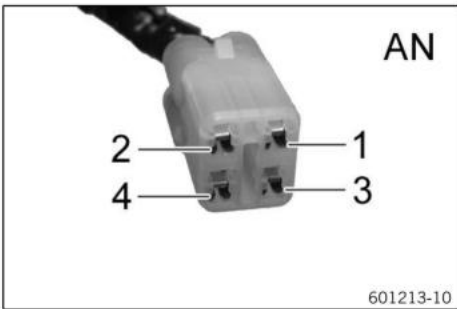
Condition
Crankshaft speed sensor is disconnected.



-  Measure the resistance between the specified points.
Alternator, charging coil/crankshaft speed sensor connector **AN** pin **3** – Alternator, charging coil/crankshaft speed sensor connector **AN** pin **4**

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.
Alternator, charging coil/crankshaft speed sensor connector **AN** pin **3** – Measuring point Ground, wiring harness/frame

Resistance	$\infty \Omega$
------------	-----------------

- » If the specification is not reached:
 - Change the crankshaft speed sensor.

- Connect the special tool to the multimeter.

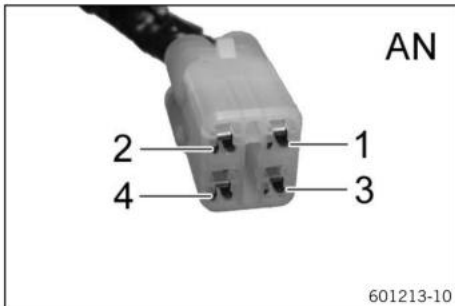
Peak voltage adapter (58429042000)  p. 294



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.
Alternator, charging coil/crankshaft speed sensor connector **AN** pin **3** – Alternator, charging coil/crankshaft speed sensor connector **AN** pin **4**

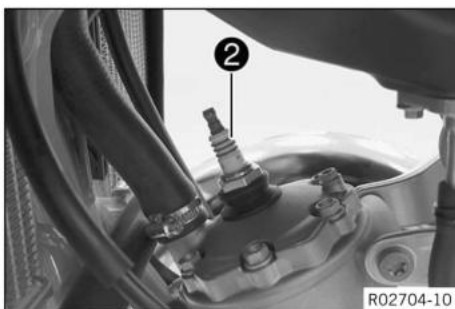
Crankshaft speed sensor	
Voltage at: 20 °C (68 °F)	2 ... 4 V

- » If the specification is not reached:
 - Change the crankshaft speed sensor.

22.7 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.

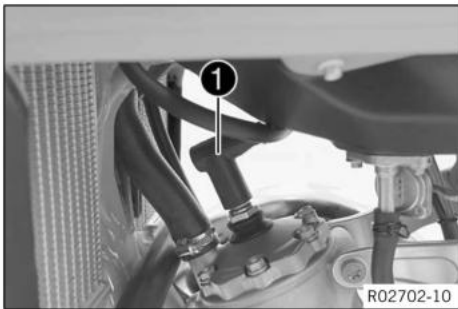
Guideline

Spark plug	M14x1.25	25 Nm (18.4 lbf ft)
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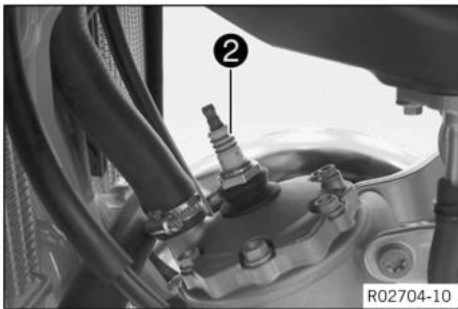


- Plug in spark plug connector **1**.

22.8 Changing the spark plug and spark plug connector



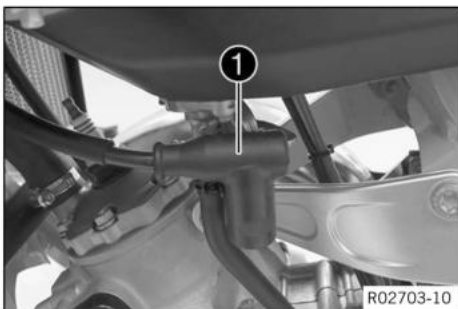
- Disconnect spark plug connector 1.



- 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.

23.1 Engine

23.1.1 All 125 models

Design	1-cylinder 2-stroke engine, water-cooled, with reed intake and exhaust control
Displacement	124.8 cm ³ (7.616 cu in)
Stroke	54.5 mm (2.146 in)
Bore	54 mm (2.13 in)
Exhaust valve - Beginning of adjustment	7,100 rpm
Crankshaft bearing	1 grooved ball bearing/1 roller bearing
Conrod bearing	Needle bearing
Piston pin bearing	Needle bearing
Pistons	Cast aluminum
Piston rings	1 rectangular ring, 1 half keystone ring
X (upper edge of piston to upper edge of cylinder)	0 ... 0.10 mm (0 ... 0.0039 in)
Z (height of control flap)	36.5 mm (1.437 in)
Primary transmission	23:73
Clutch	Multidisc clutch in oil bath/hydraulically activated
Gearbox	6-gear transmission, claw shifted
Transmission ratio	
First gear	14:32
Second gear	15:30
Third gear	17:28
Fourth gear	19:27
Fifth gear	19:23
Sixth gear	22:24
Ignition	Contactless controlled fully electronic ignition with digital ignition adjustment, type Kokusan
Spark plug	NGK BR9 ECMVX
Spark plug electrode gap	0.60 mm (0.0236 in)
Starting aid	Kick starter system

23.1.2 All 150 models

Design	1-cylinder 2-stroke engine, water-cooled, with reed intake and exhaust control
Displacement	144 cm ³ (8.79 cu in)
Stroke	54.5 mm (2.146 in)
Bore	58 mm (2.28 in)
Exhaust valve - Beginning of adjustment	7,000 rpm
Crankshaft bearing	1 grooved ball bearing/1 roller bearing
Conrod bearing	Needle bearing
Piston pin bearing	Needle bearing
Pistons	Forged aluminum
Piston rings	1 rectangular ring, 1 half keystone ring
X (upper edge of piston to upper edge of cylinder)	0 ... 0.10 mm (0 ... 0.0039 in)
Z (height of control flap)	36.5 mm (1.437 in)

Primary transmission	23:73
Clutch	Multidisc clutch in oil bath/hydraulically activated
Gearbox	6-gear transmission, claw shifted
Transmission ratio	
First gear	14:32
Second gear	15:30
Third gear	17:28
Fourth gear	19:27
Fifth gear	19:23
Sixth gear	22:24
Ignition	Contactless controlled fully electronic ignition with digital ignition adjustment, type Kokusan
Spark plug	NGK BR9 ECMVX
Spark plug electrode gap	0.60 mm (0.0236 in)
Starting aid	Kick starter system

23.2 Tolerance, engine wear limits

23.2.1 All 125 models

Piston - diameter	
Size I	53.935 ... 53.945 mm (2.12342 ... 2.12381 in)
Size II	53.945 ... 53.955 mm (2.12381 ... 2.12421 in)
Cylinder - drill hole diameter	
Size I	54.000 ... 54.012 mm (2.12598 ... 2.12645 in)
Size II	54.012 ... 54.025 mm (2.12645 ... 2.12696 in)
Piston/cylinder - mounting clearance	
New condition	0.055 ... 0.080 mm (0.00217 ... 0.00315 in)
Wear limit	0.10 mm (0.0039 in)
Piston ring end gap	
Ring 1	≤ 0.40 mm (≤ 0.0157 in)
Ring 2	≤ 0.40 mm (≤ 0.0157 in)
Cylinder/cylinder head - distortion of sealing area	≤ 0.10 mm (≤ 0.0039 in)
Connecting rod - axial play of lower conrod bearing	0.45 ... 0.75 mm (0.0177 ... 0.0295 in)
Crankshaft - run-out at bearing pin	≤ 0.03 mm (≤ 0.0012 in)
Clutch disc pack - thickness	
Wear limit	≥ 23.3 mm (≥ 0.917 in)
Shift shaft - sliding plate/shift quadrant clearance	0.40 ... 0.80 mm (0.0157 ... 0.0315 in)

23.2.2 All 150 models

Piston - diameter	
Size I	57.935 ... 57.945 mm (2.2809 ... 2.28129 in)
Size II	57.945 ... 57.955 mm (2.28129 ... 2.28169 in)
Cylinder - drill hole diameter	
Size I	58.000 ... 58.012 mm (2.28346 ... 2.28393 in)
Size II	58.012 ... 58.025 mm (2.28393 ... 2.28444 in)

Piston/cylinder - mounting clearance	
New condition	0.055 ... 0.080 mm (0.00217 ... 0.00315 in)
Wear limit	0.10 mm (0.0039 in)
Piston ring end gap	
Ring 1	≤ 0.40 mm (≤ 0.0157 in)
Ring 2	≤ 0.40 mm (≤ 0.0157 in)
Cylinder/cylinder head - distortion of sealing area	≤ 0.10 mm (≤ 0.0039 in)
Connecting rod - axial play of lower conrod bearing	0.45 ... 0.75 mm (0.0177 ... 0.0295 in)
Crankshaft - run-out at bearing pin	≤ 0.03 mm (≤ 0.0012 in)
Clutch disc pack - thickness	
Wear limit	≥ 23.3 mm (≥ 0.917 in)
Shift shaft - sliding plate/shift quadrant clearance	0.40 ... 0.80 mm (0.0157 ... 0.0315 in)

23.3 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, clutch spring retainer	M5	6 Nm (4.4 lbf ft)	
Screw, control lever, exhaust control	M5	6 Nm (4.4 lbf ft)	Loctite®243™
Screw, crankshaft speed sensor	M5	6 Nm (4.4 lbf ft)	Loctite®243™
Screw, exhaust control cover	M5	5 Nm (3.7 lbf ft)	
Screw, locking lever	M5	6 Nm (4.4 lbf ft)	Loctite®243™
Screw, retaining bracket, rotary valve	M5	6 Nm (4.4 lbf ft)	Loctite®243™
Screw, stator	M5	6 Nm (4.4 lbf ft)	Loctite®243™
Screw, water pump wheel	M5	6 Nm (4.4 lbf ft)	Loctite®243™
Bleeder screw, cylinder head	M6	8 Nm (5.9 lbf ft)	
Drain plug, water pump cover	M6	8 Nm (5.9 lbf ft)	
Nut, adjusting screw, power valve	M6	8 Nm (5.9 lbf ft)	
Screw, alternator cover	M6	8 Nm (5.9 lbf ft)	
Screw, bearing retainer	M6	10 Nm (7.4 lbf ft)	Loctite®243™
Screw, clutch slave cylinder	M6	10 Nm (7.4 lbf ft)	
Screw, control lever, exhaust control	M6	10 Nm (7.4 lbf ft)	Loctite®243™
Screw, engine case	M6	10 Nm (7.4 lbf ft)	
Screw, exhaust flange	M6	10 Nm (7.4 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, intermediate clutch cover	M6x20	10 Nm (7.4 lbf ft)	
Screw, intermediate clutch cover	M6x25	10 Nm (7.4 lbf ft)	

Screw, intermediate clutch cover	M6x30	10 Nm (7.4 lbf ft)
Screw, kick starter stop plate	M6	10 Nm (7.4 lbf ft)
Screw, outer clutch cover	M6x20	8 Nm (5.9 lbf ft)
Screw, outer clutch cover	M6x50	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, stop plate of exhaust control	M6	10 Nm (7.4 lbf ft) Loctite®243™
Screw, water pump cover	M6	10 Nm (7.4 lbf ft)
Screw, cylinder head	M7	18 Nm (13.3 lbf ft)
Nut, cylinder base	M8	23 Nm (17 lbf ft)
Screw, cylinder base	M8	20 Nm (14.8 lbf ft)
Screw, kick starter lever	M8	25 Nm (18.4 lbf ft) Loctite®243™
Gear oil drain plug	M10x1	15 Nm (11.1 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, primary gear wheel	M16LHx1.5	130 Nm (95.9 lbf ft) Loctite®243™
Nut, inner clutch hub	M18x1.5	100 Nm (73.8 lbf ft) Loctite®243™

23.4 Capacities

23.4.1 Gear oil

Gear oil	0.80 l (0.85 qt.)	Engine oil (15W/50) (📖 p. 286)
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23.4.2 Coolant

Coolant	1.2 l (1.3 qt.)	Coolant (📖 p. 286)
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23.4.3 Fuel

Total fuel tank capacity, approx.	7.5 l (1.98 US gal)	Super unleaded (98 octane) mixed with 2-stroke engine oil (1:40) (📖 p. 287)
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23.5 Chassis

Frame	Central tube frame made of chrome molybdenum steel tubing	
Fork	WP Suspension Upside down AER 48	
Suspension travel		
front	310 mm (12.2 in)	
rear	300 mm (11.81 in)	
Fork offset	22 mm (0.87 in)	

Shock absorber	WP Suspension 5018 DCC Link
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	
front	2.5 mm (0.098 in)
rear	3.5 mm (0.138 in)
Offroad tire pressure	
front	1.0 bar (15 psi)
rear	1.0 bar (15 psi)
Secondary ratio (All 125 models)	13:50
Secondary ratio (All 150 models)	13:48
Chain	5/8 x 1/4"
Rear sprockets available	48, 50, 52
Steering head angle	63.9°
Wheelbase	1,485 ± 10 mm (58.46 ± 0.39 in)
Seat height unloaded	950 mm (37.4 in)
Ground clearance unloaded	375 mm (14.76 in)
Weight without fuel, approx.	87.5 kg (192.9 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.)

23.6 Tires

Front tire	Rear tire
80/100 - 21 51M TT Dunlop GEOMAX MX3S	100/90 - 19 57M TT Dunlop GEOMAX MX3S
The tires specified represent one of the possible series production tires. Additional information is available in the Service section under: http://www.ktm.com	

23.7 Fork

23.7.1 All EU models

Fork article number	34.18.8S.01
Fork	WP Suspension Upside down AER 48
Compression damping	
Comfort	17 clicks
Standard	12 clicks
Sport	7 clicks
Rebound damping	
Comfort	17 clicks
Standard	12 clicks
Sport	7 clicks
Air pressure	8.3 bar (120 psi)

Fork length	950 mm (37.4 in)	
Oil capacity external mechanism left	210 ± 30 ml (7.1 ± 1.01 fl. oz.)	Fork oil (SAE 4) (48601166S1) (p. 287)
Oil capacity external mechanism right	210 ± 30 ml (7.1 ± 1.01 fl. oz.)	Fork oil (SAE 4) (48601166S1) (p. 287)
Grease capacity, left cartridge	5 g (0.18 oz)	Multi-purpose grease (00062010051) (p. 289)
Oil capacity, right cartridge	380 ml (12.85 fl. oz.)	Fork oil (SAE 4) (48601166S1) (p. 287)

23.7.2 All US models

Fork article number	34.18.8S.51
Fork	WP Suspension Upside down AER 48
Compression damping	
Comfort	17 clicks
Standard	12 clicks
Sport	7 clicks
Rebound damping	
Comfort	17 clicks
Standard	12 clicks
Sport	7 clicks
Air pressure	8.4 bar (122 psi)
Fork length	950 mm (37.4 in)

Oil capacity external mechanism left	200 ± ⁴⁰ / ₂₀ ml (6.76 ± ^{1.35} / _{0.68} fl. oz.)	Fork oil (SAE 4) (48601166S1) (p. 287)
Oil capacity external mechanism right	200 ± ⁴⁰ / ₂₀ ml (6.76 ± ^{1.35} / _{0.68} fl. oz.)	Fork oil (SAE 4) (48601166S1) (p. 287)
Grease capacity, left cartridge	5 g (0.18 oz)	Multi-purpose grease (00062010051) (p. 289)
Oil capacity, right cartridge	380 ml (12.85 fl. oz.)	Fork oil (SAE 4) (48601166S1) (p. 287)

23.8 Shock absorber

23.8.1 All EU models

Shock absorber article number	18.18.7S.01
Shock absorber	WP Suspension 5018 DCC Link
Lowspeed compression damping	
Comfort	17 clicks
Standard	15 clicks
Sport	13 clicks
Highspeed compression damping	
Comfort	2 turns
Standard	1.5 turns
Sport	1 turn
Rebound damping	

Comfort	17 clicks
Standard	15 clicks
Sport	13 clicks
Spring preload	7 mm (0.28 in)
Spring rate	
Weight of rider: 65 ... 75 kg (143 ... 165 lb.)	36 N/mm (206 lb/in)
Weight of rider: 75 ... 85 kg (165 ... 187 lb.)	39 N/mm (223 lb/in)
Weight of rider: 85 ... 95 kg (187 ... 209 lb.)	42 N/mm (240 lb/in)
Spring length	
Weight of rider: 65 ... 75 kg (143 ... 165 lb.)	255 mm (10.04 in)
Weight of rider: 75 ... 85 kg (165 ... 187 lb.)	260 mm (10.24 in)
Weight of rider: 85 ... 95 kg (187 ... 209 lb.)	260 mm (10.24 in)
Gas pressure	10 bar (145 psi)
Static sag	35 mm (1.38 in)
Riding sag	105 mm (4.13 in)
Fitted length	477 mm (18.78 in)
Shock absorber fluid (📖 p. 287)	SAE 2.5

23.8.2 All US models

Shock absorber article number	18.18.7S.51
Shock absorber	WP Suspension 5018 DCC Link
Lowspeed compression damping	
Comfort	17 clicks
Standard	15 clicks
Sport	13 clicks
Highspeed compression damping	
Comfort	2 turns
Standard	1.5 turns
Sport	1 turn
Rebound damping	
Comfort	17 clicks
Standard	15 clicks
Sport	13 clicks
Spring preload	6 mm (0.24 in)
Spring rate	
Weight of rider: 65 ... 75 kg (143 ... 165 lb.)	36 N/mm (206 lb/in)
Weight of rider: 75 ... 85 kg (165 ... 187 lb.)	39 N/mm (223 lb/in)
Weight of rider: 85 ... 95 kg (187 ... 209 lb.)	42 N/mm (240 lb/in)
Spring length	
Weight of rider: 65 ... 75 kg (143 ... 165 lb.)	255 mm (10.04 in)
Weight of rider: 75 ... 85 kg (165 ... 187 lb.)	260 mm (10.24 in)
Weight of rider: 85 ... 95 kg (187 ... 209 lb.)	260 mm (10.24 in)
Gas pressure	10 bar (145 psi)
Static sag	35 mm (1.38 in)
Riding sag	105 mm (4.13 in)

Fitted length	477 mm (18.78 in)
Shock absorber fluid (📖 p. 287)	SAE 2.5

23.9 Chassis tightening torques

Screw, fixed grip	M4	5 Nm (3.7 lbf ft) Loctite®243™
Screw, service hour counter	M4	1 Nm (0.7 lbf ft)
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, shock absorber adjusting ring	M5	5 Nm (3.7 lbf ft)
Screws on main silencer	M5	7 Nm (5.2 lbf ft)
Remaining nuts, chassis	M6	10 Nm (7.4 lbf ft)
Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
Screw, absorbing element on frame	M6	6 Nm (4.4 lbf ft)
Screw, absorbing element on manifold	M6	6 Nm (4.4 lbf ft)
Screw, ball joint of push rod on foot brake cylinder	M6	10 Nm (7.4 lbf ft) Loctite®243™
Screw, chain sliding guard	M6	6 Nm (4.4 lbf ft) Loctite®243™
Screw, front brake disc	M6	14 Nm (10.3 lbf ft) Loctite®243™
Screw, rear brake disc	M6	14 Nm (10.3 lbf ft) Loctite®243™
Screw, throttle grip	M6	5 Nm (3.7 lbf ft)
Nut, foot brake lever stop	M8	20 Nm (14.8 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	M8	12 Nm (8.9 lbf ft)
Screw, chain sliding piece	M8	15 Nm (11.1 lbf ft)
Screw, engine brace on engine	M8x20	25 Nm (18.4 lbf ft) Loctite®243™
Screw, engine brace on frame	M8x15	25 Nm (18.4 lbf ft) Loctite®2701™
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, subframe	M8	35 Nm (25.8 lbf ft) Loctite®2701™

Screw, top steering stem	M8	20 Nm (14.8 lbf ft) Loctite®243™
Screw, top triple clamp	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, bottom shock absorber	M10	60 Nm (44.3 lbf ft) Loctite®2701™
Screw, handlebar support	M10	40 Nm (29.5 lbf ft) Loctite®243™
Screw, top shock absorber	M10	60 Nm (44.3 lbf ft) Loctite®2701™
Nut, angle lever to link fork	M14x1.5	60 Nm (44.3 lbf ft)
Nut, frame on linkage lever	M14x1.5	60 Nm (44.3 lbf ft)
Nut, linkage lever on angle lever	M14x1.5	60 Nm (44.3 lbf ft)
Nut, fork pivot	M16x1.5	100 Nm (73.8 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	12 Nm (8.9 lbf ft) Loctite®243™
Nut, rear wheel spindle	M25x1.5	80 Nm (59 lbf ft)

23.10 Carburetor

23.10.1 All 125 models

Carburetor type	MIKUNI TMX 38
Carburetor identification number	TMX 38 87
Needle position	2nd position from top
Jet needle	6BFY43-71 (6BFY42-71)
Main jet	500 (480, 490, 520, 540, 560)
Idling jet	35 (30 / 32.5 / 37.5 / 40)
Choke nozzle	80
Needle jet	S-7
Idle air adjusting screw	
open	1.5 turns

23.10.2 Carburetor - basic setting for sandy surfaces (All 125 models)

Idle air adjusting screw	
Open	2 turns
Idling jet	37.5
Jet needle	6BFY42-71
Needle position	3rd position from top
Main jet	580



Info

If the engine is not running smoothly, use a smaller main jet.

23.10.3 All 150 models

Carburetor type	MIKUNI TMX 38
Carburetor identification number	TMX 38 88
Needle position	3rd position from top
Jet needle	6BFY42-71 (6BFY43-71)
Main jet	470 (460, 480, 490, 500, 520)
Idling jet	30 (25 / 27.5 / 32.5 / 35)
Choke nozzle	80
Needle jet	S-4
Idle air adjusting screw	
open	1.5 turns

23.10.4 Basic carburetor setting for sandy surfaces (All 150 models)

Idle air adjusting screw	
Open	2 turns
Idling jet	37.5
Jet needle	6BFY42-71
Needle position	3rd position from top
Main jet	540



Info

If the engine is not running smoothly, use a smaller main jet.

23.11 Carburetor tuning

23.11.1 Carburetor tuning (All 125 models)

MIKUNI TMX 38							
M/FT ASL ↓	TEMP →	-20°C ... -7°C -2°F ... 20°F	-6°C ... 5°C 19°F ... 41°F	6°C ... 15°C 42°F ... 60°F	16°C ... 24°C 61°F ... 78°F	25°C ... 36°C 79°F ... 98°F	37°C ... 49°C 99°F ... 120°F
3.000 m 10,000 ft ↑ 2.301 m 7,501 ft	ASO IJ NDL POS MJ	1,5 35 43-71 2 500	1,5 32,5 43-71 2 500	2 32,5 43-71 2 490	1,5 30 43-71 2 480	1,5 30 42-71 2 480	
2.300 m 7,500 ft ↑ 1.501 m 5,001 ft	ASO IJ NDL POS MJ	2 37,5 43-71 2 520	1,5 35 43-71 2 500	1,5 32,5 43-71 2 500	2 32,5 43-71 2 490	1,5 30 43-71 2 480	1,5 30 42-71 2 480
1.500 m 5,000 ft ↑ 751 m 2,501 ft	ASO IJ NDL POS MJ	1,5 35 42-71 3 520	2 37,5 43-71 2 520	1,5 35 43-71 2 500	1,5 32,5 43-71 2 500	2 32,5 43-71 2 490	1,5 30 43-71 2 480
750 m 2,500 ft ↑ 301 m 1,001 ft	ASO IJ NDL POS MJ	1,5 37,5 42-71 3 540	1,5 35 42-71 3 520	2 37,5 43-71 2 520	1,5 35 43-71 2 500	1,5 32,5 43-71 2 500	2 32,5 43-71 2 490
300 m 1,000 ft ↑ 0 m 0 ft	ASO IJ NDL POS MJ	1,5 37,5 42-71 3 540	1,5 35 42-71 3 520	2 37,5 43-71 2 520	1,5 35 43-71 2 520	1,5 32,5 43-71 2 500	2 32,5 43-71 2 490

403170-01

M/FT ASL	Sea level
TEMP	Temperature
ASO	Idle air adjusting screw open
IJ	Idling jet
NDL	Needle
POS	Needle position from top
MJ	Main jet



Info

Do not use on sandy terrain.

23.11.2 Carburetor tuning (All 150 models)

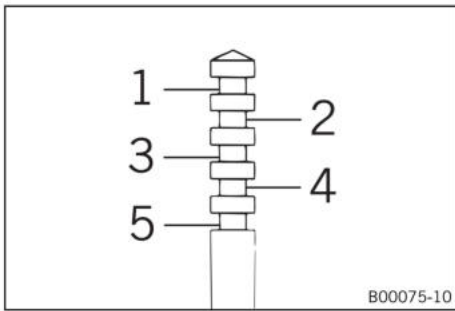
MIKUNI TMX 38							
M/FT ASL ↓	TEMP →	-20°C ... -7°C -2°F ... 20°F	-6°C ... 5°C 19°F ... 41°F	6°C ... 15°C 42°F ... 60°F	16°C ... 24°C 61°F ... 78°F	25°C ... 36°C 79°F ... 98°F	37°C ... 49°C 99°F ... 120°F
3,000 m 10,000 ft ↑ 2,301 m 7,501 ft	ASO IJ NDL POS MJ	1,5 30 42-71 3 470	1,5 32,5 43-71 2 470	2 32,5 43-71 2 460	2 30 43-71 2 460	1,5 27,5 43-71 2 450	
2,300 m 7,500 ft ↑ 1,501 m 5,001 ft	ASO IJ NDL POS MJ	1,5 32,5 42-71 3 480	1,5 30 42-71 3 470	1,5 32,5 43-71 2 470	2 32,5 43-71 2 460	2 30 43-71 2 460	1,5 27,5 43-71 2 450
1,500 m 5,000 ft ↑ 751 m 2,501 ft	ASO IJ NDL POS MJ	2 35 42-71 3 490	1,5 32,5 42-71 3 480	1,5 30 42-71 3 470	1,5 32,5 43-71 2 470	2 32,5 43-71 2 460	2 30 43-71 2 460
750 m 2,500 ft ↑ 301 m 1,001 ft	ASO IJ NDL POS MJ	1,5 35 42-71 3 500	2 35 42-71 3 490	1,5 32,5 42-71 3 480	1,5 30 42-71 3 470	1,5 32,5 43-71 2 470	2 32,5 43-71 2 460
300 m 1,000 ft ↑ 0 m 0 ft	ASO IJ NDL POS MJ	1,5 35 42-71 3 500	2 35 42-71 3 490	1,5 32,5 42-71 3 480	1,5 30 42-71 3 470	1,5 32,5 43-71 2 470	2 32,5 43-71 2 460

403171-01

M/FT ASL	Sea level
TEMP	Temperature
ASO	Idle air adjusting screw open
IJ	Idling jet
NDL	Needle
POS	Needle position from top
MJ	Main jet

i Info
Do not use on sandy terrain.

23.11.3 General carburetor tuning



1... 5

Needle position from top

The five possible needle positions are shown here.
The carburetor tuning depends on the defined ambient and operating conditions.

24.1 Cleaning the motorcycle

Note

Material damage Components become damaged or destroyed if a pressure cleaner is used incorrectly. The high pressure forces water into the electrical components, connectors, throttle cables, and bearings, etc. Pressure which is too high causes malfunctions and destroys components.

- Do not direct the water jet directly on to electrical components, connectors, throttle cables or bearings.
- Maintain a minimum distance between the nozzle of the pressure cleaner and the component.

Minimum clearance

60 cm (23.6 in)



Note

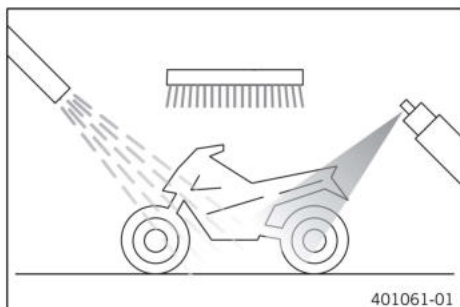
Environmental hazard Hazardous substances cause environmental damage.

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



Info

To maintain the value and appearance of the motorcycle over a long period, clean it regularly. Avoid direct sunshine when cleaning the motorcycle.



- Close off the exhaust system to keep water from entering.
- Remove coarse dirt particles with a gentle water jet.
- Spray heavily soiled parts with a normal commercial motorcycle cleaner and then brush off with a soft brush.

Motorcycle cleaner (📖 p. 289)



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.
- Empty the carburetor float chamber. (📖 p. 221)
- 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. 124)
- Treat bare metal (except for brake discs and the exhaust system) with a corrosion inhibitor.

Preserving materials for paints, metal and rubber
(📖 p. 289)

- 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. 289)



25.1 Storage

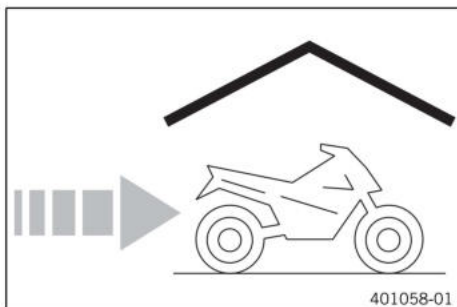
**Warning****Danger of poisoning** Fuel is poisonous and a health hazard.

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

**Info**

If you plan to garage the motorcycle for a longer period, perform the following steps or have them performed.

Before storing the motorcycle, check all parts for function and wear. If service, repairs, or replacements are necessary, you should do this during the storage period (less workshop overload). In this way, you can avoid long workshop waiting times at the start of the new season.



- When refueling for the last time before taking the motorcycle out of service, add fuel additive.

Fuel additive (📖 p. 288)

- Refuel.
- Clean the motorcycle. (📖 p. 278)
- Change the gear oil. (📖 p. 254)
- Check the antifreeze and coolant level. (📖 p. 246)
- Empty the carburetor float chamber. (📖 p. 221)
- Check tire pressure. (📖 p. 113)
- Store the vehicle in a dry location that is not subject to large fluctuations in temperature.

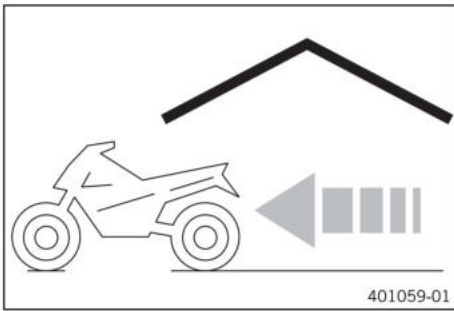
**Info**

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.

25.2 Preparing for use after storage

- Remove the motorcycle from the lift stand. (📖 p. 12)
- Perform checks and maintenance measures when preparing for use.
- Take a test ride.



26.1 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.

26.2 Required work

	after every race			
	Every 40 operating hours			
	Every 20 operating hours			
	Every 10 operating hours			
	Once after 1 operating hour			
Change the gear oil. (📖 p. 254)	•	•	•	•
Check the front brake linings. (📖 p. 134)	•	•	•	•
Check the brake linings of the rear brake. (📖 p. 141)	•	•	•	•
Check the brake discs. (📖 p. 114)	•	•	•	•
Check the brake lines for damage and leakage.	•	•	•	•
Check the rear brake fluid level. (📖 p. 144)	•	•	•	•
Check the free travel of the foot brake lever. (📖 p. 143)	•	•	•	•
Check the frame. (📖 p. 60)	•	•	•	•
Check the link fork. (📖 p. 100)	•	•	•	•
Check the fork bearing for play. (📖 p. 92)		•	•	
Check the heim joint for play. (📖 p. 66)	•	•	•	•
Check the shock absorber linkage. (📖 p. 70)	•	•	•	•
Check the tire condition. (📖 p. 113)	○	•	•	•
Check tire pressure. (📖 p. 113)	○	•	•	•
Check the wheel bearing for play. (📖 p. 114)	•	•	•	•
Check the wheel hubs.	•	•	•	•
Check the rim run-out. (📖 p. 115)	○	•	•	•
Check the spoke tension. (📖 p. 115)	○	•	•	•
Check the chain, rear sprocket, engine sprocket, and chain guide. (📖 p. 125)	•	•	•	•
Check the chain tension. (📖 p. 125)	○	•	•	•
Grease all moving parts (e.g., hand lever, chain, ...) and check for smooth operation.	•	•	•	•
Check/correct the fluid level of the hydraulic clutch. (📖 p. 235)	•	•	•	•
Check the front brake fluid level. (📖 p. 137)	•	•	•	•
Check the free travel of the hand brake lever. (📖 p. 136)	•	•	•	•
Check steering head bearing play. (📖 p. 47)	○	•	•	•
Change the spark plug and spark plug connector. (📖 p. 264)	•	•	•	
Check all hoses (e.g. fuel, cooling, bleeder, drainage, etc.) and sleeves for cracking, leaks, and incorrect routing.	○	•	•	•
Check the antifreeze and coolant level. (📖 p. 246)	○	•	•	•
Check the cables for damage and for routing without kinks.	•	•	•	•
Check that the throttle cables are undamaged, routed without sharp bends, and set correctly.	○	•	•	•

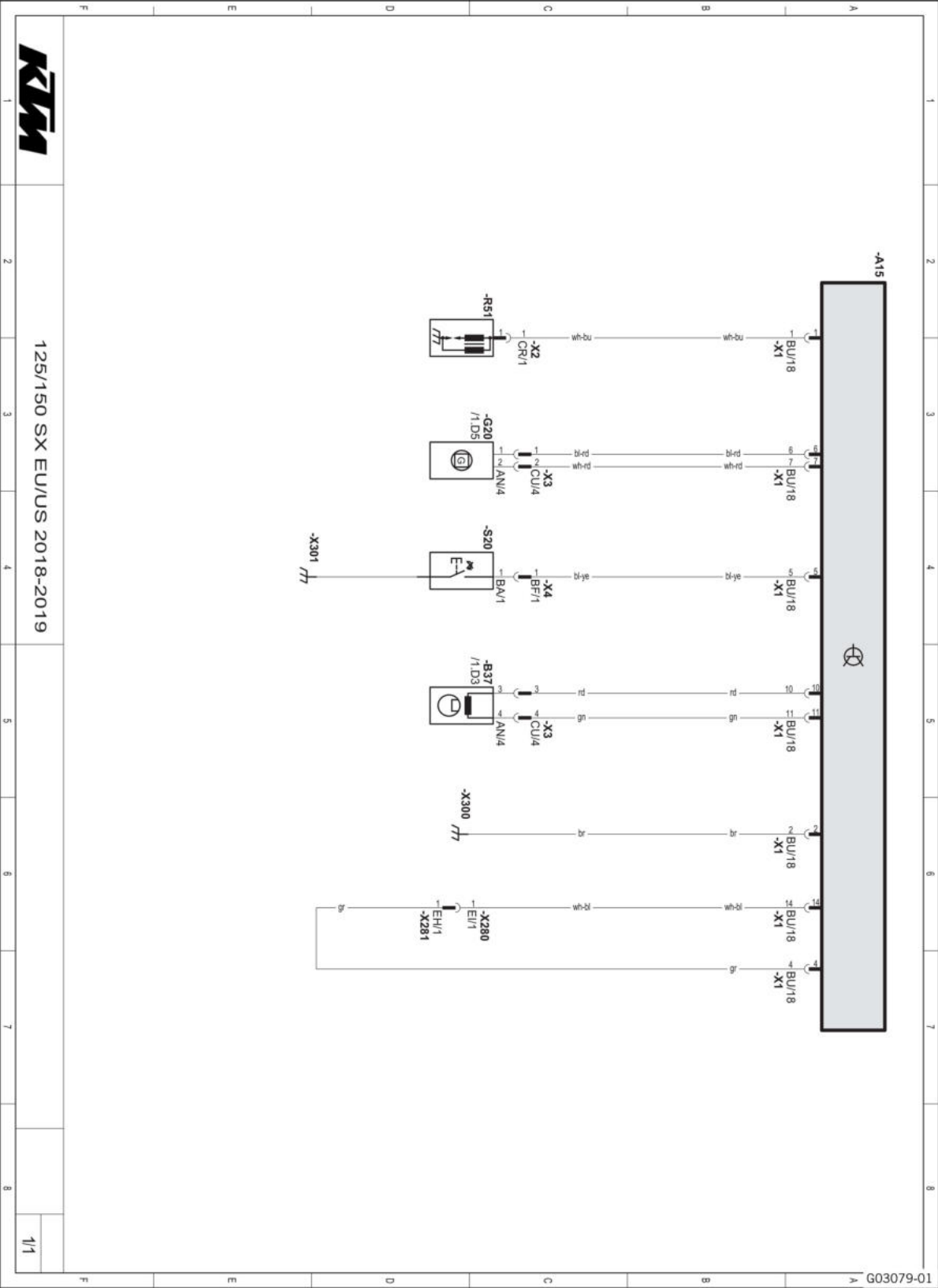
	after every race			
	Every 40 operating hours			
	Every 20 operating hours			
	Every 10 operating hours			
	Once after 1 operating hour			
Clean the air filter and air filter box. (📖 p. 105)	•	•	•	•
Change the glass fiber yarn filling in the main silencer. (📖 p. 101)		•	•	
Service the fork. (📖 p. 20)			•	
Service the shock absorber. (📖 p. 74)			•	
Check the screws and nuts for tightness.	○	•	•	•
Check the idle speed.	○	•	•	•
Final check: Check the vehicle for operating safety and take a test ride.	○	•	•	•
Make the service entry in KTM Dealer.net and in the Service & Manufacturer Warranty Booklet.	○	•	•	•

- One-time interval
- Periodic interval

26.3 Recommended work

	after every race			
	Annually			
	Every 40 operating hours			
	Once after 20 operating hours / Every 20 operating hours			
	Once after 10 operating hours / Every 10 operating hours			
Change the front brake fluid. (📖 p. 139)			•	
Change the rear brake fluid. (📖 p. 146)			•	
Change the hydraulic clutch fluid. (📖 p. 236)			•	
Lubricate the steering head bearing. (📖 p. 48)			•	
Service the fork. (📖 p. 20)	○			
Service the shock absorber. (📖 p. 74)		○		
Check/set the carburetor components. (📖 p. 226)			•	•
Perform minor engine service. (Check the inlet membrane. Check the clutch. Under difficult operating conditions: Change the piston and check the cylinder and Z dimension.)	•	•	•	•
Perform the intermediate engine service. (Change the piston and check the cylinder and Z dimension. Check the exhaust control for functioning and smooth operation.)		•	•	
Perform major engine service including removing and installing the engine. (Change the connecting rod, conrod bearing, and crank pin. Check the transmission and shift mechanism. Change all engine bearings.)			•	

- One-time interval
- Periodic interval



Components:

A15	CDI control unit
B37	Crankshaft speed sensor
G20	Alternator
R51	Ignition coil
S20	Kill switch
X280	Ignition timing map connector
X281	Ignition timing map connector

Cable colors:

bl	Black
br	Brown
bu	Blue
gn	Green
gr	Gray
lbu	Light blue
or	Orange
pk	Pink
pu	Violet
rd	Red
wh	White
ye	Yellow

Brake fluid DOT 4 / DOT 5.1**Standard/classification**

- DOT

Guideline

- Use only brake fluid that complies with the specified standard (see specifications on the container) and that exhibits the corresponding properties.

Recommended supplier**Castrol**

- **REACT PERFORMANCE DOT 4**

MOTOREX®

- **Brake Fluid DOT 5.1**

Coolant**Guideline**

- Only use high-grade, silicate-free coolant with corrosion inhibitor additive for aluminum motors. Low grade and unsuitable antifreeze causes corrosion, deposits and frothing.
- Do not use pure water as only coolant is able to meet the requirements needed in terms of corrosion protection and lubrication properties.
- Only use coolant that complies with the requirements stated (see specifications on the container) and that has the relevant properties.

Antifreeze protection to at least	–25 °C (–13 °F)
-----------------------------------	-----------------

The mixture ratio must be adjusted to the necessary antifreeze protection. Use distilled water if the coolant needs to be diluted.

The use of premixed coolant is recommended.

Observe the coolant manufacturer specifications for antifreeze protection, dilution and miscibility (compatibility) with other coolants.

Recommended supplier**MOTOREX®**

- **COOLANT M3.0**

Engine oil (15W/50)**Standard/classification**

- JASO T903 MA2 (📖 p. 304)
- SAE (📖 p. 304) (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. 304)

Guideline

- Only use high grade 2-stroke engine oil of a reputable brand.

Fully synthetic

Recommended supplier**MOTOREX®**

- Cross Power 2T

Fork oil (SAE 4) (48601166S1)**Standard/classification**

- SAE (📖 p. 304) (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. 304) (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 98 / RON 98 / PON 94)**Standard/classification**

- DIN EN 228 (ROZ 98 / RON 98 / PON 94)

Super unleaded (98 octane) mixed with 2-stroke engine oil (1:40)**Standard/classification**

- DIN EN 228
- JASO FD (📖 p. 304) (1:40)

Mixture ratio

1:40	Engine oil, 2-stroke (📖 p. 286) Super unleaded (ROZ 98 / RON 98 / PON 94) (📖 p. 287)
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Recommended supplier**MOTOREX®**

- Cross Power 2T

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 (T14034)

Recommended supplier

WP Performance Systems

- WP Racing Grease IPR 2

Lubricant (T158)

Recommended supplier

Lubcon®

- Turmogrease® PP 300

Lubricant (T625)

Recommended supplier

Molykote®

- 33 Medium

Lubricant (T152)

Recommended supplier

Bel-Ray®

- Molylube® Anti-Seize

Lubricant (T159)

Recommended supplier

Bel-Ray®

- MC-11®

Motorcycle cleaner

Recommended supplier

MOTOREX®

- Moto Clean

Multi-purpose grease (00062010051)

Recommended supplier

Klüber Lubrication®

- CENTOPLEX 2 EP

Off-road chain spray

Recommended supplier

MOTOREX®

- Chainlube Offroad

Oil for foam air filter

Recommended supplier

MOTOREX®

- Racing Bio Liquid Power

Preserving materials for paints, metal and rubber

Recommended supplier

MOTOREX®

- Moto Protect

Special cleaner for glossy and matte paint finishes, metal and plastic surfaces

Recommended supplier

MOTOREX®

- Quick Cleaner

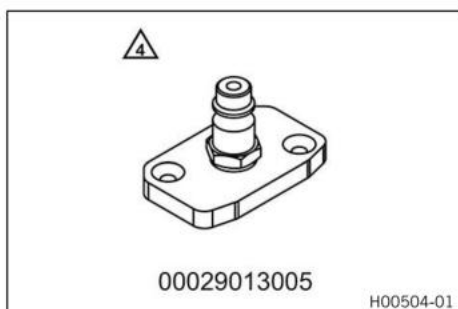
Universal oil spray

Recommended supplier

MOTOREX®

- Joker 440 Synthetic

Bleeder cover



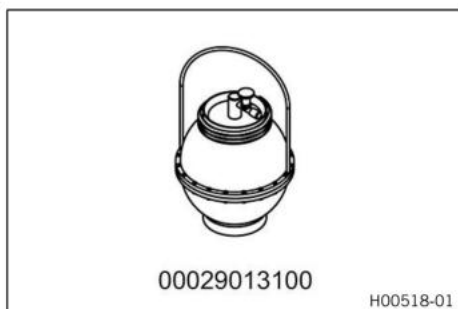
Art. no.: 00029013005

Bleeder cover



Art. no.: 00029013006

Bleeding device



Art. no.: 00029013100

Dial gauge



Art. no.: 50112013000

Dial gauge support

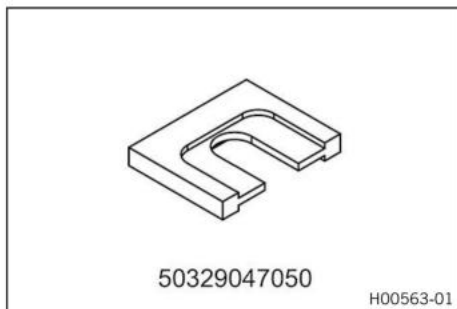
Art. no.: 50112030000

**Crankshaft pressing tool**

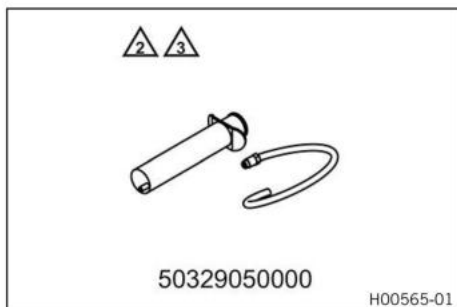
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**Separator plate**

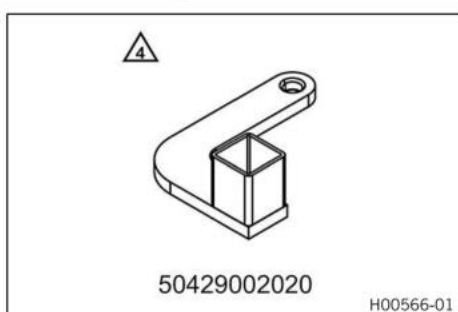
Art. no.: 50329047050

**Syringe**

Art. no.: 50329050000

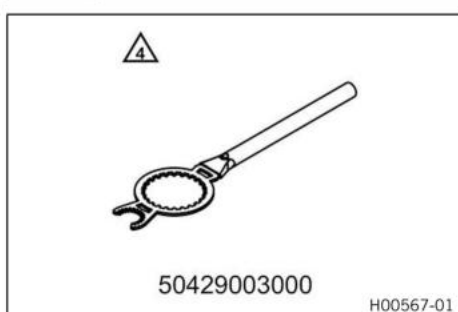


Holder for engine motor stand



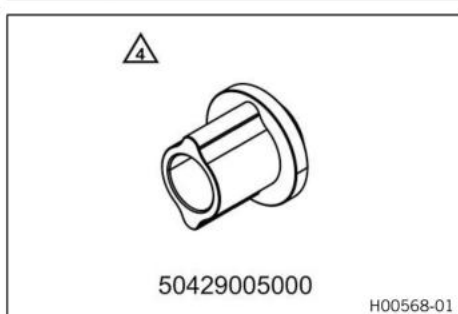
Art. no.: 50429002020

Holding wrench



Art. no.: 50429003000

Pressing tool

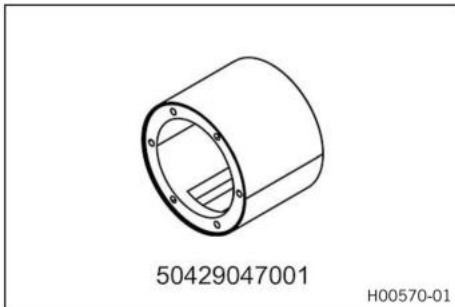


Art. no.: 50429005000

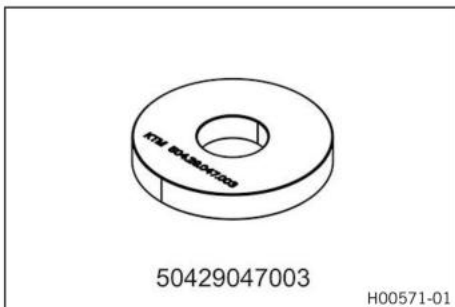
Measurement cap



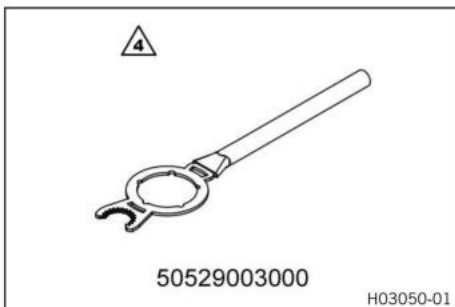
Art. no.: 50429031000

Sleeve for crankshaft pressing tool

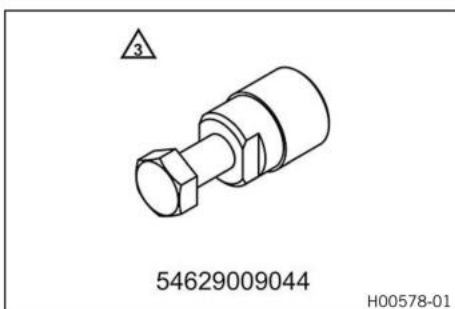
Art. no.: 50429047001

Cover for crankshaft pressing tool

Art. no.: 50429047003

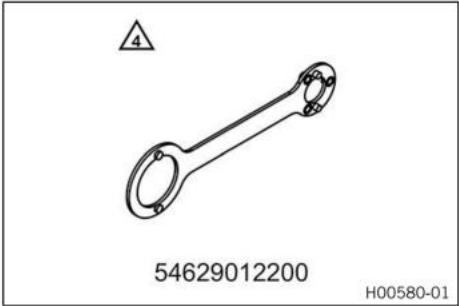
Holding wrench

Art. no.: 50529003000

Puller

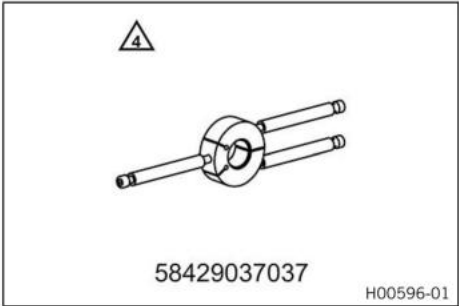
Art. no.: 54629009044

Holding wrench



Art. no.: 54629012200

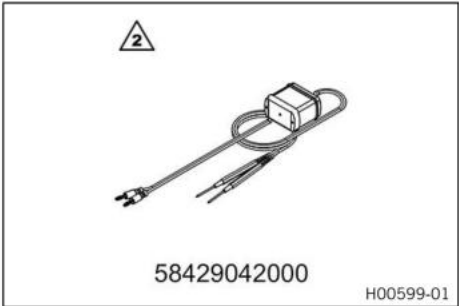
Puller



Art. no.: 58429037037

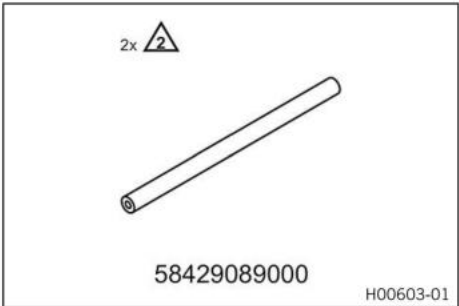
Feature	
Inside diameter	37.5 mm (1.476 in)

Peak voltage adapter



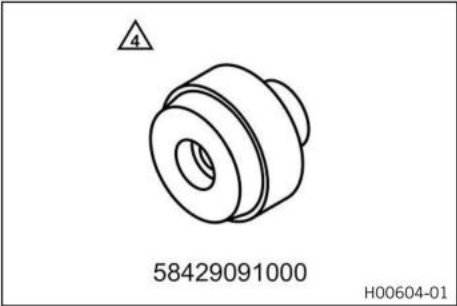
Art. no.: 58429042000

Tool bracket



Art. no.: 58429089000

Pressing tool



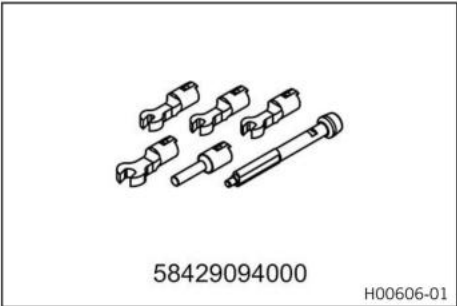
Art. no.: 58429091000

Pressing tool



Art. no.: 58429092000

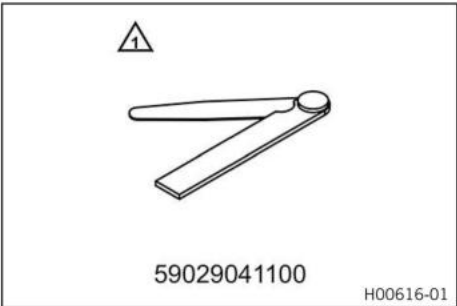
Torque wrench kit



Art. no.: 58429094000

Feature	
Torque	3 ... 15 Nm (2.2 ... 11.1 lbf ft)
Open ended bit	3.9 mm (0.154 in)
Open ended bit	4.9 mm (0.193 in)
Open ended bit	5.5 mm (0.217 in)
Open ended bit	6.8 mm (0.268 in)
Bit diameter	5.9 mm (0.232 in)

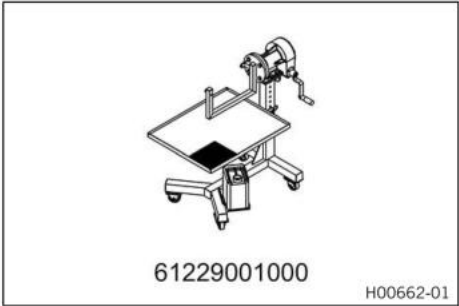
Feeler gauge



Art. no.: 59029041100

Feature	
5 piece	0.10 ... 0.25 mm (0.0039 ... 0.0098 in)

Engine assembly stand



Art. no.: 61229001000

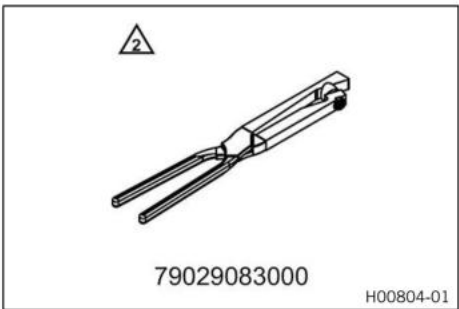
Lift stand



Art. no.: 78129955100

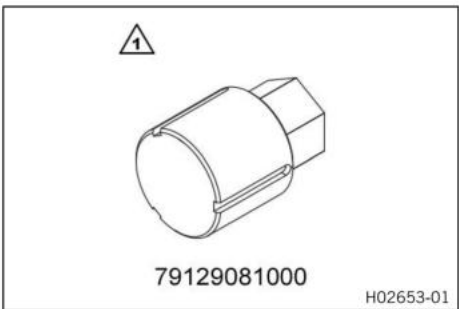
Feature	
Height	315 ... 425 mm (12.4 ... 16.73 in)
Load	≤ 150 kg (≤ 331 lb.)

Footrest spring plier



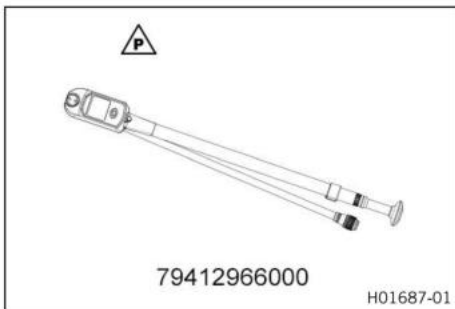
Art. no.: 79029083000

Mounting tool



Art. no.: 79129081000

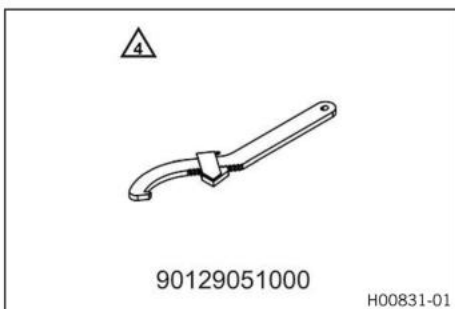
Feature	
Hexagonal driver	13 mm (0.51 in)

Fork airpump

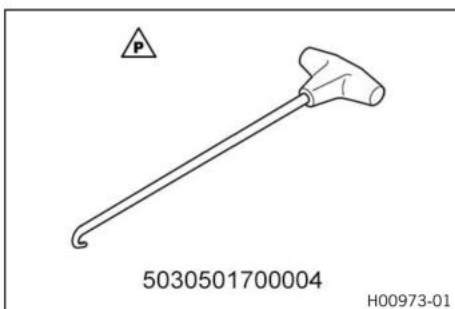
Art. no.: 79412966000

Feature

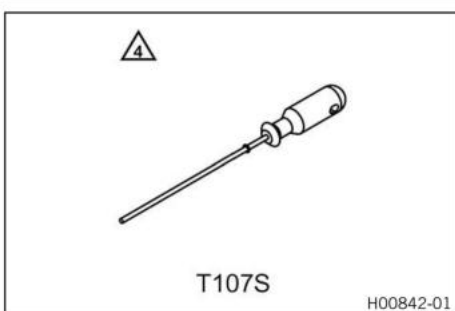
Maximum pressure	20 bar (290 psi)
Display	Digital pressure gauge
Valve connection	Schrader valve
Units	bar, psi and kg/cm ²
Material	Aluminum tube

Hook wrench

Art. no.: 90129051000

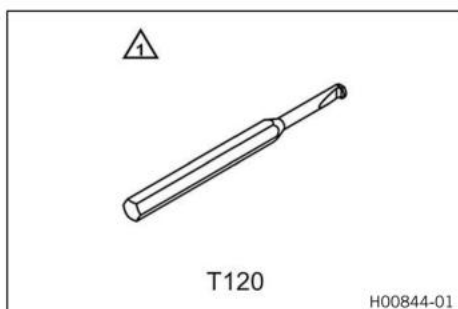
Spring hook

Art. no.: 5030501700004

Depth micrometer

Art. no.: T107S

Drift

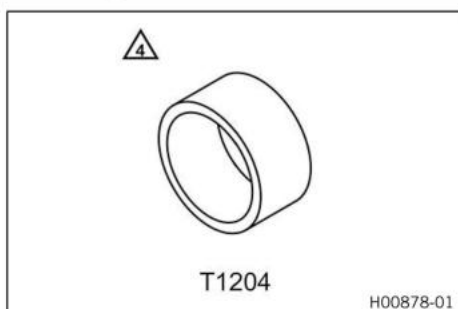


Art. no.: T120

Feature

Diameter	8 mm (0.31 in)
----------	----------------

Mounting sleeve

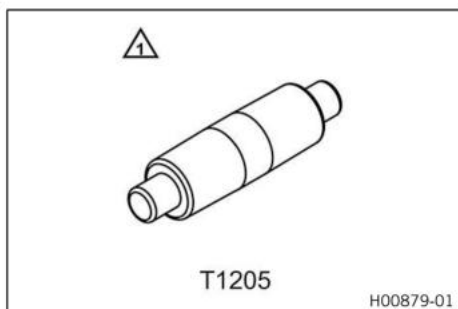


Art. no.: T1204

Feature

Diameter	25.5 ... 30.5 mm (1.004 ... 1.201 in)
----------	---------------------------------------

Calibrating unit

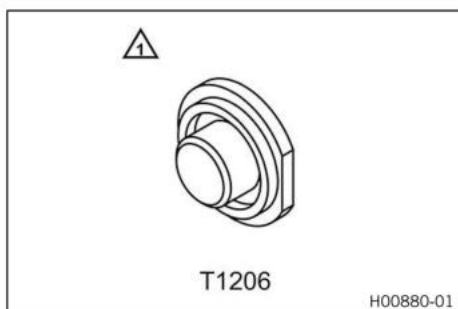


Art. no.: T1205

Feature

Diameter	18 mm (0.71 in)
----------	-----------------

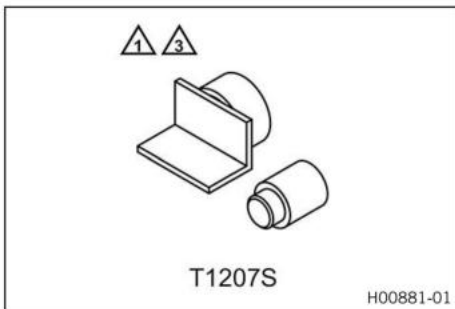
Pressing tool



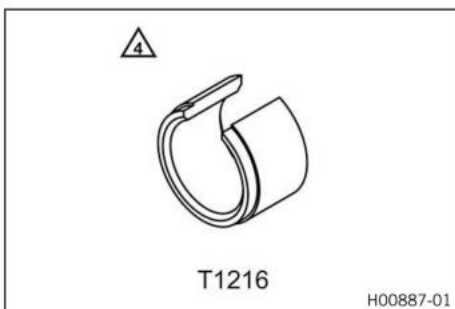
Art. no.: T1206

Feature

Diameter	15 ... 30 mm (0.59 ... 1.18 in)
----------	---------------------------------

Pressing tool

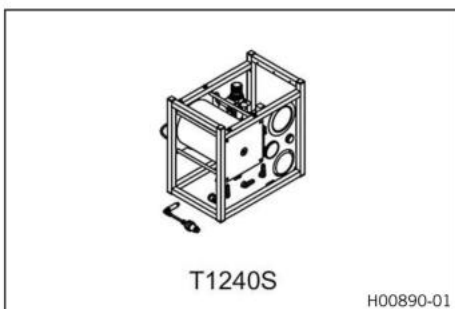
Art. no.: T1207S

Pressing tool

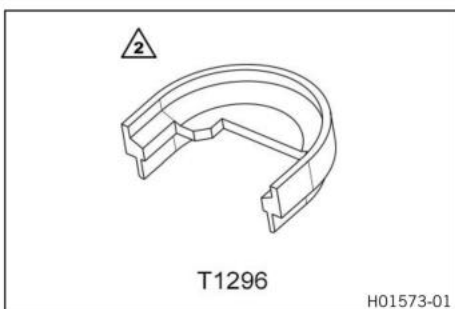
Art. no.: T1216

Feature

Diameter	38 ... 49 mm (1.5 ... 1.93 in)
----------	--------------------------------

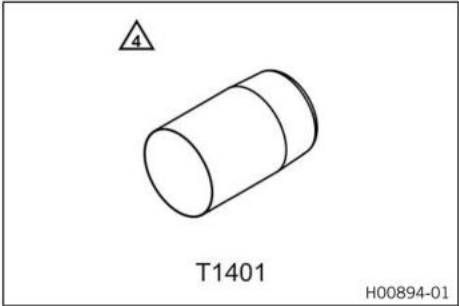
Vacuum pump

Art. no.: T1240S

Filling adapter

Art. no.: T1296

Protecting sleeve

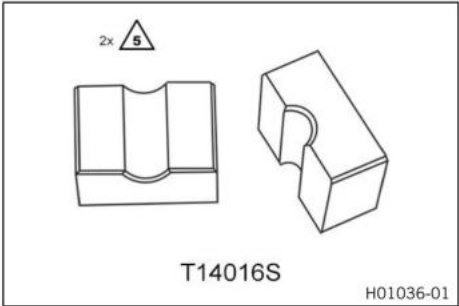


Art. no.: T1401

Feature

Diameter	48 mm (1.89 in)
----------	-----------------

Clamping stand



Art. no.: T14016S

Feature

Diameter	12 mm (0.47 in)
----------	-----------------

Ring wrench

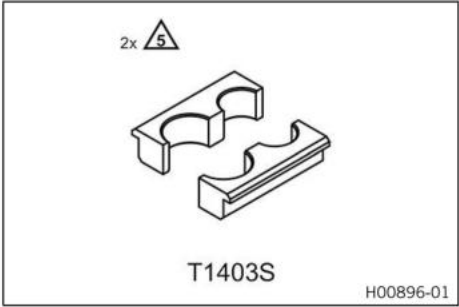


Art. no.: T14017

Feature

Hexagonal part	50 mm (1.97 in)
----------------	-----------------

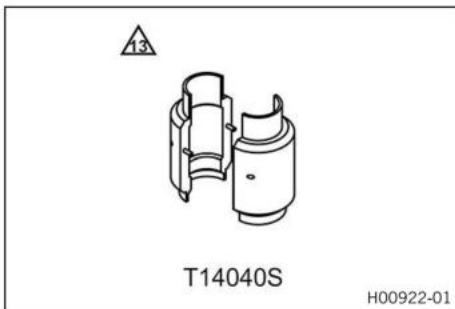
Clamping stand



Art. no.: T1403S

Feature

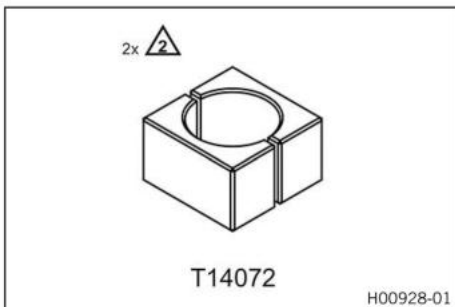
Diameter	48 mm (1.89 in)
Diameter	60 mm (2.36 in)

Mounting tool

Art. no.: T14040S

Feature

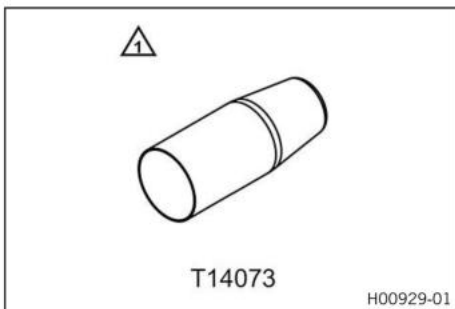
Diameter	48 mm (1.89 in)
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Clamping stand

Art. no.: T14072

Feature

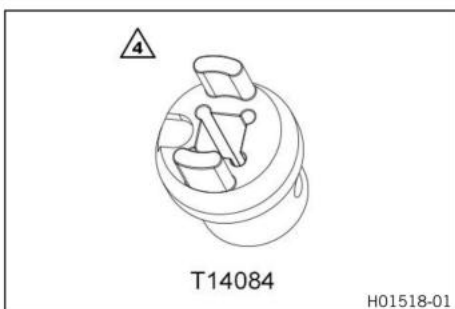
Diameter	37 mm (1.46 in)
----------	-----------------

Protecting sleeve

Art. no.: T14073

Feature

Diameter	11.5 mm (0.453 in)
----------	--------------------

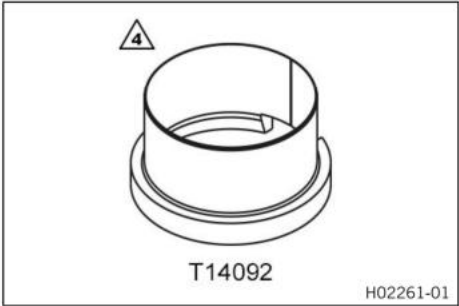
Special socket

Art. no.: T14084

Feature

Drive	1/2 in
Diameter	24 mm (0.94 in)

Mounting sleeve

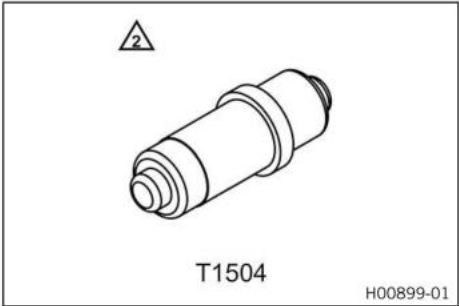


Art. no.: T14092

Feature

Diameter	34 mm (1.34 in)
----------	-----------------

Pressing tool

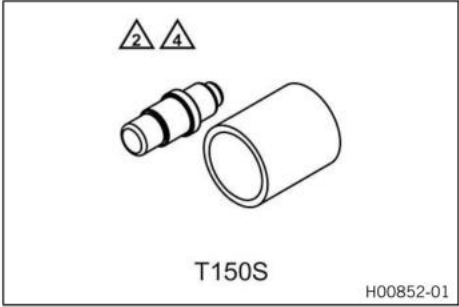


Art. no.: T1504

Feature

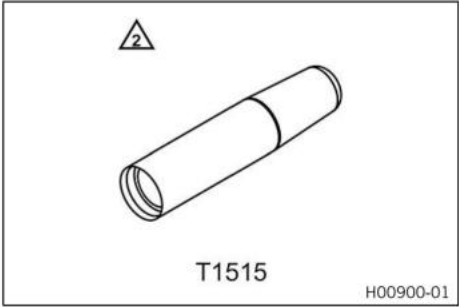
Diameter	18 mm (0.71 in)
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Mounting tool



Art. no.: T150S

Mounting sleeve



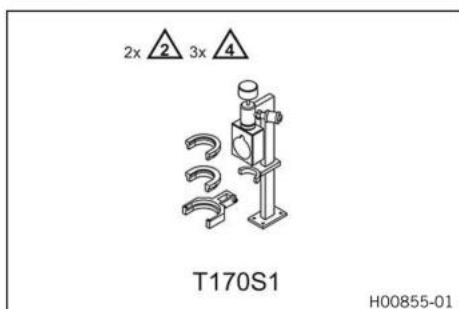
Art. no.: T1515

Feature

Diameter	18 mm (0.71 in)
----------	-----------------

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.

Art. no.	Article number
ca.	circa
cf.	compare
e.g.	for example
etc.	et cetera
i.a.	inter alia
no.	number
poss.	possibly

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KTM

KTM Sportmotorcycle GmbH
5230 Mattighofen/Austria
<http://www.ktm.com>



Photo: Mitterbauer/KTM