



250 EXC
250 EXC SIX DAYS
250 XC-W
300 EXC
300 EXC SIX DAYS
300 XC-W
300 EXC HARDENDURO
300 XC-W HARDENDURO

250 EXC EU
250 EXC SIX DAYS EU
250 XC-W US
300 EXC EU
300 EXC BR
300 EXC SIX DAYS EU
300 EXC SIX DAYS ASEAN

300 EXC SIX DAYS BR
300 EXC SIX DAYS CN
300 XC-W US
300 EXC HARDENDURO EU
300 EXC HARDENDURO CN
300 XC-W HARDENDURO US

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1.1 Symbols used

The meaning of specific symbols is described below.



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



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



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



Indicates information with more details or tips.



Indicates the result of a testing step.



Indicates a voltage measurement.



Indicates a current measurement.



Indicates a resistance measurement.



Indicates the end of an activity including potential rework.

1.2 Formats used

The typographical formats used in this document are explained below.

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

2.1 Repair Manual

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

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

2.2 Safety advice

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



Info

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

2.3 Degrees of risk and symbols



Danger

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



Warning

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



Caution

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

Note

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



Note

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

2.4 Work rules

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

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

Unless otherwise noted, normal conditions apply to all tasks and descriptions.

Ambient temperature	20 °C (68 °F)
Ambient air pressure	1,013 mbar (14.69 psi)
Relative air humidity	60 ± 5 %

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

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

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

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

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

3 IMPORTANT NOTES

3.1 Manufacturer warranty, implied warranty

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

3.2 Fuel, auxiliary substances



Note

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

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

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

3.3 Spare parts, technical accessories

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

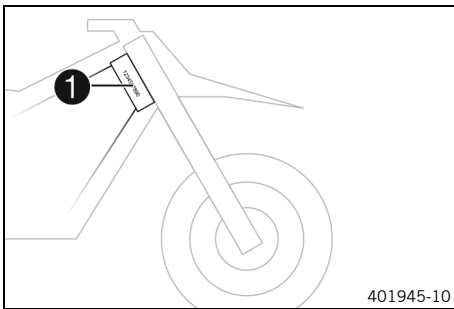
The latest news **KTM PowerParts** on your vehicle can be found on the KTM website.
International KTM Website: KTM.COM

3.4 Figures

The figures contained in the manual may depict special equipment.

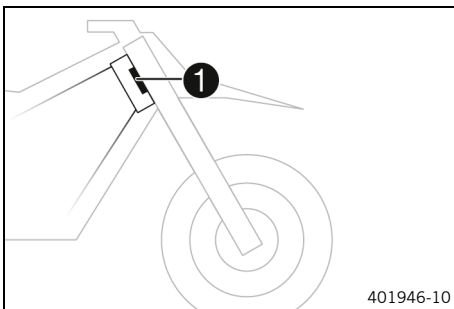
In the interest of clarity, some components may be shown disassembled or may not be shown at all. It is not always necessary to disassemble the component to perform the activity in question. Please follow the instructions in the text.

4.1 Vehicle identification number



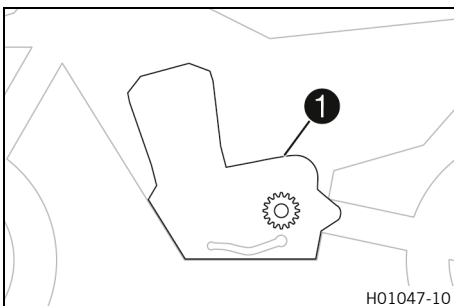
The vehicle identification number ❶ is stamped on the right side of the steering head.

4.2 Type label



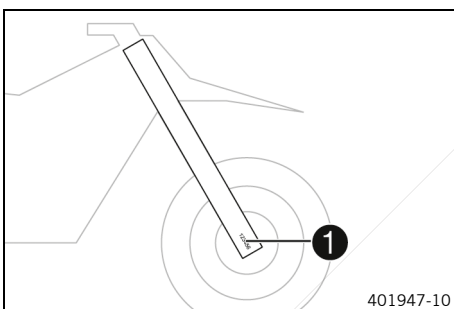
Type label ❶ is fixed to the front of the steering head.

4.3 Engine number



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

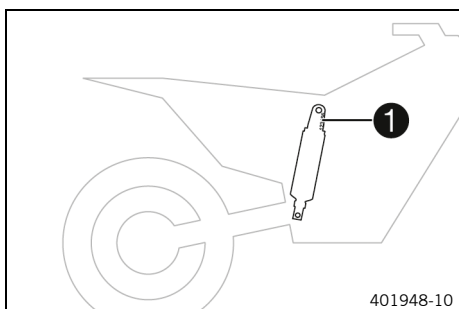
4.4 Fork part number



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

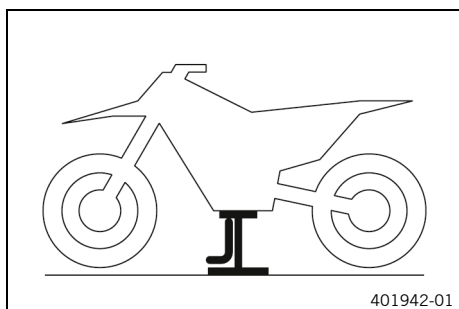
4 SERIAL NUMBERS

4.5 Shock absorber article number



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

5.1 Raising the motorcycle with a lift stand



Note

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

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

Lift stand (78129955100) (📖 p. 324)

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

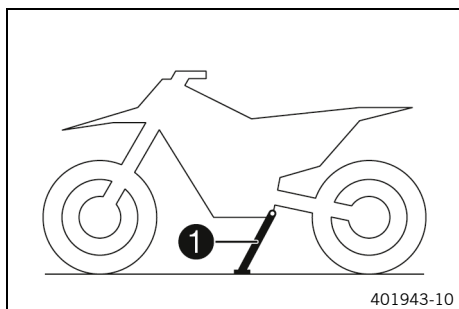


5.2 Removing the motorcycle from the lift stand

Note

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

- Park the vehicle on a firm and level surface.



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



Info

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



5.3 Starting the vehicle



Danger

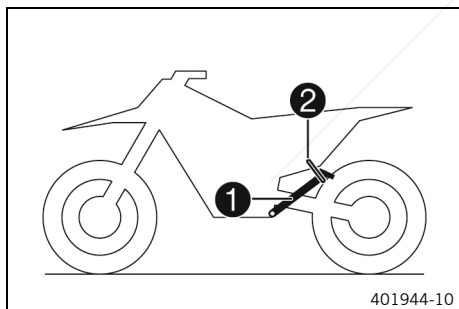
Danger of poisoning Exhaust gases are toxic and inhaling them may result in unconsciousness and death.

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

Note

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

- Always run the engine warm at a low speed.



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

Condition

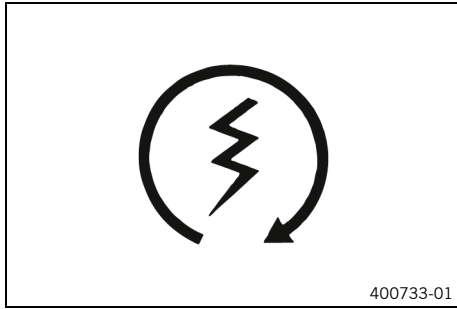
Ambient temperature: < 10 °C (< 50 °F)

- Push the cold start button in all the way.



Info

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



- Press the start button.



Info

Do not open the throttle.

Press the start button for a maximum of 5 seconds. Wait for 30 seconds before a further attempt at starting.

At temperatures below 6 °C (45 °F), several attempts at starting may be necessary to warm-up the lithium-ion battery and thereby increase the starting power.

During the starting process, the malfunction indicator lamp lights up.

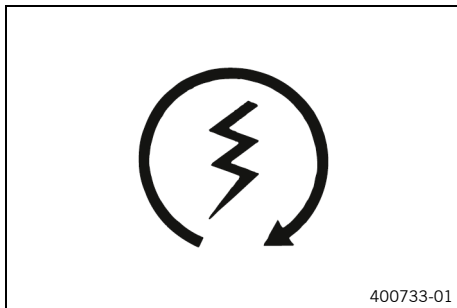
5.4 Starting the motorcycle to check the function



Danger

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

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



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



Info

Press the start button for a maximum of 5 seconds. Wait for 30 seconds before a further attempt at starting.

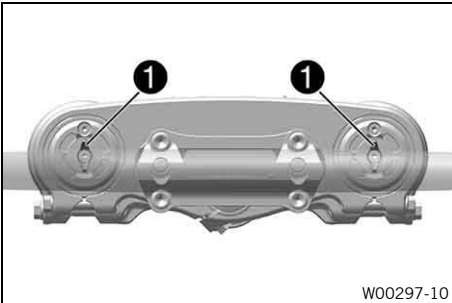
At temperatures below 15 °C (60 °F), several attempts at starting may be necessary to warm-up the lithium-ion battery and thereby increase the starting power.

During the starting process, the malfunction indicator lamp lights up.

Do not open the throttle.

6.1 Adjusting the compression damping of the fork

i Info
The hydraulic compression damping determines the fork suspension behavior.



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

i Info
Adjusters **1 COMP** are located at the top end of the fork legs.

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

Guideline

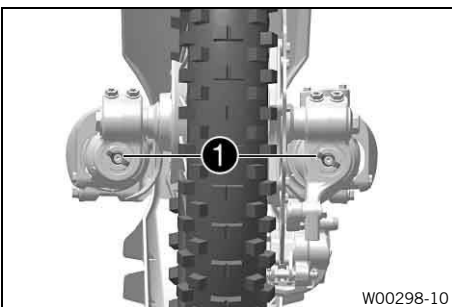
Compression damping	
Comfort	17 clicks
Standard	15 clicks
Sport	7 clicks

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



6.2 Adjusting the rebound damping of the fork

i Info
The hydraulic rebound damping determines the fork suspension behavior.



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

i Info
Adjusters **1 REB** are located at the bottom end of the fork legs.

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

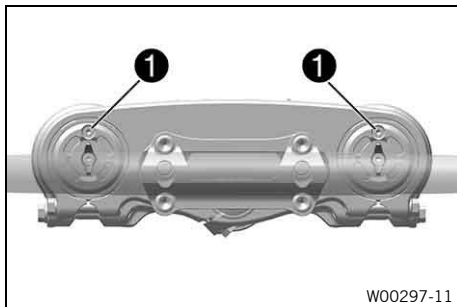
Guideline

Rebound damping	
Comfort	19 clicks
Standard	17 clicks
Sport	9 clicks

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



6.3 Bleeding the fork legs



Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 13)

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. 13)

6.4 Cleaning the dust boots of the fork legs



Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 13)
- Remove the fork protector. (📖 p. 18)

Main work

- Push dust boots ① of both fork legs downward.



Info

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



Warning

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

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

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

Universal oil spray (📖 p. 317)

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

Finishing work

- Install the fork protector. (📖 p. 18)
- Remove the motorcycle from the lift stand. (📖 p. 13)

6.5 Removing the fork legs

Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 13)
- Remove the front wheel. (📖 p. 115)

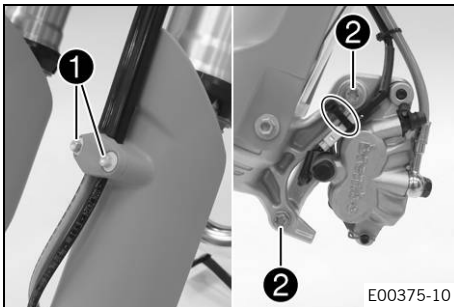
Main work

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

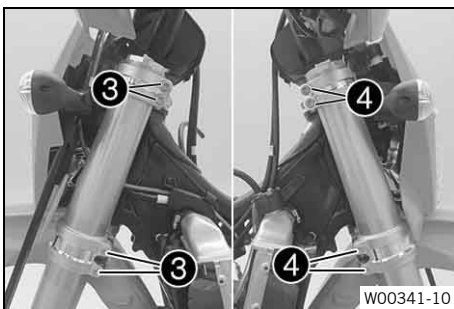


Info

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



E00375-10



W00341-10

- Loosen screws ❸. Remove the left fork leg.
- Loosen screws ❹. Remove the right fork leg.

6.6 Installing the fork legs

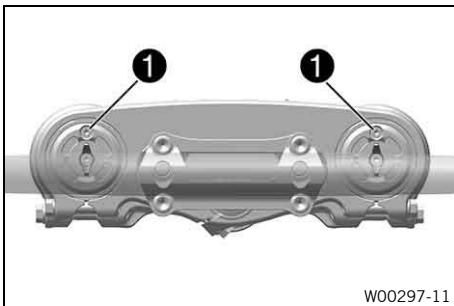
Main work

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

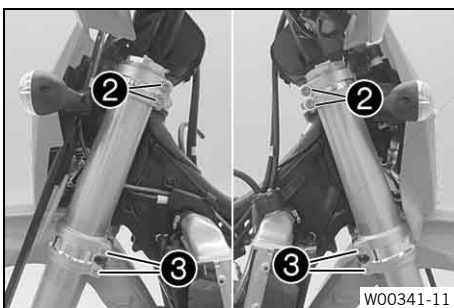


Info

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



W00297-11



W00341-11

(All standard models)

- Tighten screws ❷.

Guideline

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

- Tighten screws ❸.

Guideline

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

(All special models)

- Tighten screws ❷.

6 FORK, TRIPLE CLAMP

Guideline

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

- Tighten screws ❸.

Guideline

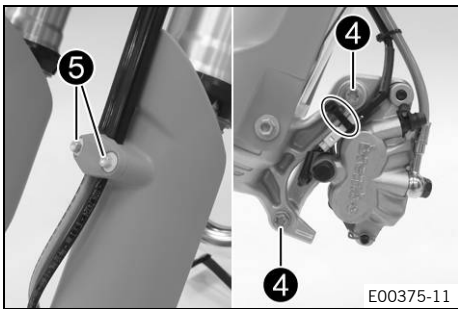
Screw, bottom triple clamp	M8	12 Nm (8.9 lbf ft)
----------------------------	----	--------------------

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

Guideline

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

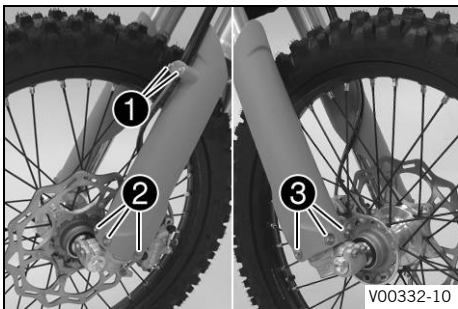
- Mount the cable ties.
- Position the brake line, the wiring harness, and the clamp. Mount and tighten screws ❺.



Finishing work

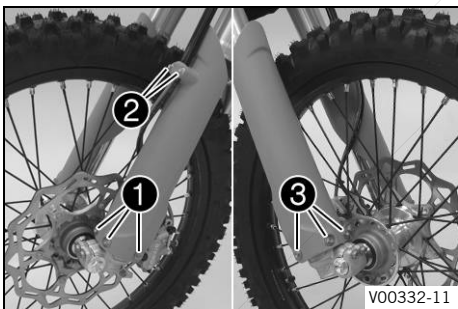
- Install the front wheel. (📖 p. 116)

6.7 Removing the fork protector



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

6.8 Installing the fork protector



- Position the fork protector 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, wiring harness, 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)
---------------------------	----	--------------------

6.9 Servicing the fork

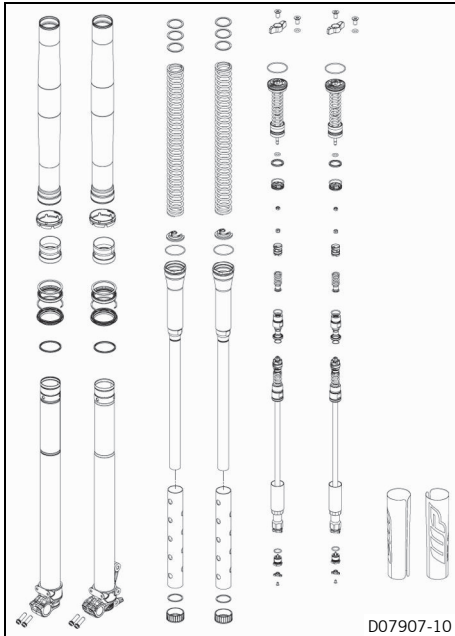


Info

The operations are the same on both fork legs.

Condition

The fork legs have been removed.



- Disassemble the fork legs. (📖 p. 19)
- Disassemble the cartridge. (📖 p. 22)
- Disassemble the piston rod. (📖 p. 24)
- Disassemble the pressure stage unit. (📖 p. 26)
- Disassemble the gasket support. (📖 p. 27)
- Check the fork legs. (📖 p. 28)
- Assemble the gasket support. (📖 p. 30)
- Assemble the pressure stage unit. (📖 p. 31)
- Assemble the piston rod. (📖 p. 32)
- Assemble the cartridge. (📖 p. 34)
- Assemble the fork legs. (📖 p. 36)

6.10 Disassembling the fork legs

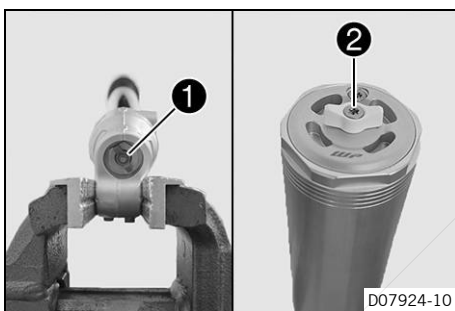


Info

The operations are the same on both fork legs.

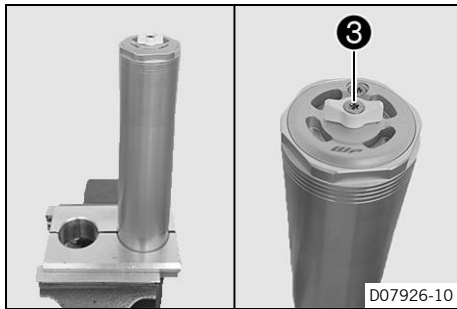
Condition

The fork legs have been removed.



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

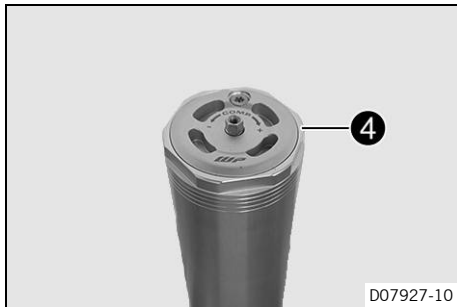
6 FORK, TRIPLE CLAMP



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

Clamping stand (T1403S) (📖 p. 332)

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



- Undo cartridge ④.

Ring wrench (T14017) (📖 p. 332)



Info

The cartridge cannot be taken off yet.

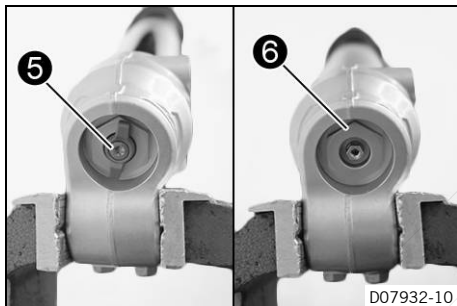


- Unclamp the fork leg.
- Drain the fork oil.



Info

Place a suitable container underneath.



- Clamp the fork leg on the fork shoe.

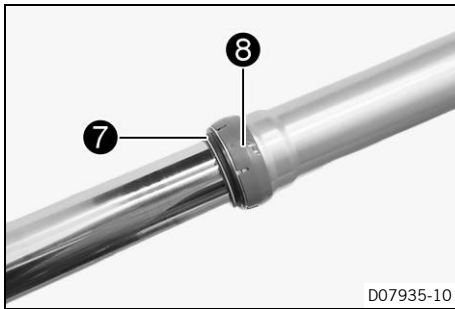
Guideline

Use soft jaws.

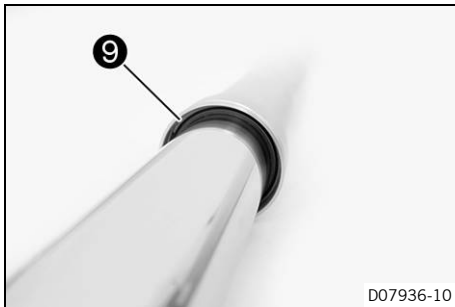
- Remove screw ⑤. Remove the adjuster of the rebound damping.
- Remove rebound adjuster ⑥.



- Remove the cartridge.

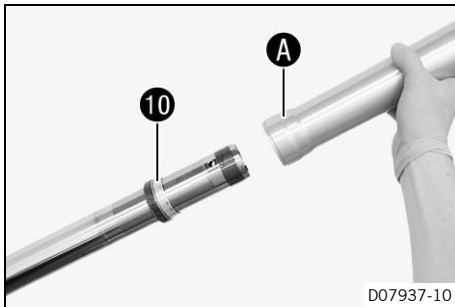


- Push dust boot **7** downwards.
- Remove fork protection ring **8**.



- Remove lock ring **9**.

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



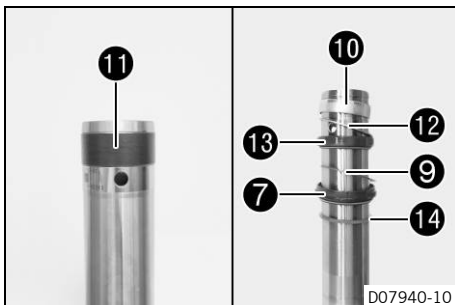
- Warm up the outside fork tube in area **A** of the lower sliding bushing.

Guideline

50 °C (122 °F)

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

i Info
Lower sliding bushing **10** must be drawn from its bearing seat.



- Remove upper sliding bushing **11**.

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

- Take off lower sliding bushing **10**.
- Take off support ring **12**.
- Take off seal ring **13**.
- Take off lock ring **9**.
- Take off dust boot **7**.
- Take off lift indicator **14**.
- Unclamp the fork leg.

6.11 Disassembling the cartridge



Info

The steps are the same for both cartridges.

Preparatory work

- Disassemble the fork legs. (📖 p. 19)

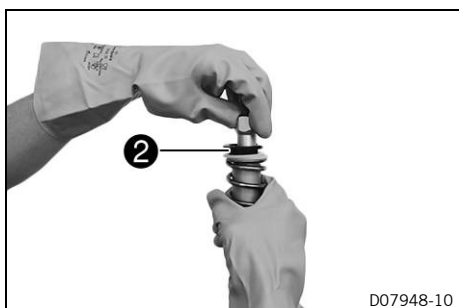
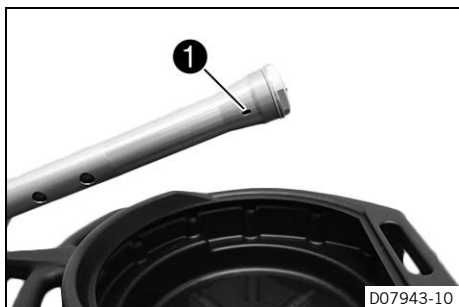
Main work

- Allow oil to drain from breathing hole ①.



Info

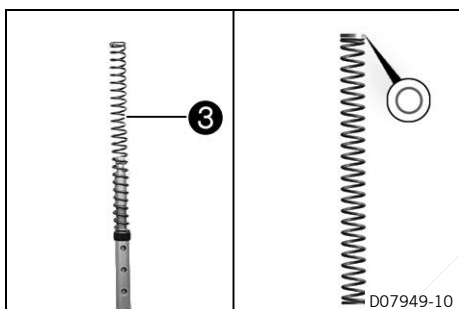
Place a suitable container underneath.



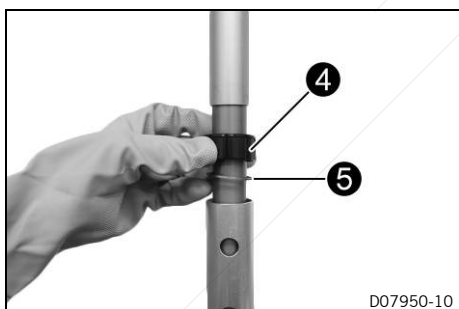
- Degrease the cartridge, turn it round, and clamp it in the area of the pressure vessel using the special tool.

Clamping stand (T531S) (📖 p. 334)

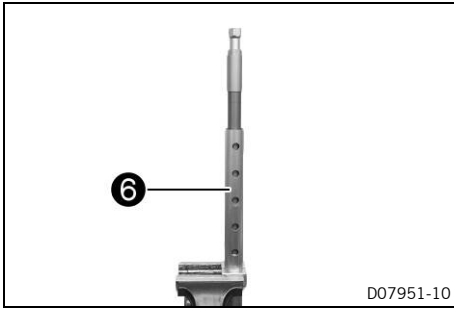
- Pull the spring down and then pull the piston rod up slightly to relieve the spring seat.
- Remove spring seat ②.



- Remove spring ③ with the preload spacer(s).



- Remove spring seat ④ and washer ⑤.



- Remove spacing tube ⑥.



- Unclamp the cartridge, turn it round, and clamp it on the flat surface of the pressure vessel.

Guideline

Use soft jaws.

- Loosen pressure stage unit ⑦ using the special tool.

Special socket (T14084) (p. 333)

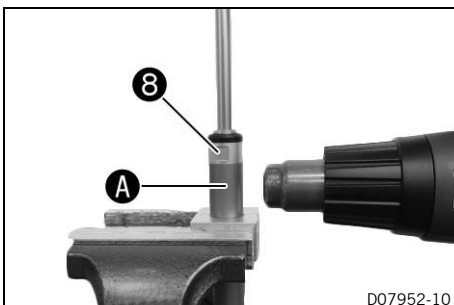
- Push the piston rod upwards and remove the pressure stage unit.

- Release the cartridge.
- Drain the remaining fork oil.



Info

Place a suitable container underneath.



- Degrease the cartridge, turn it round, and clamp it in the area of the inner tube using the special tool.

Clamping stand (T14015S) (p. 331)



Info

When clamping, make sure that the cartridge is not clamped in the area of the thread of the gasket support.

- Heat up thread area A of the tube.

Guideline

50 °C (122 °F)

- Loosen gasket support ⑧.
- Remove the piston rod.

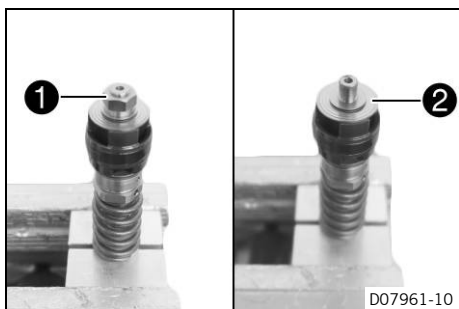


6.12 Disassembling the piston rod



Info

The steps are the same for both piston rods.



Preparatory work

- Disassemble the fork legs. (📖 p. 19)
- Disassemble the cartridge. (📖 p. 22)

Main work

- Clamp the piston rod using the special tool.

Clamping stand (T14016S) (📖 p. 331)

- Remove nut ①.



Info

In order to protect it, the end of the tap rebound is pressed in for delivery. Therefore, the end of the thread must be carefully filed off.

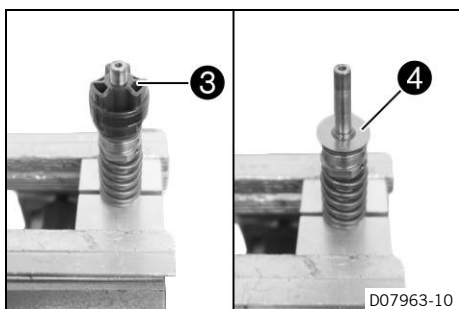
Cover components to prevent dirt from getting in.

- Remove rebound shim stack ②.



Info

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

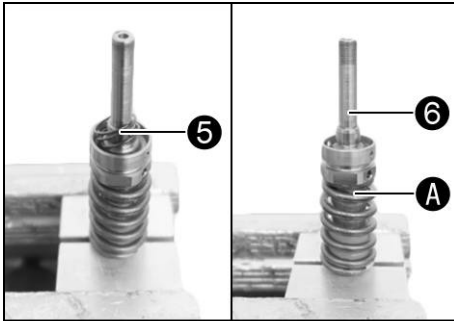


- Remove piston ③.
- Remove compression shim stack ④.



Info

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

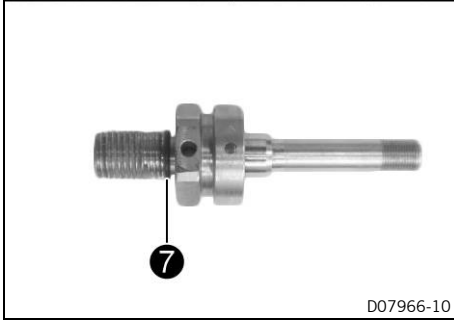


- Remove spring ⑤.
- Warm up the piston rod in area A.

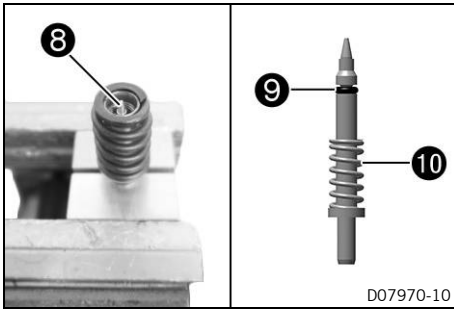
Guideline

50 °C (122 °F)

- Remove tap rebound ⑥.
- Remove O-ring ⑦.

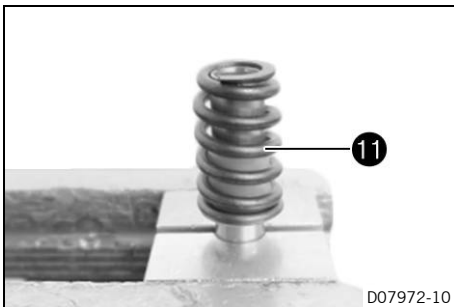


D07966-10



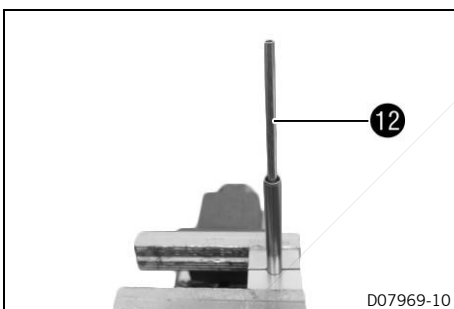
D07970-10

- Remove needle ⑧ with the spring and the O-ring.
- Remove O-ring ⑨.
- Remove spring ⑩.



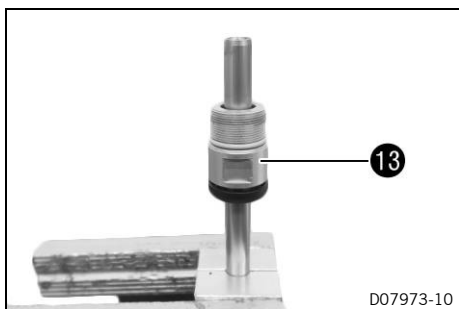
D07972-10

- Remove spring ⑪ with the bushing.



D07969-10

- Remove adjusting tube ⑫.



- Remove gasket support **13**.



Info

If the gasket support is below the clamping tool, unclamp the piston rod and remove the gasket support.

6.13 Disassembling the pressure stage unit



Info

The steps are the same for both pressure stage units.

Preparatory work

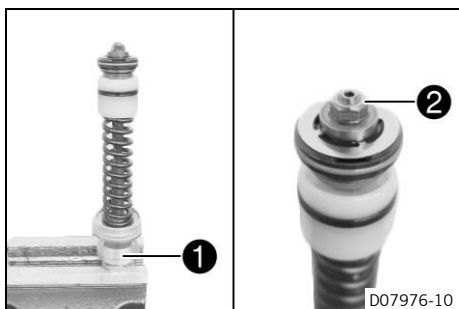
- Disassemble the fork legs. (📖 p. 19)
- Disassemble the cartridge. (📖 p. 22)

Main work

- Clamp special tool **1** into the bench vise.

Special socket (T14084) (📖 p. 333)

- Mount pressure stage unit on special tool.
- Remove nut **2**.



Info

In order to protect it, the end of the tap compression is pressed when it is prepared for delivery. Therefore, the end of the thread must be carefully filed off. Cover components to prevent dirt from getting in.

- Remove washer **3**.



Info

The shims can stick to the washer.

- Remove rebound shim stack **4**.



Info

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

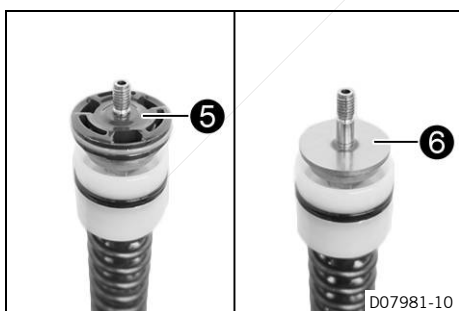


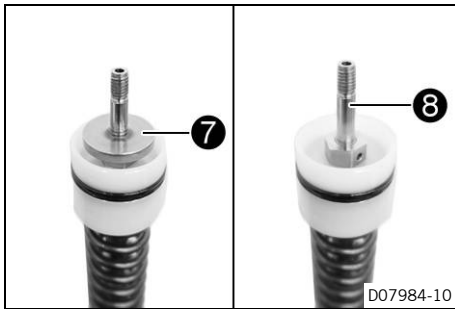
- Remove piston **5**.
- Remove compression shim stack **6**.



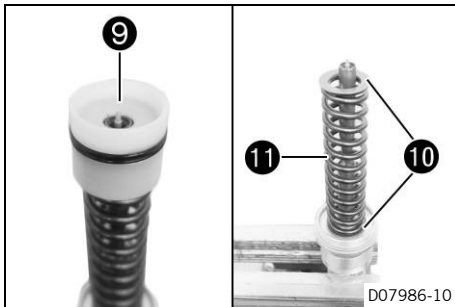
Info

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

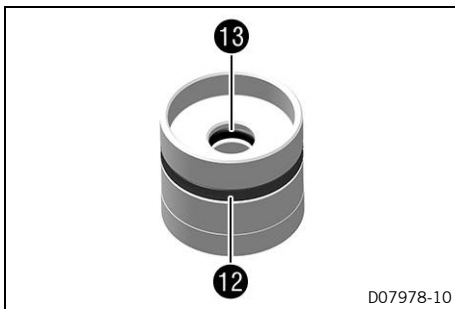




- Remove washer 7.
- Remove tap compression 8.



- Remove piston 9.
- Remove spring seats 10 with spring 11.



- Remove X-ring 12.
- Remove O-ring 13.

6.14 Disassembling the gasket support

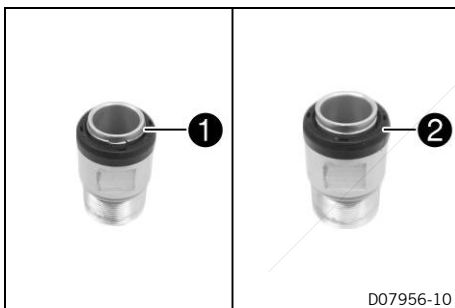
Info
The steps are the same for both gasket supports.

Preparatory work

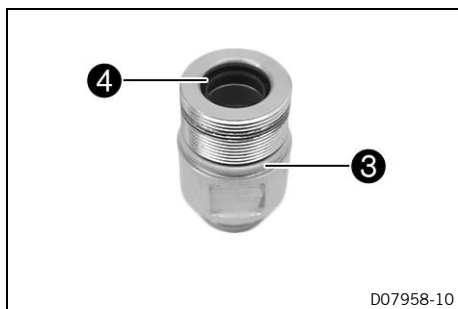
- Disassemble the fork legs. (p. 19)
- Disassemble the cartridge. (p. 22)
- Disassemble the piston rod. (p. 24)

Main work

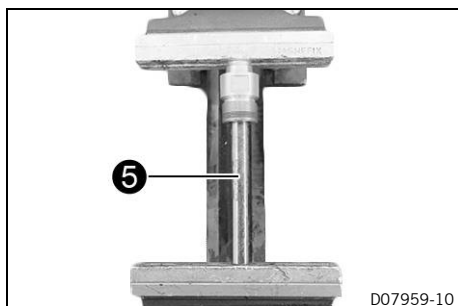
- Remove lock ring 1.
- Remove ring 2.



6 FORK, TRIPLE CLAMP



- Remove O-ring **3**.
- Remove seal ring **4**.



- Press out the pilot bushing using special tool **5**.

Guideline

Use soft jaws.

Pressing tool (T14076) (p. 333)

6.15 Checking the fork legs



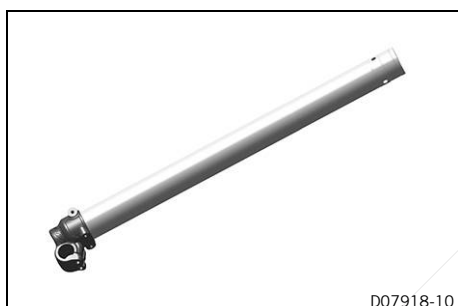
Info

The operations are the same on both fork legs.

Condition

The fork legs have been disassembled.

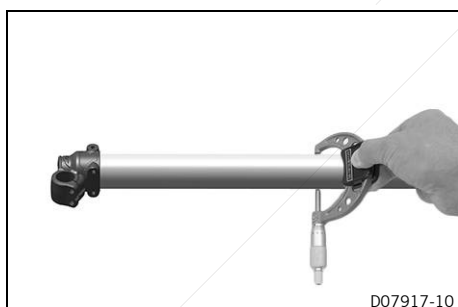
- Check the inside fork tube for damage.
 - » If damage is found:
 - Change the inside fork tube.

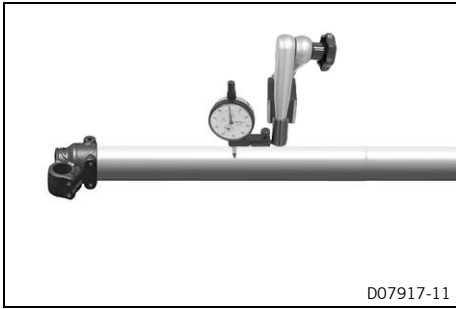


- Measure the outside diameter of the inside fork tube at several places.

Outside diameter of the inside fork tube	47.84 ... 48.14 mm (1.8835 ... 1.8953 in)
--	--

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

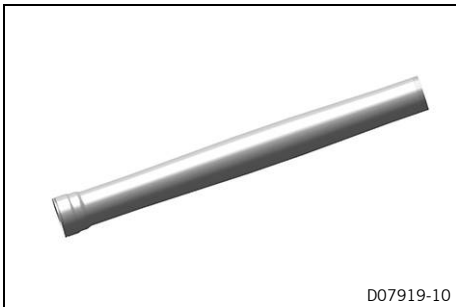




- Measure the run-out of the inside fork tube.

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

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



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

Inside diameter of the outside fork tube	49.07 ... 49.14 mm (1.9319 ... 1.9346 in)
--	--

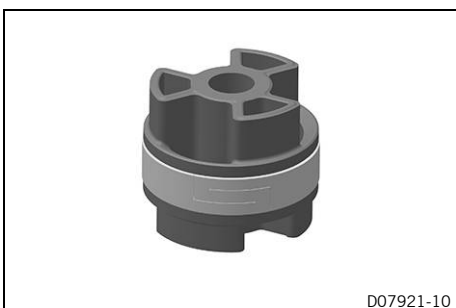
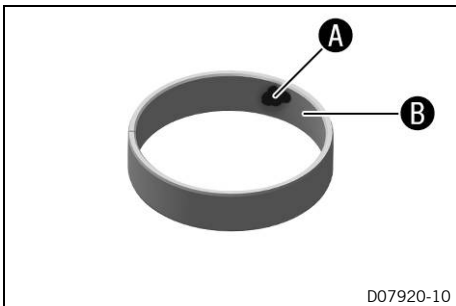
- » If the measured value is greater than the specified value:
 - Change the outside fork tube.

- Check the outside fork tube for damage.

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

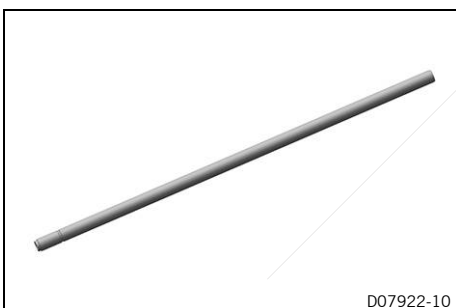
- Check the surface of the sliding bushings.

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



- Check the piston ring for damage and wear.

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



- Check the piston rod for damage.

- » If damage is found:
 - Replace the piston rod.

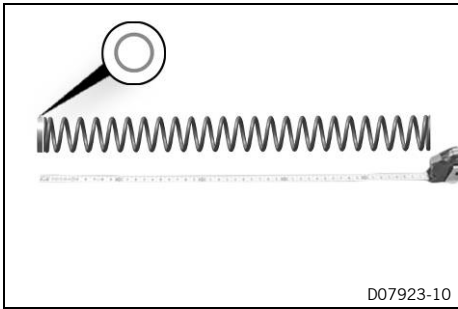
- Measure the outside diameter of the piston rod at several locations.

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.
- Check the spring length.

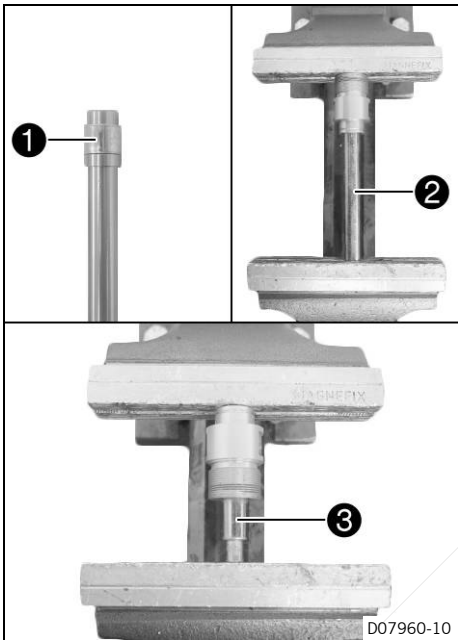
Guideline

Spring length with preload spacer(s)	476 mm (18.74 in)
--------------------------------------	-------------------

- » If the measured value is greater than the specified value:
 - Reduce the thickness of the preload spacer(s).
- » If the measured value is less than the specified value:
 - Increase the thickness of the preload spacer(s).

6.16 Assembling the gasket support

i Info
The steps are the same for both gasket supports.



- Press new pilot bushing ❶ in with special tool ❷.

Guideline

Use soft jaws.

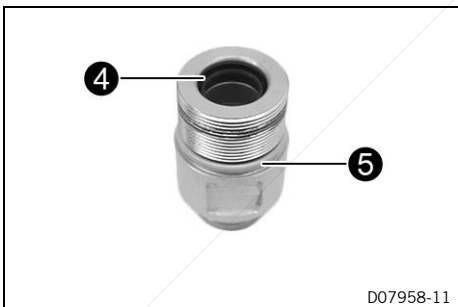
Pressing tool (T14076) (p. 333)

- Position the gasket support with a suitable tool.
- Grease and press through special tool ❸.

Fork oil (SAE 4) (48601166S1) (p. 315)

Calibrating unit (T14021) (p. 332)

- ✓ The pilot bushing is to be calibrated.



- Lightly grease and mount seal ring ❹.

Lubricant (T14034) (p. 316)

- Lightly grease and mount O-ring ❺.

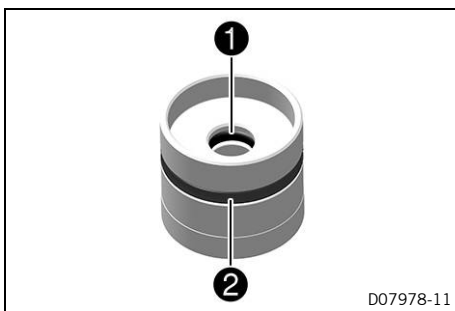
Lubricant (T159) (p. 316)



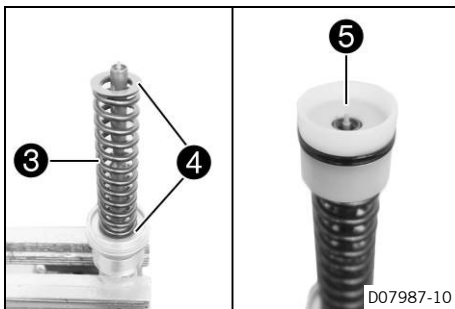
- Mount ring **6**.
- ✓ The label faces upward.
- Mount lock ring **7**.

6.17 Assembling the pressure stage unit

i Info
The steps are the same for both pressure stage units.



- Mount O-ring **1**.
- Mount X-ring **2**.



- Clamp special tool into the bench vise.
- Special socket (T14084) (p. 333)
- Mount pressure stage unit on special tool.
 - Mount spring **3** with spring seats **4**.
 - ✓ The ridge of the spring seats faces the spring.

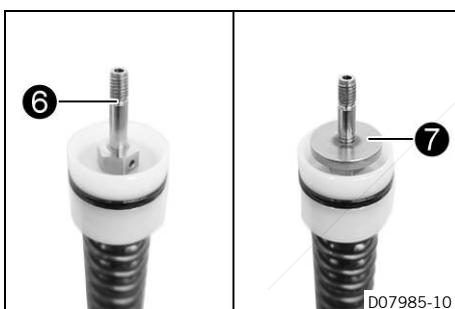
i Info
The spring seats are the same on both sides.

- Lightly grease the inner O-ring of the piston.
- Fork oil (SAE 4) (48601166S1) (p. 315)
- Mount piston **5** with the shorter inner cut-out facing upward.
 - Mount and tighten tap compression **6**.

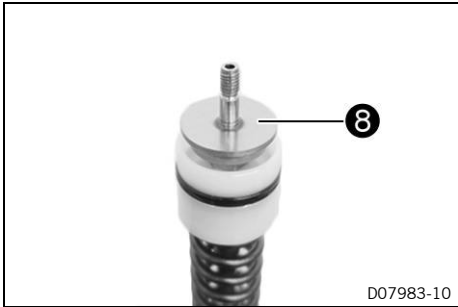
Guideline

Tap compression on piston rod	M8x1	8 Nm (5.9 lbf ft) Loctite®243™
-------------------------------	------	--

- Mount washer **7** with the groove facing downward.



6 FORK, TRIPLE CLAMP



- Mount compression shim stack 8.

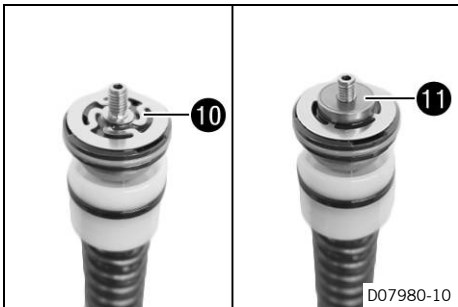
i **Info**
Note the setting list.



- Mount piston 9 with seal ring.

Guideline

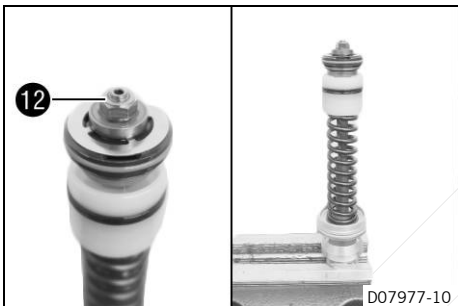
View A	of piston from above
View B	of piston from below



- Mount rebound shim stack 10.

i **Info**
Note the setting list.

- Mount washer 11 with the groove facing upward.



- Mount and tighten nut 12.

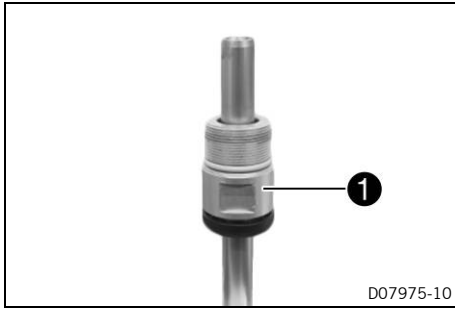
Guideline

Nut on pressure stage unit	M6x1	5.5 Nm (4.06 lbf ft) Loctite®243™
----------------------------	------	---

Do not reuse the nut, always mount a new nut.

6.18 Assembling the piston rod

i **Info**
The steps are the same for both piston rods.



- Lightly grease the seal ring of the gasket support.

Lubricant (T14034) (p. 316)

- Lightly grease the O-ring of the gasket support.

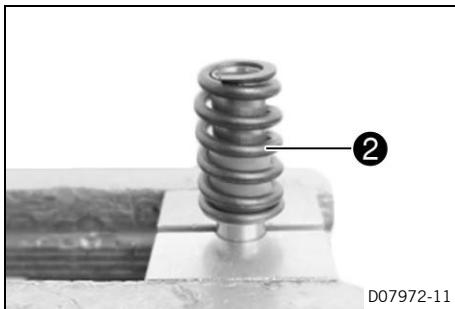
Lubricant (T159) (p. 316)

- Mount gasket support **1** on the piston rod with the thread facing upward.



Info

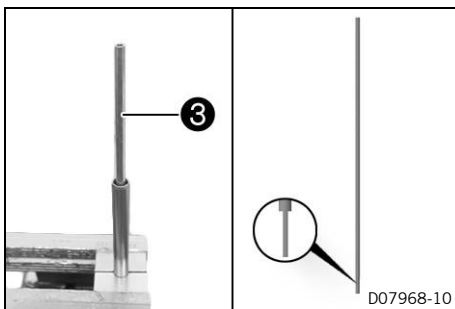
Incorrect assembly can damage the sealing lip of the seal ring and this could mean that the cartridge can no longer be assembled.



- Clamp the piston rod using the special tool.

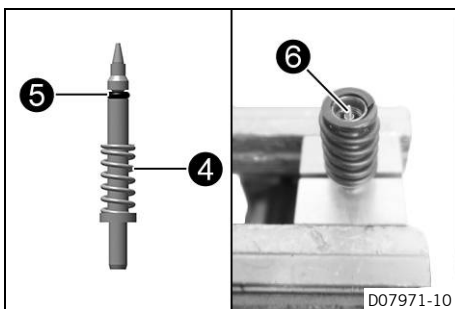
Clamping stand (T14016S) (p. 331)

- Mount spring **2** with the bushing facing downward.



- Mount adjusting tube **3**.

- ✓ The side with the smaller outside diameter at the end of the adjusting tube points downwards.



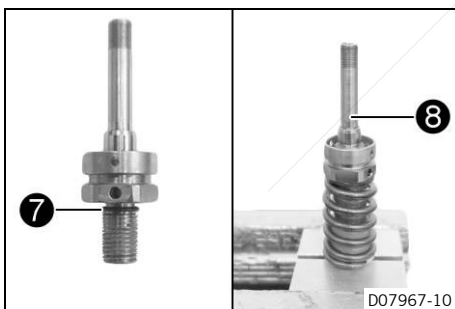
- Mount spring **4**.

- Lightly grease and mount O-ring **5**.

Special grease (00062010053) (p. 317)

- Mount needle **6** with the spring and O-ring.

- ✓ The needle tip faces upward.



- Lightly grease and mount O-ring **7**.

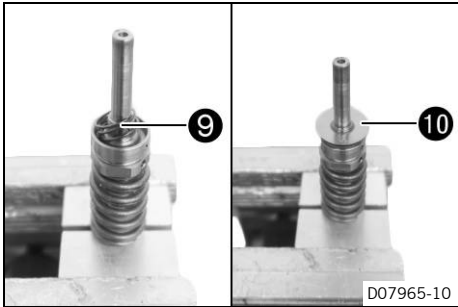
Special grease (00062010053) (p. 317)

- Mount and tighten tap rebound **8** with the spring seat and the O-ring.

Guideline

Tap rebound on the piston rod	M9x1	20 Nm (14.8 lbf ft) Loctite®243™
-------------------------------	------	--

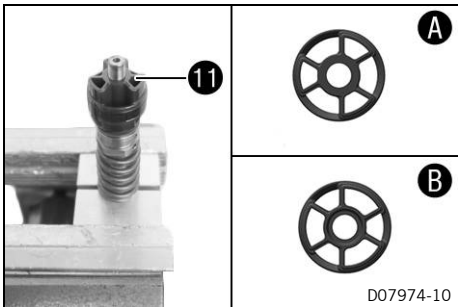
6 FORK, TRIPLE CLAMP



- Mount spring 9.
- Mount compression shim stack 10.

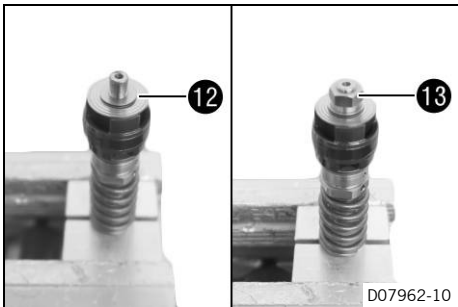
Info
Note the setting list.

- Press the shim stack down against the spring force and over the collar of the tap rebound.



- Mount piston 11 with the piston ring.

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



- Mount rebound shim stack 12.

Info
Note the setting list.

- Mount and tighten nut 13 with the collar facing downward.

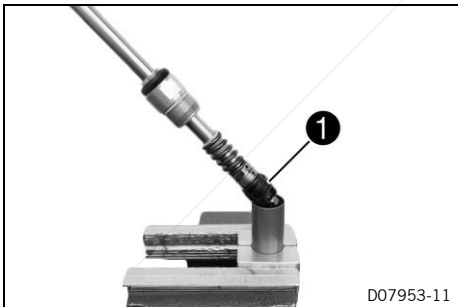
Guideline		
Nut, tap rebound	M6x0.5	5 Nm (3.7 lbf ft) Loctite®243™

Do not reuse the nut, always mount a new nut.

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

6.19 Assembling the cartridge

Info
The steps are the same for both cartridges.



- Degrease the cartridge, turn it round, and clamp it in the area of the inner tube using the special tool.

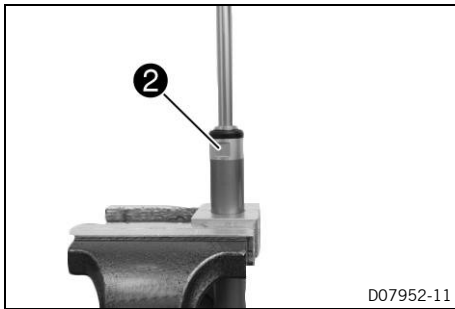
Clamping stand (T14015S) (📖 p. 331)

Info
When clamping, make sure that the cartridge is not clamped in the area of the thread of the gasket support.

- Lubricate piston ring 1.

Fork oil (SAE 4) (48601166S1) (📖 p. 315)

- Mount the piston rod.



- Mount and tighten gasket support **2**.

Guideline

Gasket support on cartridge	M24.5x1	46 Nm (33.9 lbf ft) Loctite®243™
-----------------------------	---------	--



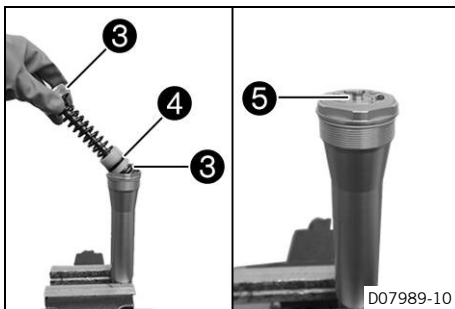
- Unclamp the cartridge, turn it round, and clamp it on the flat surface of the pressure vessel.

Guideline

Use soft jaws.

- Add the fork oil while pulling out and pushing in the piston rod numerous times.

Oil capacity, cartridge	175 ml (5.92 fl. oz.)	Fork oil (SAE 4) (48601166S1) (p. 315)
-------------------------	--------------------------	--



- Lubricate O-rings **3** and seal ring **4** of pressure stage unit **5**.

Fork oil (SAE 4) (48601166S1) (p. 315)
--

- Push the piston rod upward and mount and tighten pressure stage unit **5** using the special tool.

Guideline

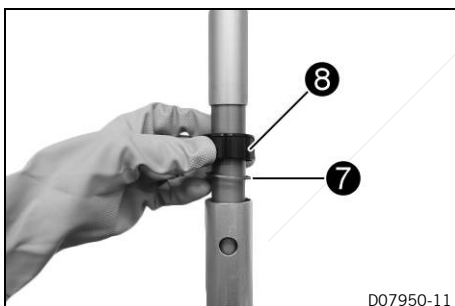
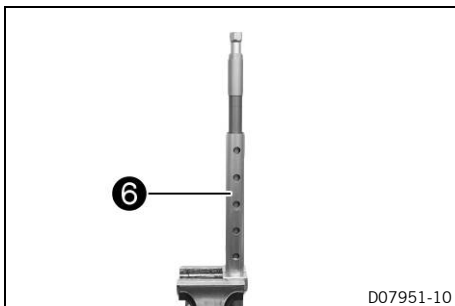
Pressure stage unit on the cartridge	M44x1	30 Nm (22.1 lbf ft)
--------------------------------------	-------	---------------------

Special socket (T14084) (p. 333)

- Unclamp the cartridge and clamp it in the area of the pressure vessel using the special tool.

Clamping stand (T531S) (p. 334)

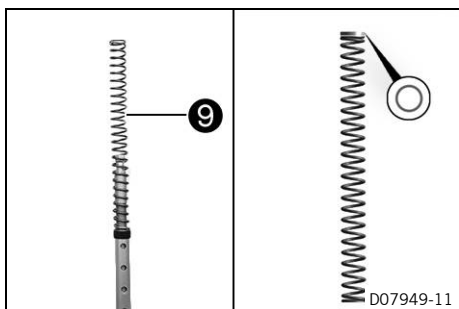
- Mount spacing tube **6**.



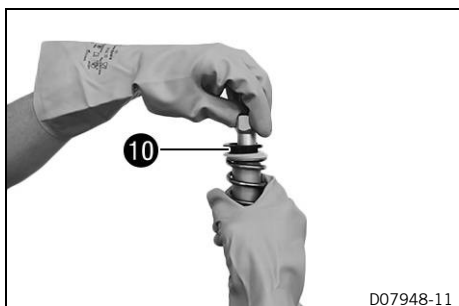
- Mount washer **7** and spring seat **8**.

- ✓ The side of the spring seat with the smaller inside diameter faces upward.

6 FORK, TRIPLE CLAMP



- Position spring ⑨ with the preload spacer(s).



- Pull the spring down and then pull the piston rod up slightly so that the spring seat can be mounted.



Info

The piston rod may slip down during this step and must be pulled up again.

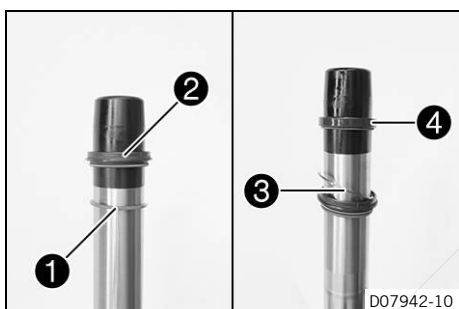
- Mount spring seat ⑩.

6.20 Assembling the fork legs



Info

The operations are the same on both fork legs.



Preparatory work

- Check the fork legs. (📖 p. 28)

Main work

- Clamp inside fork tube on fork shoe.

Guideline

Use soft jaws.

- Mount the special tool.

Protecting sleeve (T1401) (📖 p. 331)

- Position lift indicator ①.

- Grease and push on dust boot ②.

Fork oil (SAE 4) (48601166S1) (📖 p. 315)

✓ The sealing lip with the spring expander points downward.



Info

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

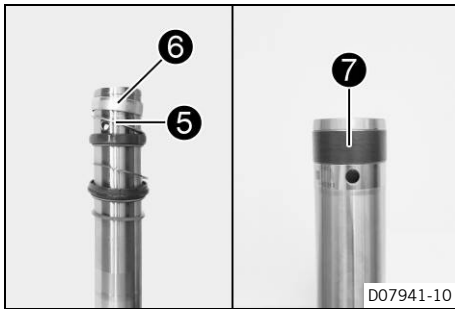
- Push on lock ring ③.

- Grease and push on seal ring ④.

Fork oil (SAE 4) (48601166S1) (📖 p. 315)

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

- Remove the special tool.



- Push on support ring **5**.
- Sand edges of the sliding bushings with 600 grit sandpaper; then clean and grease the bushings.

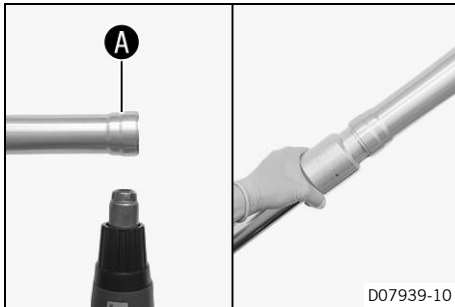
Fork oil (SAE 4) (48601166S1) (p. 315)

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



Info

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



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

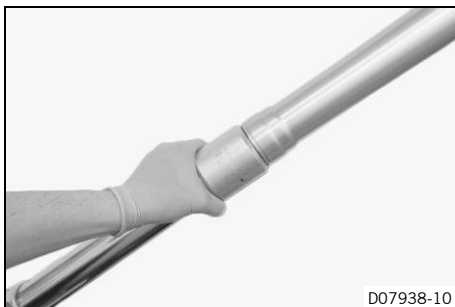
Guideline

50 °C (122 °F)

- Hold the lower sliding bushing with the longer side of the special tool.

Mounting tool (T14040S) (p. 332)

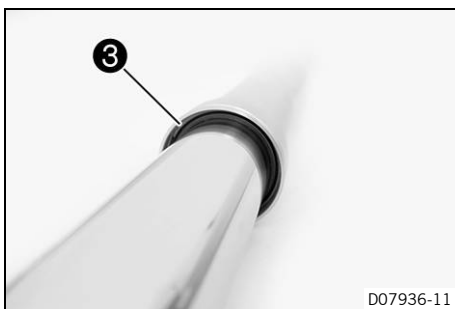
- Slide on the outside fork tube.
- Press the sliding bushing all the way into the outside fork tube.



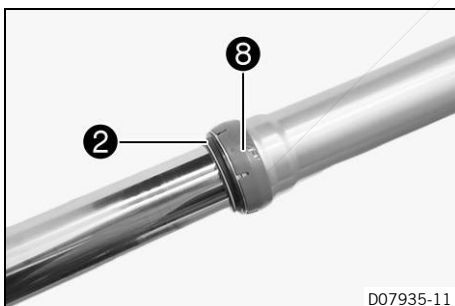
- Position the support ring.
- Hold the seal ring with shorter side of the special tool.

Mounting tool (T14040S) (p. 332)

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



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

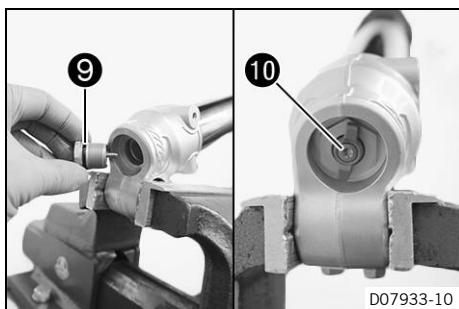


- Mount dust boot **2**.
- Mount fork protection ring **8**.

6 FORK, TRIPLE CLAMP



- Slide the cartridge into the inside fork tube.



- Lightly lubricate O-ring **9** on the rebound adjuster.

Lubricant (T159) (p. 316)

- Mount and tighten the rebound adjuster.

Guideline

Rebound adjuster on the axle clamp	M20x1	40 Nm (29.5 lbf ft)
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- Mount the adjuster of the rebound damping. Mount screw **10**.

Guideline

Screw, rebound damping adjustment	M4x0.5	1.5 Nm (1.11 lbf ft)
-----------------------------------	--------	----------------------

- Unclamp the fork leg and clamp it vertically on the axle clamp.

Guideline

Use soft jaws.

- Fill with fork oil.

Oil capacity, external mechanism	390 ml (13.19 fl. oz.)	Fork oil (SAE 4) (48601166S1) (p. 315)
----------------------------------	------------------------	--



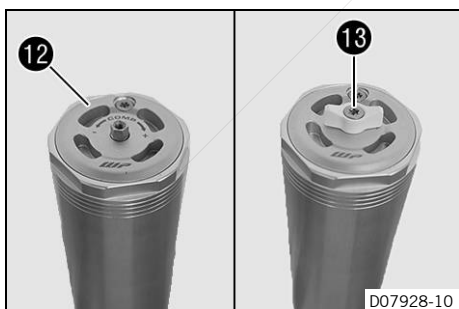
- Lubricate O-ring **11** of the cartridge.

Lubricant (T159) (p. 316)

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

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

Clamping stand (T1403S) (p. 332)



- Tighten cartridge **12**.

Guideline

Screw cap on outside fork tube	M51x1	50 Nm (36.9 lbf ft)
--------------------------------	-------	---------------------

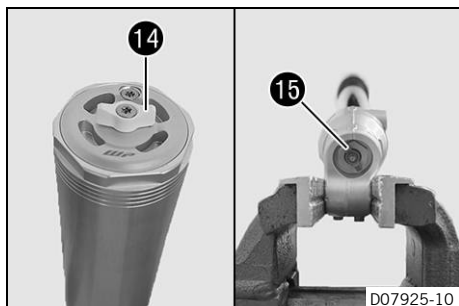
Ring wrench (T14017) (p. 332)

- Mount the adjuster on the compression damping.

- Mount and tighten screw **13**.

Guideline

Screw, compression adjuster	M4x0.5	2 Nm (1.5 lbf ft)
-----------------------------	--------	-------------------



Condition

Value not determined on removal:

- Turn compression adjuster 14 and rebound adjuster 15 clockwise all the way.
- Turn counterclockwise by the number of clicks corresponding to the fork type.

Guideline

Compression damping	
Comfort	17 clicks
Standard	15 clicks
Sport	7 clicks
Rebound damping	
Comfort	19 clicks
Standard	17 clicks
Sport	9 clicks

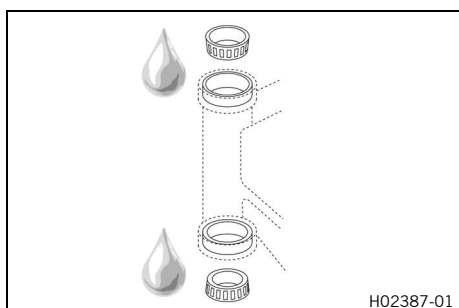
Condition

Value determined on removal:

- Turn compression adjuster 14 and rebound adjuster 15 clockwise all the way.
- Set the adjusters to the positions determined upon removal.



6.21 Lubricating the steering head bearing



- Remove the lower triple clamp. (p. 39)
- Install the lower triple clamp. (p. 40)



Info

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

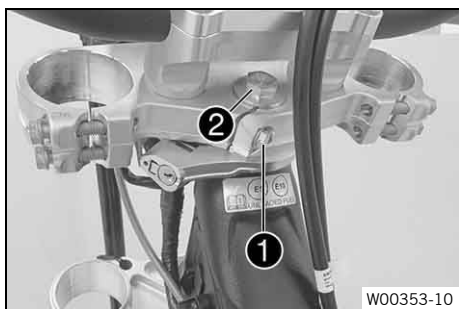


6.22 Removing the lower triple clamp

Preparatory work

- Raise the motorcycle with a lift stand. (p. 13)
- Remove the front wheel. (p. 115)
- Remove the fork legs. (p. 17)
- Remove the headlight mask with the headlight. (p. 109)
- Remove front fender. (p. 108)
- Remove the seat. (p. 95)
- Remove the fuel tank. (p. 96)
- Take off the handlebar cushion.

6 FORK, TRIPLE CLAMP



Main work

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



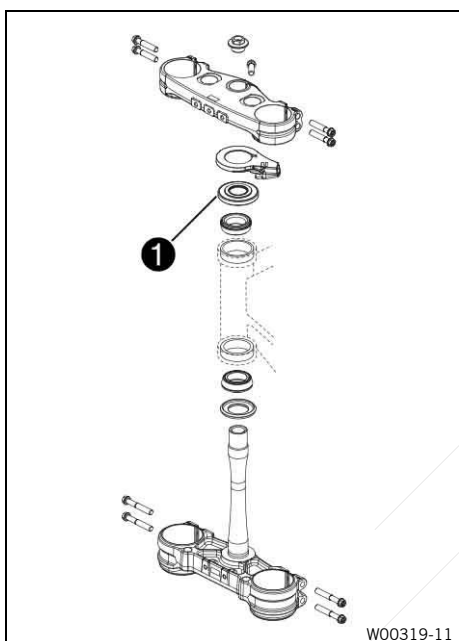
Info

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



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

6.23 Installing the lower triple clamp

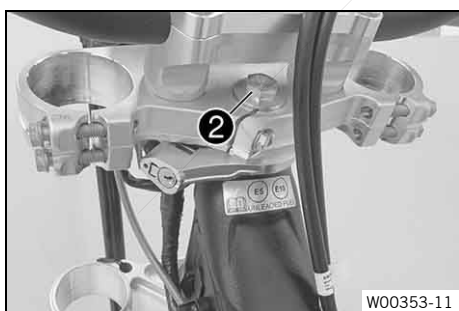


Main work

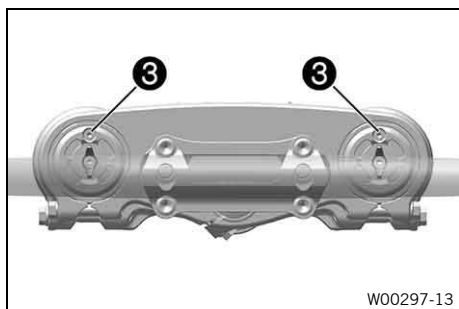
- Clean the bearing and sealing elements, check for damage, and grease.

High viscosity grease (p. 316)

- Insert the lower triple clamp with the steering stem. Mount upper steering head bearing.
- Push on protective ring ①.



- Position the upper triple clamp and handlebar.
- Mount screw ②, but do not tighten it yet.



- Position the fork legs.
- ✓ Bleeder screws 3 are positioned toward the front.



Info

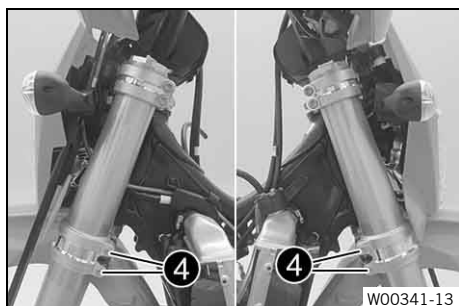
Grooves are milled into the side of the upper end of the fork legs. The second milled groove (from the top) must be flush with the upper edge of the upper triple clamp. The pressure and rebound damping is located in the left and right fork leg.

(All standard models)

- Tighten screws 4.

Guideline

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

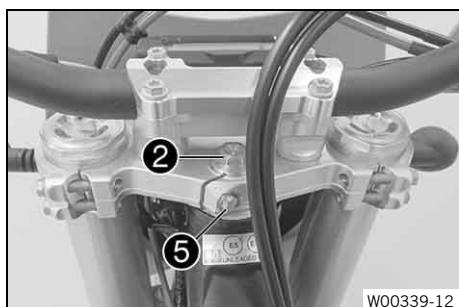


(All special models)

- Tighten screws 4.

Guideline

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



- Tighten screw 2.

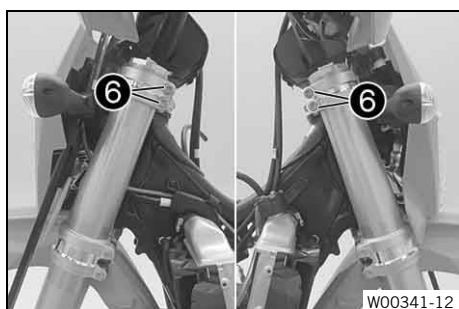
Guideline

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

- Tighten screw 5.

Guideline

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



(All standard models)

- Tighten screws 6.

Guideline

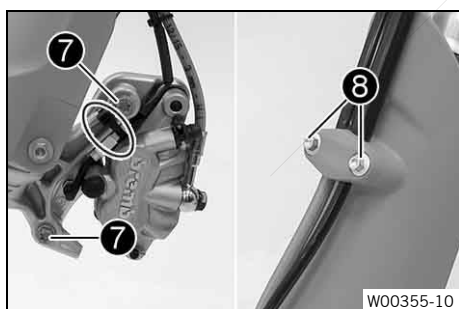
Screw, top triple clamp	M8	20 Nm (14.8 lbf ft)
-------------------------	----	---------------------

(All special models)

- Tighten screws 6.

Guideline

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



- Position the brake caliper, and mount and tighten screws 7.

Guideline

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

- Mount the cable ties.
- Position the brake line, the wiring harness, and the clamp. Mount and tighten screws 8.

Finishing work

- Mount the handlebar cushion.
- Install front fender. (📖 p. 108)
- Install the front wheel. (📖 p. 116)
- Install the headlight mask with the headlight. (📖 p. 109)
- Check the wiring harness, cables, and brake and clutch lines for freedom of movement and correct routing.
- Check the steering head bearing for play. (📖 p. 43)
- Remove the motorcycle from the lift stand. (📖 p. 13)
- Check the headlight setting. (📖 p. 156)
- Install the fuel tank. (📖 p. 97)
- Mount the seat. (📖 p. 95)

6.24 Changing the steering head bearing

Preparatory work

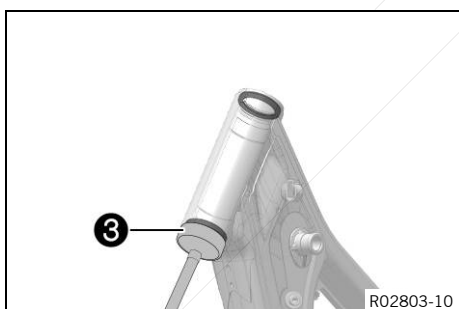
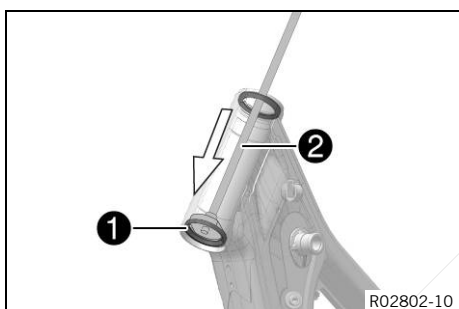
- Raise the motorcycle with a lift stand. (📖 p. 13)
- Remove the front wheel. (📖 p. 115)
- Remove the fork legs. (📖 p. 17)
- Remove the headlight mask with the headlight. (📖 p. 109)
- Remove front fender. (📖 p. 108)
- Remove the seat. (📖 p. 95)
- Remove the fuel tank. (📖 p. 96)
- Take off the handlebar cushion.
- Remove the lower triple clamp. (📖 p. 39)

Main work

- Remove lower bearing ring ❶ with special tool ❷.

Tool bracket (58429089000) (📖 p. 321)

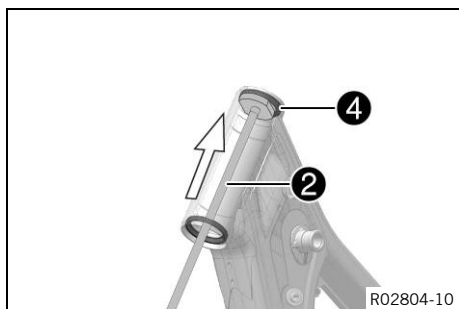
Pressing tool (58429092000) (📖 p. 322)
--



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

Tool bracket (58429089000) (📖 p. 321)

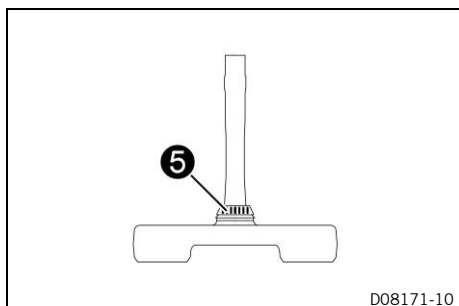
Pressing tool (58429091000) (📖 p. 322)
--



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

Tool bracket (58429089000) (p. 321)

Pressing tool (58429092000) (p. 322)



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



Info

Only press the bearing in via the inner ring.

Finishing work

- Install the lower triple clamp. (p. 40)
- Mount the handlebar cushion.
- Install front fender. (p. 108)
- Install the front wheel. (p. 116)
- Install the headlight mask with the headlight. (p. 109)
- Check the wiring harness, cables, and brake and clutch lines for freedom of movement and correct routing.
- Check the steering head bearing for play. (p. 43)
- Remove the motorcycle from the lift stand. (p. 13)
- Check the headlight setting. (p. 156)
- Install the fuel tank. (p. 97)
- Mount the seat. (p. 95)

6.25 Checking the steering head bearing play



Warning

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

- Correct incorrect steering head bearing play immediately.

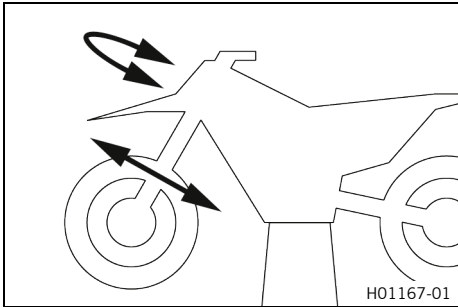


Info

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

Preparatory work

- Raise the motorcycle with a lift stand. (p. 13)



Main work

- Move the handlebar to the straight-ahead position. Move the fork legs to and fro in the direction of travel.

Play should not be detectable on the steering head bearing.

 - » If there is detectable play:
 - Adjust the steering head bearing play. (📖 p. 44)
- Move the handlebar to and fro over the entire steering range.

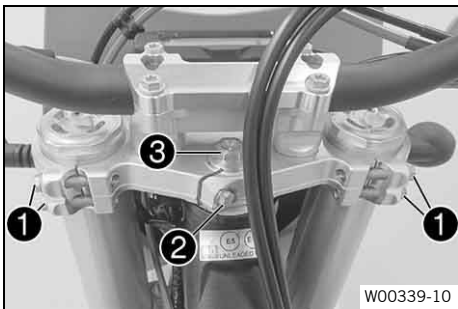
It must be possible to move the handlebar easily over the entire steering range. There should be no detectable detent positions.

 - » If detent positions are detected:
 - Adjust the steering head bearing play. (📖 p. 44)
 - Check the steering head bearing and change if necessary.
- Check the steering stop bolts for correct adjustment and locking.

Finishing work

- Remove the motorcycle from the lift stand. (📖 p. 13)

6.26 Adjusting the steering head bearing play



Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 13)

Main work

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

Guideline

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

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

(All standard models)

- Tighten screws ❶.

Guideline

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

(All special models)

- Tighten screws ❶.

Guideline

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

- Tighten screw ❷.

Guideline

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

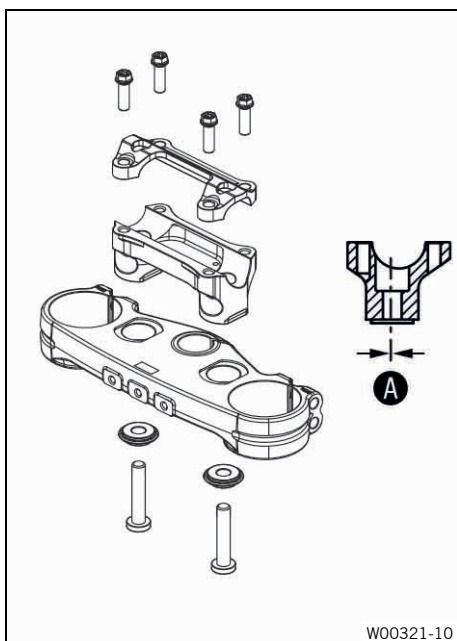
Finishing work

- Check the steering head bearing for play. (📖 p. 43)

- Remove the motorcycle from the lift stand. (📖 p. 13)



7.1 Handlebar position

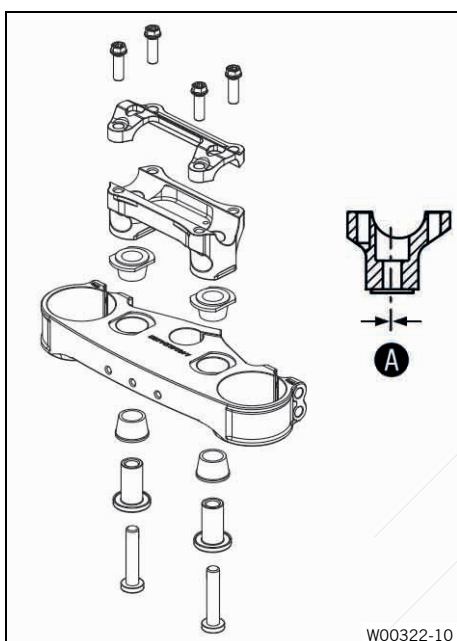


(All standard models)

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

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

The handlebar support can be mounted in two different positions.



(All special models)

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

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

The handlebar support can be mounted in two different positions.

7.2 Adjusting the handlebar position

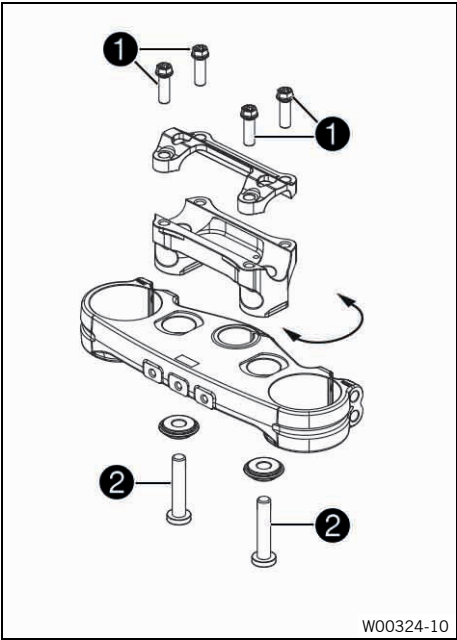


Warning

Danger of accidents A repaired handlebar poses a safety risk.

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

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



(All standard models)

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

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

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

Guideline

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

Info
Position the handlebar support so that it is even.

- Position the handlebar.

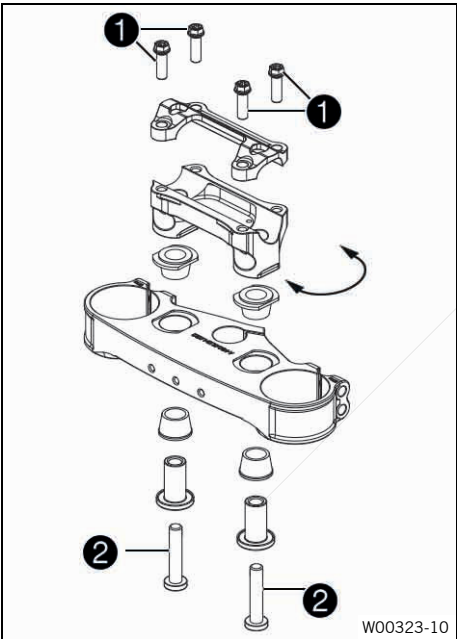
Info
Make sure the cables and wiring are positioned correctly.

- Position the handlebar clamp. Mount screws 1 and tighten evenly.

Guideline

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

Info
Make sure the installed gaps are even.



(All special models)

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

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

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

Guideline

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

Info
Position the handlebar support so that it is even.

- Position the handlebar.



Info

Make sure the cables and wiring are positioned correctly.

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

Guideline

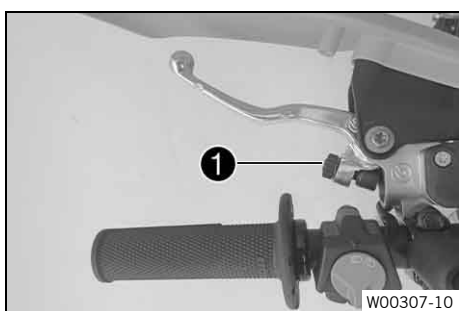
Screw, handlebar clamp	M8	20 Nm (14.8 lbf ft)
------------------------	----	------------------------



Info

Make sure the installed gaps are even.

7.3 Adjusting the basic position of the clutch lever



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



Info

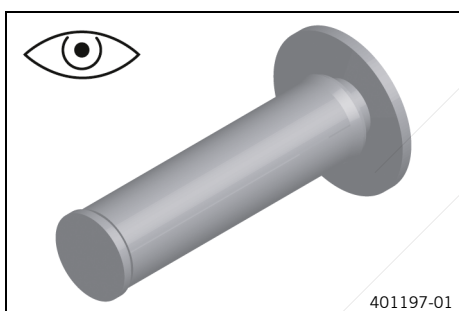
Turn the adjusting screw counterclockwise to decrease the distance between the clutch lever and the handlebar.

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 the rubber grip



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

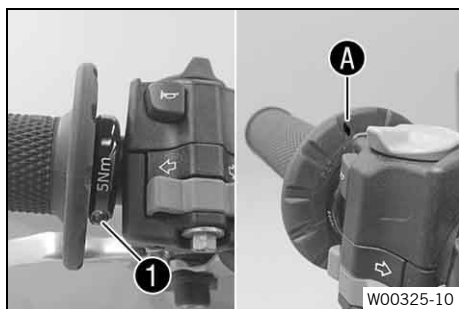


Info

The rubber grips are vulcanized onto a sleeve on the left and onto the handle tube of the throttle grip on the right. The left sleeve is clamped onto the handlebar.

The rubber grip can only be replaced with the sleeve or the throttle tube.

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



- Check that screw ① is firmly seated.

Guideline

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

Diamond ① must be positioned visibly as shown in the figure.

7.5 Checking the throttle cable routing



Warning

Danger of accidents The throttle cable can become kinked, trapped or blocked if it is not routed correctly.

If the throttle cable is kinked, trapped or blocked, the speed can no longer be controlled.

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

Preparatory work

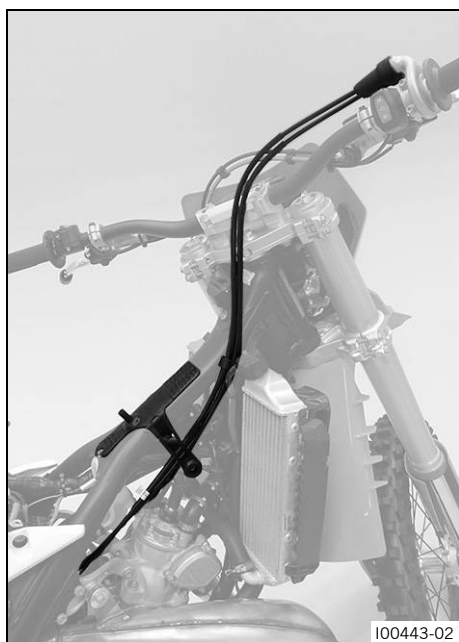
- Remove the seat. (📖 p. 95)
- Remove the fuel tank. (📖 p. 96)

Main work

- Check the throttle cable routing.

Both throttle cables must be routed, side by side, on the back of the handlebars, above the fuel tank roller on the right of the frame to the throttle valve body. Both throttle cables must be secured behind the rubber strap of the fuel tank support.

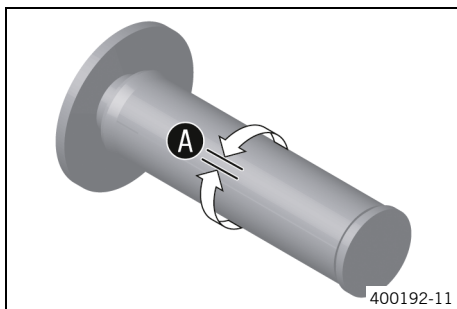
- » If the throttle cable routing is not as specified:
 - Correct the throttle cable routing.



Finishing work

- Install the fuel tank. (📖 p. 97)
- Mount the seat. (📖 p. 95)

7.6 Checking the play in the throttle cable



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

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

- » If the throttle cable play does not meet the specified value:
 - Adjust the play in the throttle cable. (📖 p. 50)



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 the play in the throttle cable. (📖 p. 50)

7.7 Adjusting the play in the throttle cable

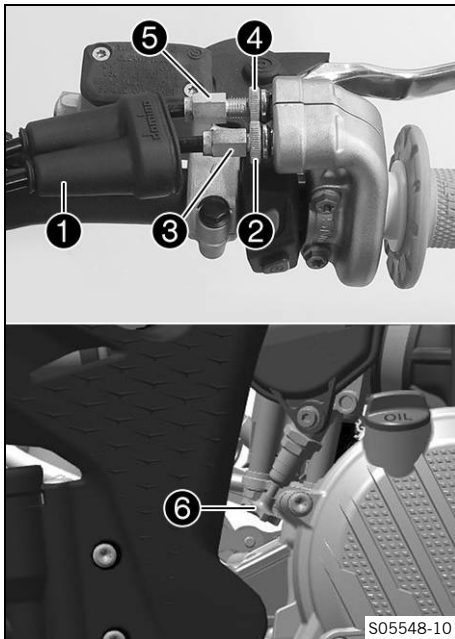


Info

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

Preparatory work

- Remove the seat. (📖 p. 95)
- Remove the fuel tank. (📖 p. 96)
- Check the throttle cable routing. (📖 p. 49)

**Main work**

- Move the handlebar to the straight-ahead position.
- Push back sleeve ①.
- Loosen nut ②.
- Turn adjusting screw ③ in as far as possible.
- Loosen nut ④.
- Push cold start button ⑥ all the way to the stop.
- Turn adjusting screw ⑤ so that the cold start button moves to the basic position when the throttle grip is turned to the front.
- Tighten nut ④.
- Turn adjusting screw ③ so that there is play in the throttle cable at the throttle grip.

Guideline

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

- Tighten nut ②.
- Slide on sleeve ①.
- Check the throttle grip for smooth operation.

Finishing work

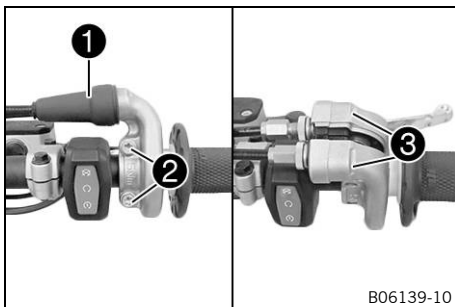
- Check the play in the throttle cable. (📖 p. 50)

7.8 Setting the characteristic map of the throttle response

**Info**

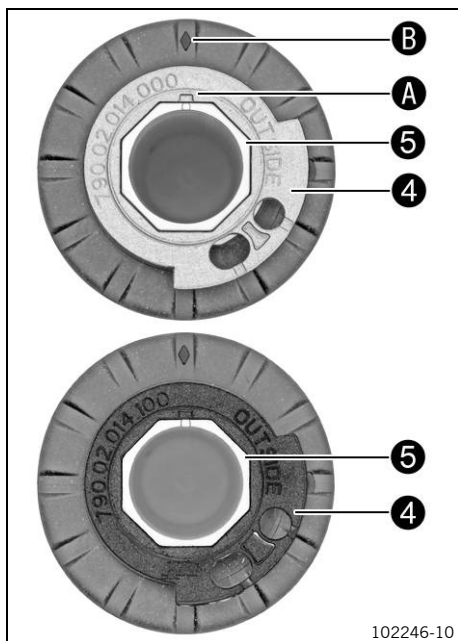
On the throttle grip, the characteristic map of the throttle response is changed by changing the guide plate.

A guide plate with a different characteristic map is supplied.

**Main work**

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

7 HANDLEBAR, CONTROLS



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

Guideline

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

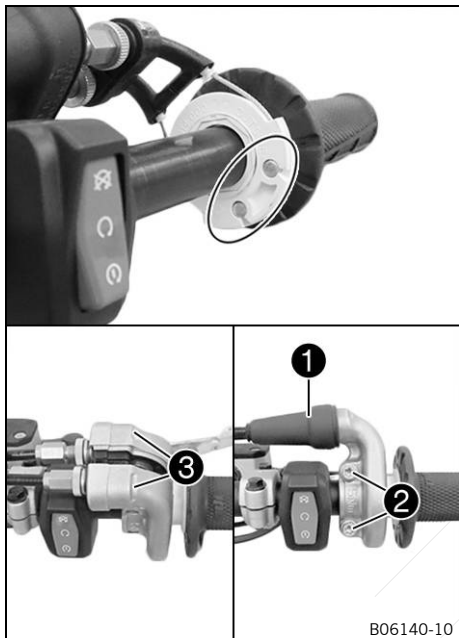
Grey guide plate (79002014000)

Alternative 1

Black guide plate (79002014100)

Info

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



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

Guideline

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

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

Finishing work

- Check the play in the throttle cable. (📖 p. 50)

8.1 Checking the frame



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

- Change the frame.

Guideline

Repairs on the frame are not permitted.

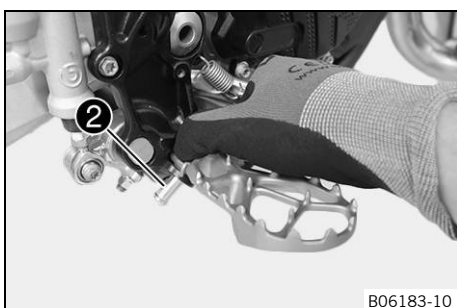
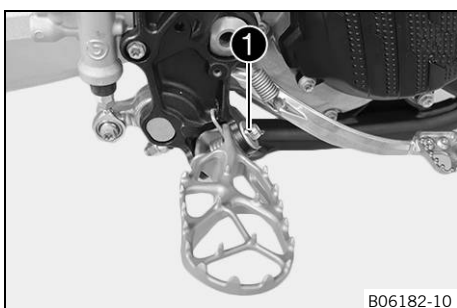
8.2 Changing the footrests

Preparatory work

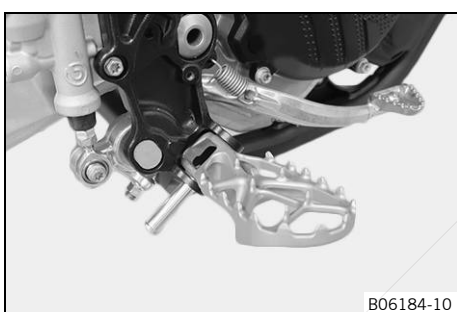
- Remove the frame protector. (📖 p. 55)

Main work

- Remove pin ❶ and take off the washer.



- Apply pressure to the spring with your thumb.
- Remove pin ❷.
- Take off the footrest.

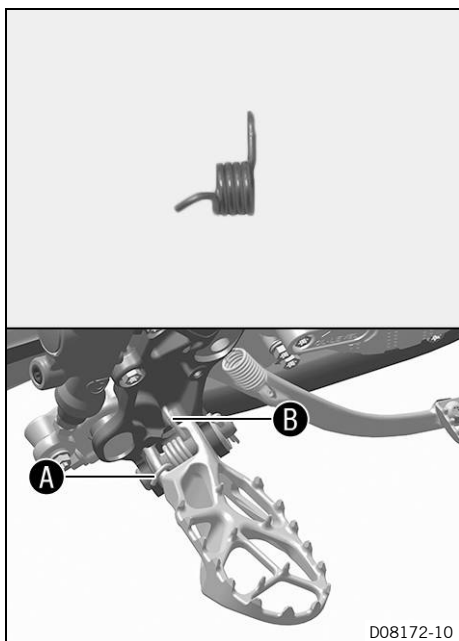


- Position the new footrest and pin.

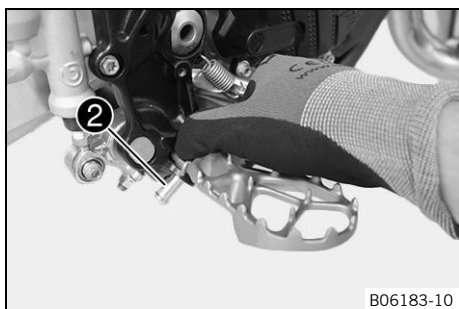


Info

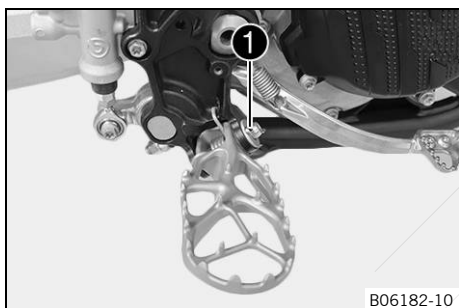
Only insert the pin to the extent that the spring can still be mounted.



- Position spring as shown.
- ✓ The spring engages in area **A** and **B**.



- Apply pressure to the spring with your thumb.
- Mount pin **2**.

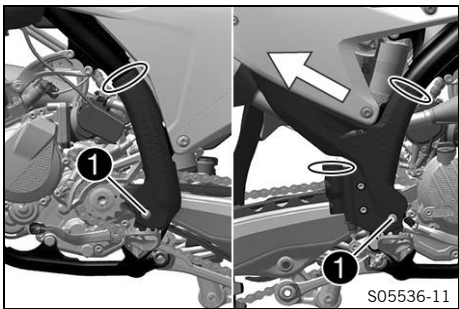


- Mount the washer and splint **1**.
- Repeat these steps on the opposite side.

Finishing work

- Install the frame protector. (📖 p. 55)

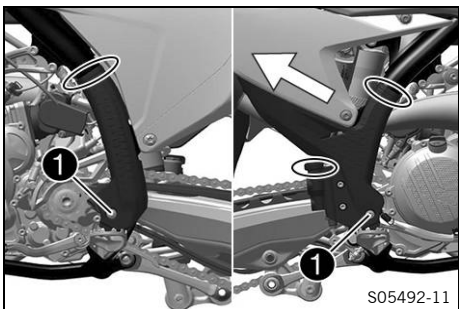
8.3 Removing the frame protector



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



8.4 Installing the frame protector



- Position the left frame protector.
- Insert the right frame protector from below and push it to the rear.
- Mount screws 1 with the bushings and tighten.

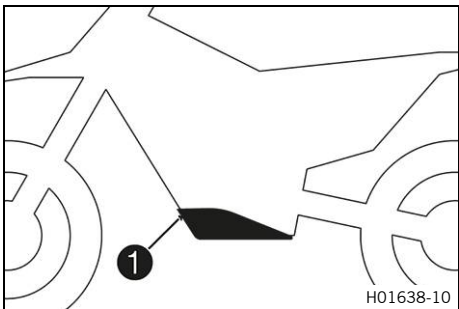
Guideline

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

- Secure the frame protector with cable ties.



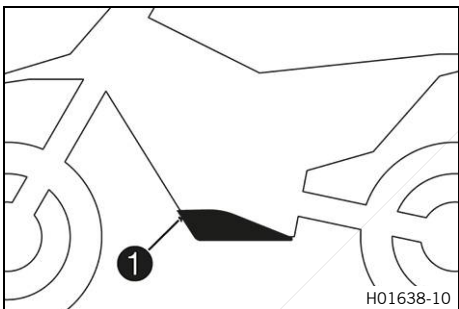
8.5 Removing the engine guard (All XC-W and special models)



- Remove screws 1 and engine guard.



8.6 Installing the engine guard (All XC-W and special models)



- Attach the engine guard on the frame at the rear and swing up at the front.
- Mount and tighten screws 1.

Guideline

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



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



Caution

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

- Please follow the description provided.



Info

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



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

Guideline

Highspeed compression damping	
Comfort	2.5 turns
Standard	2 turns
Sport	1.5 turns



Info

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

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



Caution

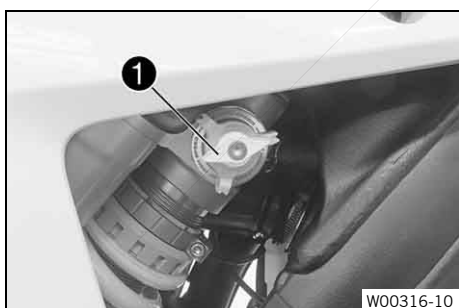
Risk of injury Parts of the shock absorber will move around if the shock absorber is detached incorrectly. The shock absorber is filled with highly compressed nitrogen.

- Please follow the description provided.



Info

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



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

Guideline

Lowspeed compression damping	
Comfort	18 clicks
Standard	15 clicks
Sport	12 clicks

**Info**

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



9.3 Adjusting the rebound damping of the shock absorber

**Caution**

Risk of injury Parts of the shock absorber will move around if the shock absorber is detached incorrectly.

The shock absorber is filled with highly compressed nitrogen.

- Please follow the description provided.



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

Guideline

Rebound damping	
Comfort	18 clicks
Standard	15 clicks
Sport	12 clicks

**Info**

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

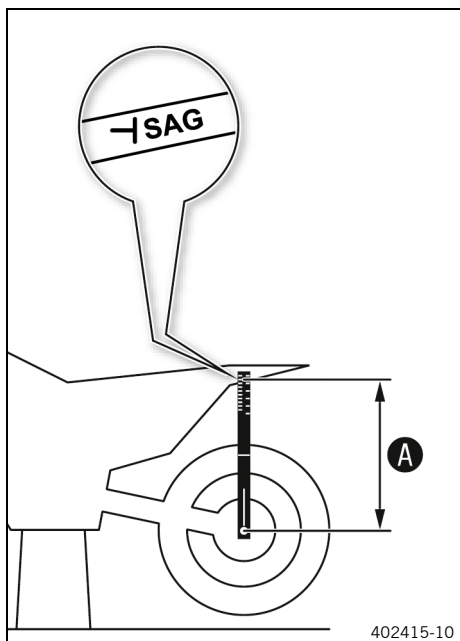


9.4 Measuring the dimension of the rear wheel unloaded

Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 13)

9 SHOCK ABSORBER, LINK FORK



Main work

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

Sag gauge (00029090100)

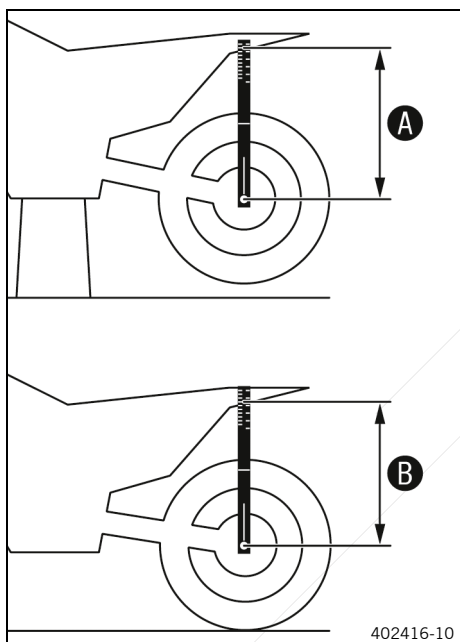
Pin, sag scale (00029990010)

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

Finishing work

- Remove the motorcycle from the lift stand. (p. 13)

9.5 Checking the static sag of the shock absorber



- Measure dimension **A** of rear wheel unloaded. (p. 57)
- Hold the motorcycle upright with aid of an assistant.
- Measure the distance again between the rear axle and marking **SAG** on the rear fender using the sag gage.
- Note the value as dimension **B**.



Info

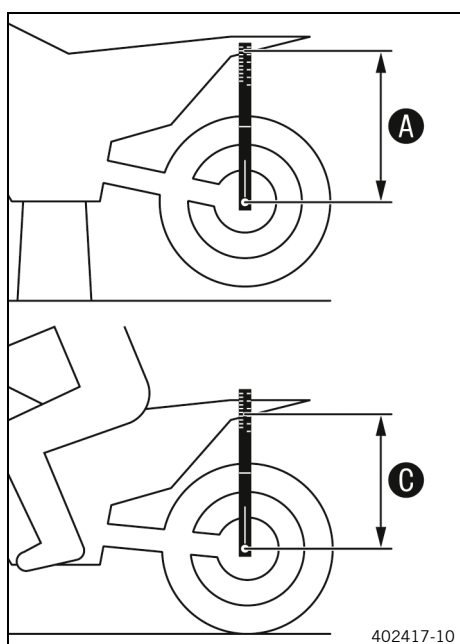
The static sag is the difference between measurements **A** and **B**.

- Check the static sag.

Static sag	38 mm (1.5 in)
------------	----------------

- » If the static sag is less or more than the specified value:
 - Adjust the spring preload of the shock absorber. (p. 59)

9.6 Checking the rider sag of the shock absorber



- Measure dimension **A** of rear wheel unloaded. (📖 p. 57)
- With another person holding the motorcycle, the rider, wearing full protective clothing, sits on the seat in a normal sitting position (feet on footrests) and bounces up and down a few times.
 - ✓ The rear wheel suspension levels out.
- Another person again measures the distance between the rear axle and marking **SAG** on the rear fender using the sag gage.
- Note the value as dimension **C**.



Info

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

- Check the rider sag.

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

- » If the rider sag differs from the specified measurement:
 - Adjust the rider sag. (📖 p. 60)

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.

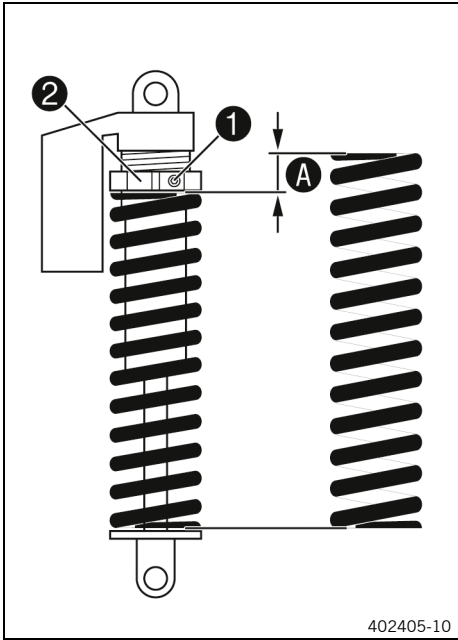


Info

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. 13)
- Remove the seat. (📖 p. 95)
- Remove the frame protector. (📖 p. 55)
- Remove main silencer. (📖 p. 86)
- Remove the shock absorber. (📖 p. 61)
- 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. 325)

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

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

Guideline

Spring preload	7 mm (0.28 in)
----------------	----------------

i Info
Depending on the static sag and/or the rider 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)
--------------------------------------	----	-------------------

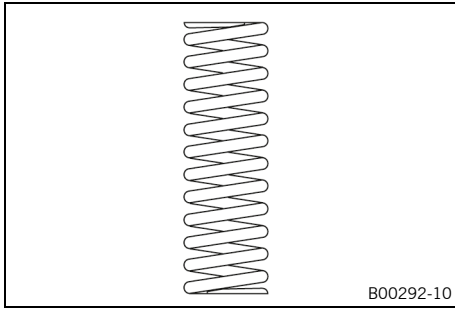
Finishing work

- Install the shock absorber. (p. 62)
- Install the main silencer. (p. 86)
- Install the frame protector. (p. 55)
- Mount the seat. (p. 95)
- Remove the motorcycle from the lift stand. (p. 13)

9.8 Adjusting the rider sag

Preparatory work

- Raise the motorcycle with a lift stand. (p. 13)
- Remove the seat. (p. 95)
- Remove the frame protector. (p. 55)
- Remove main silencer. (p. 86)
- Remove the shock absorber. (p. 61)
- After removing the shock absorber, clean it thoroughly.



Main work

- Select and mount a suitable spring.

Guideline

Spring rate	
Weight of rider: 65 ... 75 kg (143 ... 165 lb.)	66 N/mm (377 lb/in)
Weight of rider: 75 ... 85 kg (165 ... 187 lb.)	69 N/mm (394 lb/in)
Weight of rider: 85 ... 95 kg (187 ... 209 lb.)	72 N/mm (411 lb/in)



Info

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

Finishing work

- Install the shock absorber. (📖 p. 62)
- Install the main silencer. (📖 p. 86)
- Install the frame protector. (📖 p. 55)
- Mount the seat. (📖 p. 95)
- Remove the motorcycle from the lift stand. (📖 p. 13)
- Check the static sag of the shock absorber. (📖 p. 58)
- Check the rider sag of the shock absorber. (📖 p. 59)
- Adjust the rebound damping of the shock absorber. (📖 p. 57)



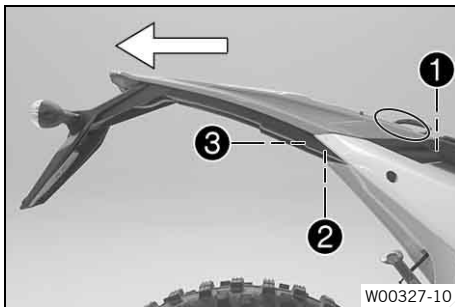
9.9 Removing the shock absorber

Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 13)
- Remove the seat. (📖 p. 95)
- Remove the frame protector. (📖 p. 55)
- Remove main silencer. (📖 p. 86)

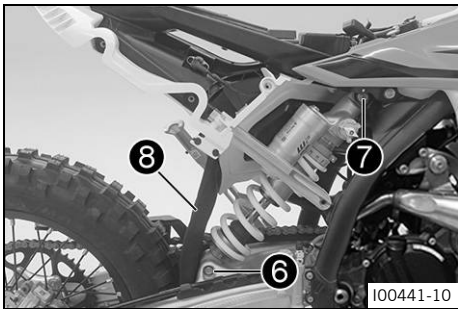
Main work

- Loosen and remove screws ❶. Disconnect the tail light and turn signal plug-in connections.
- Loosen screws ❷ and screws ❸ and remove them.
- Take off the license plate holder with tail light toward the rear.



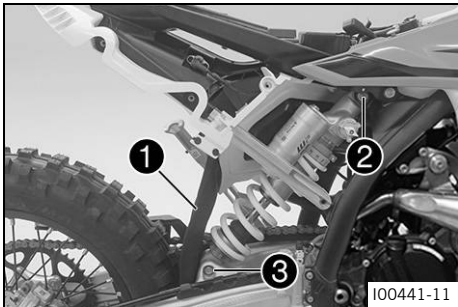
- Loosen and remove screw ❹.
- Loosen and remove screw ❺.
- Carefully take off the right side cover to the side.
- ✓ The right side cover also engages behind the spoiler.

9 SHOCK ABSORBER, LINK FORK



- Remove screw 6 and lower the rear wheel with the link fork as far as possible without blocking the rear wheel. Secure the rear wheel in this position.
- Remove screw 7, push splash protector 8 to the side, and remove the shock absorber.

9.10 Installing the shock absorber



Main work

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

Guideline

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

- Mount and tighten screw 3.

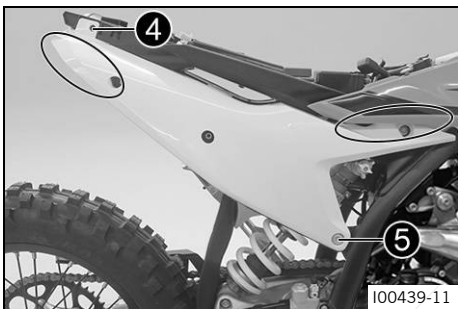
Guideline

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



Info

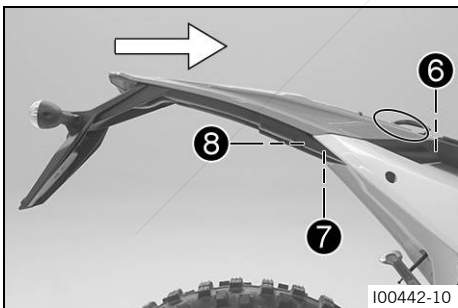
The heim joint for the shock absorber on the link fork is Teflon coated. It must not be lubricated with grease, nor with any other lubricants. Lubricants dissolve the Teflon coating, thereby drastically reducing the service life.



- Position the right side cover on the tail section.
 - ✓ Position the right side cover correctly behind the spoiler.
 - ✓ Ensure that it is correctly seated on the tail section.
- Mount and tighten screw 4.
 - ✓ Tighten screw hand-tight.
- Mount and tighten screw 5.

Guideline

Screw, sub-frame, top	M8	35 Nm (25.8 lbf ft) Loctite®243™
-----------------------	----	--



- Slide the license plate holder with tail light carefully onto the tail section.
 - ✓ Pay attention to cable routing.
 - Fit and tighten screws 6.
- #### Guideline
- | | | |
|---------------------------|----|--------------------|
| Remaining screws, chassis | M6 | 10 Nm (7.4 lbf ft) |
|---------------------------|----|--------------------|
- Connect the plug-in connections for the tail light and turn signals and secure and stow them well.
 - Mount and tighten screws 7.

Guideline

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

- Fit and tighten screws 8.

Guideline

Remaining screws, chassis	EJOT PT® K60x25-Z	2 Nm (1.5 lbf ft)
------------------------------	----------------------	-------------------

Finishing work

- Install the main silencer. (p. 86)
- Install the frame protector. (p. 55)
- Mount the seat. (p. 95)
- Remove the motorcycle from the lift stand. (p. 13)



9.11 Servicing the shock absorber



Caution

Risk of injury Parts of the shock absorber will move around if the shock absorber is detached incorrectly.

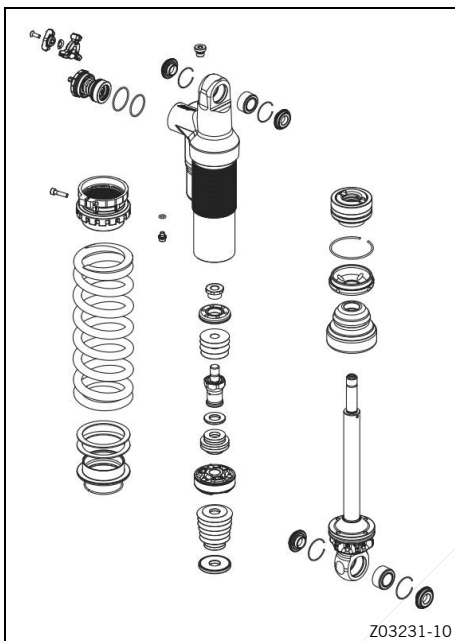
The shock absorber is filled with highly compressed nitrogen.

- Please follow the description provided.

Condition

The shock absorber has been removed.

- Remove the spring. (p. 64)
- Disassemble the damper. (p. 65)
- Disassemble the piston rod. (p. 66)
- Check the damper. (p. 67)
- Change the heim joint. (p. 68)
- Assemble the piston rod. (p. 70)
- Assemble the damper. (p. 71)
- Install the spring. (p. 77)



9.12 Removing the spring

Condition

The shock absorber has been removed.

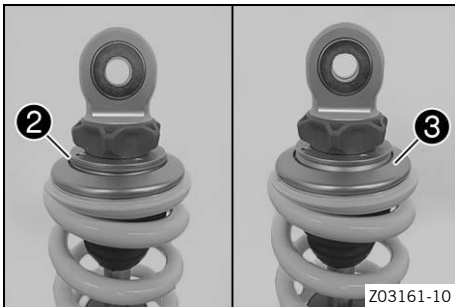
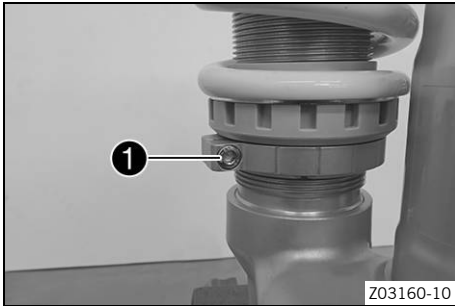
- Clamp the shock absorber into the vise.

Guideline

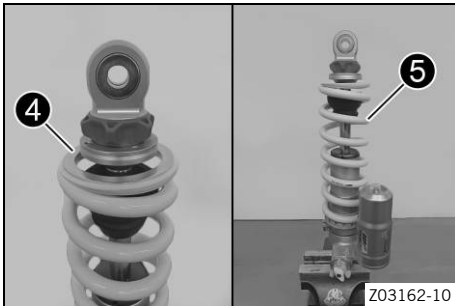
Use soft jaws.

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

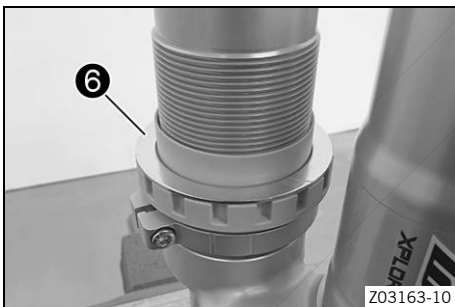
Hook wrench (90129051000) (📖 p. 325)



- Remove lock ring ②.
- Remove spring seat ③.



- Remove washer ④.
- Remove spring ⑤.



- Remove washer ⑥.

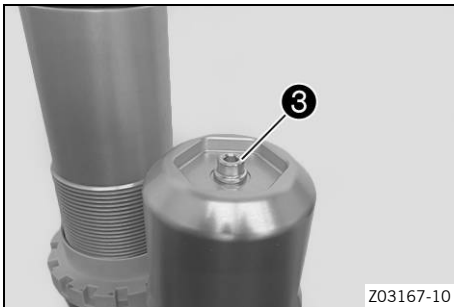
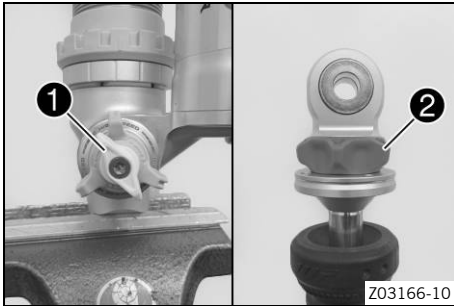
9.13 Disassembling the damper

Preparatory work

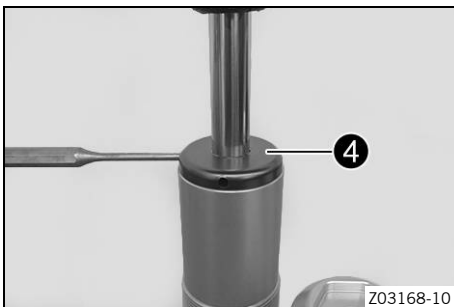
- Remove the spring. (📖 p. 64)

Main work

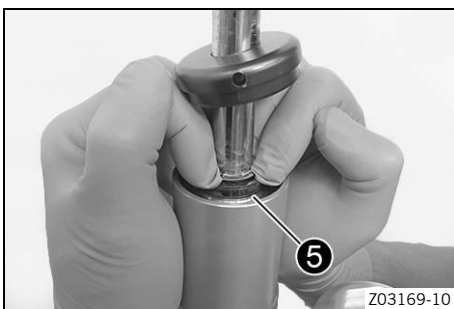
- Make a note of the present state of compression damping ❶ and rebound damping ❷.
- Open the adjusters of the compression and rebound damping completely.



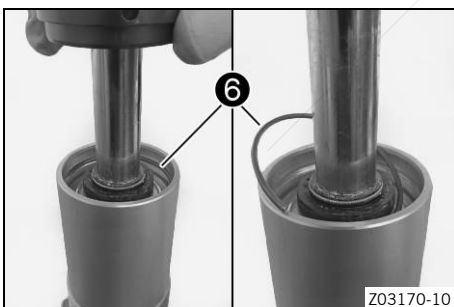
- Slowly open screw ❸.
- ✓ The nitrogen pressure dissipates.
- Remove screw ❸ with the O-ring.



- Remove locking cap ❹.



- Push in seal ring retainer ❺.



- Remove lock ring ❻.



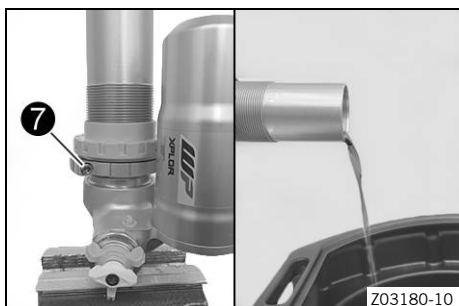
Info

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

9 SHOCK ABSORBER, LINK FORK



- Remove the piston rod.

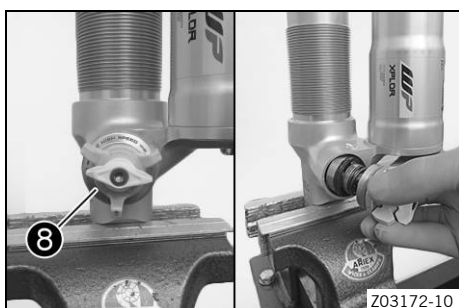


- Remove adjusting ring 7 with the clamping ring.
- Drain the oil.



Info

Place a collecting container underneath.



- Remove compression adjuster 8 using the special tool.
Remove the spring and piston.

Socket (T18004) (p. 334)



Info

Place a collecting container underneath.

9.14 Disassembling the piston rod

Preparatory work

- Remove the spring. (p. 64)
- Disassemble the damper. (p. 65)

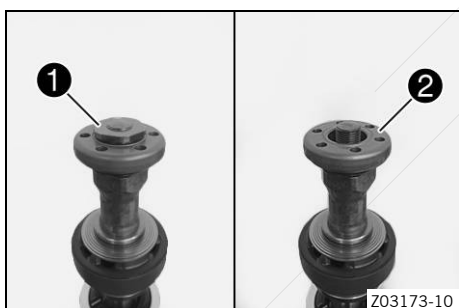
Main work

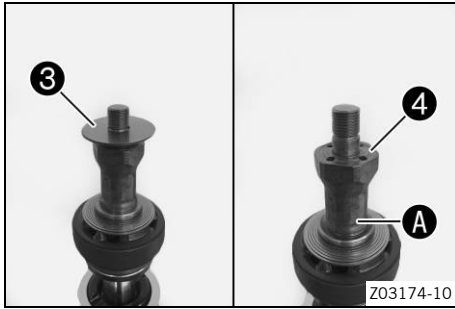
- Clamp the piston rod with the fork in a bench vise.

Guideline

Use soft jaws.

- Remove nut 1.
- Remove piston 2.





- Remove compression shim stack ③.

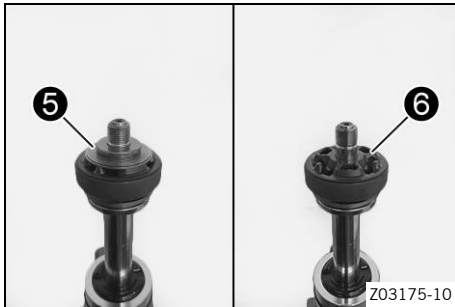
i Info
Guide the compression shim stack onto a screwdriver and put them aside together.

- Heat up support ④ in area A.

Guideline

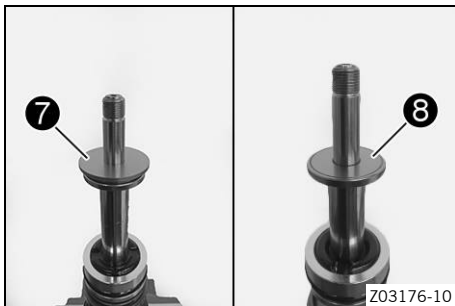
50 °C (122 °F)

- Remove holder.
- Remove rebound shim stack ⑤ and washer.



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

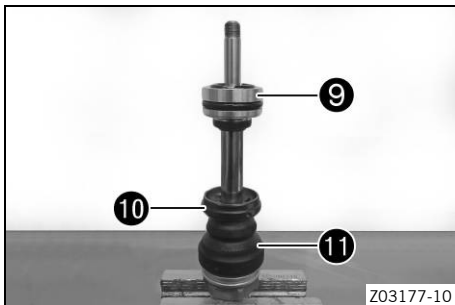
- Remove piston ⑥.



- Remove compression shim stack ⑦.

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

- Remove rebound washer ⑧.

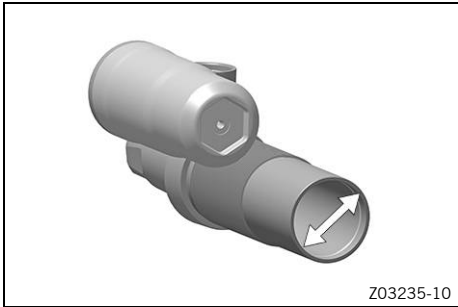


- Remove seal ring retainer ⑨.
- Remove locking cap ⑩ and rubber buffer ⑪.

9.15 Checking the damper

Condition

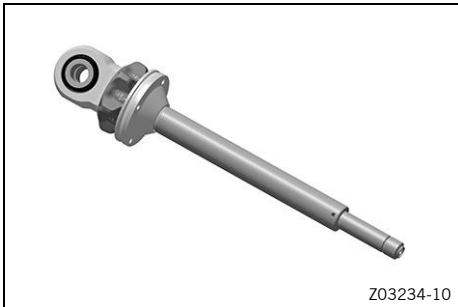
The damper has been disassembled.



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

Damper cartridge	
Diameter	$\leq 46.08\text{ mm } (\leq 1.8142\text{ in})$

- » 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.



- 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.

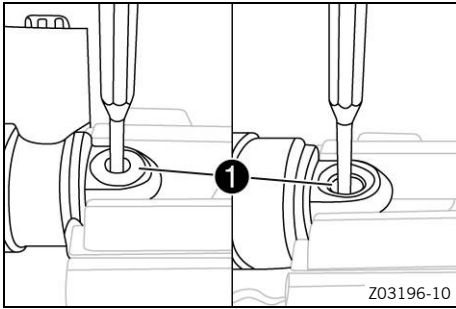
Piston rod	
Run-out	$\leq 0.02\text{ mm } (\leq 0.0008\text{ in})$

- » 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.



9.16 heim joint, changing

Condition
The shock absorber has been removed.



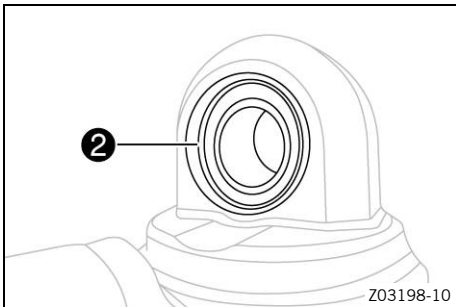
- Clamp the shock absorber into the vise.

Guideline

Use soft jaws.

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

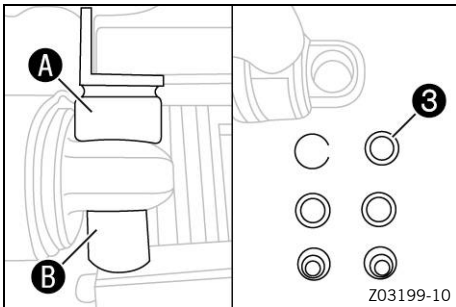
Drift (T120) (p. 330)



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

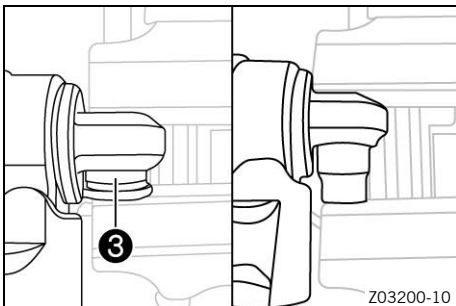
Pressing tool (T1207S) (p. 330)

- Remove second lock ring **2**.



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

Pressing tool (T1207S) (p. 330)



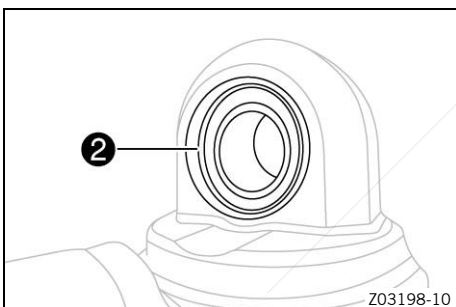
- Position new heim joint **3** and the special tool.

Guideline

Use soft jaws.

Pressing tool (T1206) (p. 330)

- Press the heim joint all the way in.

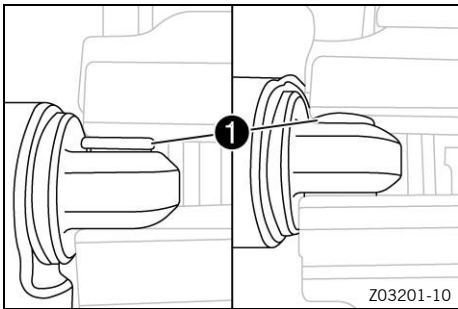


- Press the heim joint against the lock ring using the special tool.

Pressing tool (T1207S) (p. 330)

- Mount second lock ring **2**.

9 SHOCK ABSORBER, LINK FORK



- Position both collar bushings 1 and press in.

i Info
Always use new collar bushings.

9.17 Assembling the piston rod



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

Use soft jaws.

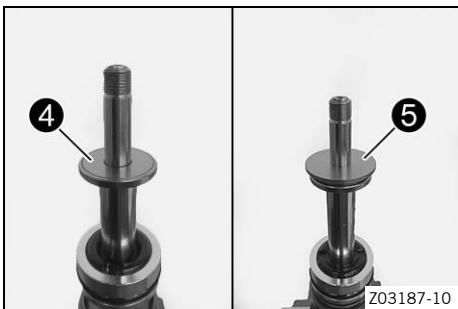
- Mount rubber buffer 1 and protection cap 2.
- Position special tool on the piston rod.

Mounting sleeve (T1554) (p. 333)

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

Lubricant (T625) (p. 316)

- Remove the special tool.



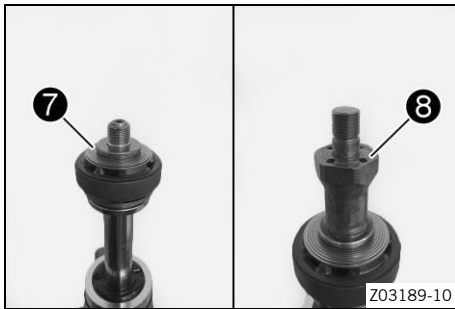
- Mount rebound washer 4 with cut-out facing down.
- Mount compression shim stack 5 with the smaller washers facing downward.



- Mount piston 6.

Guideline

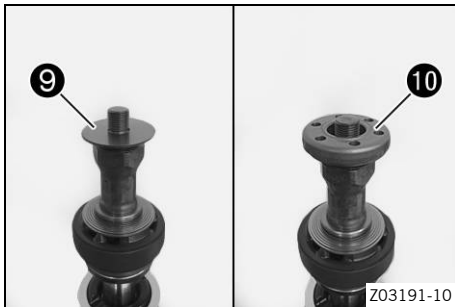
View A	of piston from above
View B	of piston from below



- Mount rebound shim stack 7 with the smaller washers facing upward.
- Mount and tighten support 8.

Guideline

Piston rod holder	M12x1	40 Nm (29.5 lbf ft) Loctite®2701™
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- Mount compression shim stack 9 with the smaller washers facing downward.
- Mount piston 10.



- Mount and tighten nut 11.

Guideline

Piston rod nut	M10x1	25 Nm (18.4 lbf ft)
----------------	-------	---------------------

9.18 Assembling the damper

Preparatory work

- Assemble the piston rod. (📖 p. 70)

Main work

- Grease the O-rings of the compression adjuster.

Lubricant (T159) (📖 p. 316)

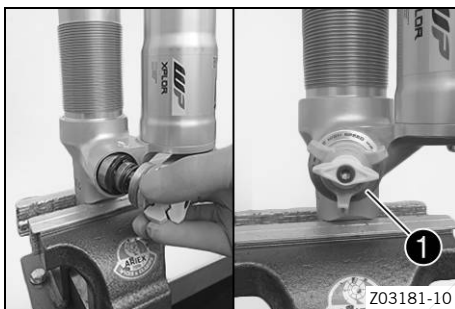
- Lubricate the thread.

Lubricant (T159) (📖 p. 316)

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

Guideline

Compression damping adjuster	M31x1	35 Nm (25.8 lbf ft)
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9 SHOCK ABSORBER, LINK FORK



- Clamp the damper in a bench vise.

Guideline

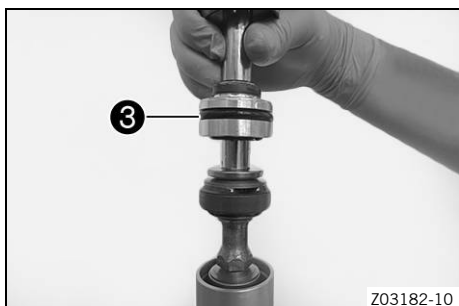
Use soft jaws.

- Mount adjusting ring (2) with the clamping ring.



Info

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



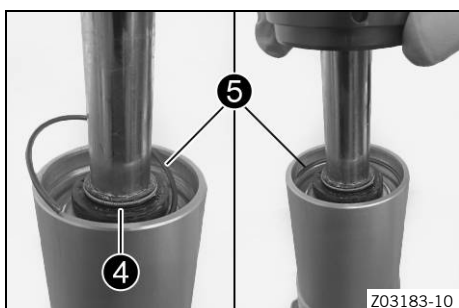
- Fill the damper cartridge about half full.

Shock absorber fluid (SAE 2.5) (50180751S1) (p. 315)

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

Lubricant (T158) (p. 316)

- Mount the piston rod carefully.



- Mount seal ring retainer (4) and slide it under the ring groove.

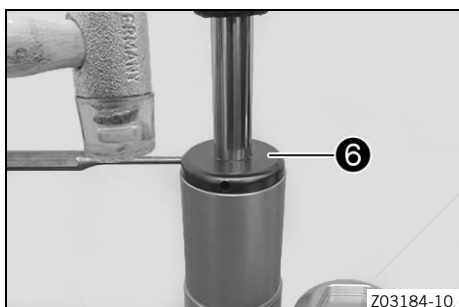
- Mount lock ring (5).



Info

Do not scratch the inside surface.

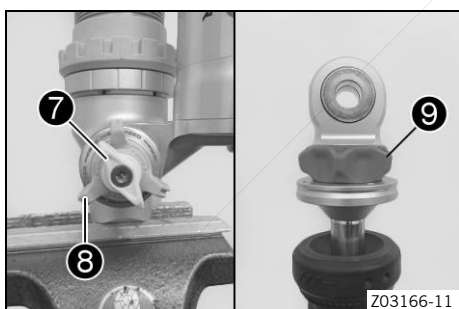
- Pull out the piston rod until the seal ring retainer is flush with the lock ring.



- Mount locking cap (6) of the damper cartridge.

- Bleed and fill the damper. (p. 73)

- Fill the damper with nitrogen. (p. 76)



Alternative 1

- Turn adjusting screw (7) clockwise up to the last perceptible click.

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

Guideline

Lowspeed compression damping	
Comfort	18 clicks
Standard	15 clicks
Sport	12 clicks

- Turn adjusting screw (8) clockwise all the way.

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

Guideline

Highspeed compression damping	
Comfort	2.5 turns
Standard	2 turns
Sport	1.5 turns

- Turn adjusting screw ⑨ clockwise up to the last perceptible click.
- Turn counterclockwise by the number of clicks corresponding to the shock absorber type.

Guideline

Rebound damping	
Comfort	18 clicks
Standard	15 clicks
Sport	12 clicks

Alternative 2



Warning

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

Modifications which are not coordinated with others 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.



9.19 Bleeding and filling the damper

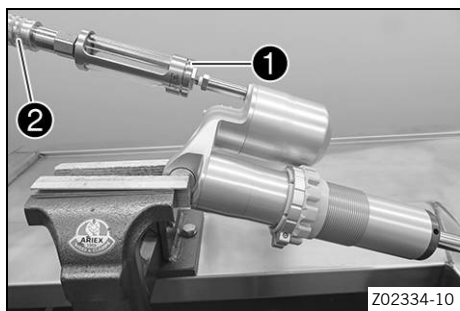


Info

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.

9 SHOCK ABSORBER, LINK FORK



- 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. 331)

- 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

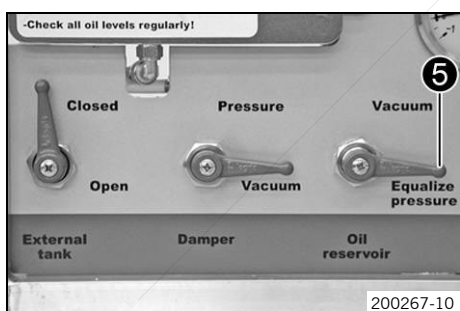
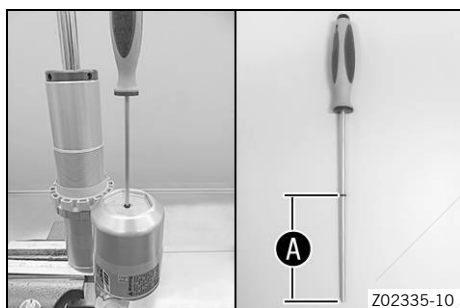
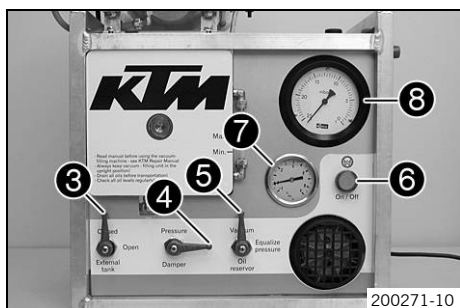
- ✓ Vacuum gauge 8 drops to the required value.

4 mbar

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

Depth micrometer (T107S) (p. 330)

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



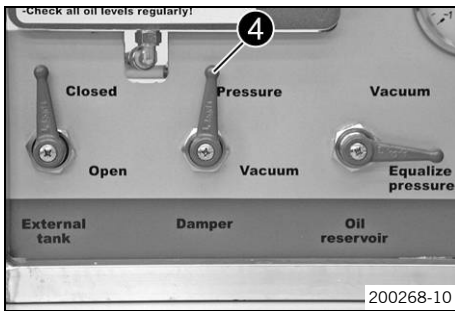
- When the vacuum gauge reaches the required value, turn control lever **Oil reservoir** 5 to **Equalize pressure**.

Guideline

4 mbar

- ✓ The pressure gauge increases to the required value.

0 bar



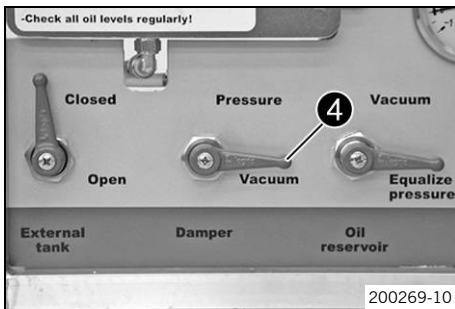
- When the pressure gauge reaches the specified value, turn control lever **Damper 4** to **Pressure**.

Guideline

0 bar

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

3 bar



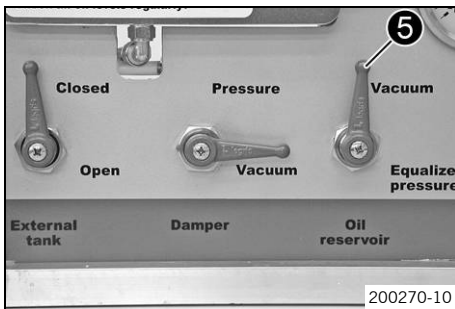
- When the pressure gauge reaches the specified value, turn control lever **Damper 4** to **Vacuum**.

Guideline

3 bar

- ✓ The pressure gauge drops to the required value.

0 bar



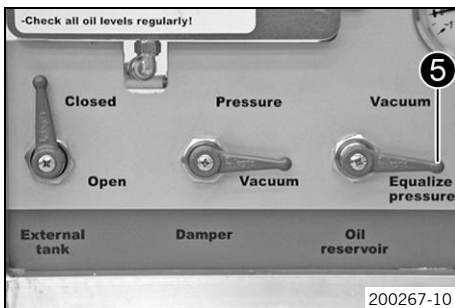
- When the pressure gauge reaches the specified value, turn control lever **Oil reservoir 5** to **Vacuum**.

Guideline

0 bar

- ✓ The vacuum gauge drops to the required value.

4 mbar



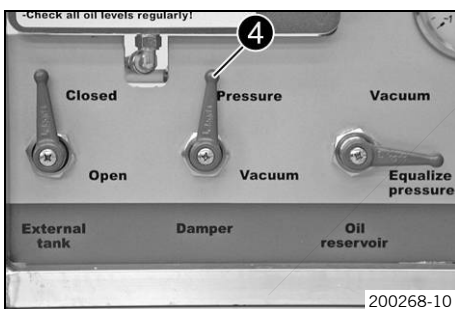
- When the vacuum gauge reaches the required value, turn control lever **Oil reservoir 5** to **Equalize Pressure**.

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**.

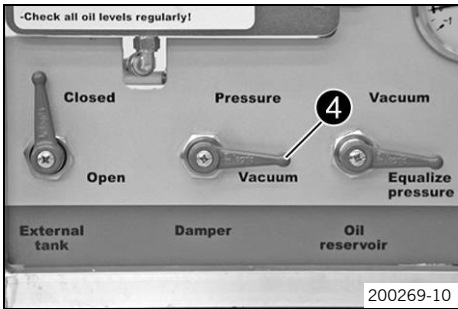
Guideline

0 bar

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

3 bar

9 SHOCK ABSORBER, LINK FORK



- 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.

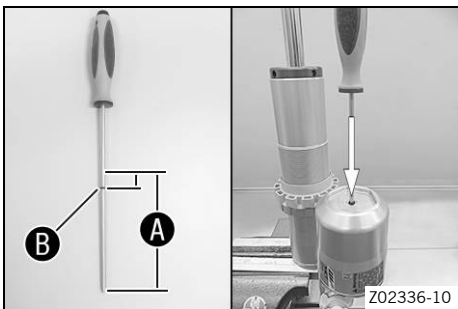
- Slide O-ring **B** to the end of the special tool by the specified value (distance **A** minus specified value).

Guideline

5 mm

Depth micrometer (T107S) (p. 330)

- 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.



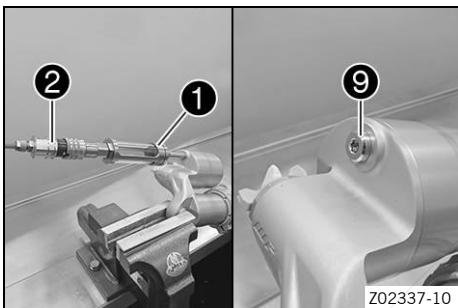
Info

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

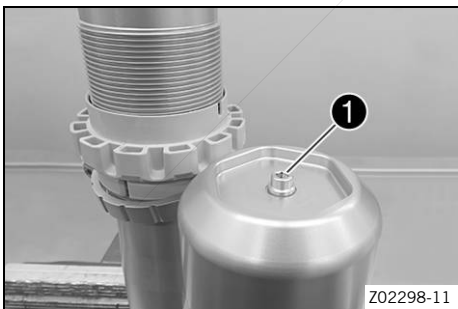
- Remove the adapter.
- Mount and tighten screw **9**.

Guideline

Filling port screw	1/8"	14 Nm (10.3 lbf ft)
--------------------	------	---------------------



9.20 Filling the damper with nitrogen

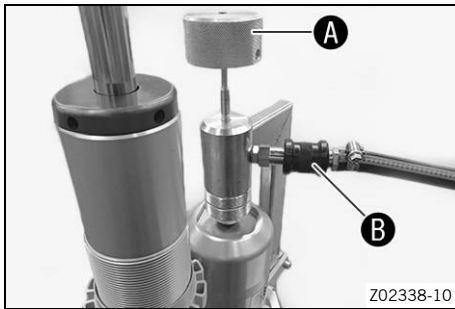


- Mount screw **1** with the O-ring and screw in approx. 2 full turns, but do not tighten it fully.



Info

The piston rod is fully extended.



- Secure the special tool in the vise.

Filling tool (T170S1) (p. 333)

Filling adapter (T18001) (p. 334)

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

Filling gas - nitrogen

- Adjust the pressure regulator.

Guideline

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

- Position the damper in the special tool.

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

- Open filler tap **B**.

- Fill the damper for at least 15 seconds.

Guideline

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



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.

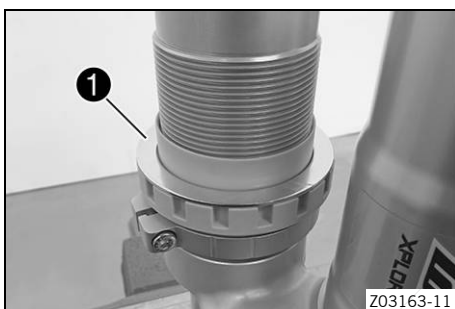
- Tighten the filling port screw.

Guideline

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

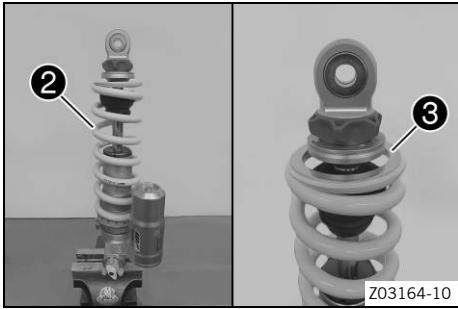


9.21 Installing the spring



- Mount washer **1**.

9 SHOCK ABSORBER, LINK FORK

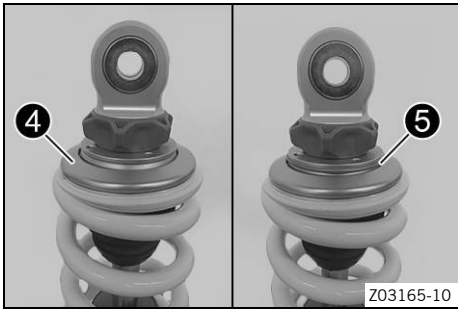


- Measure the total spring length while the spring is not under tension.
- Position spring ②.

Guideline

Spring rate	
Weight of rider: 65 ... 75 kg (143 ... 165 lb.)	66 N/mm (377 lb/in)
Weight of rider: 75 ... 85 kg (165 ... 187 lb.)	69 N/mm (394 lb/in)
Weight of rider: 85 ... 95 kg (187 ... 209 lb.)	72 N/mm (411 lb/in)

- Mount washer ③.
- Mount spring seat 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. 325)	

Alternative 2



Warning

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

Modifications which are not coordinated with others 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.

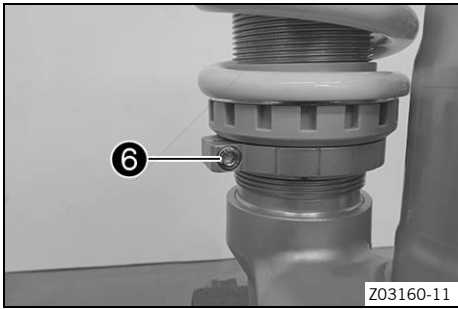
- Tension the spring to the length measured during disassembly by turning the adjusting ring.

Hook wrench (90129051000) (📖 p. 325)	
--------------------------------------	--

- Tighten screw ⑥.

Guideline

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



9.22 Checking the link fork



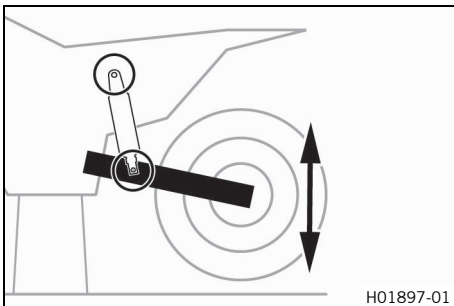
- Check the link fork for damage, cracks, and deformation.
 - » If the link fork shows signs of damage, cracks, or deformation:

- Change the link fork.

Guideline

Repairs on the link fork are not permitted.

9.23 Checking the shock absorber heim joint for play



Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 13)
- Place a load on the front of the vehicle.
- ✓ The rear wheel is not in contact with the ground.

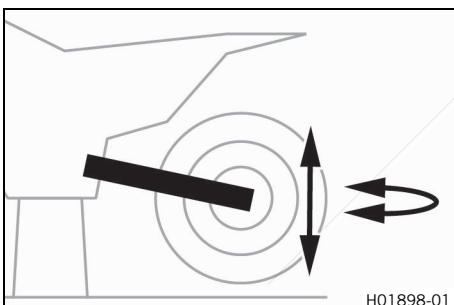
Main work

- Check the top and bottom heim joints.
- Move the link fork up and down.
 - » If there is detectable play:
 - Change the heim joint. (📖 p. 68)

Finishing work

- Remove the load from the front of the vehicle.
- Remove the motorcycle from the lift stand. (📖 p. 13)

9.24 Checking the fork bearing for play



Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 13)
- Place a load on the front of the vehicle.
- ✓ The rear wheel is not in contact with the ground.

Main work

- Move the link fork up and down.
 - » If there is detectable play:
 - Change the link fork bearing. (📖 p. 82)
- Move the link fork from one side to the other.
 - » If there is detectable play:
 - Change the link fork bearing. (📖 p. 82)

Finishing work

- Remove the motorcycle from the lift stand. (📖 p. 13)

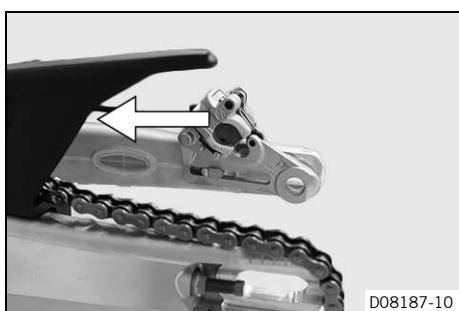
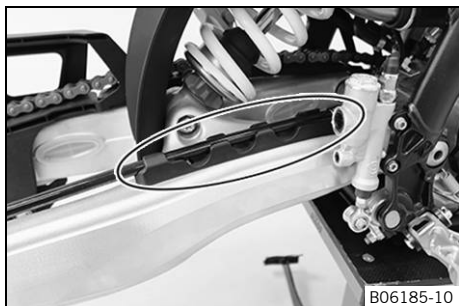
9.25 Removing the link fork

Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 13)
- Remove the rear wheel. (📖 p. 119)
- Remove the frame protector. (📖 p. 55)

Main work

- Take the brake line out of the guide.

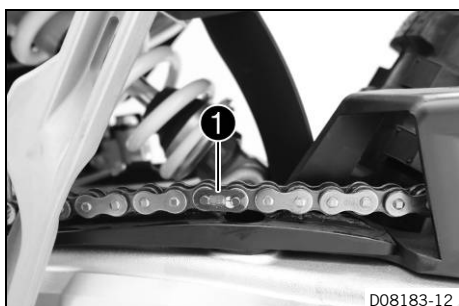


- Push the brake caliper forward, slip it out, and hang it to the side.



Info

Cover the components to protect them against damage.



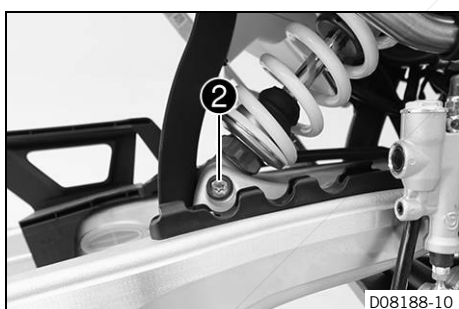
- Remove connecting link ① of the chain.



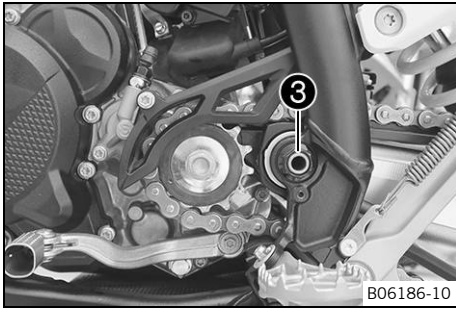
Info

Cover the components to protect them against damage.

- Take off the chain.



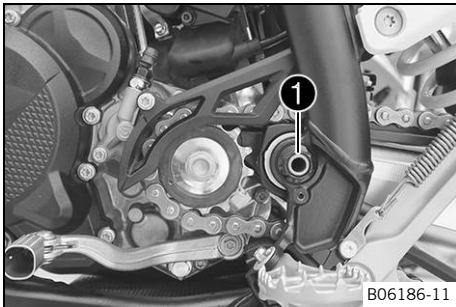
- Remove screw ②.
- Push the link fork down and away from the shock absorber.



- Remove nut ③.
- Remove the swingarm pivot.
- Take off the link fork.



9.26 Installing the link fork

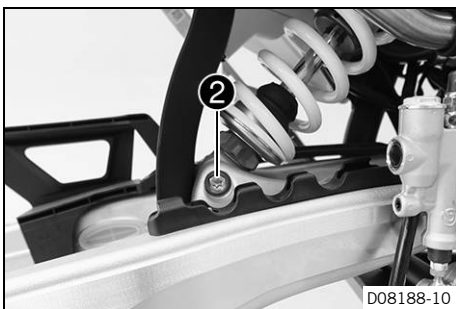


Main work

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

Guideline

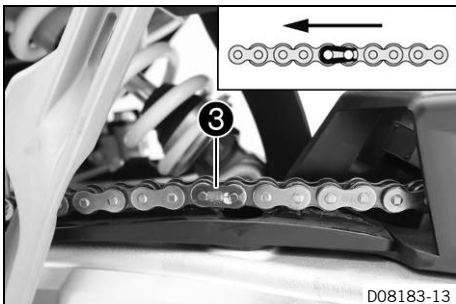
Nut, fork pivot	M16x1.5	100 Nm (73.8 lbf ft)
-----------------	---------	-------------------------



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

Guideline

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

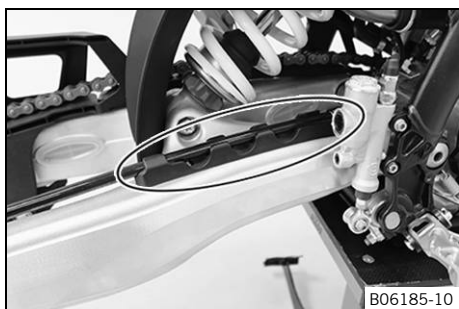
Guideline

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



- Position the brake caliper.

9 SHOCK ABSORBER, LINK FORK



- Position the brake line in the guide.

Finishing work

- Install the rear wheel. (📖 p. 120)
- Check the chain tension. (📖 p. 125)
- Remove the motorcycle from the lift stand. (📖 p. 13)
- Install the frame protector. (📖 p. 55)

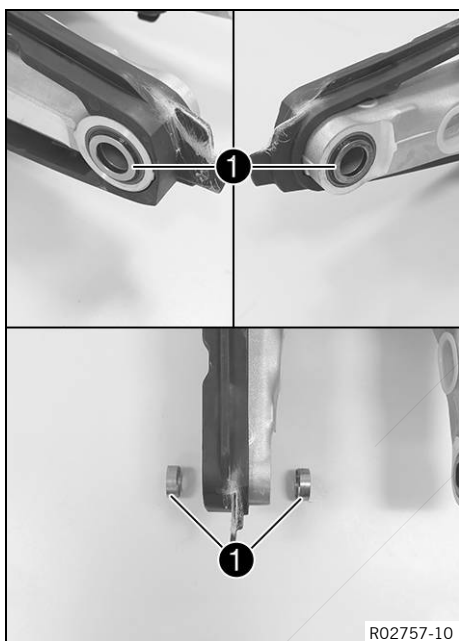
9.27 Changing the link fork bearing

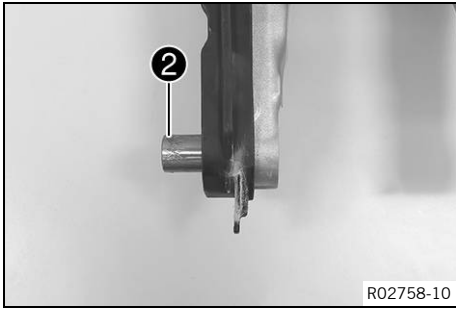
Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 13)
- Remove the rear wheel. (📖 p. 119)
- Remove the frame protector. (📖 p. 55)
- Remove the link fork. (📖 p. 80)

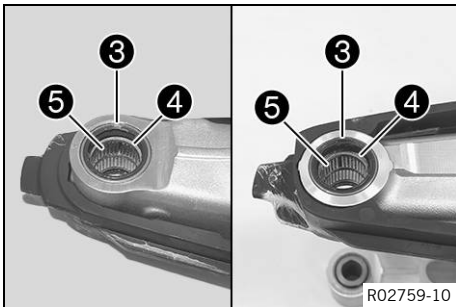
Left fork bearing

- Remove collar bushings ❶.

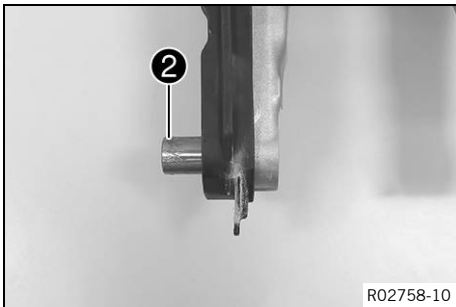




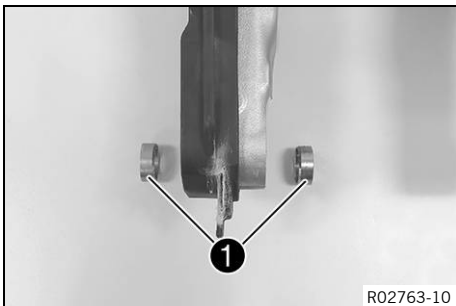
- Remove bushing ②.



- Remove radial 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 radial shaft seal rings ③.



- Mount bushing ②.

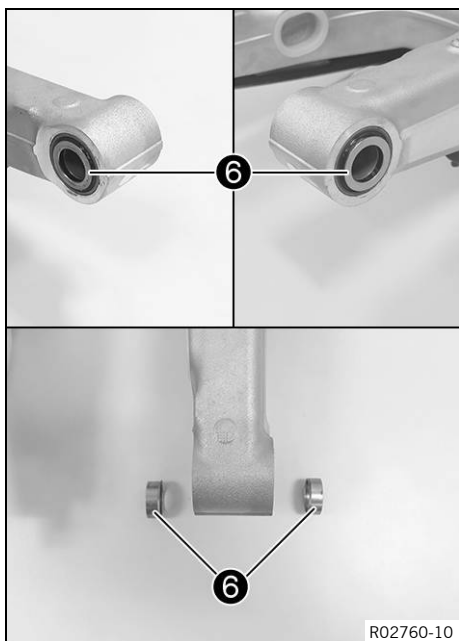


- Grease the radial shaft seal rings.

Long-life grease (📖 p. 316)

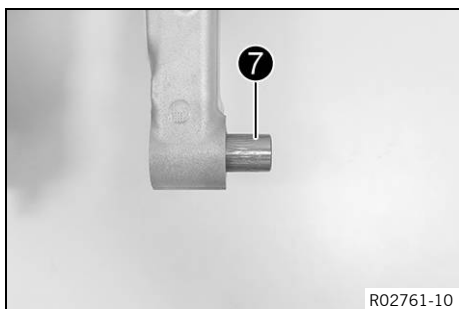
- Position the collar bushings ① with the shoulder facing inward.

9 SHOCK ABSORBER, LINK FORK

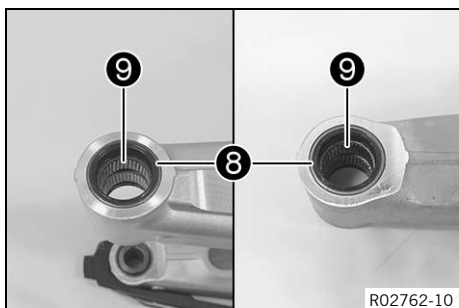


Right fork bearing

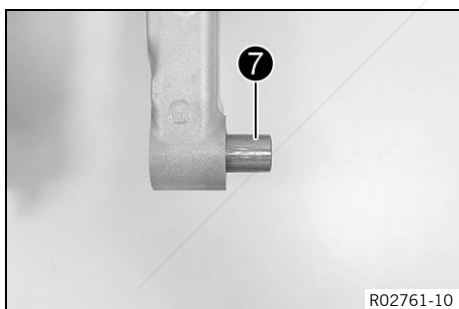
- Remove collar bushings ⑥.



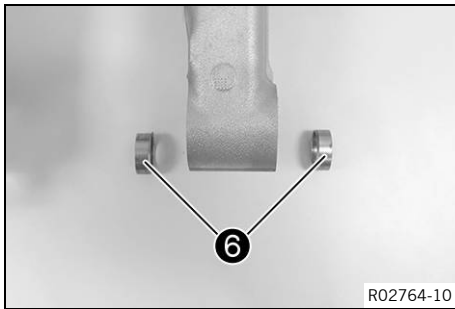
- Remove bushing ⑦.



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



- Mount bushing ⑦.



- Grease the radial shaft seal rings.

Long-life grease (📖 p. 316)

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

Finishing work

- Install the link fork. (📖 p. 81)
- Install the rear wheel. (📖 p. 120)
- Check the chain tension. (📖 p. 125)
- Remove the motorcycle from the lift stand. (📖 p. 13)
- Install the frame protector. (📖 p. 55)

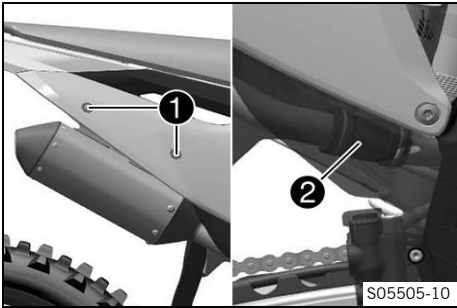
10.1 Removing the main silencer



Warning

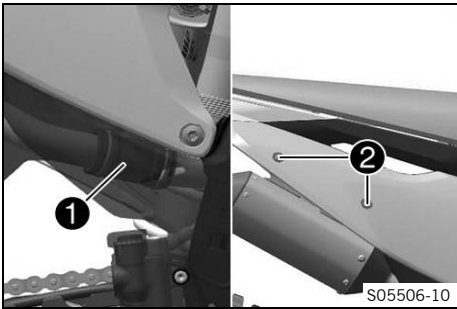
Danger of burns The exhaust system gets hot when the vehicle is driven.

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



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

10.2 Installing the main silencer



- Mount the main silencer with rubber sleeve ❶ and the spring rings.
- Mount and tighten screws ❷.

Guideline

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

10.3 Removing the manifold



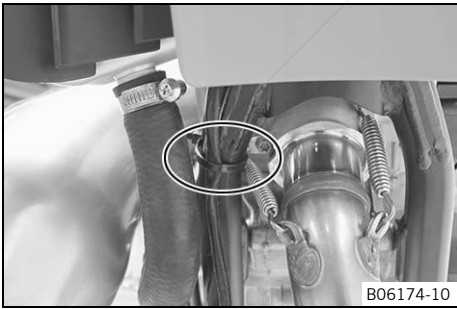
Warning

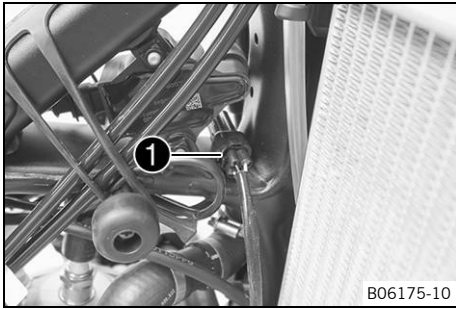
Danger of burns The exhaust system gets hot when the vehicle is driven.

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

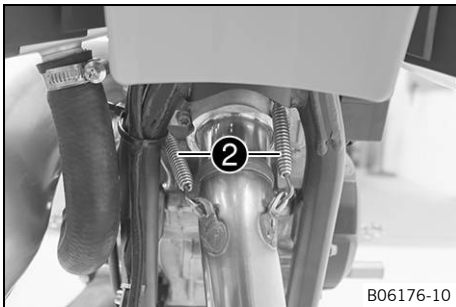
- Preparatory work**
- Remove main silencer. (📖 p. 86)

- Main work**
(All EU models)
- Remove the fuel tank. (📖 p. 96)
 - Remove the cable tie(s) and expose the cable.



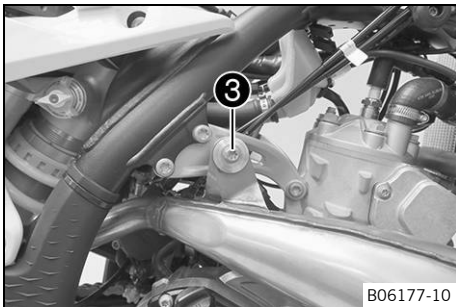


- Disconnect plug-in connector **1** of the lambda sensor.
- Expose the cable.

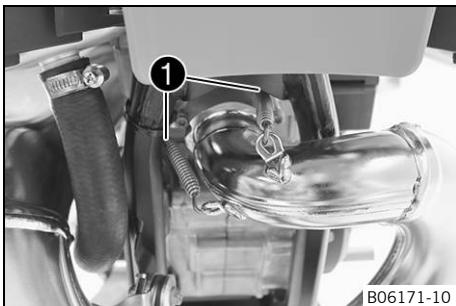


- Remove springs **2**.

Spring hook (50305017000C1) (📖 p. 329)



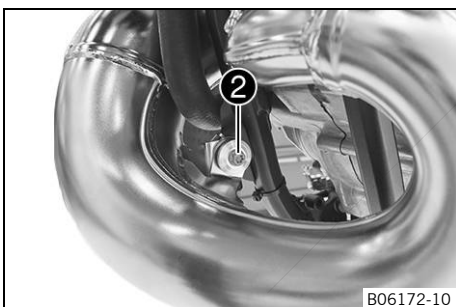
- Remove screw **3**.
- Take off the manifold in a forward direction.



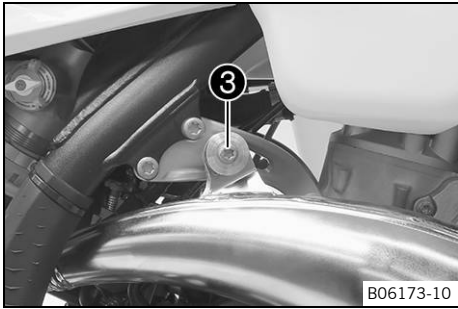
(All EU models apart from EU)

- Remove springs **1**.

Spring hook (50305017000C1) (📖 p. 329)

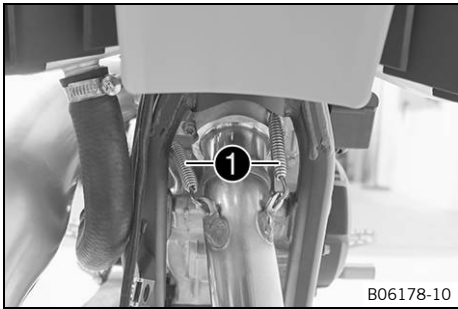


- Remove screw **2**.



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

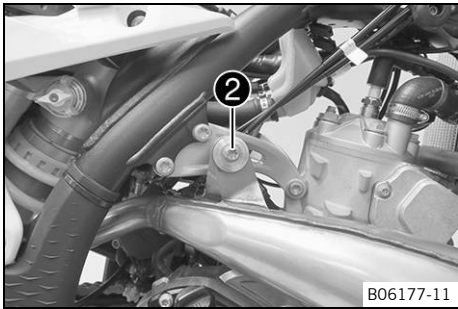
10.4 Installing the manifold



Main work
(All EU models)

- Position the manifold and mount springs ①.

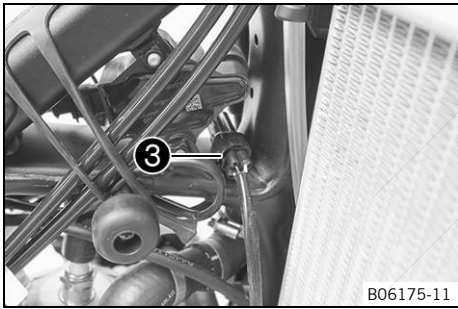
Spring hook (50305017000C1) (📖 p. 329)



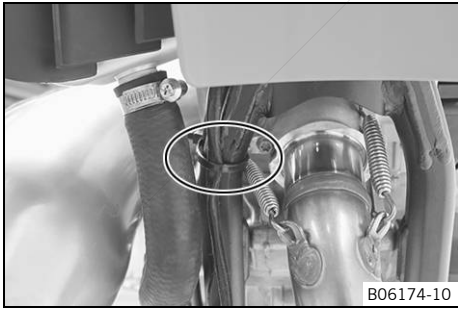
- Mount and tighten screw ②.

Guideline

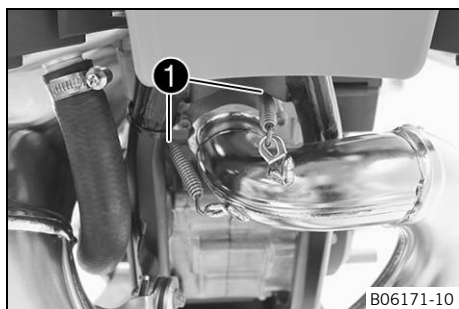
Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
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- Join plug-in connector ③ of the lambda sensor.



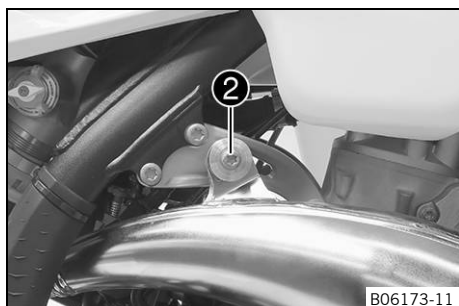
- Route the cable without tension and secure it with a cable tie.
- Install the fuel tank. (📖 p. 97)



(All EU models apart from EU)

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

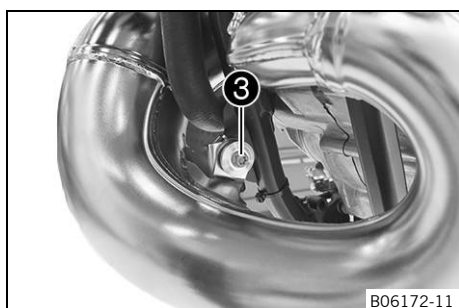
Spring hook (50305017000C1) (📖 p. 329)



- Mount screw **2**, but do not tighten it yet.

Guideline

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



- Mount and tighten screw **3**.

Guideline

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

- Tighten screw **2**.

Guideline

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

Finishing work

- Install the main silencer. (📖 p. 86)



10.5 Changing the glass fiber yarn filling of the main silencer



Warning

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

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

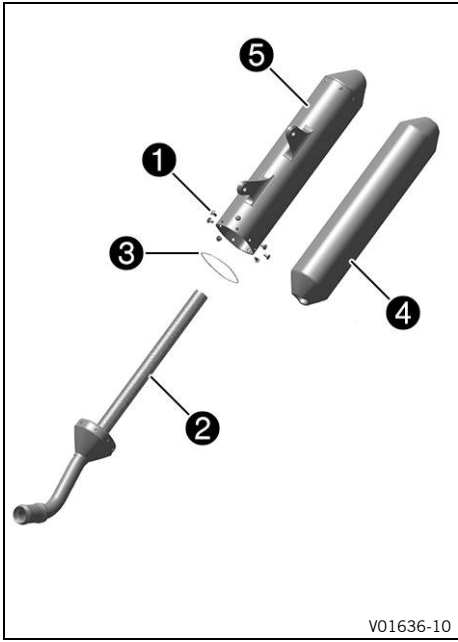


Info

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

Preparatory work

- Remove main silencer. (📖 p. 86)



Main work

- Remove screws ①. Pull out inner tube ② with O-ring ③.
- Pull glass fiber yarn filling ④ from the inner tube.
- Clean the parts that need to be reinstalled and check for damage.
- Mount new glass fiber yarn filling ④ on the inner tube.
- Push outer tube ⑤ over the inner tube with the new glass fiber yarn filling and the O-ring.
- Mount and tighten all screws ①.

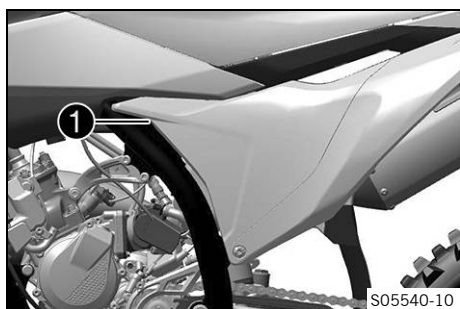
Guideline

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

Finishing work

- Install the main silencer. (📖 p. 86)

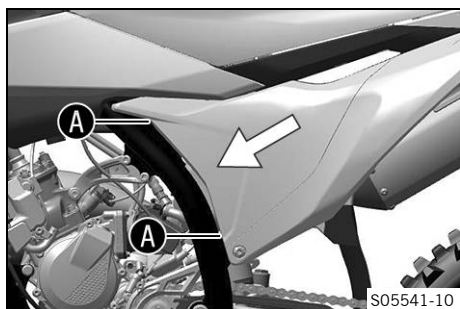
11.1 Removing the air filter box cover



Condition

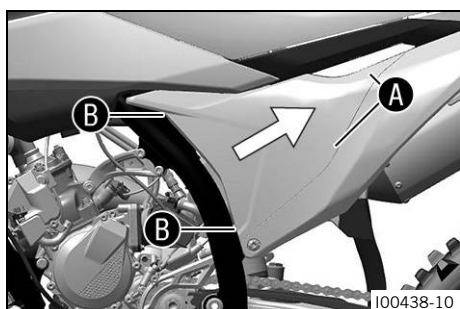
The air filter box cover is secured.

- Remove screw 1.

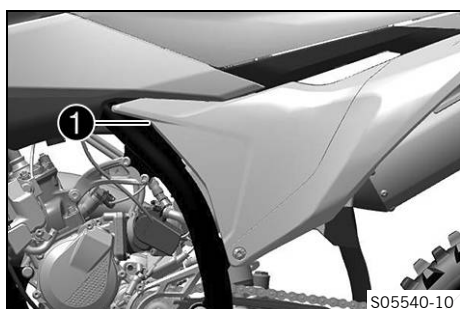


- Pull off the air filter box cover in area A and push it sideways and forward. Take off the air filter box cover.

11.2 Installing the air filter box cover



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



Condition

The air filter box cover is secured.

- Mount and tighten screw 1.

Guideline

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

11.3 Removing the air filter

Note

Engine damage Unfiltered intake air has a negative effect on the service life of the engine.

Dust and dirt will enter the engine without an air filter.

- Only operate the vehicle if it is equipped with an air filter.



Note

Environmental hazard Hazardous substances cause environmental damage.

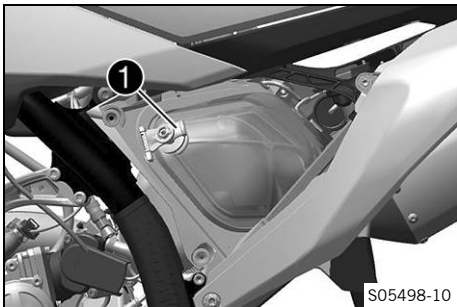
- Dispose of oils, grease, filters, fuel, cleaning agents, brake fluid, etc., correctly and in compliance with the applicable regulations.

Preparatory work

- Remove the air filter box cover. (📖 p. 91)

Main work

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

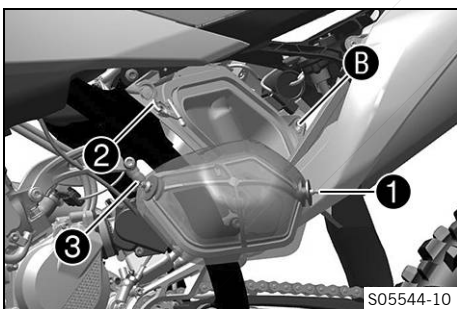
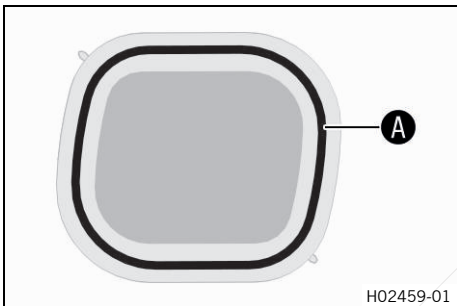


11.4 Installing the air filter

Main work

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

Long-life grease (📖 p. 316)



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



Info

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

Finishing work

- Install the air filter box cover. (📖 p. 91)

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. 91)
- Remove the air filter. (📖 p. 92)

Main work

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

Air filter cleaner (📖 p. 316)



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. 317)

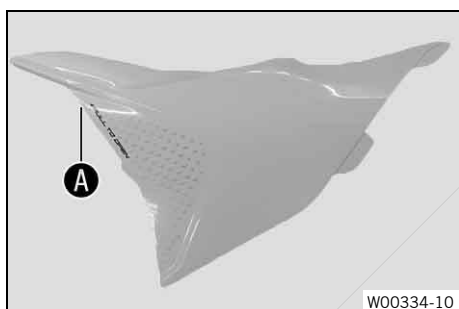
- Clean the air filter box.
- Clean the intake flange and check it for damage and tightness.

Finishing work

- Install the air filter. (📖 p. 92)
- Install the air filter box cover. (📖 p. 91)



11.6 Preparing air filter box cover for securing



Preparatory work

- Remove the air filter box cover. (📖 p. 91)

Main work

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

Guideline

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

Finishing work

- Install the air filter box cover. (📖 p. 91)



12.1 Opening the fuel tank filler cap



Danger

Fire hazard Fuel is highly flammable.

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

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



Warning

Danger of poisoning Fuel is harmful to health.

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



Note

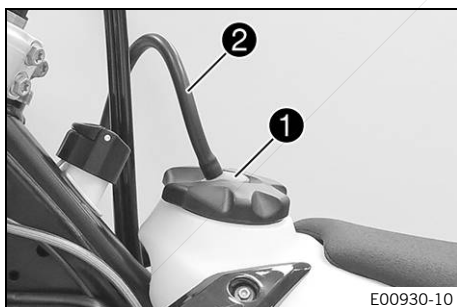
Environmental hazard Improper handling of fuel is a danger to the environment.

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



- Press release button **1**, turn the fuel tank filler cap counter-clockwise, and lift it off.

12.2 Closing the fuel tank filler cap



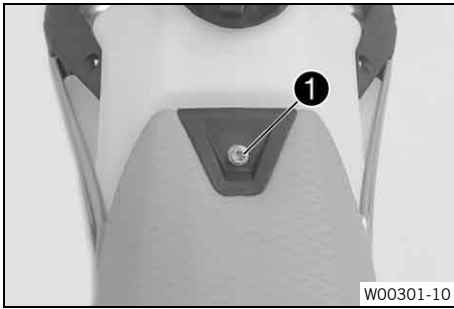
- Mount the fuel tank filler cap and turn it clockwise until release button **1** engages.



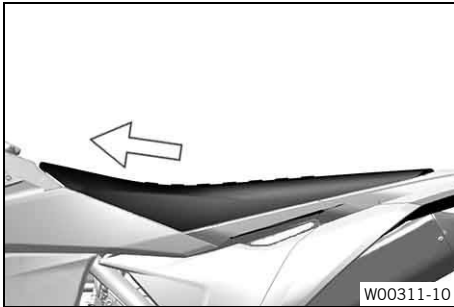
Info

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

12.3 Removing the seat

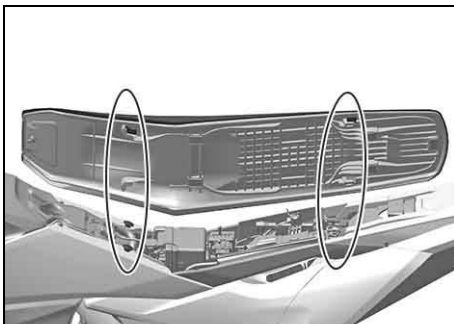


- Remove screw 1.

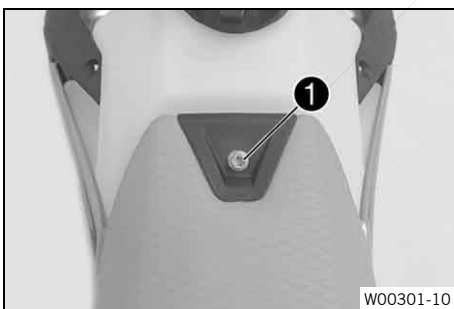
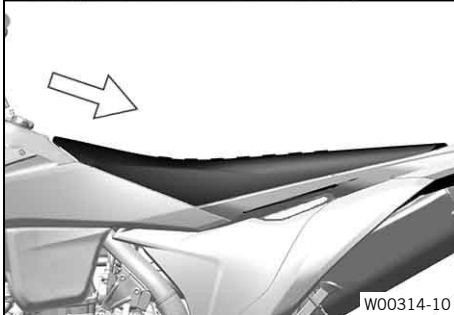


- Pull seat toward the fuel tank and lift it off.

12.4 Mounting the seat



- Mount the front of the seat on the collar bushings of the fuel tank, lower the seat at the rear, and push the seat to the rear.
 ✓ The holding lugs engage in the recesses at the back.
- Make sure the seat is latched in place correctly.



- Mount and tighten screw 1.

Guideline

Screw, seat fixing	M6	8 Nm (5.9 lbf ft)
--------------------	----	-------------------

12.5 Removing the fuel tank



Danger

Fire hazard Fuel is highly flammable.

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

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



Warning

Danger of poisoning Fuel is harmful to health.

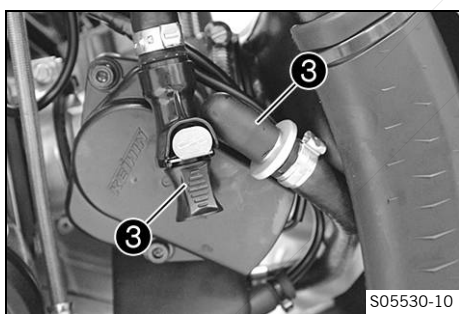
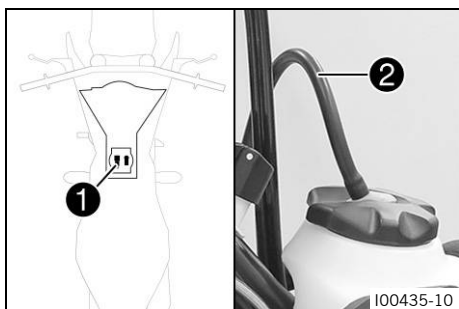
- Avoid skin, eye and clothing contact with fuel.
- Immediately consult a doctor if you swallow fuel.
- Do not inhale fuel vapors.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse the eyes thoroughly with water, and consult a doctor in case of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

Preparatory work

- Remove the seat. (📖 p. 95)

Main work

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



- Clean the quick release coupling thoroughly with compressed air.



Info

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

- Disconnect the quick release coupling.

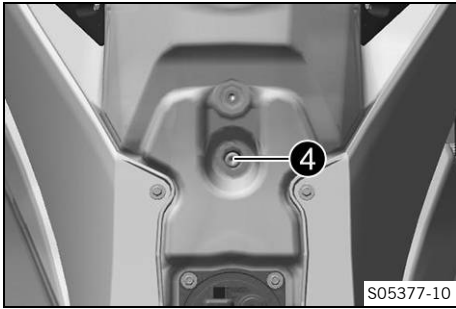


Info

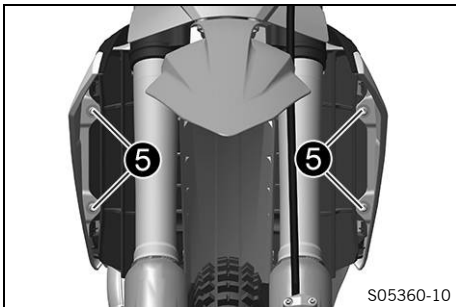
Remaining fuel may flow out of the fuel hose.

- Mount wash cap set ③.

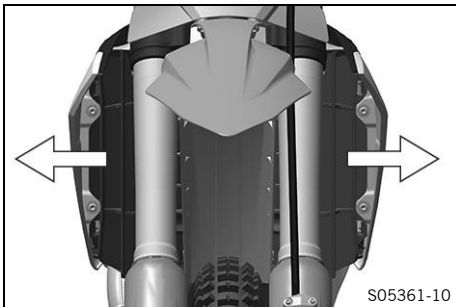
Wash cap set (81212016100)



- Remove screw 4 with the rubber bushing.



- Remove screws 5 with the collar bushings.
- (All EXC models)**
- Hang the horn and horn bracket to one side.



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

12.6 Installing the fuel tank



Danger

Fire hazard Fuel is highly flammable.

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

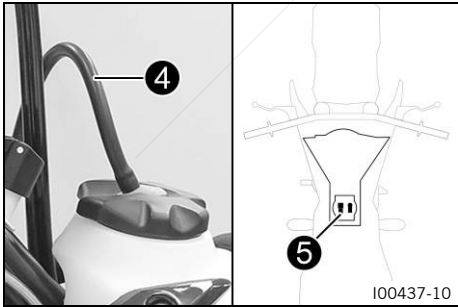
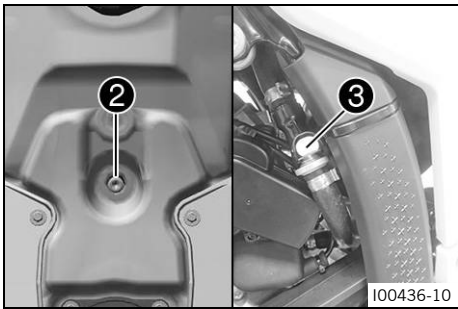
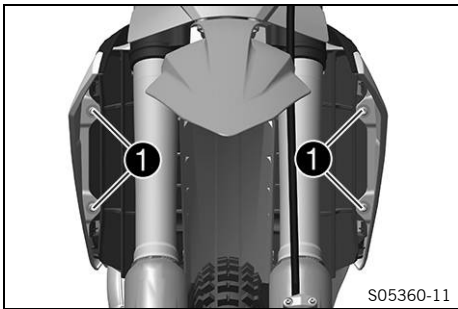
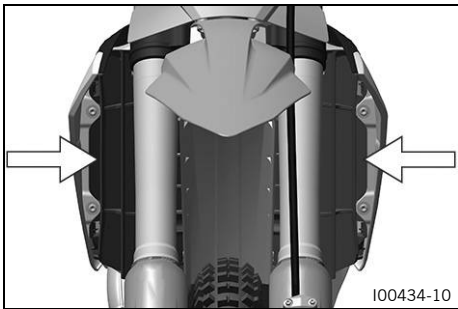
- Do not fuel the vehicle in the vicinity of open flames or lit cigarettes.
- Switch off the engine for refueling.
- Make sure that no fuel is spilled; particularly not on hot parts of the vehicle.
- If any fuel is spilled, wipe it off immediately.
- Observe the specifications for refueling.



Warning

Danger of poisoning Fuel is harmful to health.

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



Main work

- Check the throttle cable routing. (📖 p. 49)
- Position the fuel tank and fit the two spoilers to the sides in front of the radiator bracket.
- Make sure that no cables or throttle cables are trapped or damaged.

(All EXC models)

- Position the horn with the horn bracket.

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

Guideline

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

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

Guideline

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

- Remove the wash cap set.
- Clean the quick release coupling thoroughly with compressed air.



Info

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

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

Silicone spray (📖 p. 317)

- Join quick release coupling **3**.



Info

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

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

Finishing work

- Mount the seat. (📖 p. 95)



12.7 Changing the fuel screen



Danger

Fire hazard Fuel is highly flammable.

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

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



Warning

Danger of poisoning Fuel is harmful to health.

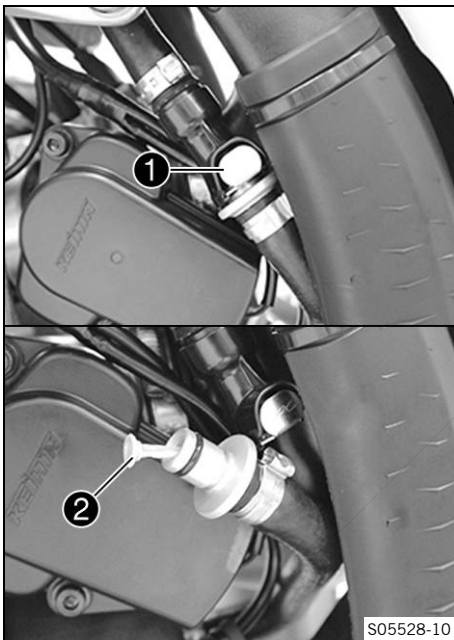
- Avoid skin, eye and clothing contact with fuel.
- Immediately consult a doctor if you swallow fuel.
- Do not inhale fuel vapors.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse the eyes thoroughly with water, and consult a doctor in case of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



Note

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

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



- Clean quick release coupling ① thoroughly with compressed air.



Info

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

- Disconnect the quick release coupling.



Info

Remaining fuel may flow out of the fuel hose.

- Pull fuel screen ② out of the connecting piece.
- Insert the new fuel screen all the way into the connecting piece.
- Spray silicone spray onto a lint-free cleaning cloth and lightly lubricate the O-ring of the quick-release coupling.

Silicone spray (📖 p. 317)

- Join the quick release coupling.



Danger

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

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

- Start the engine and check the response.

12.8 Changing the fuel filter



Danger

Fire hazard Fuel is highly flammable.

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

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



Warning

Danger of poisoning Fuel is harmful to health.

- Avoid skin, eye and clothing contact with fuel.
- Immediately consult a doctor if you swallow fuel.
- Do not inhale fuel vapors.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse the eyes thoroughly with water, and consult a doctor in case of fuel contact with the eyes.
- Change your clothing if 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 seat. (📖 p. 95)

Main work

(All EU/ASEAN models)

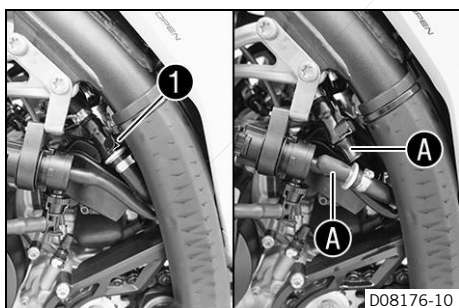
- Clean quick release coupling ❶ thoroughly with compressed air.



Info

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

- Disconnect the quick release coupling.



D08176-10

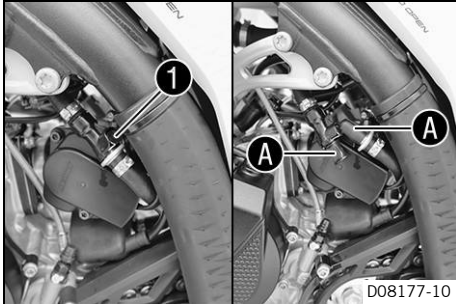


Info

Remaining fuel may flow out of the fuel hose.

- Mount wash cap set **A**.

Wash cap set (81212016100)



(All BR/CN/XC-W models)

- Clean quick release coupling **1** thoroughly with compressed air.



Info

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

- Disconnect the quick release coupling.

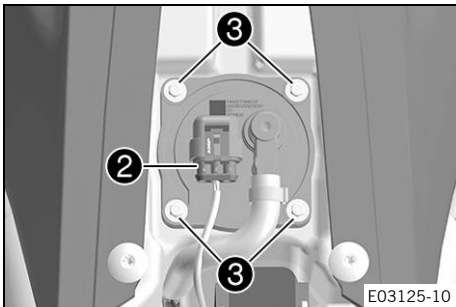


Info

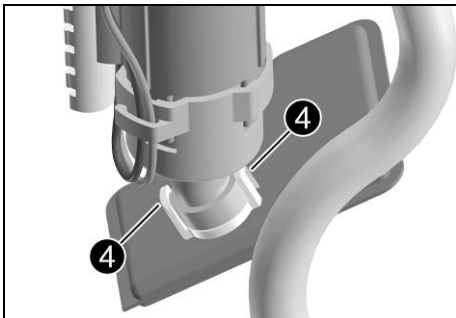
Remaining fuel may flow out of the fuel hose.

- Mount wash cap set **A**.

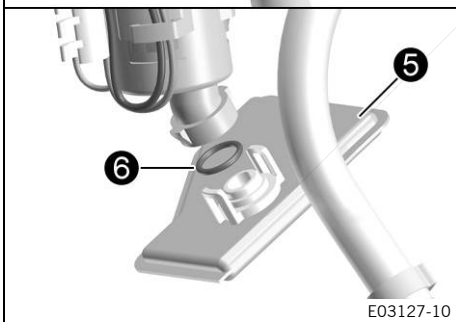
Wash cap set (81212016100)

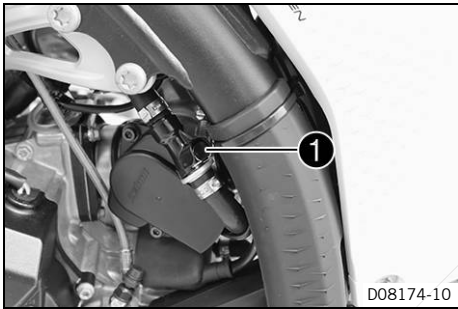
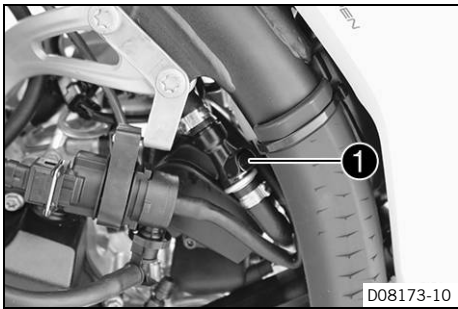
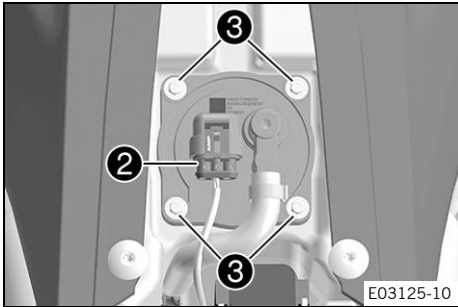


- Unplug fuel pump connector **2**.
- Remove screws **3**.
- Pull out the fuel pump.



- Carefully disassemble locks **4**.
- Take off the fuel filter **5** with the O-ring.
- Mount new O-ring **6**.
- Mount a new fuel filter.
- ✓ The wide side of the fuel filter faces the fuel line.
- ✓ The fuel filter engages in the fuel pump with an audible click.





- Position the fuel pump.
 - ✓ The connector and the fuel line face the rear.
- Thread the fuel line downwards.
- Mount and tighten screws 3.

Guideline

Screw, fuel pump	EJOT PT® K60x30 Z	2.5 Nm (1.84 lbf ft)
------------------	----------------------	-------------------------

- Plug in fuel pump connector 2.

(All EU/ASEAN models)

- Remove the wash cap set and thoroughly clean the quick release coupling using compressed air.



Info

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

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

Silicone spray (📖 p. 317)

- Join the quick-release coupling 1 of the fuel line.



Info

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

(All BR/CN/XC-W models)

- Remove the wash cap set and thoroughly clean the quick release coupling using compressed air.



Info

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

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

Silicone spray (📖 p. 317)

- Join the quick-release coupling 1 of the fuel line.



Info

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

Finishing work

- Mount the seat. (📖 p. 95)

12.9 Changing the fuel pump



Danger

Fire hazard Fuel is highly flammable.

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

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



Warning

Danger of poisoning Fuel is harmful to health.

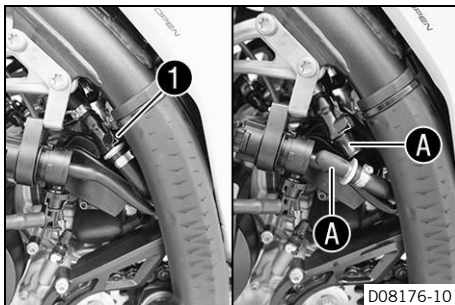
- Avoid skin, eye and clothing contact with fuel.
- Immediately consult a doctor if you swallow fuel.
- Do not inhale fuel vapors.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse the eyes thoroughly with water, and consult a doctor in case of fuel contact with the eyes.
- Change your clothing if 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 seat. (📖 p. 95)

Main work

(All EU/ASEAN models)

- Clean quick release coupling ❶ thoroughly with compressed air.



Info

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

- Disconnect the quick release coupling.

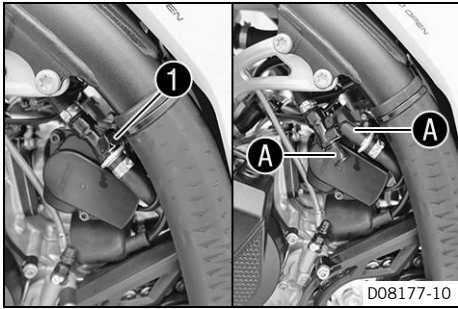


Info

Remaining fuel may flow out of the fuel hose.

- Mount wash cap set ❶.

Wash cap set (81212016100)



(All BR/CN/XC-W models)

- Clean quick release coupling **1** thoroughly with compressed air.

Info

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

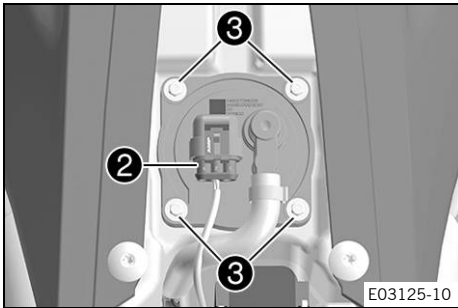
- Disconnect the quick release coupling.

Info

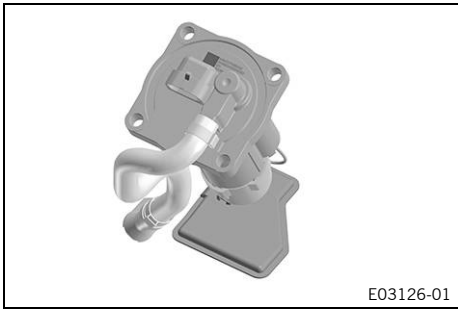
Remaining fuel may flow out of the fuel hose.

- Mount wash cap set **A**.

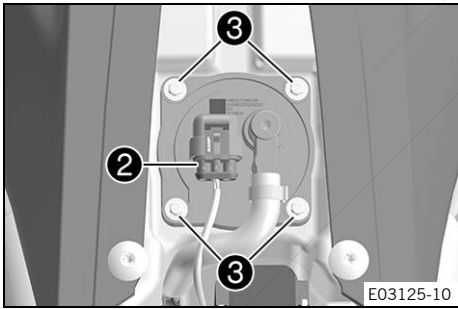
Wash cap set (81212016100)



- Unplug fuel pump connector **2**.
- Remove screws **3**.



- Pull out the fuel pump.
- Position the new fuel pump.
✓ The connector and the fuel line face the rear.
- Thread the fuel line downwards.

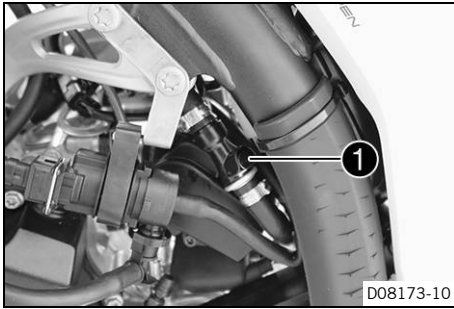


- Mount and tighten screws **3**.

Guideline

Screw, fuel pump	EJOT PT® K60x30 Z	2.5 Nm (1.84 lbf ft)
------------------	-----------------------------	-------------------------

- Plug in fuel pump connector **2**.



(All EU/ASEAN models)

- Remove the wash cap set and thoroughly clean the quick release coupling using compressed air.



Info

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

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

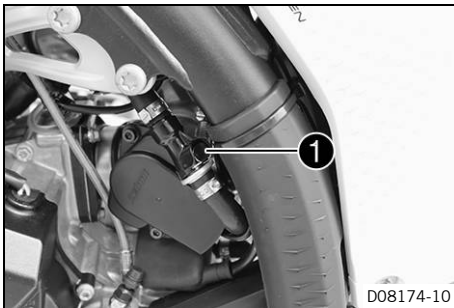
Silicone spray (📖 p. 317)

- Join the quick-release coupling ① of the fuel line.



Info

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



(All BR/CN/XC-W models)

- Remove the wash cap set and thoroughly clean the quick release coupling using compressed air.



Info

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

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

Silicone spray (📖 p. 317)

- Join the quick-release coupling ① of the fuel line.



Info

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

Finishing work

- Mount the seat. (📖 p. 95)



12.10 Checking the fuel pressure



Danger

Fire hazard Fuel is highly flammable.

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

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



Warning

Danger of poisoning Fuel is harmful to health.

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

Condition

The fuel tank is completely full.

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

The diagnostics tool is disconnected.

- (All EU/ASEAN models)**
- Clean the quick release coupling thoroughly with compressed air.



Info

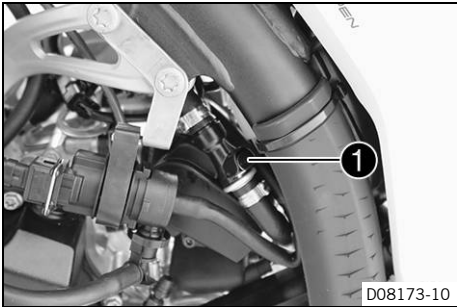
Under no circumstances should dirt enter into the fuel line. Dirt in the fuel line clogs the injection valve!

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



Info

Remaining fuel may flow out of the fuel hose.



- (All BR/CN/XC-W models)**
- Clean the quick release coupling thoroughly with compressed air.



Info

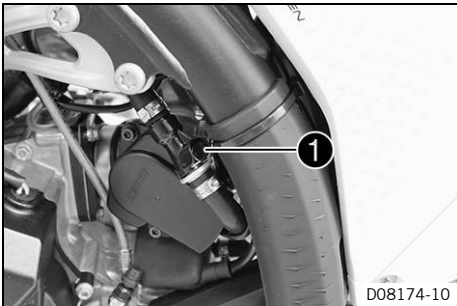
Under no circumstances should dirt enter into the fuel line. Dirt in the fuel line clogs the injection valve!

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



Info

Remaining fuel may flow out of the fuel hose.

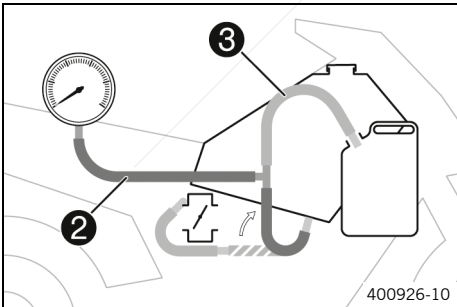


- Mount special tool ②.
- Pressure testing tool (61029094000) (📖 p. 323)

- Mount special tool ③ with nozzle code 0,60.
- Testing hose (61029093000) (📖 p. 323)

- Position the hose end in a fuel can.
- Guideline
- | | |
|------------------------|-------------------|
| Minimum size, fuel can | 10 l (2.6 US gal) |
|------------------------|-------------------|

- Connect the diagnostics tool and start it.



- Select **"Actuator test" > "Fuel pump"**.

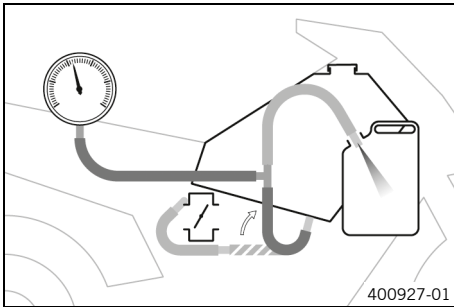
Guideline

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

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

Fuel pressure	
When the fuel pump is active	3.3 ... 3.7 bar (48 ... 54 psi)

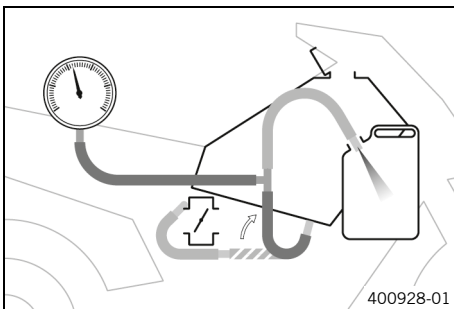
- » If the specification is not reached:
 - Open the fuel tank filler cap. (📖 p. 94)
 - Check the fuel tank breather.



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

Fuel pressure	
When the fuel pump is active	3.3 ... 3.7 bar (48 ... 54 psi)

- » If the specification is not reached:
 - Check that the fuel line is clear.
 - Change the fuel filter. (📖 p. 100)
 - Change the fuel pump. (📖 p. 103)



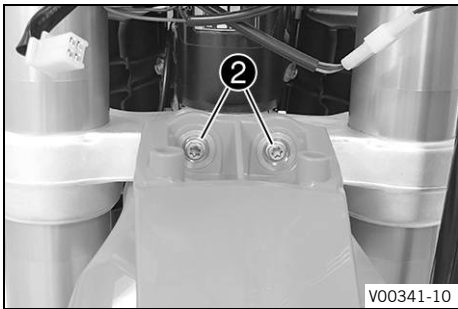
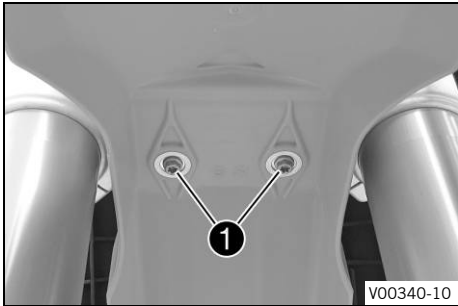
- Stop the **"Actuator test" > "Fuel pump"** by pressing the **"Quit"** button.
- Remove the special tools.
- Join the quick release coupling.



13.1 Removing front fender

- Preparatory work**
- Remove the headlight mask with the headlight. (📖 p. 109)

- Main work**
- Remove screws ❶.



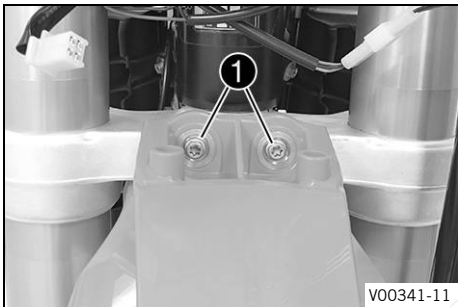
- Remove screws ❷. Take off front fender.

13.2 Installing front fender

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

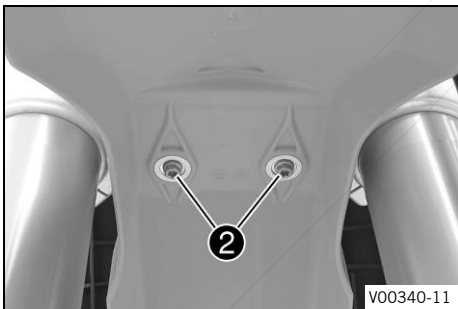
Guideline

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



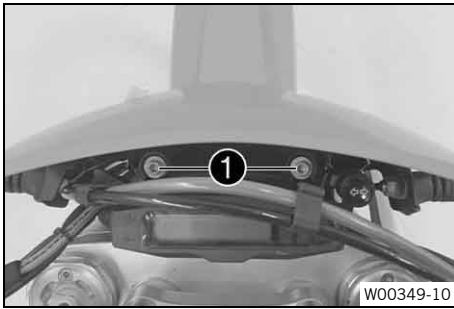
- Mount and tighten screws ❷.
- Guideline

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

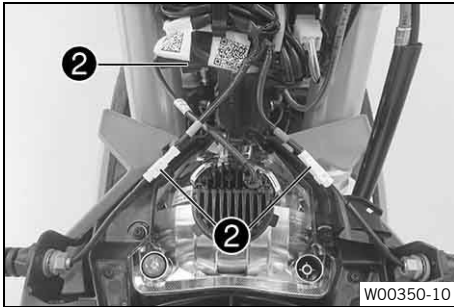


- Finishing work**
- Install the headlight mask with the headlight. (📖 p. 109)
 - Check the headlight setting. (📖 p. 156)

13.3 Removing the headlight mask with the headlight

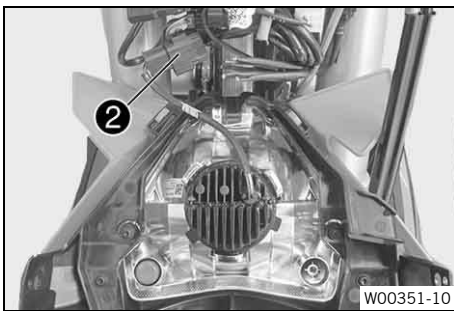


- Release screws ①.
- Slide the headlight mask up and swing it forward.
- Disconnect the brake line at the headlight mask.



(All EXC models)

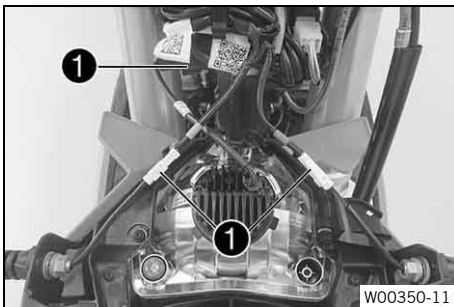
- Detach plug-in connectors ② and take off the headlight mask with the headlight.



(All XC-W models)

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

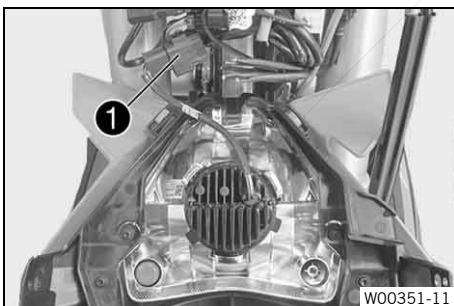
13.4 Installing the headlight mask with the headlight



Main work

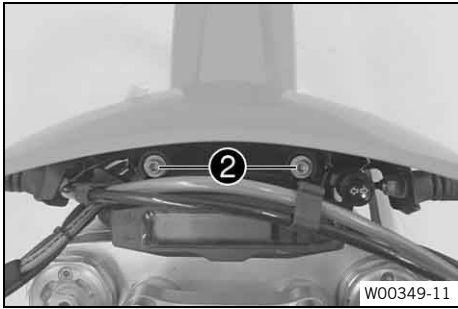
(All EXC models)

- Join plug-in connectors ①.



(All XC-W models)

- Join plug-in connector ①.



- Position the brake line in the brake line guide.
- Position the headlight mask.
- ✓ The holding lugs engage in the fender.
- Mount and tighten screws ②.

Guideline

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

Finishing work

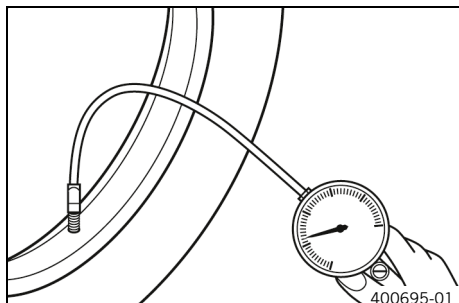
- Check the headlight setting. (📖 p. 156)



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

Street tire pressure (All EXC models)	
front	2.0 bar (29 psi)
rear	2.0 bar (29 psi)

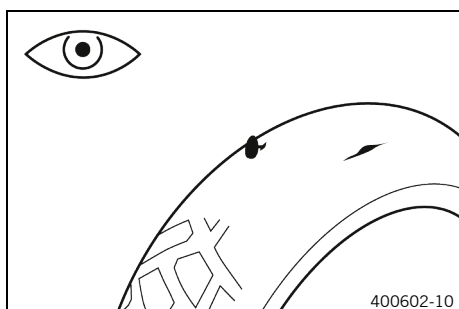
Offroad tire pressure	
front	1.0 bar (15 psi)
rear	1.0 bar (15 psi)

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

14.2 Checking the tire condition

Info

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



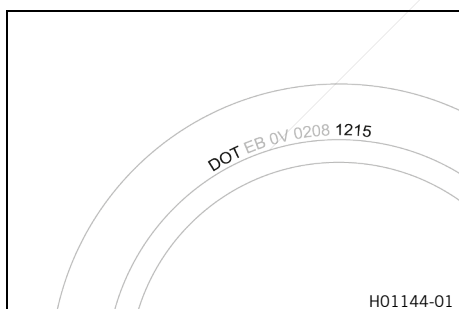
- Check the front and rear tires for cuts, embedded objects, and other damage.
 - » If the tires have cuts, run-in objects, or other damage:
 - Change the tires.
- Check the tread depth.

Info

Adhere to the legally required minimum tread depth.

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

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





Info

The tire date of manufacture is usually contained in the tire label and is indicated by the last four digits of the **DOT** number. The first two digits indicate the week of manufacture and the last two digits the year of manufacture.

KTM recommends that the tires be changed after 5 years at the latest, regardless of the actual state of wear.

- » If the tires are more than 5 years old:
 - Change the tires.

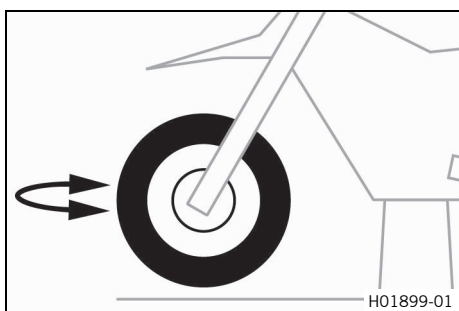
14.3 Checking the wheel bearing for play

Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 13)
- Place a load on the rear of the vehicle.
- ✓ The front wheel is not in contact with the ground.

Main work

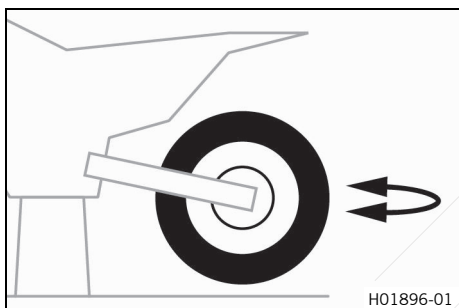
- Move the front wheel from side to side.



Info

Hold fork leg to check it.

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



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. 13)

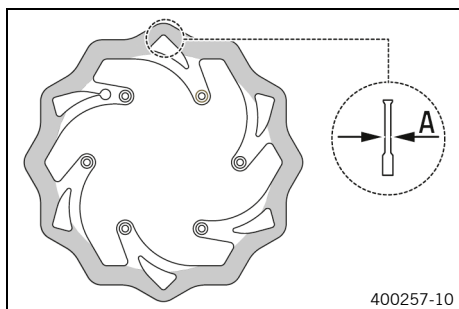
14.4 Checking the brake discs



Warning

Danger of accidents Worn-out brake discs reduce the braking effect.

- Make sure that worn-out brake discs are replaced immediately.



- Check the front and rear brake disc thickness at multiple points for the dimension **A**.



Info

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

Brake discs - wear limit (All standard models)	
front	2.5 mm (0.098 in)
rear	3.5 mm (0.138 in)
Brake discs - wear limit (All special models)	
front	2.5 mm (0.098 in)
rear	3.7 mm (0.146 in)

- » If the brake disc thickness is less than the specified value:
 - Change the front brake disc. (📖 p. 117)
 - Change the rear brake disc. (📖 p. 121)
- 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. 117)
 - Change the rear brake disc. (📖 p. 121)



14.5 Checking the rim run-out



Warning

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

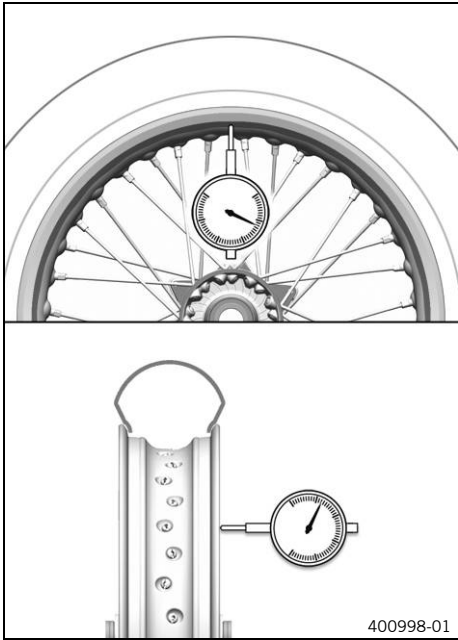
The spokes break due to being overloaded if they are too tightly tensioned. If the tension in the spokes is too low, then lateral and radial run-out will form in the wheel. Other spokes will become looser as a result.

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



Info

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



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

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

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

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

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

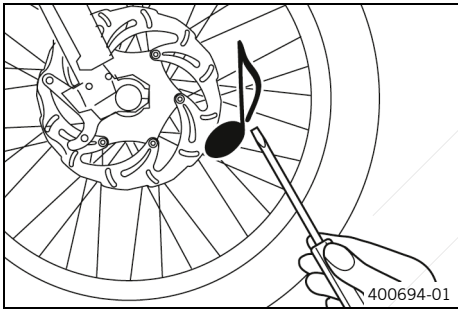
- Correct the spoke tension.

14.6 Checking spoke tension

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

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

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



- Strike each spoke briefly using a screwdriver blade.

Info
The frequency of the sound depends on the spoke length and spoke diameter.
If you hear different tone frequencies from different spokes of equal length and diameter, this is an indication of different spoke tensions.

You should hear a high note.

- » If the spoke tension differs:
 - Correct the spoke tension.
- Check the spoke torque.

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

Torque wrench kit (58429094000) (📖 p. 322)

14.7 Front wheel

14.7.1 Removing the front wheel

Preparatory work

- Raise the motorcycle with a lift stand. (p. 13)

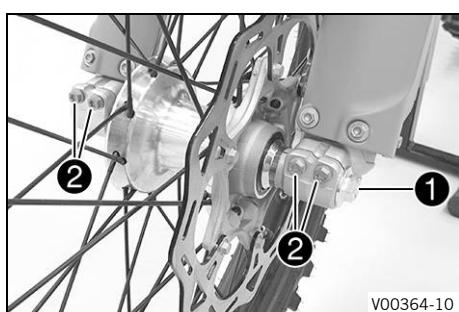
Main work

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

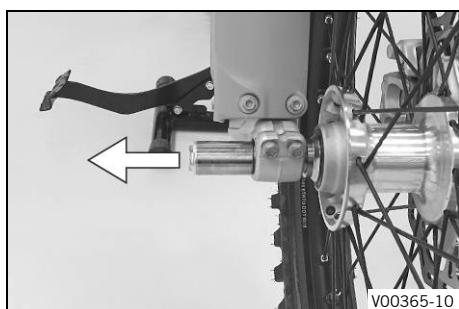


Info

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



- Loosen screw ① by several rotations.
- Loosen screws ②.
- Press on screw ① to push the wheel spindle out of the axle clamp.
- Remove screw ①.



Warning

Danger of accidents Damaged brake discs reduce the braking effect.

- Always lay the wheel down in such a way that the brake disc is not damaged.

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

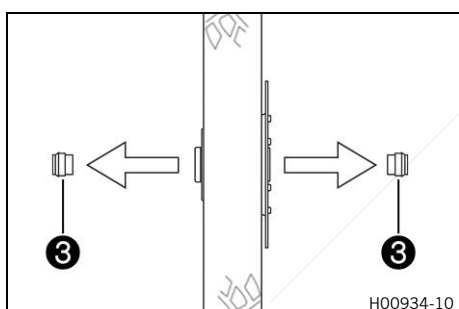


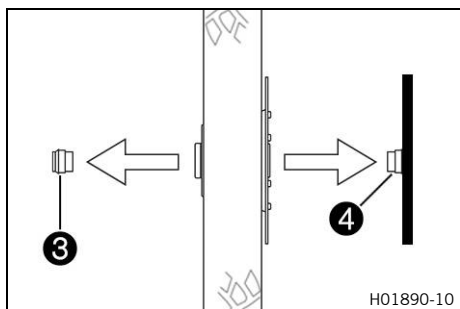
Info

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

(All models apart from HARDENDURO)

- Remove spacers ③.





(All HARDENDURO models)

- Remove spacer 3 and brake disc guard 4.

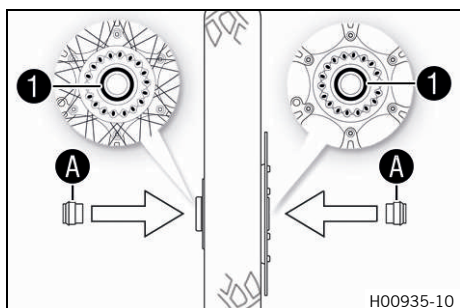
14.7.2 Installing the front wheel



Warning

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

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



(All models apart from HARDENDURO)

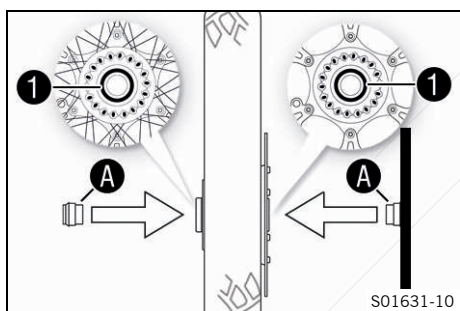
- Check the wheel bearing for damage and wear.
 - » If the wheel bearing is damaged or worn:
 - Change front wheel bearing. (p. 118)
- Clean and grease shaft seal rings 1 and contact surfaces A of the spacers.

Long-life grease (p. 316)

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

Long-life grease (p. 316)

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



(All HARDENDURO models)

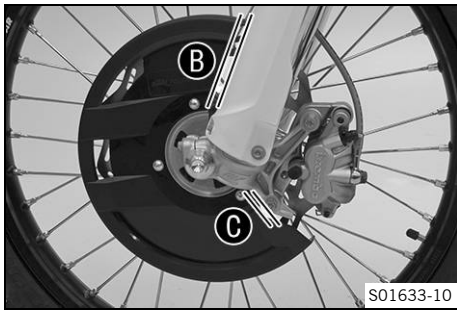
- Check the wheel bearing for damage and wear.
 - » If the wheel bearing is damaged or worn:
 - Change front wheel bearing. (p. 118)
- Clean and grease shaft seal rings 1 and contact surfaces A of the spacers.

Long-life grease (p. 316)

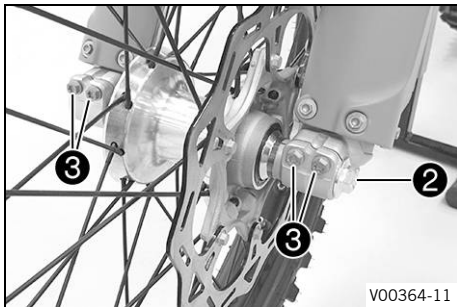
- Insert the spacer and brake disc guard.
- Clean and grease the wheel spindle.

Long-life grease (p. 316)

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



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



- Mount and tighten screw **2**.

Guideline

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

- Operate the hand brake lever several times until the brake linings are seated correctly against the brake disc.
- Remove the motorcycle from the lift stand. (p. 13)
- Operate the front brake and compress the fork a few times firmly.

✓ The fork legs straighten.

- Tighten screws **3**.

Guideline

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



14.7.3 Changing the front brake disc



Info

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

Preparatory work

- Raise the motorcycle with a lift stand. (p. 13)
- Remove the front wheel. (p. 115)

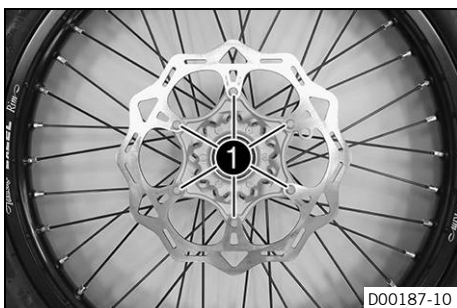
Main work

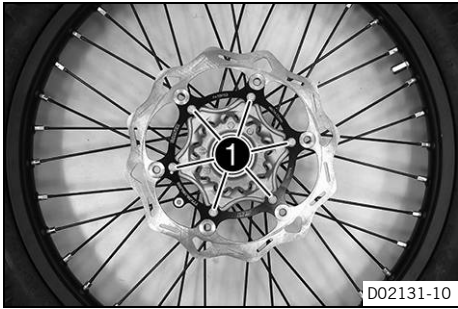
(All standard models)

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

Guideline

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





(All special models)

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

Guideline

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

Finishing work

- Install the front wheel. (📖 p. 116)

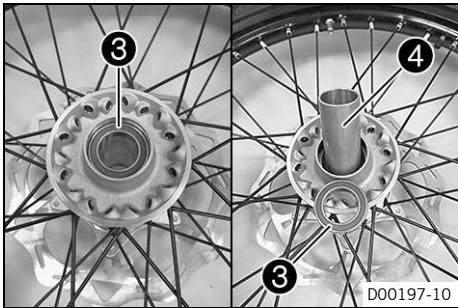
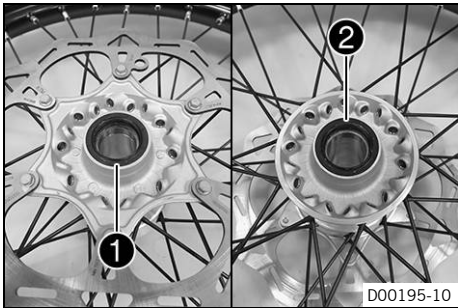
14.7.4 Changing the front wheel bearing

Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 13)
- Remove the front wheel. (📖 p. 115)

Main work

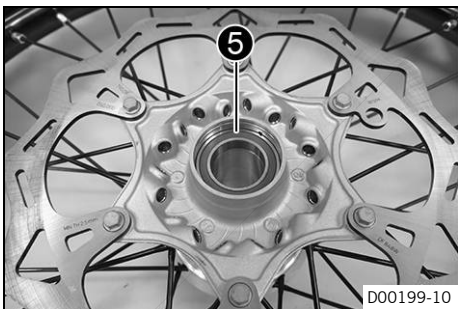
- Remove radial shaft seal rings 1 and 2.



- Press out bearing 3 using a suitable tool.

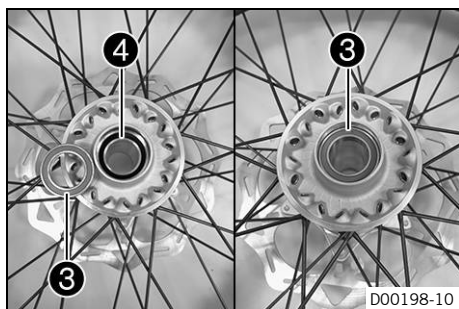
i Info
Spacing tube 4 can be pushed aside.

- Remove spacing tube 4.



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

i 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.

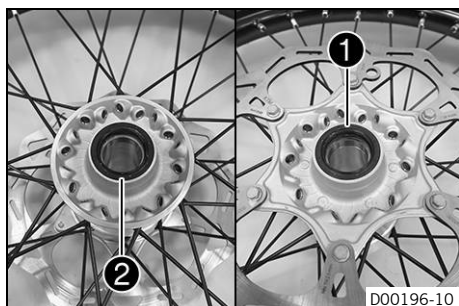
Long-life grease (📖 p. 316)

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



Info

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



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

Finishing work

- Install the front wheel. (📖 p. 116)



14.8 Rear wheel

14.8.1 Removing the rear wheel

Preparatory work

- Raise the motorcycle with a lift stand. (📖 p. 13)

Main work

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



Info

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

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



Info

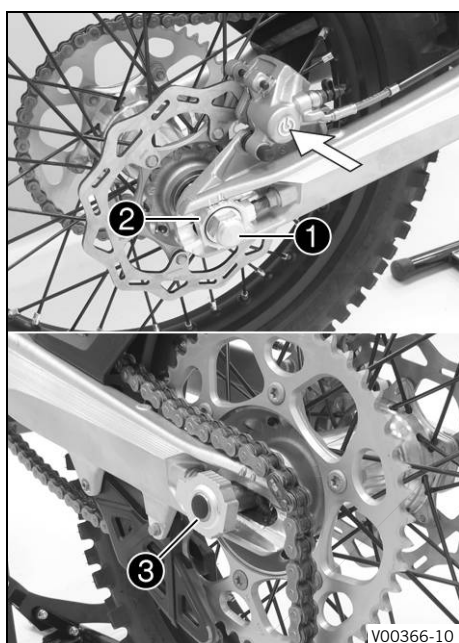
Cover the components to protect them against damage.



Warning

Danger of accidents Damaged brake discs reduce the braking effect.

- Always lay the wheel down in such a way that the brake disc is not damaged.



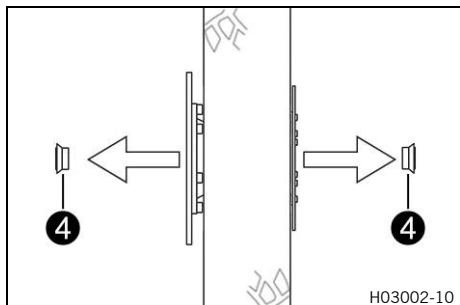
- Hold the rear wheel and remove the wheel spindle. Take the rear wheel out of the link fork.



Info

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

- Remove spacers ④.



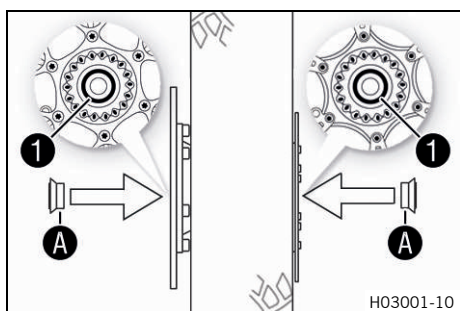
14.8.2 Installing the rear wheel



Warning

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

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



Main work

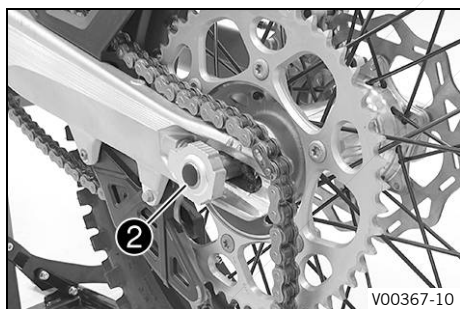
- Check the wheel bearing for damage and wear.
 - » If the wheel bearing is damaged or worn:
 - Change the rear wheel bearing. (p. 122)
- Clean and grease shaft seal rings ① and contact surfaces A of the spacers.

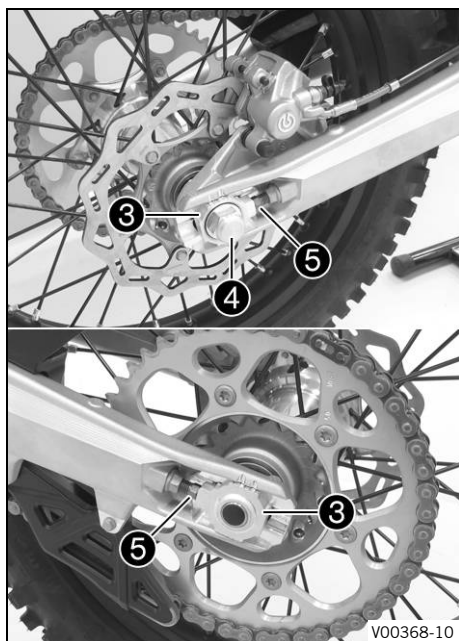
Long-life grease (p. 316)

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

Long-life grease (p. 316)

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





- Position chain adjuster ③. Mount nut ④, but do not tighten it yet.
- Make sure that chain adjusters ③ are fitted correctly on adjusting screws ⑤.
- Check the chain tension. (p. 125)
- Tighten nut ④.

Guideline

Nut, wheel spindle, rear	M22x1.5	80 Nm (59 lbf ft)
--------------------------	---------	-------------------



Info

The wide adjustment range of the chain adjusters (32 mm (1.26 in)) enables different secondary ratios with the same chain length.

Chain adjusters ③ can be turned by 180°.

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

Finishing work

- Remove the motorcycle from the lift stand. (p. 13)



14.8.3 Changing the rear brake disc



Info

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

Preparatory work

- Raise the motorcycle with a lift stand. (p. 13)
- Remove the rear wheel. (p. 119)

Main work

(All standard models)

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

Guideline

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

(All special models)

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

Guideline

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



Finishing work

- Install the rear wheel. (📖 p. 120)
- Remove the motorcycle from the lift stand. (📖 p. 13)

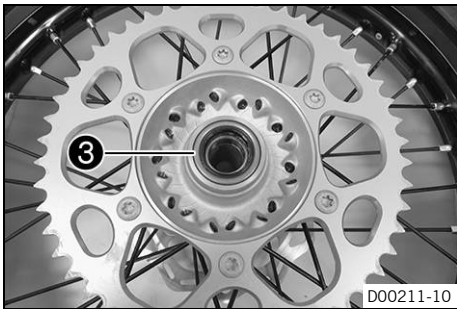
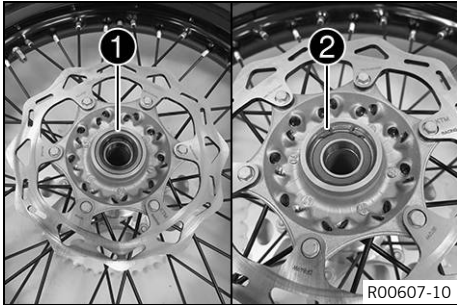
14.8.4 Changing the rear wheel bearing

Preparatory work

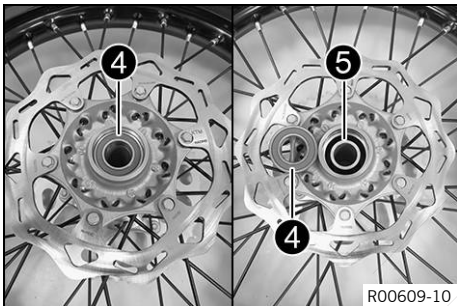
- Raise the motorcycle with a lift stand. (📖 p. 13)
- Remove the rear wheel. (📖 p. 119)

Main work

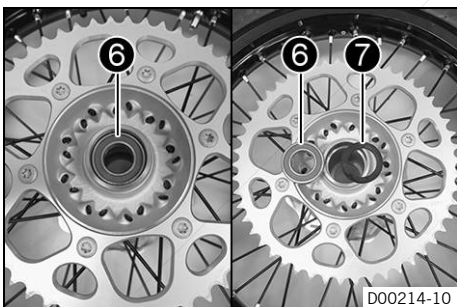
- Remove radial shaft seal ring **1**.
- Remove lock ring **2**.



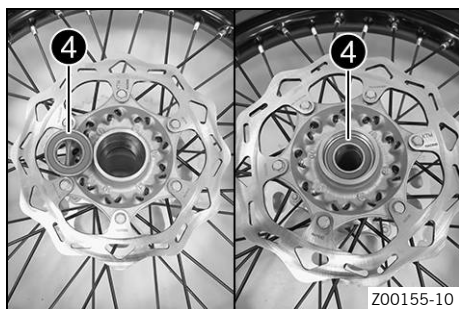
- Remove radial shaft seal ring **3**.



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



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

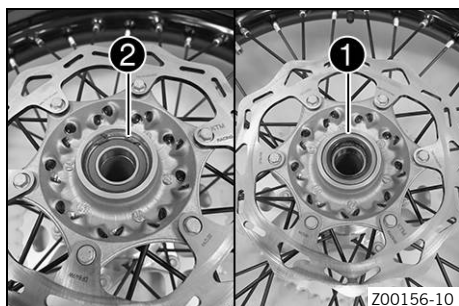


- Press new bearing **4** all the way in from the outside to the inside.

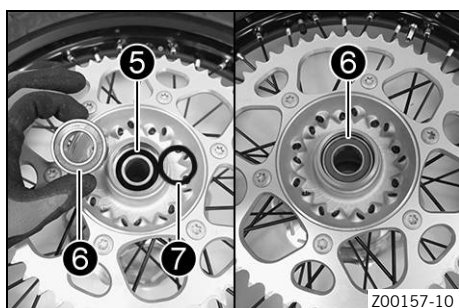


Info

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



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



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

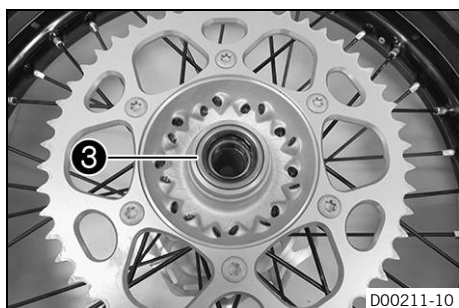
Long-life grease (📖 p. 316)

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



Info

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

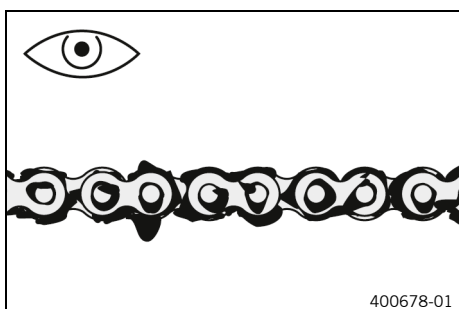


- Grease new radial shaft seal ring **3** and press it in until it is flush.

Finishing work

- Install the rear wheel. (📖 p. 120)
- Remove the motorcycle from the lift stand. (📖 p. 13)

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

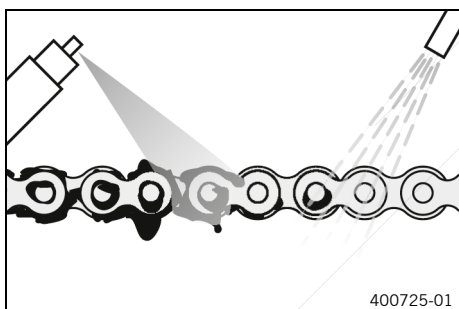
Environmental hazard Hazardous substances cause environmental damage.

- 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. 13)

Main work

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

Chain cleaner (📖 p. 316)

- After drying, apply chain spray.

Off-road chain spray (📖 p. 317)

Finishing work

- Remove the motorcycle from the lift stand. (📖 p. 13)

14.8.7 Checking the chain tension



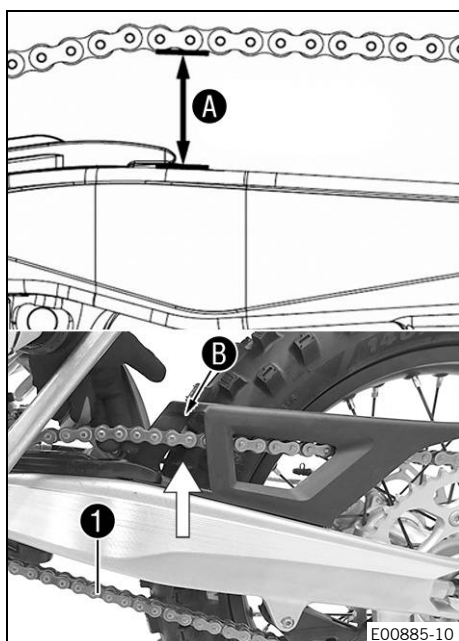
Warning

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. 13)

Main work

- Pull the chain at the end of the chain sliding piece upward to measure chain tension A.



Info

Lower chain section 1 must be taut.

When the chain guard is mounted, it must be possible to pull up the chain at least to the point where it makes contact with chain guard B.

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

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

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

Finishing work

- Remove the motorcycle from the lift stand. (p. 13)



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

Preparatory work

- Raise the motorcycle with a lift stand. (p. 13)

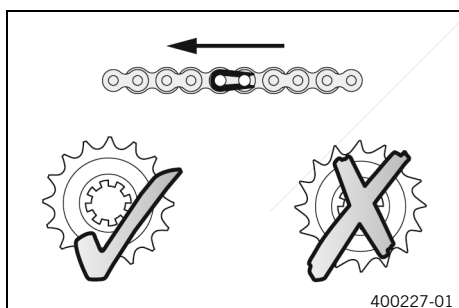
Main work

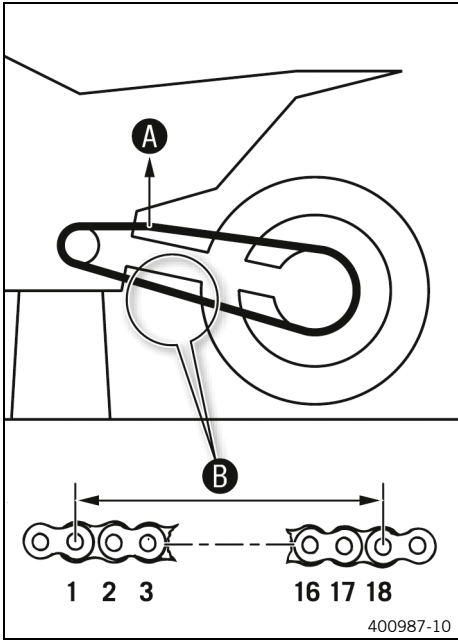
- Shift the transmission into neutral.
- Check the chain, rear sprocket, and engine sprocket for wear.
 - » If the chain, rear sprocket or engine sprocket is worn:
 - Change the drivetrain kit. (p. 128)



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.



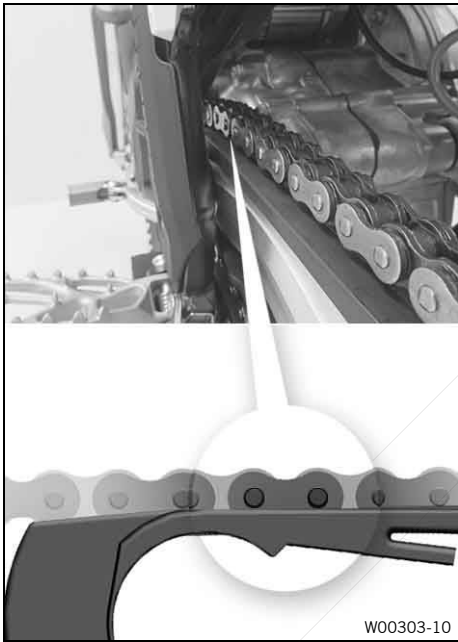
Info
Chain wear is not always even, so you should repeat this measurement at different chain positions.

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. 128)



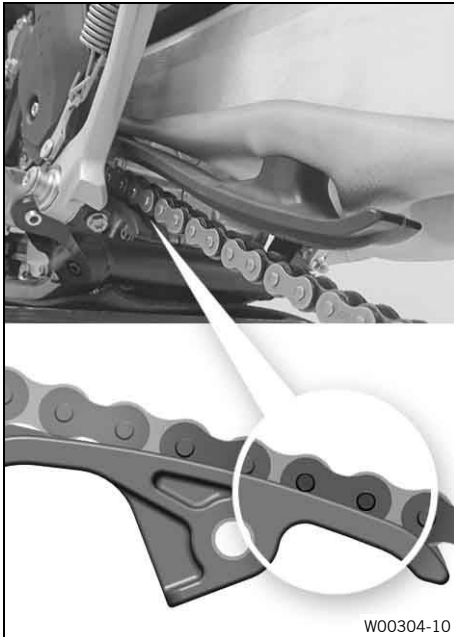
Info
When a new chain is mounted, the rear sprocket and engine sprocket should also be changed.
New chains wear out faster on old, worn sprockets.



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

Guideline

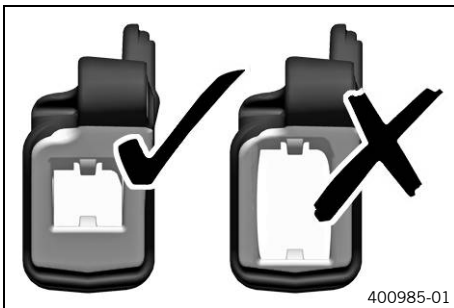
Screw, chain sliding guard	M6	6 Nm (4.4 lbf ft) Loctite®243™
----------------------------	----	--



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

Guideline

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



- Check the chain guide for wear.



Info

Wear can be seen on the front of the chain guide.

- » If the light part of the chain guide is worn:
 - Change the chain guide.



- Check that the chain guide is firmly seated.
 - » If the chain guide is loose:
 - Tighten the screws on the chain guide.

Guideline

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

Finishing work

- Remove the motorcycle from the lift stand. (📖 p. 13)

14.8.9 Adjusting the chain tension



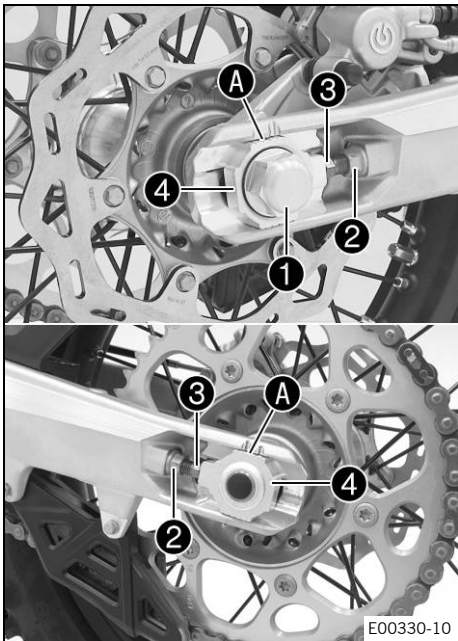
Warning

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. 13)
 - 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, wheel spindle, rear | M22x1.5 | 80 Nm (59 lbf ft) |
|--------------------------|---------|-------------------|



Info

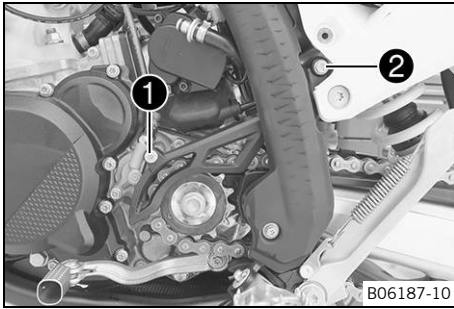
The wide adjustment range of the chain adjusters (32 mm (1.26 in)) enables different secondary ratios with the same chain length.

Chain adjusters ❹ can be turned by 180°.

- Finishing work**
- Remove the motorcycle from the lift stand. (📖 p. 13)

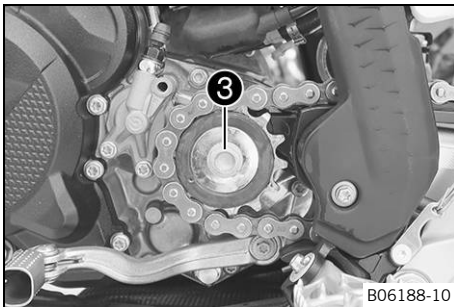
14.8.10 Changing the drivetrain kit

- Preparatory work**
- Raise the motorcycle with a lift stand. (📖 p. 13)
 - Remove the air filter box cover. (📖 p. 91)

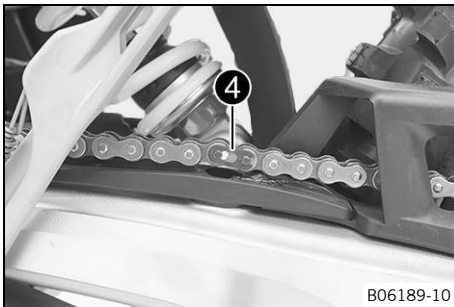


Main work

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



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



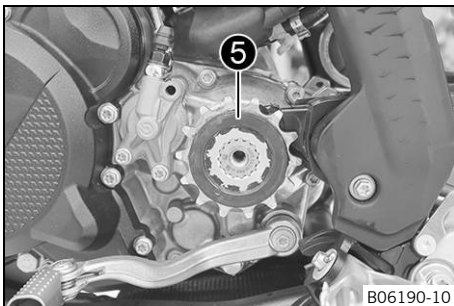
- Remove connecting link ④ of the chain.



Info

Cover the components to protect them against damage.

- Take off the chain.
- Remove the rear wheel. (📖 p. 119)



- Remove engine sprocket ⑤.



(All standard models)

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

Guideline

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

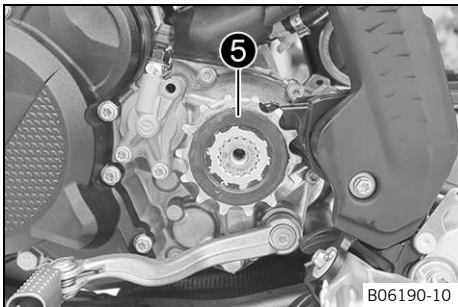


(All special models)

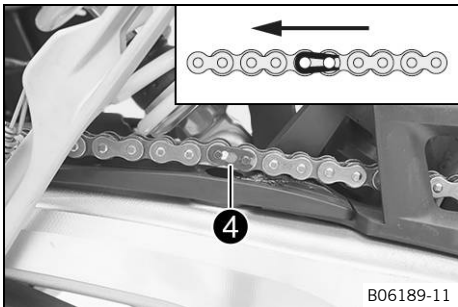
- Remove fittings 6. Take off the rear sprocket.
- Position the new rear sprocket. Mount and tighten the fittings.

Guideline

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



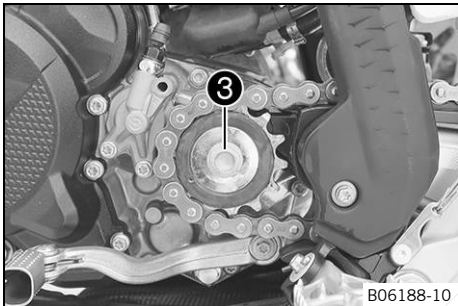
- Slide new engine sprocket 5 onto the countershaft.
- Install the rear wheel. (📖 p. 120)



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

Guideline

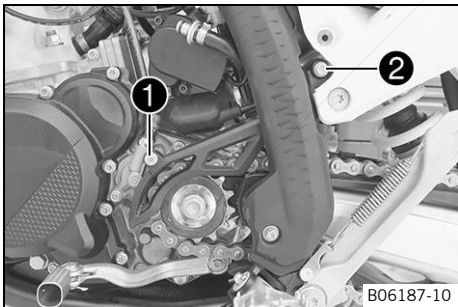
The closed side of the chain joint lock must face in the direction of travel.



- Have an assistant operate the rear brake.
- Mount and tighten screw 3 with washer.

Guideline

Screw, drive chain engine sprocket	M10	60 Nm (44.3 lbf ft) Loctite®2701™
------------------------------------	-----	---



- Position the engine sprocket cover.
- Mount and tighten screw 1.

Guideline

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

- Mount and tighten screw 2.

Guideline

Screw, engine sprocket cover	M8	15 Nm (11.1 lbf ft)
------------------------------	----	---------------------

Finishing work

- Install the air filter box cover. (📖 p. 91)
- Check the chain tension. (📖 p. 125)

- Remove the motorcycle from the lift stand. (📖 p. 13)



15.1 Changing the main fuse



Warning

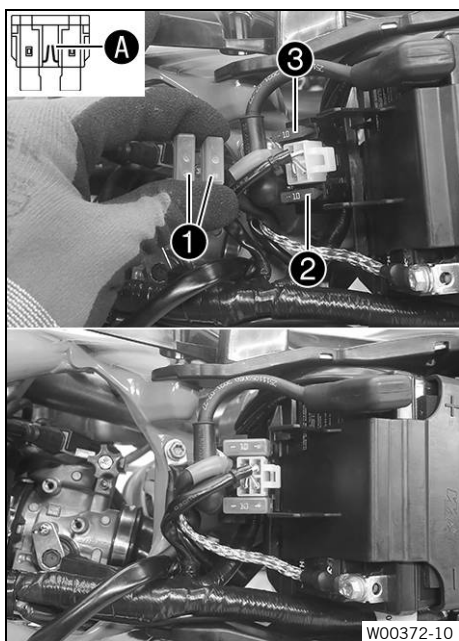
Fire hazard Incorrect fuses overload the electrical system.

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



Info

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



Preparatory work

- Remove the seat. (📖 p. 95)

Main work

- Take off protection caps ①.
- Remove faulty main fuse ②.



Info

A faulty fuse has a burned-out fuse wire **A**.
A spare fuse ③ is located in the starter relay.

- Insert a new main fuse.

Fuse (58011109120) (📖 p. 284)

- Check that the electrical system is functioning properly.



Tip

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

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

Finishing work

- Mount the seat. (📖 p. 95)

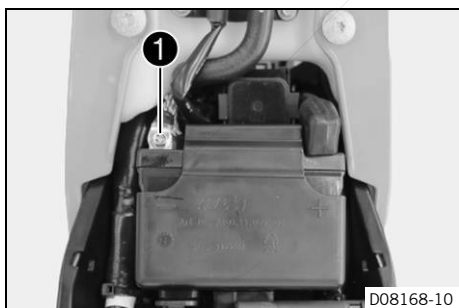
15.2 Disconnecting the negative cable of the 12-V battery

Preparatory work

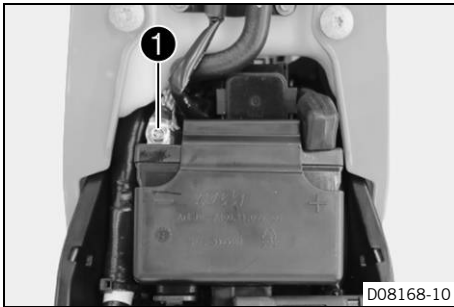
- Remove the seat. (📖 p. 95)

Main work

- Disconnect negative cable ① of the 12-V battery.



15.3 Connecting the negative cable of the 12-V battery



Main work

- Connect negative cable ① of the 12-V battery.

Guideline

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

Finishing work

- Mount the seat. (📖 p. 95)



15.4 Removing the 12-V battery



Note

Environmental hazard 12 V batteries contain environmentally hazardous materials.

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



Note

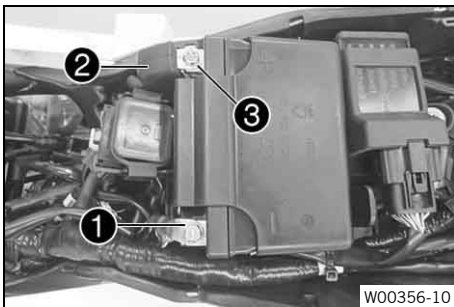
Environmental hazard Hazardous substances cause environmental damage.

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

Preparatory work

- Remove the seat. (📖 p. 95)
- Remove the fuel tank. (📖 p. 96)

Main work

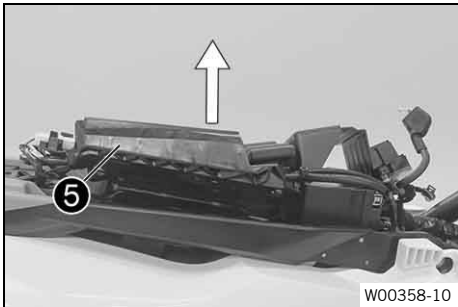
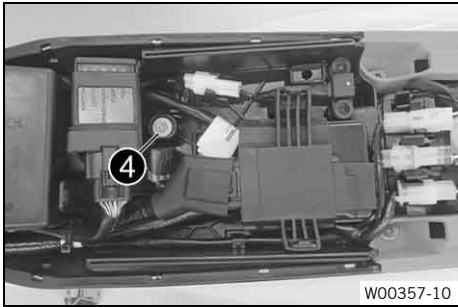


Warning

Risk of injury 12 V batteries contain harmful substances.

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

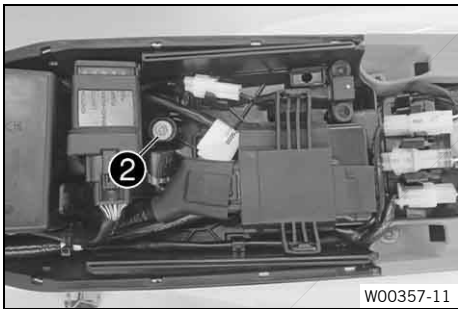
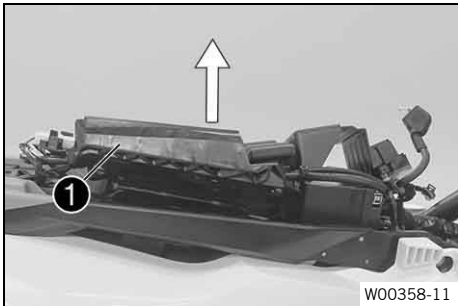
- Disconnect negative cable ① from the 12-V battery.



- Pull back positive terminal cover ② and disconnect positive cable ③ from the 12-V battery.
- Remove screw ④.
- Pull up battery holding bracket ⑤ and remove the 12-V battery to the rear.

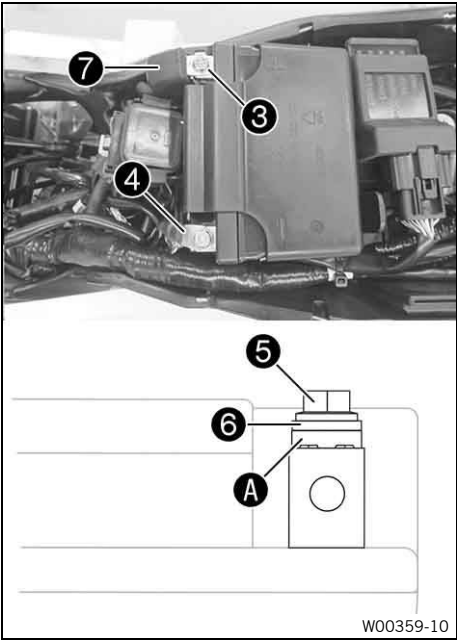
i Info
Pay attention to the wiring harness.

15.5 Installing the 12-V battery



- Main work**
- Pull up battery holding bracket ①, insert the 12-V battery into the battery compartment with the terminals facing upward and secure with battery holding bracket ①.
- 12-V battery (HJTZ5S-FP-C) (📖 p. 284)
- i Info**
Ensure that the cable is routed correctly.

- Mount and tighten screw ②.
- Guideline
- | | | |
|--------------------------------|----|-------------------|
| Screw, battery support bracket | M6 | 6 Nm (4.4 lbf ft) |
|--------------------------------|----|-------------------|



- Connect positive cable 3 to the 12-V battery.

Guideline

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

- Connect negative cable 4 to the 12 V battery.

Guideline

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

Contact disks A must be mounted under screws 5 and cable sockets 6 with the claws toward the battery terminal.

- Slide positive terminal cover 7 over the positive terminal.

Finishing work

- Install the fuel tank. (p. 97)
- Mount the seat. (p. 95)

15.6 Charging the 12-V battery



Warning

Risk of injury 12 V batteries contain harmful substances.

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

Note

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

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



Note

Environmental hazard 12 V batteries contain environmentally hazardous materials.

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



Note

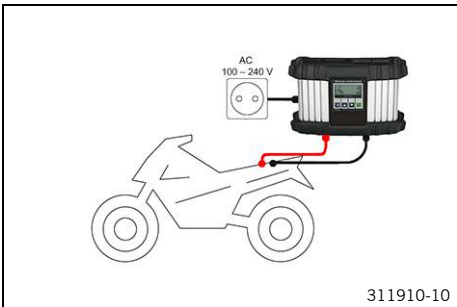
Environmental hazard Hazardous substances cause environmental damage.

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

i

Info

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



- Preparatory work**
- Remove the seat. (📖 p. 95)
 - Disconnect the negative cable of the 12-V battery. (📖 p. 132)

Main work

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

EU battery charger **XCharge-professional** (00029095050)
(📖 p. 319)

Alternative 1

US battery charger **XCharge-professional**
(00029095051) (📖 p. 319)

Alternative 2

UK battery charger **XCharge-professional**
(00029095052) (📖 p. 319)

i

Info

Follow the instructions of the charger and the manual.

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

Guideline

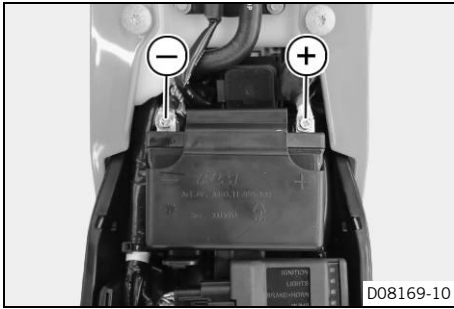
The charging current, charging voltage, and charging time must not be exceeded.	
Recharge the 12-V battery regularly when the motorcycle is not being used	3 months

Finishing work

- Connect the negative cable of the 12-V battery. (📖 p. 133)
- Mount the seat. (📖 p. 95)

15.7 Checking the charging voltage

- Condition**
- The 12-V battery must be fully functional and completely charged.
- Preparatory work**
- Remove the seat. (📖 p. 95)



Main work

- Carry out start procedure. (📖 p. 13)
- **V** Measure the voltage between the specified points.
Measuring point **plus (+)** – Measuring point **Ground (-)**

Charging voltage	
5,000 rpm	13.5 ... 15.0 V

- » If the displayed value is less than the specified value:
 - Check the plug-in connections from the alternator to the voltage regulator.
 - Check the plug-in connections from the voltage regulator to the wiring harness.
 - Check the stator winding of the alternator. (📖 p. 274)
- » If the displayed value is greater than the specified value:
 - Change voltage regulator.

Finishing work

- Mount the seat. (📖 p. 95)



15.8 Checking the open-circuit current

Preparatory work

- Remove the seat. (📖 p. 95)
- Disconnect the negative cable of the 12-V battery. (📖 p. 132)

Main work

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

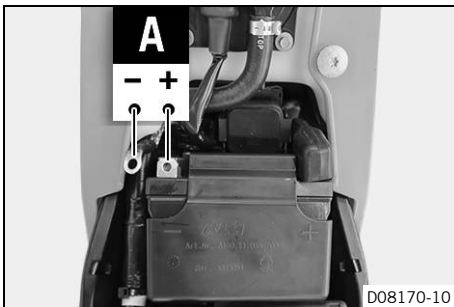
i Info
The value of the open-circuit current only applies to vehicles in their original state without additional electrical power consumers.

Maximum open-circuit current	< 1.0 mA
------------------------------	----------

- » If the measured value is greater than the specified value:
 - Disconnect the voltage regulator from the wiring harness and perform the measurement again.

Finishing work

- Connect the negative cable of the 12-V battery. (📖 p. 133)
- Mount the seat. (📖 p. 95)



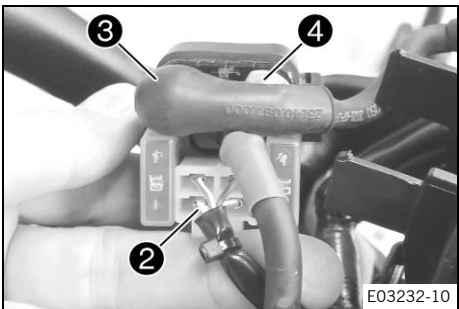
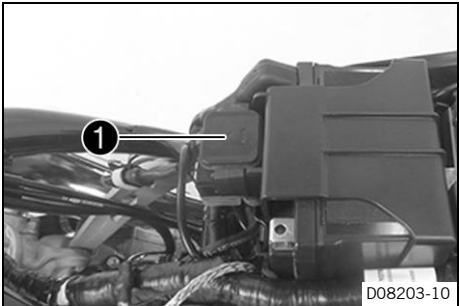
15.9 Checking the starter relay

Preparatory work

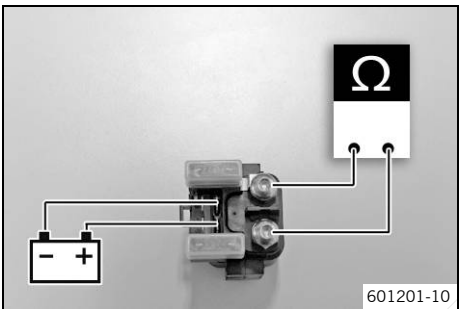
- Remove the seat. (📖 p. 95)
- Remove the fuel tank. (📖 p. 96)
- Disconnect the negative cable of the 12-V battery. (📖 p. 132)

Main work

- Pull starter relay ❶ from the holder.



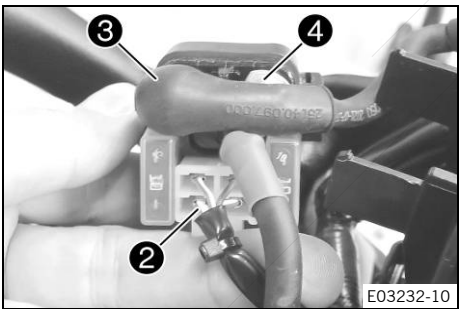
- Unplug connector ❷.
- Disconnect cable ❸ from the starter relay.
- Disconnect cable ❹ from the starter relay.



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

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

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

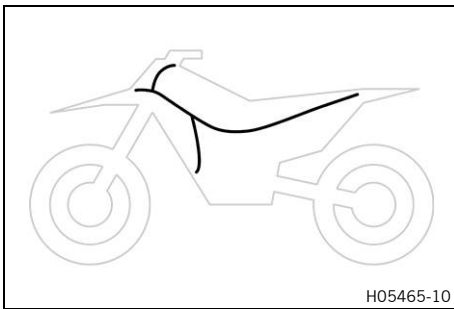


- Clamp cable ❹ on the starter relay.
- Clamp cable ❸ on the starter relay.
- Plug in connector ❷.
- Mount the starter relay onto the holder and route the cable.

Finishing work

- Connect the negative cable of the 12-V battery. (📖 p. 133)
- Install the fuel tank. (📖 p. 97)
- Mount the seat. (📖 p. 95)

15.10 Checking the wiring harness



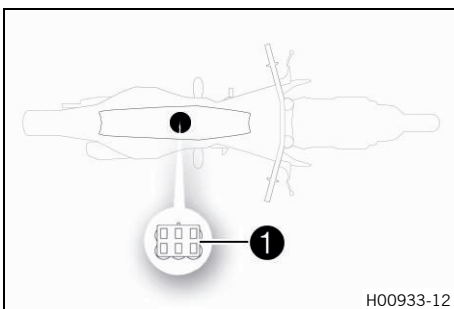
- Check that the wiring harness has been routed without kinks.
 - » If the wiring harness is kinked or trapped/pinched:
 - Correct the routing of the wiring harness.
- Check the wiring harness for damage.
 - » If the wiring harness is damaged:
 - Change the wiring harness.



Info

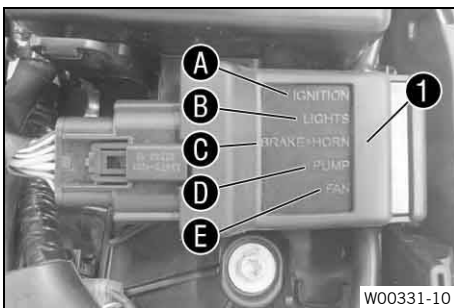
Repair of the wiring harness is not recommended by KTM.

15.11 Diagnostics connector



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

15.12 OCU



OCU 1 is located under the seat.

The OCU replaces the electronic fuses and relays.

All outputs are switched depending on the signals of the voltage regulator and ECU.

The outputs are deactivated individually in the event of overcurrent.

This enables easy error detection because the status of each output is indicated via LED lights.

The OCU monitors the electronics system completely independently.

As soon as an indicated error is rectified, the status light of the OCU changes from red to green.

Overview

A	Ignition
B	Light
C	Brake light + horn
D	Fuel pump
E	Radiator fan

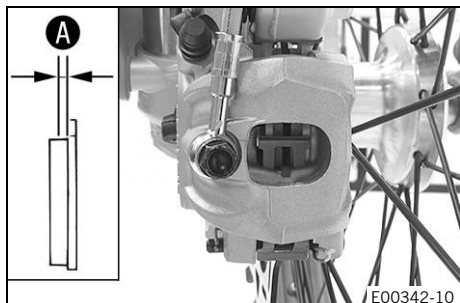
16.1 Checking that the brake linings of the front brake are secured



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 lining thickness **A**.

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

- » If it is less than the minimum thickness:

- Change the brake linings of the front brake.
(📖 p. 140)

- Check the brake linings for damage and cracking.

- » If there is damage or cracking:

- Change the brake linings of the front brake.
(📖 p. 140)

- Check that the brake linings are secured.

- » If the brake linings are not secured correctly:

- Secure brake linings, replace with new parts if necessary.

16.2 Changing the brake linings of the front brake



Warning

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

- Ensure that service work and repairs are performed professionally.



Warning

Skin irritation Brake fluid is a harmful substance.

- 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 Brake fluid which is too old or of the wrong type impairs the function of the brake system.

- Make sure that brake fluid for the front and rear brake is changed in accordance with the service schedule.
- Make sure that only clean, approved brake fluid from a tightly sealed container is used.



Warning

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

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



Warning

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

Not all brake linings are tested and approved for KTM motorcycles. The structure and friction coefficient of the brake linings, and thus their brake power, may vary greatly from that of original brake linings.

If brake linings are used that differ from the original equipment, compliance with the original homologation is not guaranteed. In this case, the vehicle no longer corresponds to its condition at delivery and the manufacturer warranty shall be void.

- Only use brake linings approved and recommended by KTM.



Note

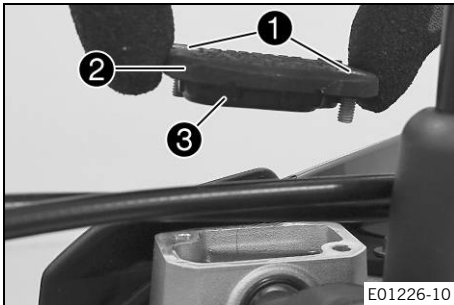
Environmental hazard Hazardous substances cause environmental damage.

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



Info

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

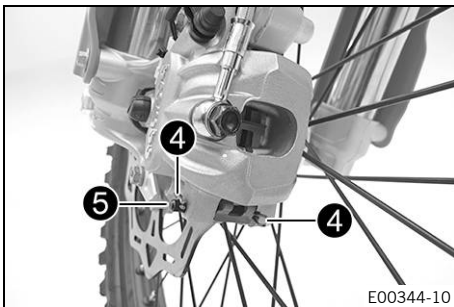


- Move the brake fluid reservoir mounted on the handlebar to a horizontal position.
- Remove screws ①.
- Take off cover ② with membrane ③.
- Manually press the brake caliper toward the brake disc to push back the brake pistons. Ensure that brake fluid does not flow out of the brake fluid reservoir, extract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

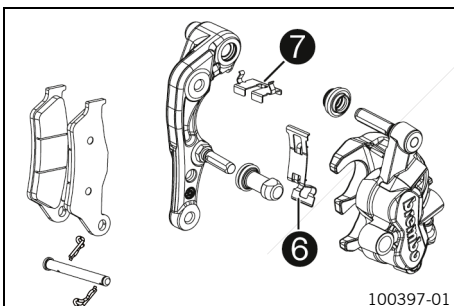


Info

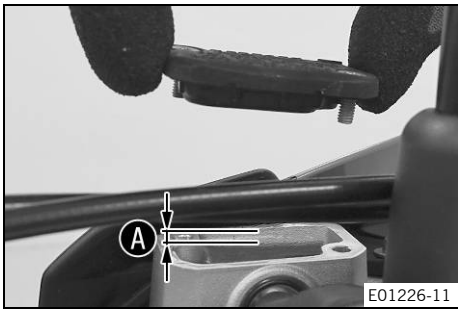
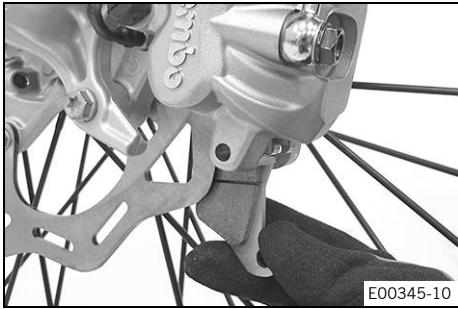
Make sure that you do not press the brake caliper against the spokes when pushing back the brake pistons.



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



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



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

i Info
Always change the brake linings in pairs.

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

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

Guideline

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

Brake fluid DOT 4 / DOT 5.1 (📖 p. 314)	
--	--

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

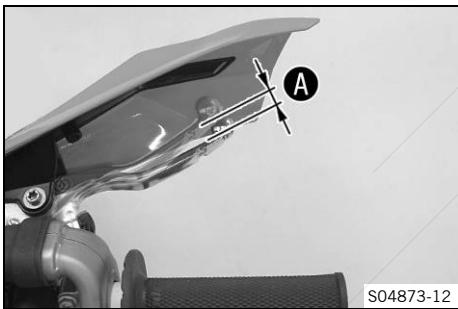
i Info
Use water to immediately clean up any brake fluid that has overflowed or spilled.

16.3 Checking the free travel of the hand brake lever

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

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

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

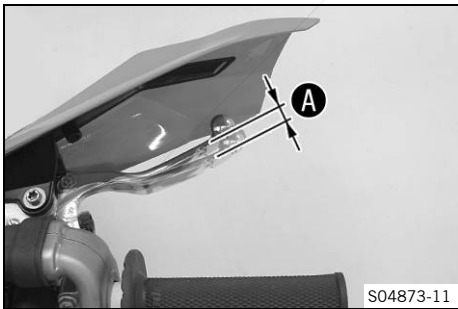


(All EXC models)

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

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

- » If the free travel does not match the specification:
 - Adjust the free travel of the handbrake lever. (📖 p. 143)



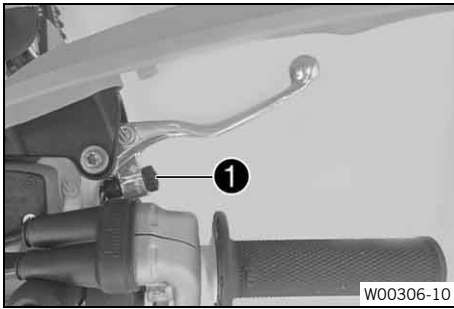
(All XC-W models)

- 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.

16.4 Adjusting the free travel of the handbrake lever



- Check the free travel of the hand brake lever. (📖 p. 142)
- Adjust the free travel of the hand brake lever with adjusting screw ①.



Info

Turn the adjusting screw clockwise to reduce free travel. The pressure point moves away from the handlebar.

Turn the adjusting screw counterclockwise to increase free travel. The pressure point moves towards the handlebar.

The range of adjustment is limited.

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

Do not make any adjustments while riding.

16.5 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.

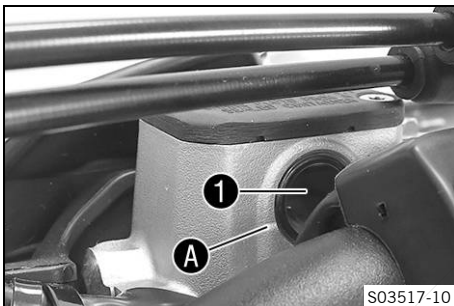
- Check the brake system and do not continue riding until the problem is eliminated.



Warning

Danger of accidents Brake fluid which is too old or of the wrong type impairs the function of the brake system.

- Make sure that brake fluid for the front and rear brake is changed in accordance with the service schedule.
- Make sure that only clean, approved brake fluid from a tightly sealed container is used.



- Move the brake fluid reservoir mounted on the handlebar to a horizontal position.
- Check the brake fluid level in level viewer ①.
 - » If the brake fluid level has dropped below marking A in the level viewer:
 - Add front brake fluid. (📖 p. 144)

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 is a harmful substance.

- 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 Brake fluid which is too old or of the wrong type impairs the function of the brake system.

- Make sure that brake fluid for the front and rear brake is changed in accordance with the service schedule.
- Make sure that only clean, approved brake fluid from a tightly sealed container is used.



Note

Environmental hazard Hazardous substances cause environmental damage.

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

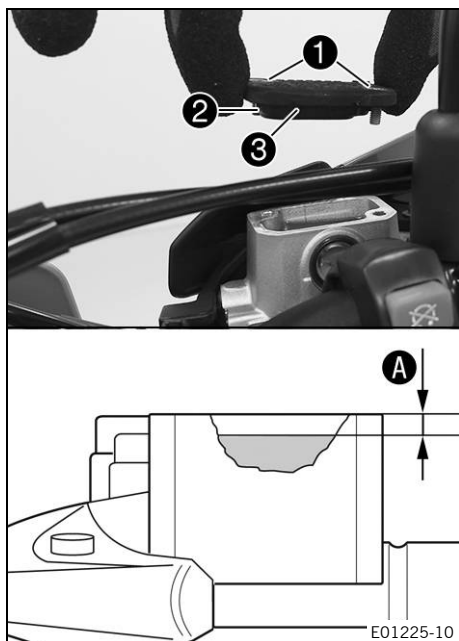


Info

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

Preparatory work

- Check that the brake linings of the front brake are secured.
(📖 p. 140)



Main work

- Move the brake fluid reservoir mounted on the handlebar to a horizontal position.
- Remove screws ①.
- Take off cover ② with membrane ③.
- Add brake fluid to level A.

Guideline

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

Brake fluid DOT 4 / DOT 5.1 (📖 p. 314)
--

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



Info

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



16.7 Changing the front brake fluid



Warning

Danger of accidents An insufficient brake fluid level will cause the brake system to fail.

If the brake fluid level drops below the specified marking or the specified value, the brake system is leaking or the brake linings are worn down.

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



Warning

Skin irritation Brake fluid is a harmful substance.

- 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 Brake fluid which is too old or of the wrong type impairs the function of the brake system.

- Make sure that brake fluid for the front and rear brake is changed in accordance with the service schedule.
- Make sure that only clean, approved brake fluid from a tightly sealed container is used.



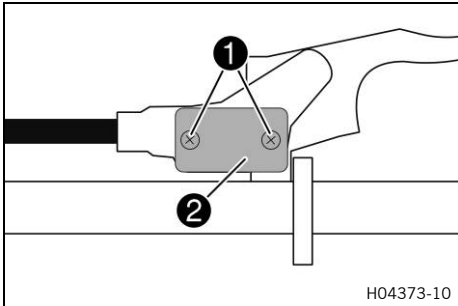
Note

Environmental hazard Hazardous substances cause environmental damage.

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

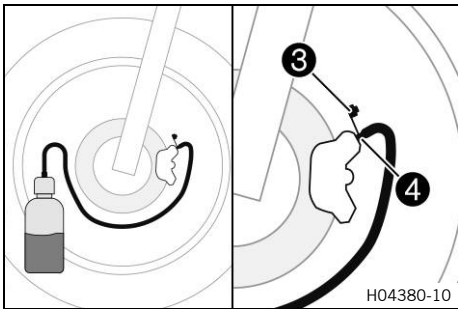


Info
Avoid contact between brake fluid and painted parts. Brake fluid corrodes paint.



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

Syringe (50329050000) (📖 p. 320)
Brake fluid DOT 4 / DOT 5.1 (📖 p. 314)



- Pull off protection cap **3** of the brake caliper bleeder screw. Connect the bleeder bottle hose.
- Pull the hand brake lever and hold it in place.
- Open bleeder screw **4** by approx. one half turn.
- ✓ Brake fluid runs into the bleeder bottle hose.
- Tighten bleeder screw **4**.
- Release the hand brake lever.
- Repeat the procedure until fresh brake fluid emerges from the hose of the bleeder bottle without bubbles.



Info
Ensure that the brake fluid reservoir is always filled with a sufficient amount of fresh brake fluid.

- Remove the bleeder bottle hose. Mount protection cap **3**.
- Add brake fluid to level **A**.

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

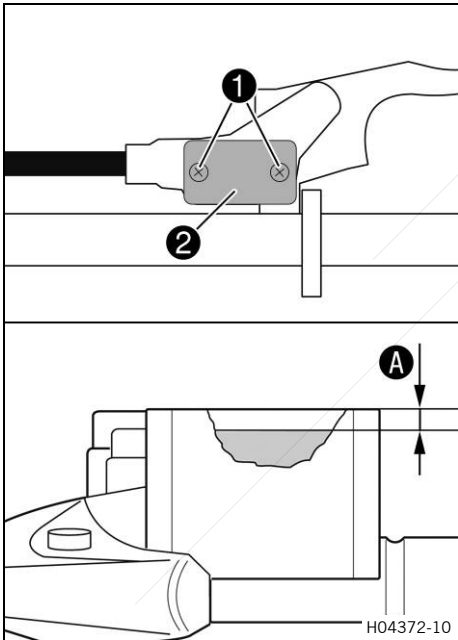
Brake fluid DOT 4 / DOT 5.1 (📖 p. 314)
--

- Position cover **2** with the membrane. Mount and tighten screws **1**.



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

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



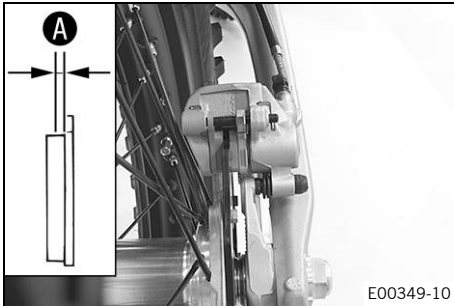
16.8 Checking that the brake linings of the rear brake are secured



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 lining thickness **A**.

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

- » If it is less than the minimum thickness:
 - Change the rear brake linings. (📖 p. 147)
- Check the brake linings for damage and cracking.
 - » If there is damage or cracking:
 - Change the rear brake linings. (📖 p. 147)
- Check that the brake linings are secured.
 - » If the brake linings are not secured correctly:
 - Secure brake linings, replace with new parts if necessary.

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 is a harmful substance.

- 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 Brake fluid which is too old or of the wrong type impairs the function of the brake system.

- Make sure that brake fluid for the front and rear brake is changed in accordance with the service schedule.
- Make sure that only clean, approved brake fluid from a tightly sealed container is used.



Warning

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

Not all brake linings are tested and approved for KTM motorcycles. The structure and friction coefficient of the brake linings, and thus their brake power, may vary greatly from that of original brake linings.

If brake linings are used that differ from the original equipment, compliance with the original homologation is not guaranteed. In this case, the vehicle no longer corresponds to its condition at delivery and the manufacturer warranty shall be void.

- Only use brake linings approved and recommended by KTM.



Note

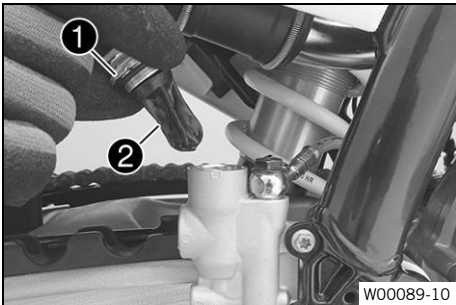
Environmental hazard Hazardous substances cause environmental damage.

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



Info

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

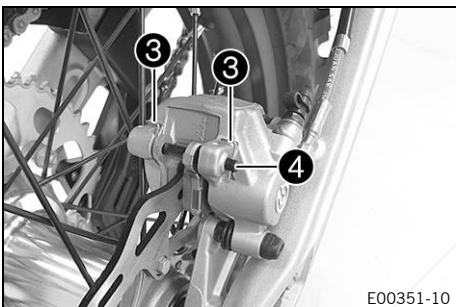


- Stand the vehicle upright.
- Remove screw cap ① with membrane ② and the O-ring.
- Press the brake piston back into the basic position and ensure that brake fluid does not flow out of the brake fluid reservoir; extract some if necessary.

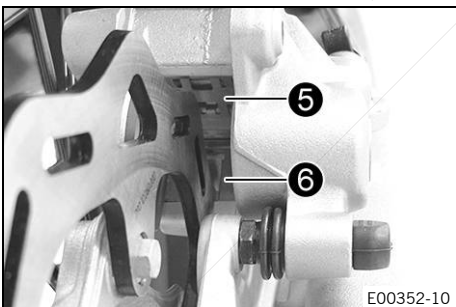


Info

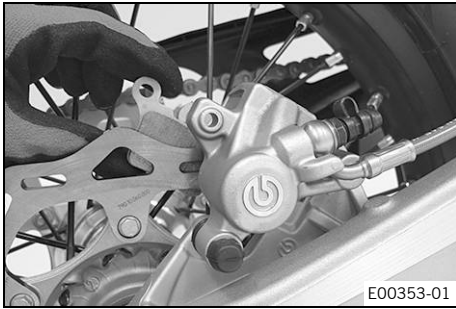
Make sure that you do not press the brake caliper against the spokes when pushing back the brake piston.



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



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



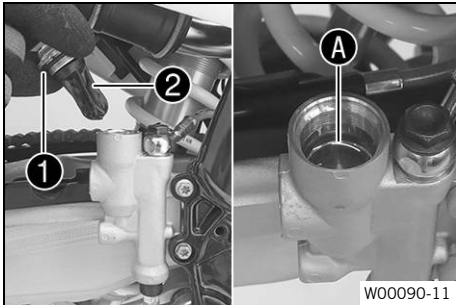
- Insert the new brake linings, insert the pin, and mount the cotter pins.



Info

Always change the brake linings in pairs.

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



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

Brake fluid DOT 4 / DOT 5.1 (📖 p. 314)

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



Info

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

16.10 Checking the free travel of foot brake lever

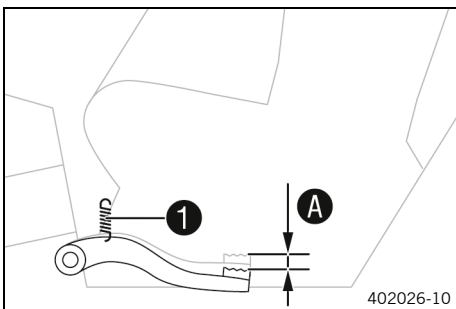


Warning

Danger of accidents The brake system will fail if it overheats or is adjusted incorrectly.

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.
- Ensure that the adjustment steps are performed properly.



- 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. 150)
- Reconnect spring **1**.

16.11 Adjusting the basic position of the foot brake lever

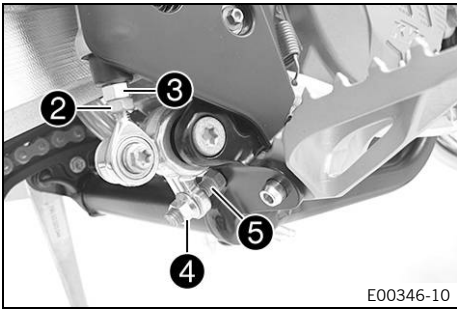
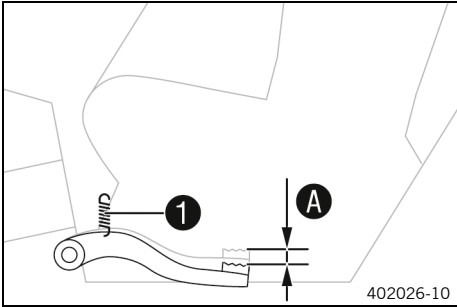


Warning

Danger of accidents The brake system will fail if it overheats or is adjusted incorrectly.

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.
- Ensure that the adjustment steps are performed properly.



– 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		
Rear brake lever stop nut	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.

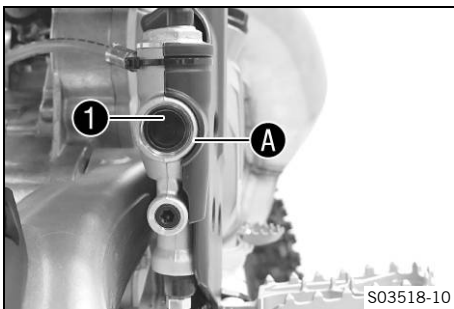
- Check the brake system and do not continue riding until the problem is eliminated.



Warning

Danger of accidents Brake fluid which is too old or of the wrong type impairs the function of the brake system.

- Make sure that brake fluid for the front and rear brake is changed in accordance with the service schedule.
- Make sure that only clean, approved brake fluid from a tightly sealed container is used.



- Stand the vehicle upright.
- Check the brake fluid level in the viewer ①.
 - » If the fluid has dropped below marking A in the level viewer:
 - Add rear brake fluid. (📖 p. 151)

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 is a harmful substance.

- 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 Brake fluid which is too old or of the wrong type impairs the function of the brake system.

- Make sure that brake fluid for the front and rear brake is changed in accordance with the service schedule.
- Make sure that only clean, approved brake fluid from a tightly sealed container is used.



Note

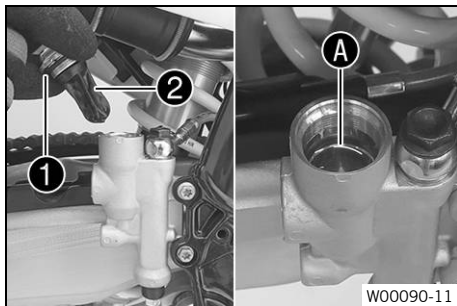
Environmental hazard Hazardous substances cause environmental damage.

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



Info

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



Preparatory work

- Check that the brake linings of the rear brake are secured. (📖 p. 147)
- Remove the frame protector. (📖 p. 55)

Main work

- Stand the vehicle upright.
- Remove screw cap ❶ with membrane ❷ and the O-ring.
- Add brake fluid up to the marking A.

Brake fluid DOT 4 / DOT 5.1 (📖 p. 314)

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



Info

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

Finishing work

- Install the frame protector. (📖 p. 55)

16.14 Changing the 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 is a harmful substance.

- 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 Brake fluid which is too old or of the wrong type impairs the function of the brake system.

- Make sure that brake fluid for the front and rear brake is changed in accordance with the service schedule.
- Make sure that only clean, approved brake fluid from a tightly sealed container is used.



Note

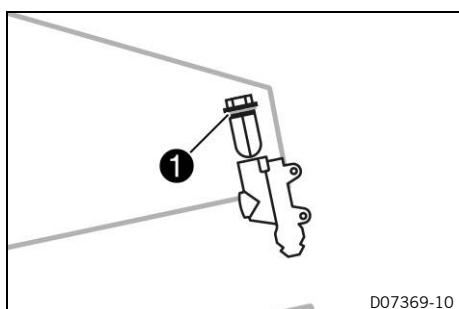
Environmental hazard Hazardous substances cause environmental damage.

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



Info

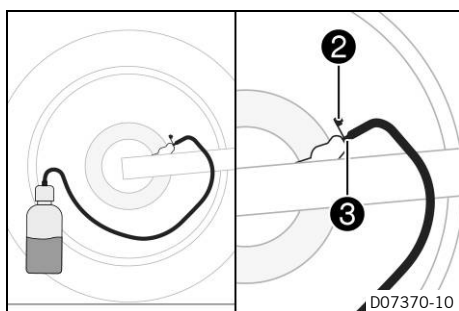
Avoid contact between brake fluid and painted parts. Brake fluid corrodes paint.



- Remove the cable ties from the frame protector in the area of the brake fluid reservoir.
- 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. 320)

Brake fluid DOT 4 / DOT 5.1 (p. 314)



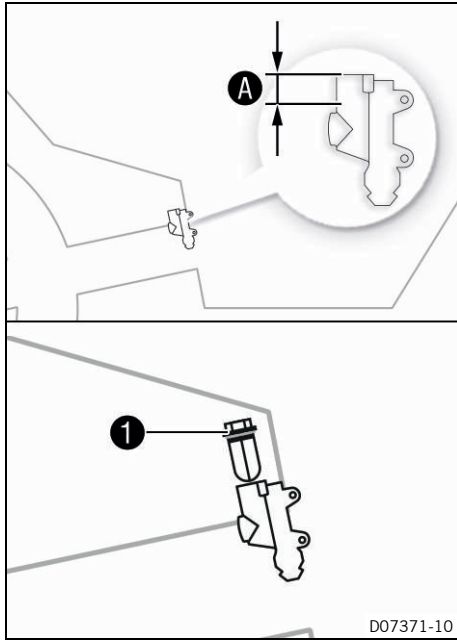
- Pull off protection cap ② of the brake caliper bleeder screw. Connect the bleeder bottle hose.
- Actuate the foot brake lever and hold it in place.
- Open bleeder screw ③ by approx. one half turn.
- ✓ Brake fluid runs into the bleeder bottle hose.
- Tighten bleeder screw ③.
- Release foot brake lever.
- Repeat the procedure until fresh brake fluid emerges from the hose of the bleeder bottle without bubbles.



Info

Ensure that the brake fluid reservoir is always filled with a sufficient amount of fresh brake fluid.

- Remove the bleeder bottle hose. Mount protection cap ②.



- Stand the vehicle upright.
- Correct the brake fluid to marking **A**.

Brake fluid DOT 4 / DOT 5.1 (p. 314)

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



Info

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

- Check the foot brake lever for a firm pressure point.
- Mount the new cable ties on the frame protector in the area of the brake fluid reservoir.

17.1 Changing the headlight bulb

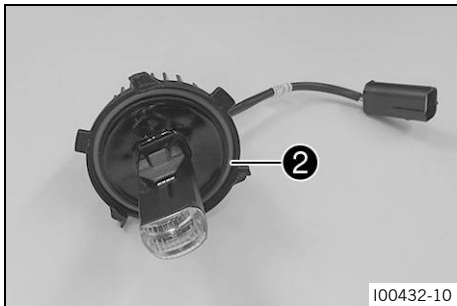
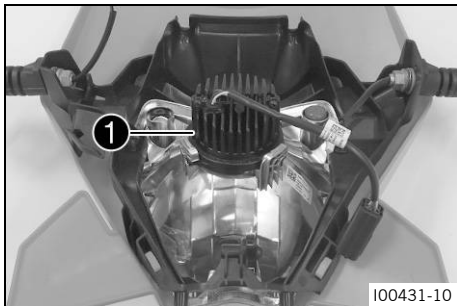
Note

Impairments to reflectors and lamps Grease on the reflector reduces the emitted light.

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

Grease residue on the bulb reduces heat dissipation and increases the heat of the bulb, thus reducing its service life.

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



Preparatory work

- Remove the headlight mask with the headlight. (📖 p. 109)

Main work

- Turn LED unit ① counterclockwise all the way and take it out of the reflector.

Guideline

Only touch the LED unit on the cooling element.

- Insert the LED unit into the reflector and turn it clockwise all the way.

Headlight (LED)



Info

Ensure that O-ring ② is seated properly.

Finishing work

- Install the headlight mask with the headlight. (📖 p. 109)
- Check the headlight setting. (📖 p. 156)



17.2 Changing the turn signal bulb (All EXC models)

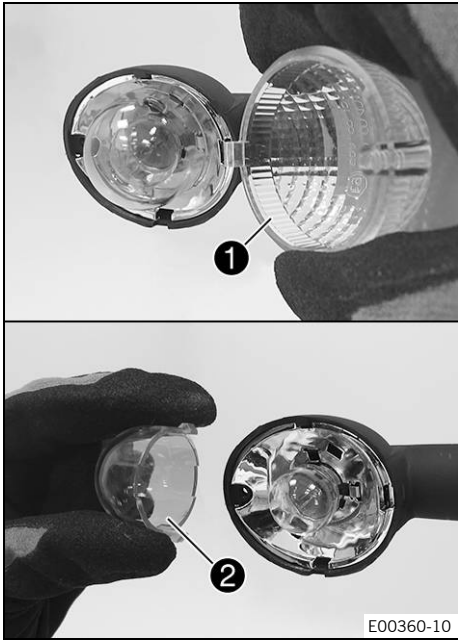
Note

Impairments to reflectors and lamps Grease on the reflector reduces the emitted light.

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

Grease residue on the bulb reduces heat dissipation and increases the heat of the bulb, thus reducing its service life.

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



Main work

- Remove the screw on the rear of the turn signal housing.
- Carefully remove turn signal glass ①.
- Lightly squeeze orange cap ② in the area of the holding lugs and take it off.
- Press the turn signal bulb lightly into the socket, turn it counterclockwise by about 30°, and take it out of the socket.

Info

Do not touch the reflector with your fingers and keep it free from grease.

- Press the new turn signal bulb carefully into the socket and turn it clockwise until it stops.

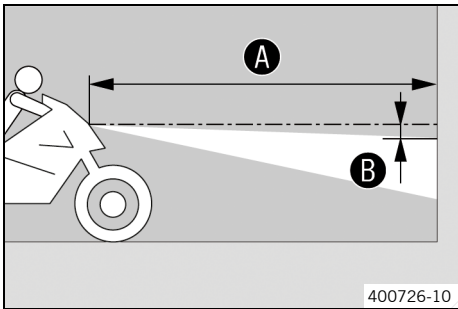
Turn signal (R10W / socket BA15s) (📖 p. 284)

- Mount the orange cap.
- Position the turn signal glass.
- Insert the screw and first turn counterclockwise until it engages in the thread with a small jerk. Tighten the screw lightly.

Finishing work

- Check that the turn signal system is functioning properly.

17.3 Checking the headlight setting



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

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

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

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

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

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

- » If the boundary between light and dark does not meet specifications:
 - Adjust the headlight range. (📖 p. 157)

17.4 Adjusting the headlight range

Preparatory work

- Check the headlight setting. (📖 p. 156)

Main work

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

Guideline

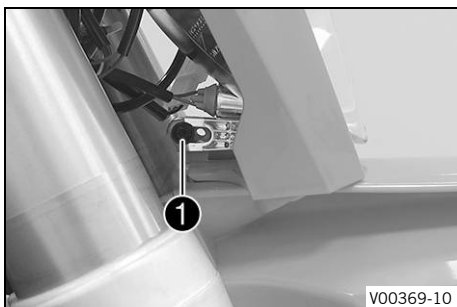
The boundary between light and dark must be exactly on the lower mark for a motorcycle with rider (instructions on how to apply the mark: Checking the headlight setting).



Info

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

- Tighten screw ❶.



V00369-10

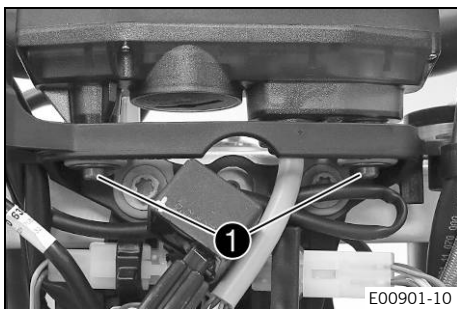
17.5 Changing the combination instrument battery

Preparatory work

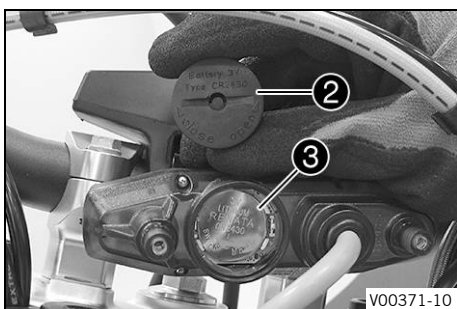
- Remove the headlight mask with the headlight. (📖 p. 109)

Main work

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



E00901-10

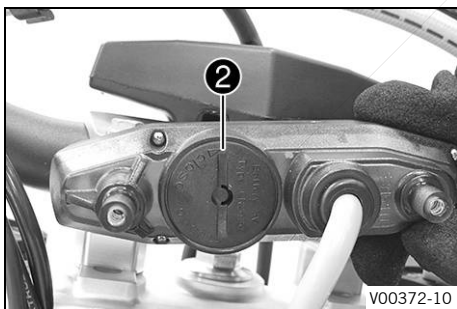


V00371-10

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

Combination instrument battery (CR 2430) (📖 p. 284)

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



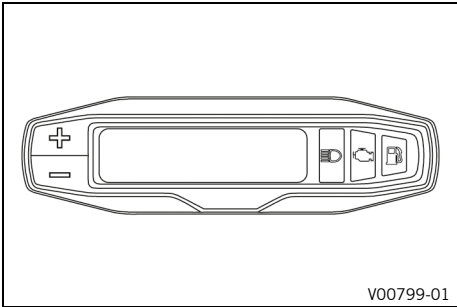
V00372-10

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

Finishing work

- Install the headlight mask with the headlight. (📖 p. 109)
- Check the headlight setting. (📖 p. 156)
- Set kilometers or miles. (📖 p. 158)
- Adjust combination instrument function. (📖 p. 159)
- Set the clock. (📖 p. 160)

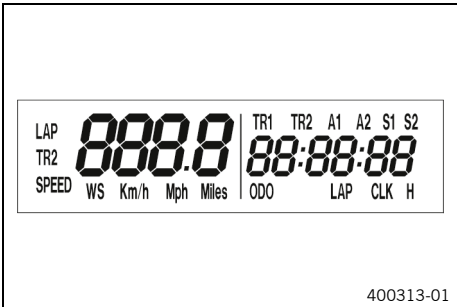
17.6 Combination instrument overview



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

i Info
When the vehicle is delivered, only the **SPEED/H** and **SPEED/ODO** display modes are activated.

17.7 Activation and test



Activating combination instrument

The combination instrument is activated when one of the buttons is pressed or an impulse comes from the wheel speed sensor.

Display test

To enable you to check that the display is functioning properly, all display segments light up briefly.



WS (wheel size)

After the display function check, the wheel circumference **WS** is displayed briefly.

i Info
The number 2205 equals the circumference of the 21" front wheel with standard tires.

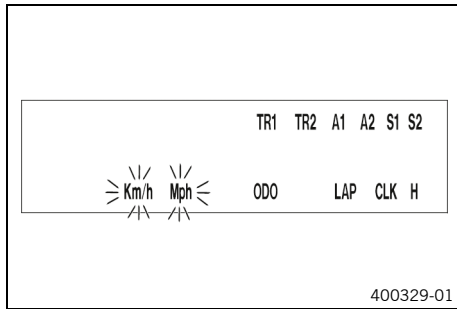
The display then changes to the last selected mode.

17.8 Setting kilometers or miles

i Info
If you change the unit, the value **ODO** is retained and converted accordingly.
The values **TR1**, **TR2**, **A1**, **A2** and **S1** are cleared when the unit of measure is changed.

Condition

The motorcycle is stationary.



- Repeatedly press the button briefly until **H** appears at the bottom right of the display.
- Press the button for 2–3 seconds.
 - ✓ The Setup menu is displayed and the active functions are shown.
- Repeatedly press the button briefly until **Km/h/Mph** flashes.

Adjusting the Km/h

- Press the button .

Adjusting the Mph

- Press the button .
- Wait 3 - 5 seconds.
 - ✓ The settings are stored.



Info

If no button is pressed for 10–12 seconds, or if an impulse comes from the wheel speed sensor, the settings are automatically saved and the setup menu is closed.



17.9 Adjusting combination instrument function



Info

When the vehicle is delivered, only the **SPEED/H** and **SPEED/ODO** display modes are activated.

Condition

The motorcycle is stationary.

- Repeatedly press the button briefly until **H** appears at the bottom right of the display.
- Press the button for 2–3 seconds.
 - ✓ The Setup menu is displayed and the active functions are shown.



Info

If no button is pressed for 10–12 seconds, the settings are automatically saved.
If no button is pressed for 20 seconds, or if an impulse comes from the wheel speed sensor, the settings are automatically saved and the setup menu is closed.

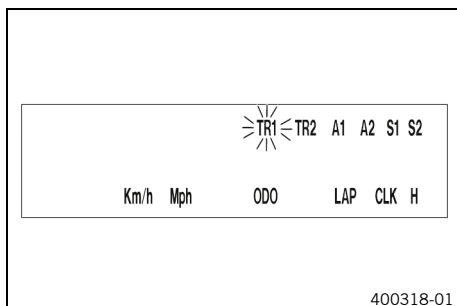
- Repeatedly press the button briefly until the desired function flashes.
 - ✓ The selected function flashes.

Activating the function

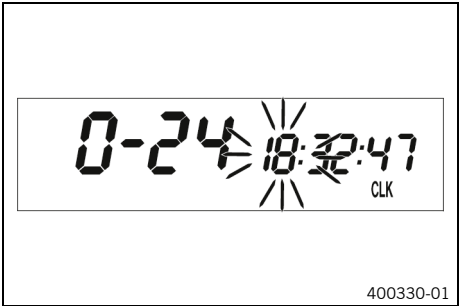
- Press the button .
 - ✓ The symbol continues to appear in the display and the next function appears.

Deactivating a function

- Press the button .
 - ✓ The symbol disappears in the display and the next function appears.



17.10 Setting the clock

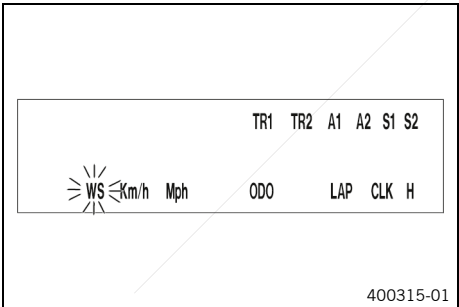


- Condition**
The motorcycle is stationary.
- Repeatedly press the button briefly until **CLK** appears at the bottom right of the display.
 - Press the button for 2–3 seconds.
 - ✓ The hour display flashes.
 - Adjust hour display with the button and/or button .
 - Wait 3 - 5 seconds.
 - ✓ The next segment of the display flashes and can be set.
 - You can set the following segments in the same way as the hours by pressing the button and the button .

i Info
The seconds can only be set to zero.
If no button is pressed for 15–20 seconds, or if an impulse comes from the wheel speed sensor, the settings are automatically saved and the setup menu is closed.

17.11 Adjusting the wheel circumference

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



- Condition**
The motorcycle is stationary.
- Preparatory work**
- Remove the headlight mask with the headlight. (📖 p. 109)
 - Unplug combination instrument connector.
- Main work**
- Repeatedly press the button briefly until **H** appears at the bottom right of the display.
 - Press the button for 2–3 seconds.
 - Repeatedly press the button until the **WS** indicator flashes.
 - Press the button briefly.

i Info
The wheel circumference is displayed in millimeters.

- Enlarging the wheel circumference**
- Press the button .
- Reducing the wheel circumference**
- Press the button .



Info

If no button is pressed for 20 seconds, or if no impulse comes from the wheel speed sensor, the settings are automatically saved and the Setup menu is closed.

Finishing work

- Plug in combination instrument connector.
- Remove the headlight mask with the headlight. (📖 p. 109)



17.12 Viewing the lap time



Info

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

Condition

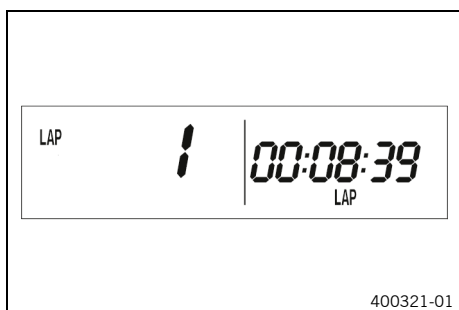
The motorcycle is stationary.

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



Info

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

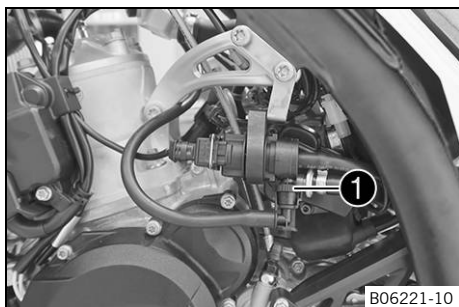


18.1 Removing the engine

Preparatory work

(All XC-W and special models)

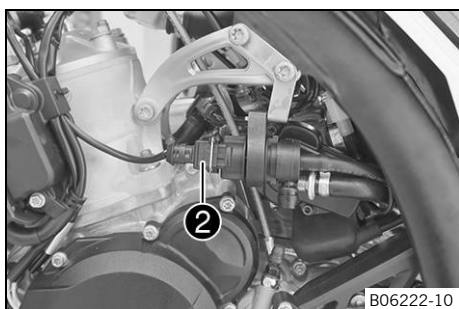
- Remove the engine guard. (📖 p. 55)
- Raise the motorcycle with a lift stand. (📖 p. 13)
- Remove the frame protector. (📖 p. 55)
- Remove the air filter box cover. (📖 p. 91)
- Remove the seat. (📖 p. 95)
- Remove the fuel tank. (📖 p. 96)
- Disconnect the negative cable of the 12-V battery. (📖 p. 132)
- Drain the coolant. (📖 p. 239)
- Remove main silencer. (📖 p. 86)
- Remove the manifold. (📖 p. 86)



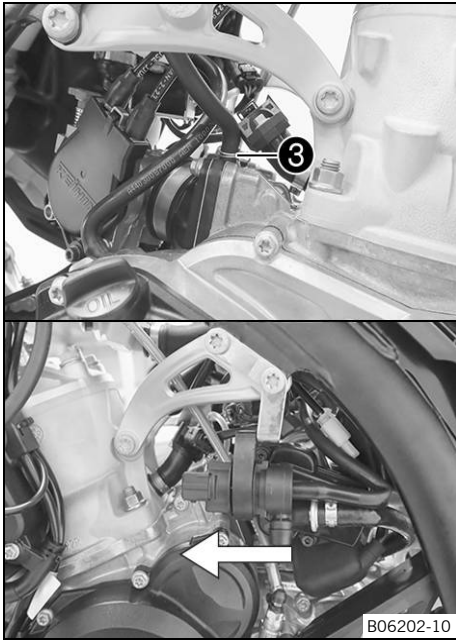
Main work

(All EU/ASEAN models)

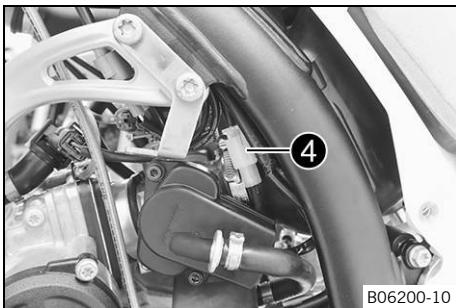
- Unplug hose piece ❶.



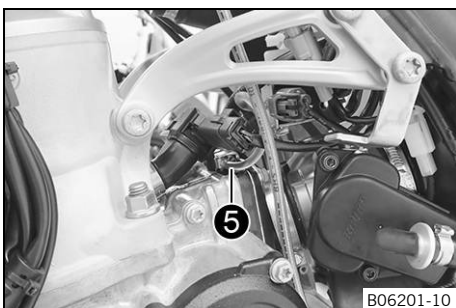
- Unplug connector ❷.



- Push hose clip **3** back and pull the hose off the engine.
- Pull the fuel vapor valve off of the holder and remove it.



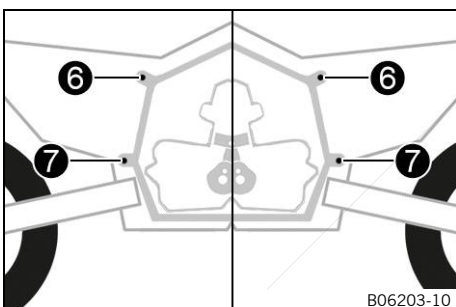
- Unplug connector **4** on the brake light switch.



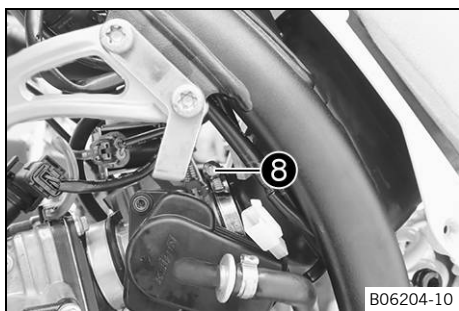
- Push back hose clamp **5**.
- Pull the hose off the reed valve housing.

**Info**

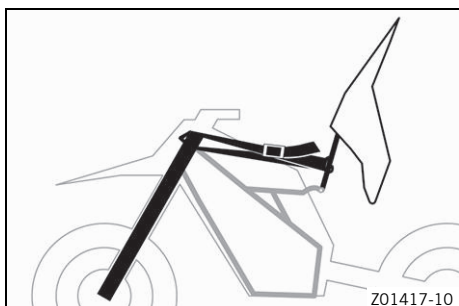
Residual oil may escape from the hose.



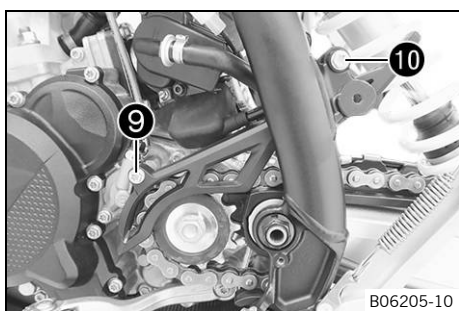
- Loosen screws **6**.
- Remove screws **7**.



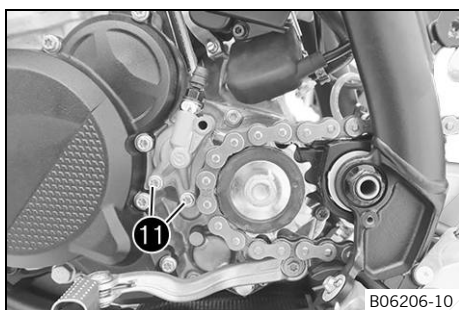
- Loosen hose clip 8.
- Lift up the subframe slightly.
- Take off hose clip 8.



- Pivot the subframe up and secure it.



- Remove screw 9.
- Remove screw 10.
- Take off the engine sprocket cover.

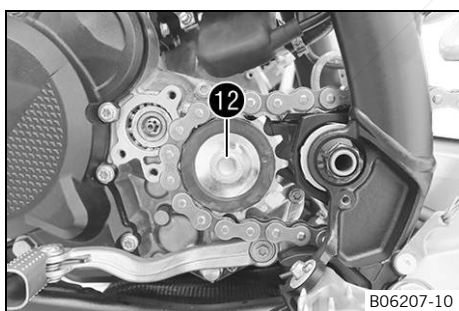


- Remove screws 11.
- Take off the slave cylinder of the clutch and hang to the side.



Info

Do not kink the clutch line.
Do not activate the clutch lever while the slave cylinder of the clutch is removed.

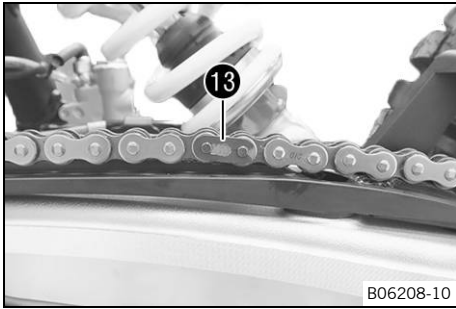


- Actuate the foot brake lever.
- Loosen screw 12.



Info

The help of an assistant is useful in this step.



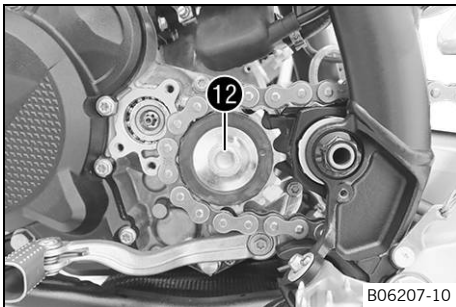
- Remove connecting link 13 of the chain.



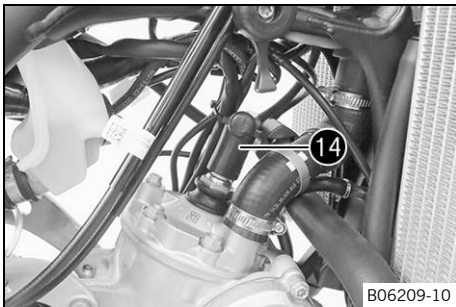
Info

Cover the components to protect them against damage.

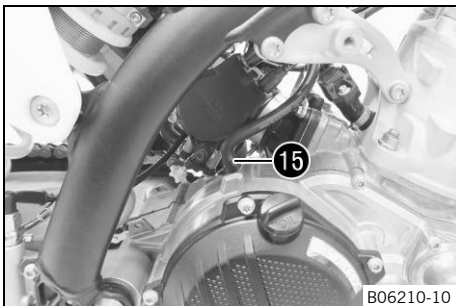
- Take off the chain.



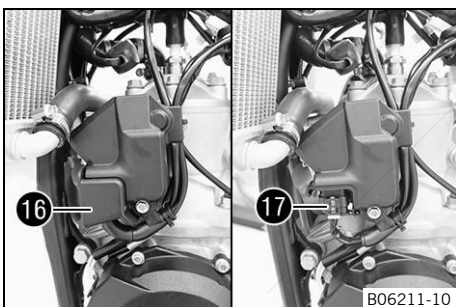
- Remove screw 12 with washer.
- Take off the engine sprocket.



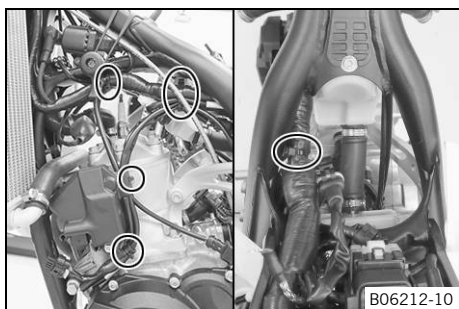
- Disconnect spark plug connector 14.



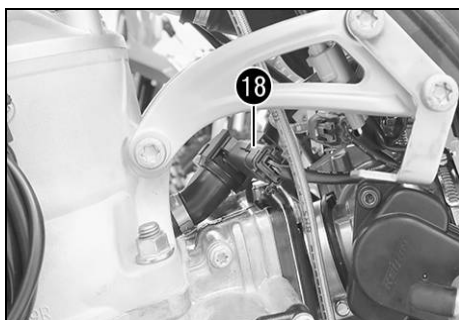
- Pull off vent hose 15.



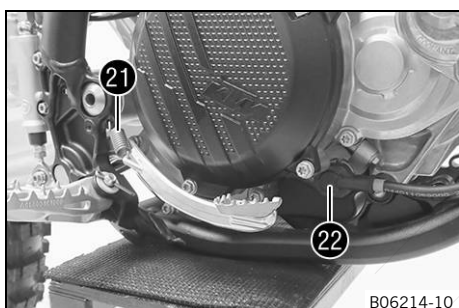
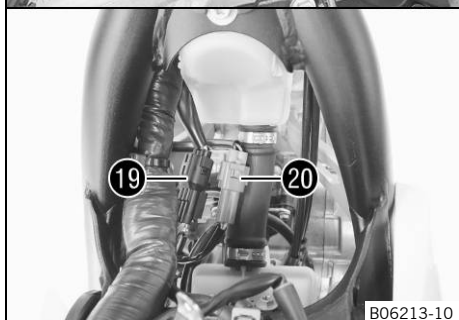
- Remove cover 16.
- Disconnect plug 17 of the exhaust control.



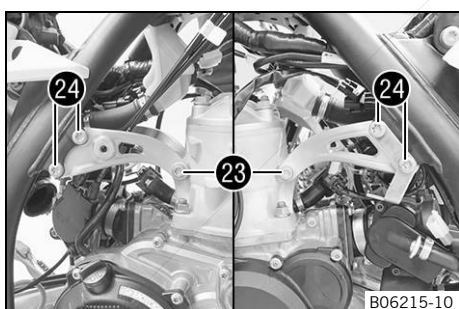
- Remove the cable ties and expose the cable.



- Unplug connector 18.
- Disconnect plug-in connector 19.
- Disconnect plug-in connector 20.
- Expose the cable.

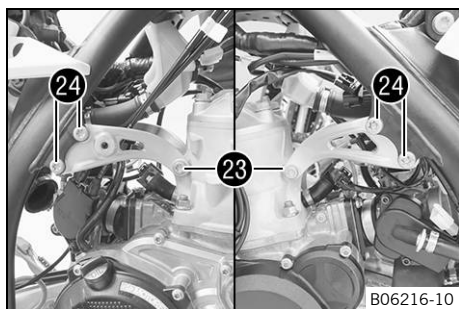


- Remove spring 21.
- Push back protection cap 22 and remove the nut.
- Hang the positive cable to the side.



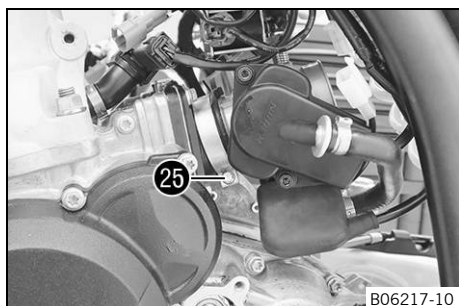
(All EU/ASEAN models)

- Remove screws 23.
- Remove screws 24.
- Take the engine brace off with the bracket.

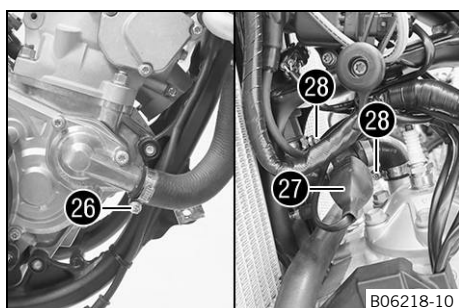


(All BR/CN/XC-W models)

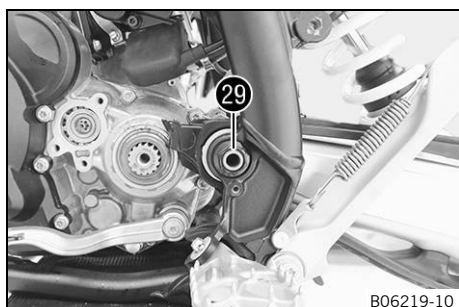
- Remove screws 23.
- Remove screws 24.
- Take off the engine braces.



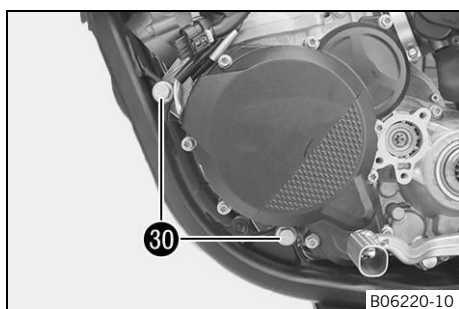
- Loosen hose clip 25.
- Pull the throttle valve body out of the intake flange toward the rear and hang it to one side.



- Loosen hose clip 26.
- Push back protection cap 27 and remove the connector.
- Release hose clips 28.
- Pull off the radiator hoses.



- Remove nut 29.
- Remove the swingarm pivot.
- Pull the link fork back slightly.



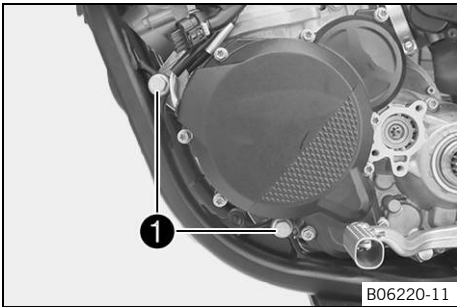
- Remove screws 30.
- Lift out the engine sideways.



Info

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

18.2 Installing the engine



Main work

- Position the engine in the frame.

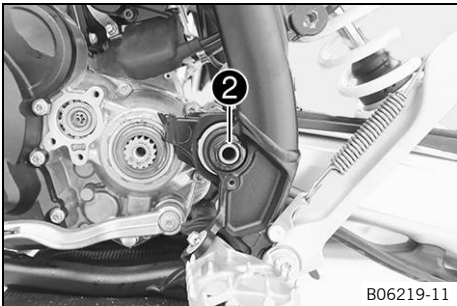


Info
The help of an assistant is useful in this step.
Make sure that the motorcycle is sufficiently secured against falling over.
Cover the components to protect them against damage.

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

Guideline

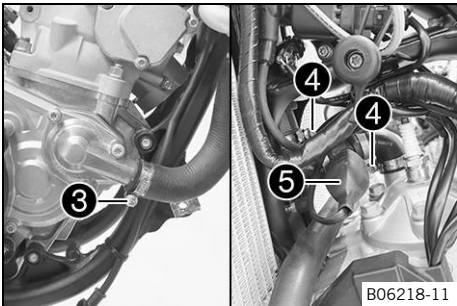
Engine bracket screw	M10	60 Nm (44.3 lbf ft)
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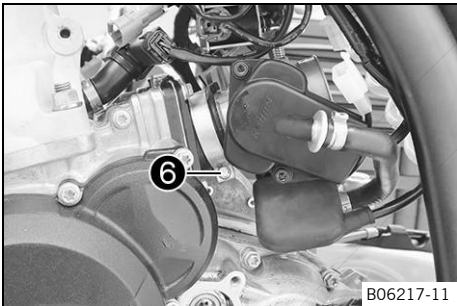
- Position the link fork.
- Mount the swingarm pivot.
- Mount nut **2**, but do not tighten yet.

Guideline

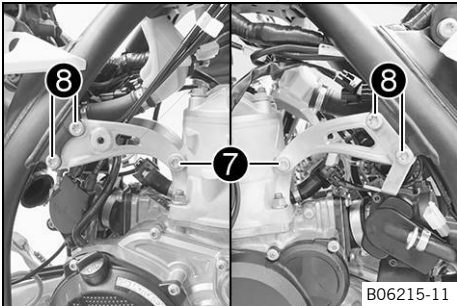
Nut, fork pivot	M16x1.5	100 Nm (73.8 lbf ft)
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- Mount the radiator hoses.
- Position and tighten hose clips **3** and **4**.
- Plug in connector and position protection cap **5**.



- Position the throttle valve body in the intake flange.
- Position and tighten hose clip **6**.



(All EU/ASEAN models)

- Position the engine brace with the bracket.
- Mount and tighten screws **7**.

Guideline

Screw, engine brace	M8x15	25 Nm (18.4 lbf ft) Loctite®2701™
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- Mount and tighten screws **8**.

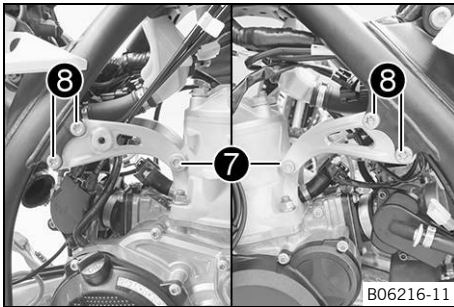
Guideline

Screw, engine brace	M8x15	25 Nm (18.4 lbf ft) Loctite®2701™
---------------------	-------	---

- 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)



(All BR/CN/XC-W models)

- Position the engine braces.
- Mount and tighten screws **7**.

Guideline

Screw, engine brace	M8x15	25 Nm (18.4 lbf ft) Loctite®2701™
---------------------	-------	---

- Mount and tighten screws **8**.

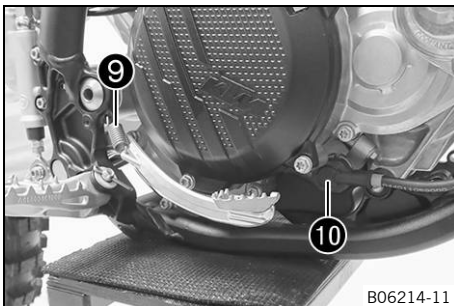
Guideline

Screw, engine brace	M8x15	25 Nm (18.4 lbf ft) Loctite®2701™
---------------------	-------	---

- 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)

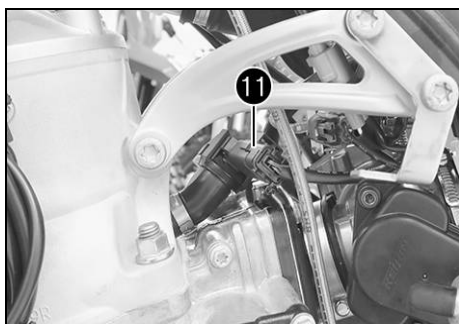


- Mount spring **9**.
- Position the positive cable and mount and tighten the nut.

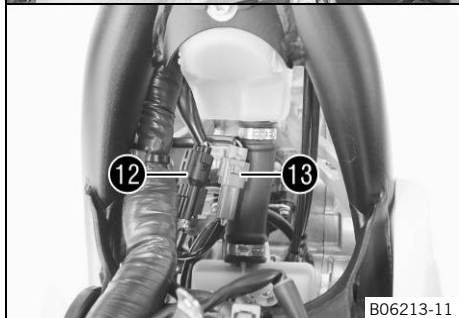
Guideline

Nut, cable on starter motor	M6	4 Nm (3 lbf ft)
-----------------------------	----	-----------------

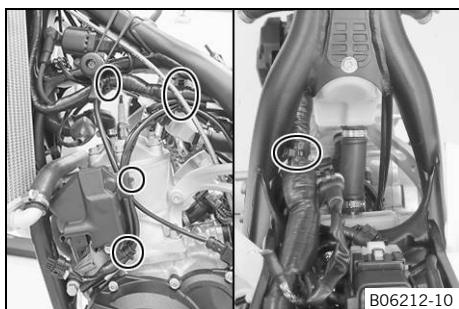
- Mount protection cap **10**.



- Plug in connector 11.
- Route the cable without tension and join plug-in connector 12.
- Route the cable without tension and join plug-in connector 13.

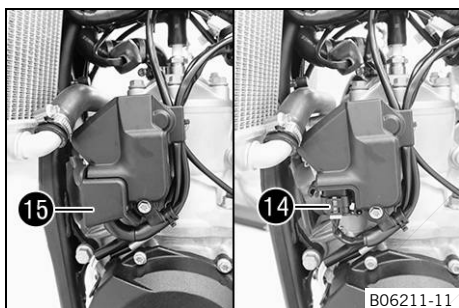


B06213-11



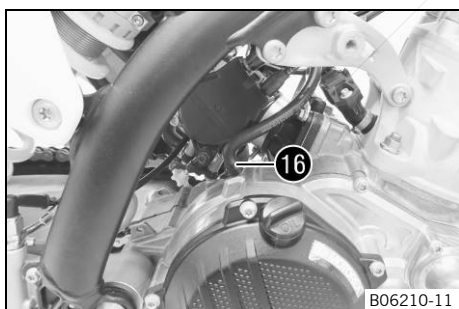
B06212-10

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



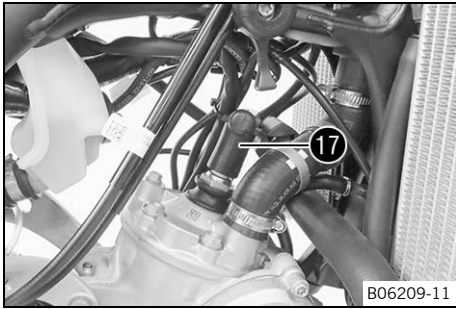
B06211-11

- Plug in connector 14 of the exhaust control.
- Position cover 15.

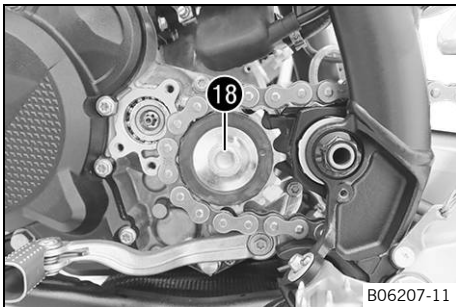


B06210-11

- Mount vent hose 16.



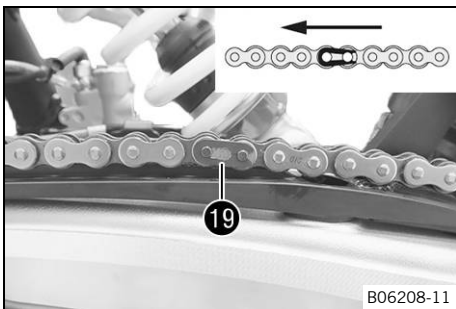
- Plug in spark plug connector **17**.



- Slide on the engine sprocket with the collar facing the engine.
- Mount screw **18** with washer, but do not tighten yet.

Guideline

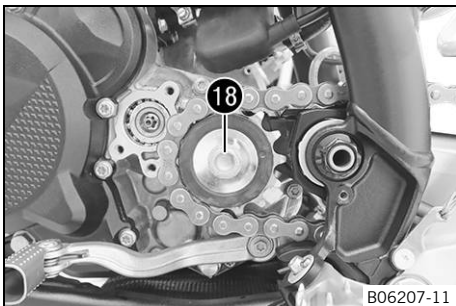
Screw, drive chain engine sprocket	M10	60 Nm (44.3 lbf ft) Loctite®2701™
------------------------------------	-----	---



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

Guideline

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



- Actuate the foot brake lever.
- Tighten bolt **18**.

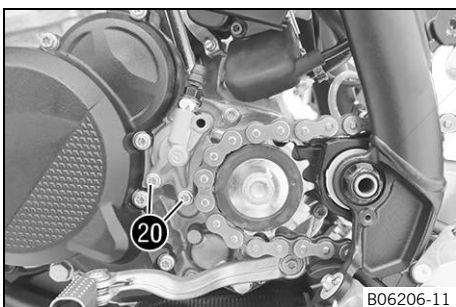
Guideline

Screw, drive chain engine sprocket	M10	60 Nm (44.3 lbf ft) Loctite®2701™
------------------------------------	-----	---



Info

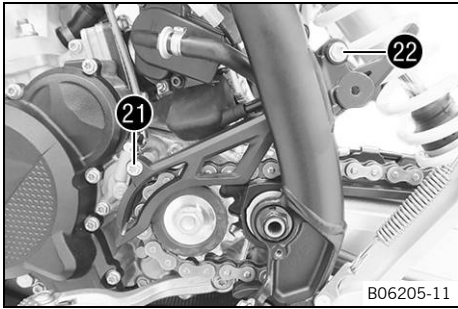
The help of an assistant is useful in this step.



- Position the clutch slave cylinder with the O-ring.
- Mount and tighten screws **20**.

Guideline

Screw, clutch slave cylinder	M6	10 Nm (7.4 lbf ft)
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- Position the engine sprocket cover.
- Mount and tighten screw 21.

Guideline

Screw, clutch slave cylinder	M6	10 Nm (7.4 lbf ft)
------------------------------	----	--------------------

- Mount and tighten screw 22.

Guideline

Screw, engine sprocket cover	M8	15 Nm (11.1 lbf ft)
------------------------------	----	---------------------

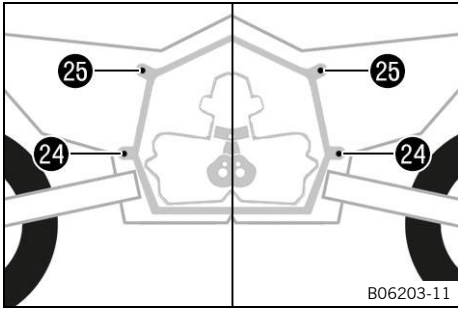
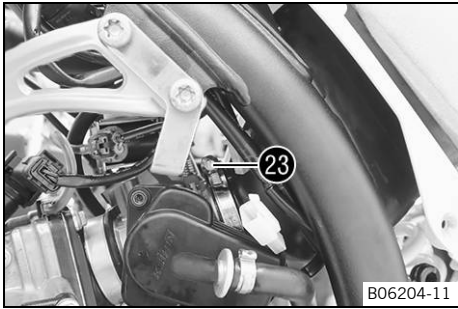
- Remove the locking piece and position the subframe.



Info

Watch out for the intake flange.

- Position the inlet sleeve on the throttle valve body.
- Position and tighten hose clip 23.



- Mount and tighten screws 24.

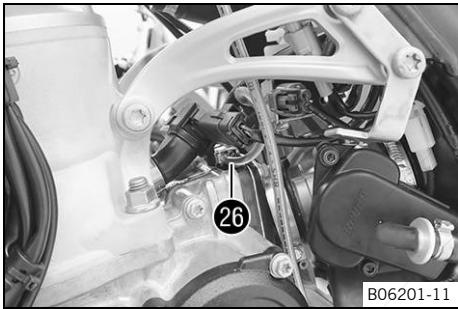
Guideline

Screw, sub-frame, top	M8	35 Nm (25.8 lbf ft) Loctite®243™
-----------------------	----	--

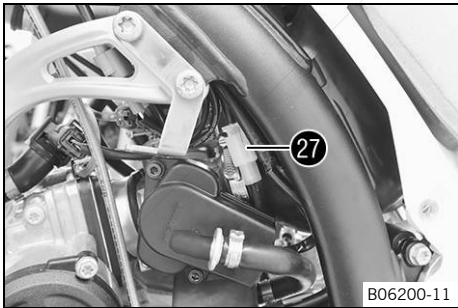
- Remove screws 25.
- Mount and tighten screws 25.

Guideline

Screw, sub-frame bottom	M8	30 Nm (22.1 lbf ft) Loctite®2701™
-------------------------	----	---

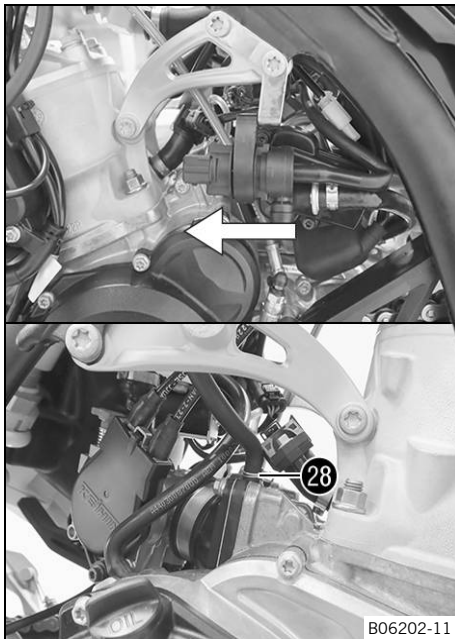


- Mount hose on the reed valve housing.
- Position hose clamp 26.



(All EU/ASEAN models)

- Plug in connector 27 of the brake light switch.



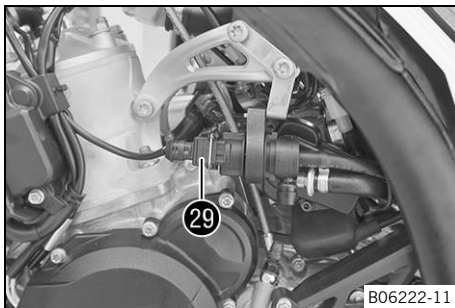
- Mount fuel vapor valve on the holder.



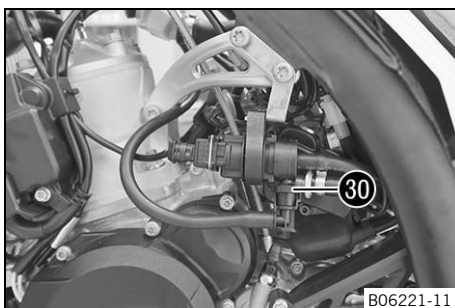
Info

Make sure the cables and wiring are routed correctly.

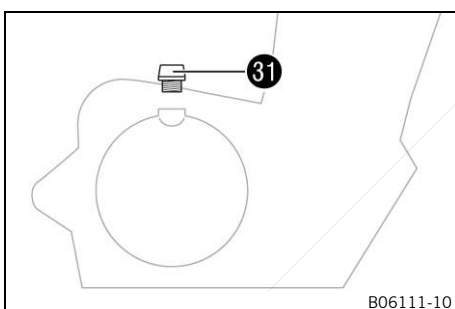
- Plug the hose into the engine and position hose clip 28.



- Plug in connector 29.



- Plug in hose piece 30.



- Remove filler plug 31 with the O-ring, and fill up with gear oil.

Gear oil	0.80 l (0.85 qt.)	Engine oil (15W/50) (p. 314)
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- Mount and tighten filler plug 31 with the O-ring.

Finishing work

- Install the manifold. (p. 88)
- Install the main silencer. (p. 86)
- Connect the negative cable of the 12-V battery. (p. 133)

- Install the fuel tank. (📖 p. 97)
- Mount the seat. (📖 p. 95)
- Install the air filter box cover. (📖 p. 91)
- Install the frame protector. (📖 p. 55)
- Remove the motorcycle from the lift stand. (📖 p. 13)
- Refill with coolant. (📖 p. 240)

(All XC-W and special models)

- Install the engine guard. (📖 p. 55)

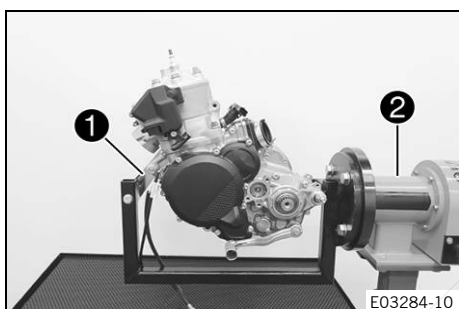
Condition

Work on the exhaust control has been carried out.

- Program the end positions of the exhaust control. (📖 p. 259)
- Mount the seat. (📖 p. 95)
- Clear the fault memory using the KTM diagnostics tool.
- Go for a short test ride.
- Read out the fault memory using the KTM diagnostics tool.
- Check the engine for leaks.
- Check the gear oil level. (📖 p. 262)
- Check 2-stroke oil level. (📖 p. 263)
- Check the coolant level. (📖 p. 239)

18.3 Engine disassembly

18.3.1 Clamping engine into the engine work stand



- Mount special tool ① on motor work stand ②.

Engine work stand (61229001000) (📖 p. 323)

Holder and fitting for work stand (55429002000)
(📖 p. 321)

- Mount the motor on special tool ①.

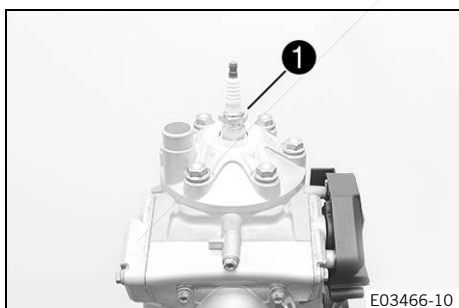
18.3.2 Removing the cylinder head and the cylinder

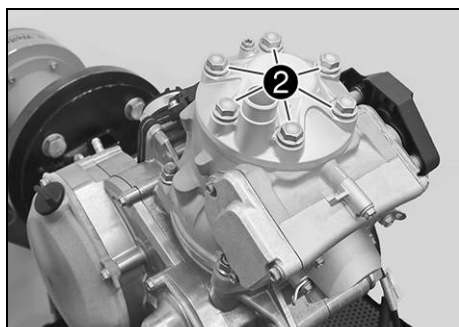
Preparatory work

- Clamp the engine into the engine work stand. (📖 p. 174)

Removing the cylinder head

- Remove spark plug ①.





- Loosen screws **2** in a crisscross pattern and remove them.
- Take off the cylinder head.

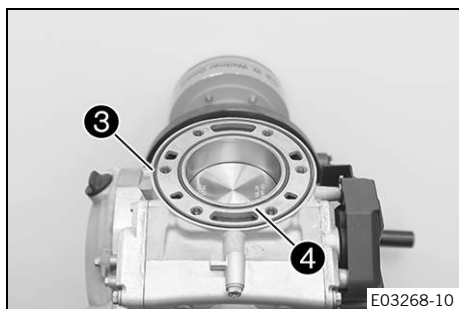


Info

The cylinder head consists of two parts; the combustion chamber liner and the cylinder head cover.

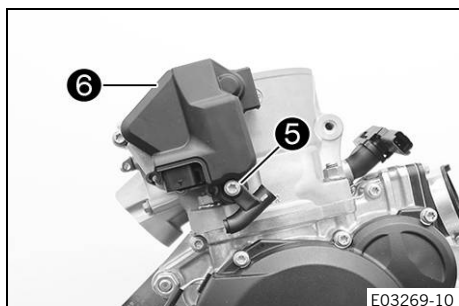


E03373-10



E03268-10

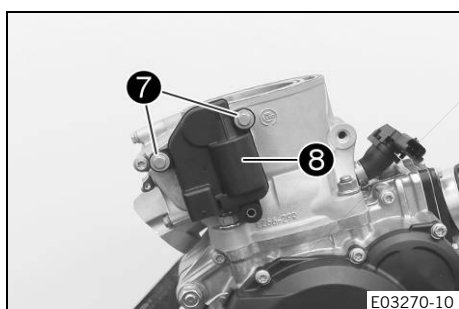
- Remove O-rings **3** and **4**.



E03269-10

Removing the cylinder

- Remove screw **5**.
- Take off cover **6**.



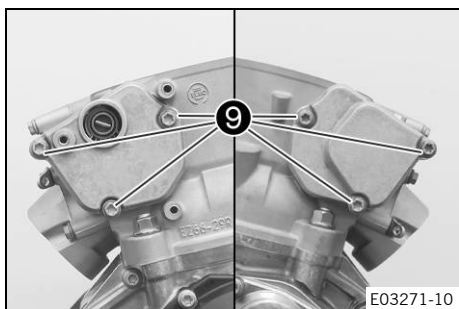
E03270-10

- Remove screws **7**.
- Take off actuator **8**.

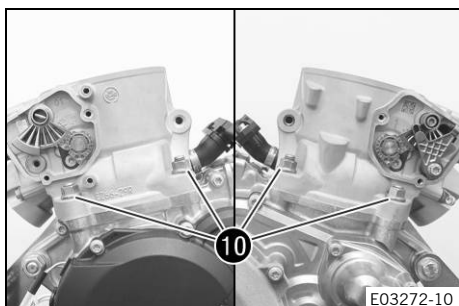


Info

If the actuator of the exhaust control has been removed, the end positions of the exhaust control must be reprogrammed.



- Remove screws ⑨.
- Take off both covers of the exhaust control with the gaskets.



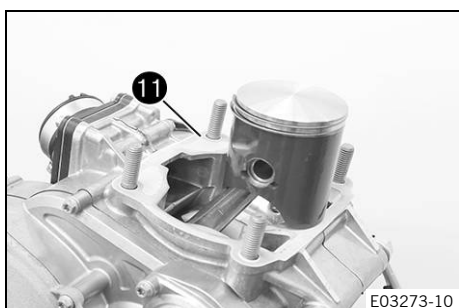
- Remove nuts ⑩.



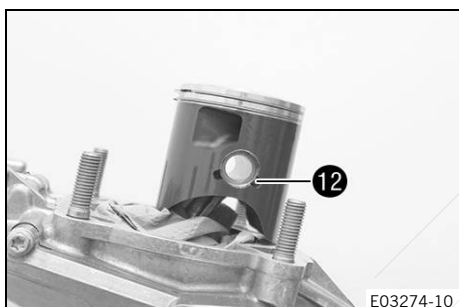
Info

Raise the cylinder slightly to be able to remove the front nuts.

- Carefully slide the cylinder up and take it off.

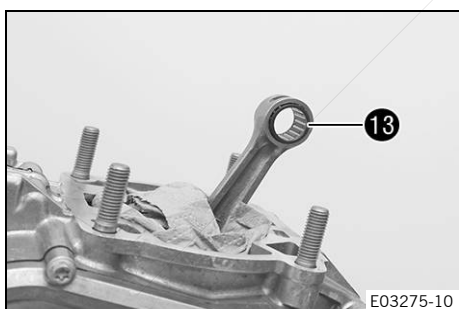


- Take off cylinder base gasket ⑪.
- Uncover the crankcase.



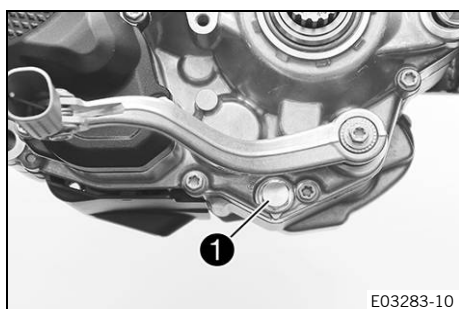
Removing the piston

- Remove piston ring lock ⑫.
- Remove the piston pin.
- Take off the piston.



- Remove upper conrod bearing ⑬.

18.3.3 Draining the gear oil



- Remove gear oil drain plug **1** with the magnet and seal ring.
- Let the gear oil drain fully.



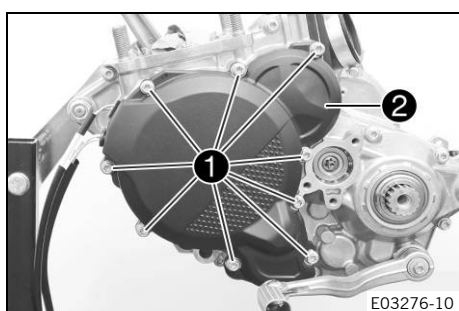
18.3.4 Disassembling the alternator side

Preparatory work

- Clamp the engine into the engine work stand. (📖 p. 174)

Removing the alternator cover

- Remove screws **1**. Take off alternator cover **2** with the gasket.



Info

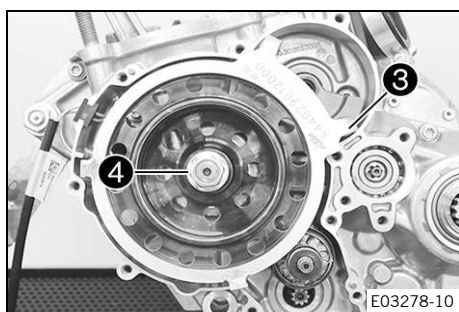
Ensure that the cylindrical pins remain in place.

Removing the rotor

- Mount special tool **3**.

Holding wrench (A44029012000) (📖 p. 329)

- Remove nut **4** with washer.



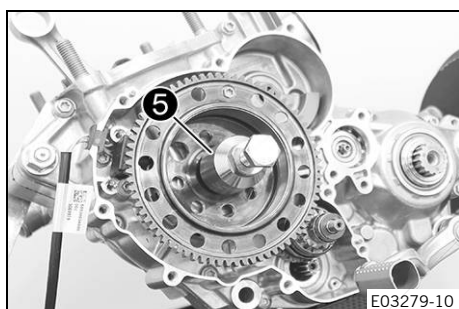
- Mount special tool **5**, hold, and pull off the rotor by screwing in the screw.

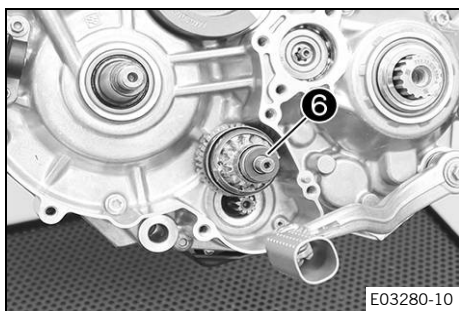
Puller (79229032044) (📖 p. 324)



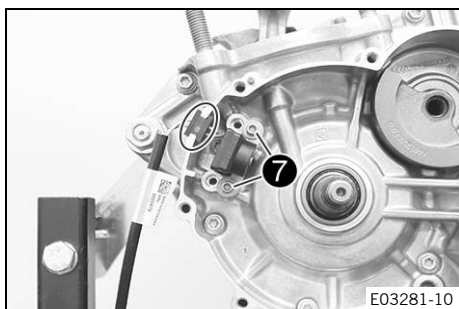
Info

Ensure that the woodruff key remains in place.





- Take off Bendix ⑥.



- Pull the rubber grommet out of the engine case.
- Remove screws ⑦.
- Take off the crankshaft speed sensor.

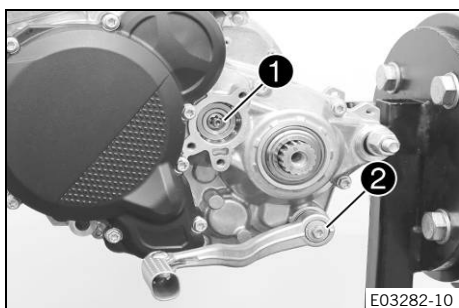
18.3.5 Dismantling the clutch side

Preparatory work

- Clamp the engine into the engine work stand. (📖 p. 174)
- Drain the gear oil. (📖 p. 177)

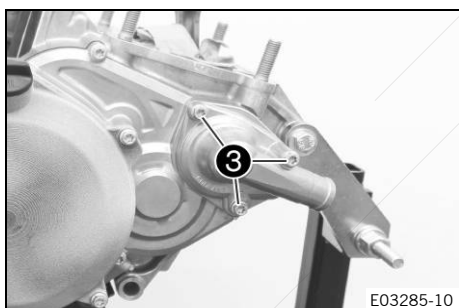
Main work

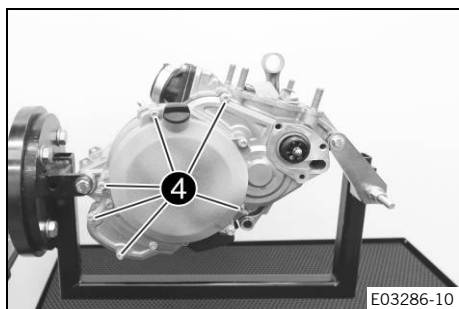
- Remove clutch push rod ①.
- Remove screw ② with washers. Take off the shift lever.



Removing the water pump and clutch cover

- Remove screws ③.
- Take off the water pump cover with the gasket.



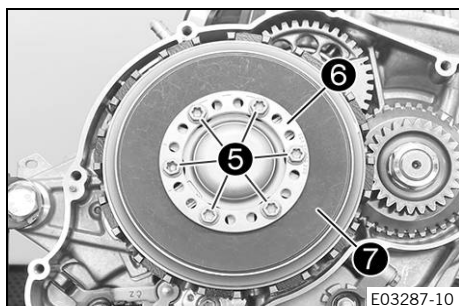


- Remove screws 4.
- Take off the clutch cover with the gasket.



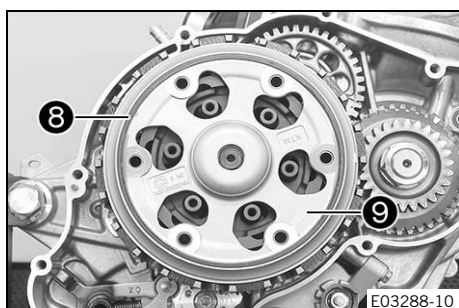
Info

Ensure that the cylindrical pins remain in place.

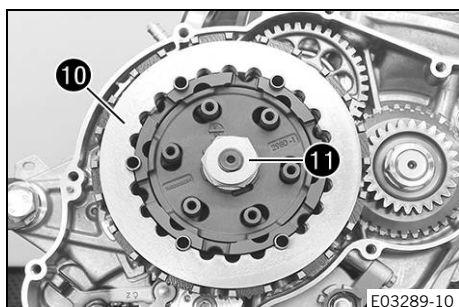


Removing the clutch discs

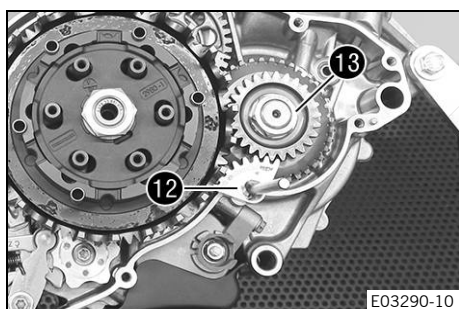
- Loosen screws 5 in an incremental crisscross pattern and remove them.
- Take off spring retainer 6.
- Take off spring washer 7.



- Take off pretension ring 8.
- Take off clutch pressure cap 9.



- Remove clutch disc pack 10 completely.
- Remove clutch throw-out 11.



Removing the clutch basket

- Hold the primary gear wheel using special tool 12.

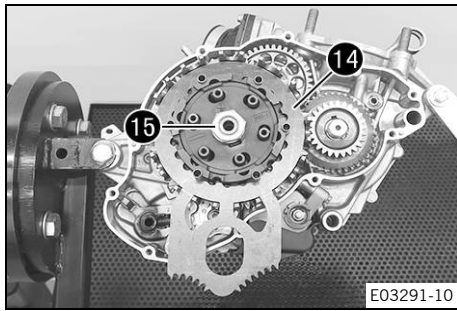
Gear segment (80029004000) (p. 325)

- Remove nut 13.



Info

LH thread!



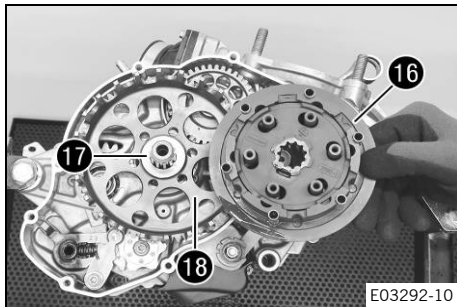
- Hold the inner clutch hub with special tool **14**. Loosen nut **15**.

Holding wrench (59029003100) (p. 322)

Alternative 1

Holding wrench (51129003000) (p. 320)

- Remove the nut with the wedge lock washer.



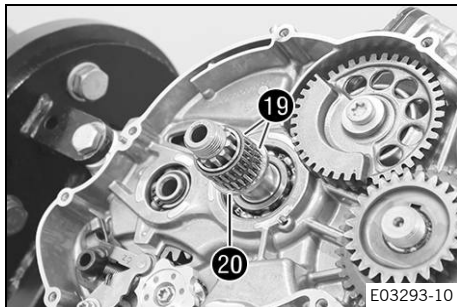
- Take off inner clutch hub **16** and washer **17**.



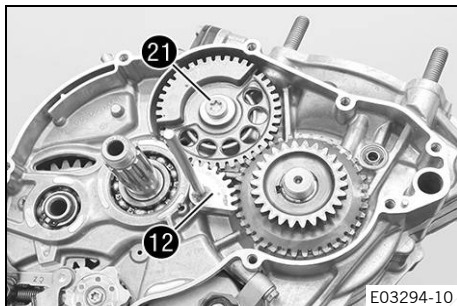
Info

The washer usually sticks to the inner clutch hub.

- Take off clutch basket **18**.



- Take off needle bearing **19** and collar bushing **20**.

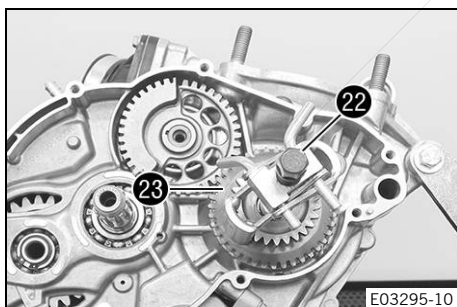


Removing the balancer shaft drive wheel and primary gear

- Hold the balancer shaft in place using the special tool **12**.

Gear segment (80029004000) (p. 325)

- Remove screw **21** with washer.



- Mount special tool **22** and pull off the primary gear wheel by screwing in the screw.

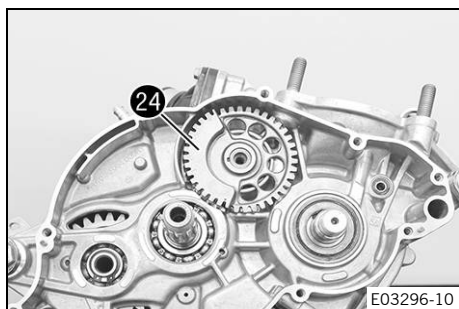
Puller (46129021000) (p. 319)

- Take off primary gear wheel **23**.

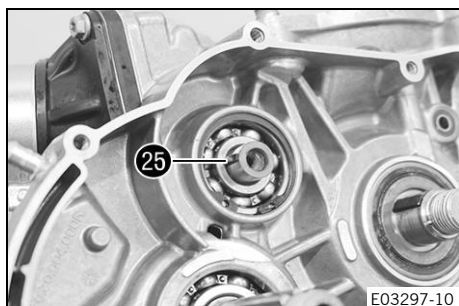


Info

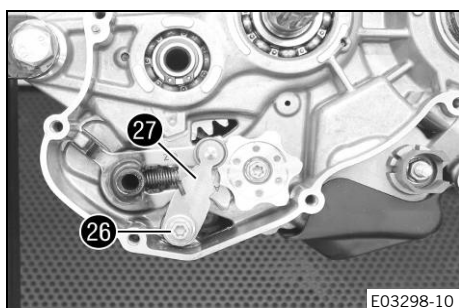
Ensure that the woodruff key remains in place.



- Remove balancer shaft drive wheel **24**.

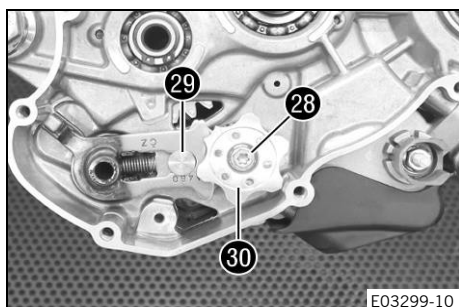


- Remove woodruff key **25**.

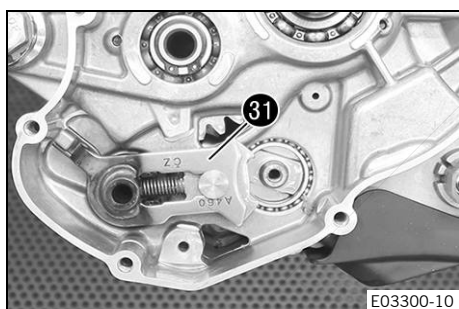


Removing the shift shaft, shift drum locating unit and locking lever

- Remove screw **26** with washer.
- Take off locking lever **27** with the sleeve and spring.



- Remove screw **28**.
- Push shift shaft sliding plate **29** away from shift drum locating unit **30** and take off the shift drum locating unit.



- Remove shift shaft **31** with the washer.



18.3.6 Preparing the engine for housing disassembly

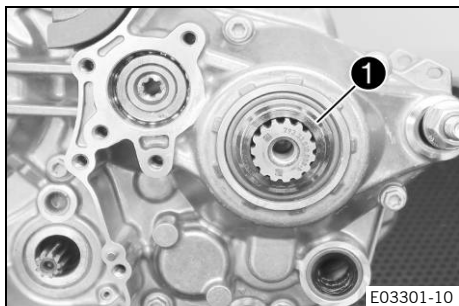
Preparatory work

- Clamp the engine into the engine work stand. (📖 p. 174)
- Remove the cylinder head and the cylinder. (📖 p. 174)

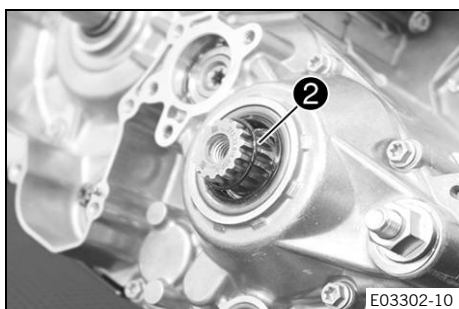
- Disassemble the alternator side. (📖 p. 177)
- Drain the gear oil. (📖 p. 177)
- Dismantle the clutch side. (📖 p. 178)

Removing the spacer, balancer shaft and lock ring

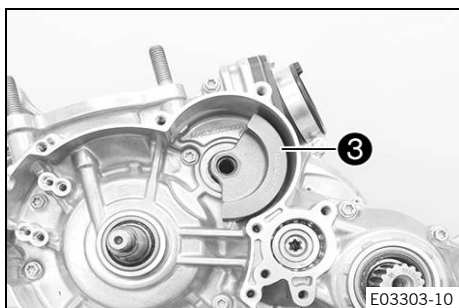
- Remove spacer ❶.



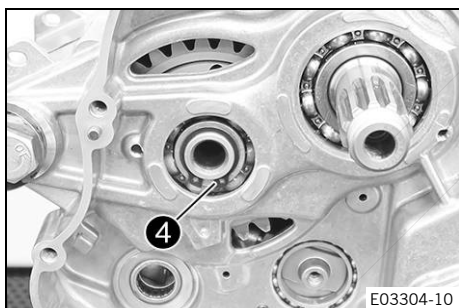
- Take off O-ring ❷.



- Remove balancer shaft ❸ toward the left.

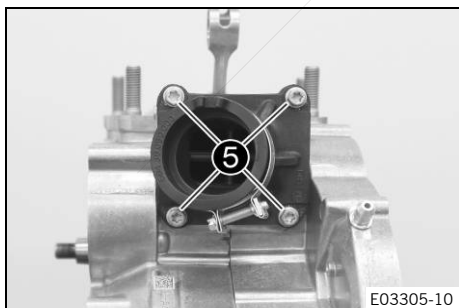


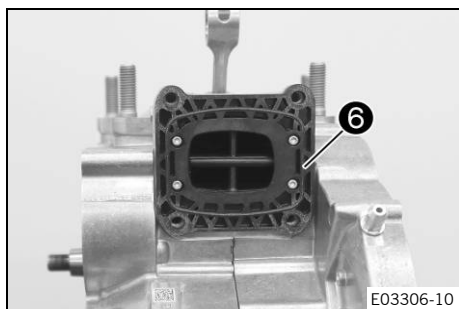
- Remove lock ring ❹.



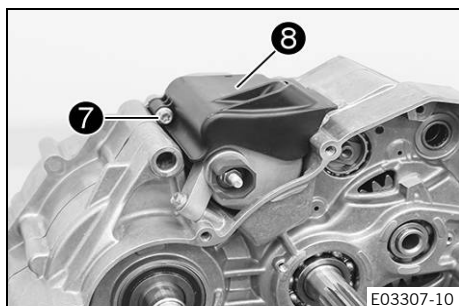
Removing the reed valve housing

- Remove screws ❺.
- Take off intake flange and gasket.



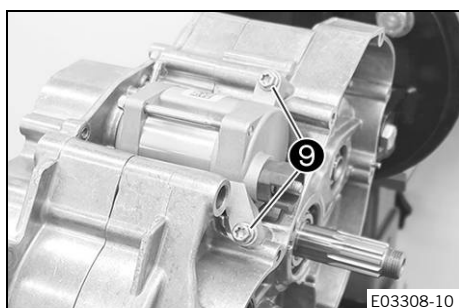


- Remove reed valve housing **6**.
- Take off the gasket.



Removing the starter motor

- Remove screw **7**.
- Take off cover **8**.



- Remove screws **9**.
- Take off the starter motor.

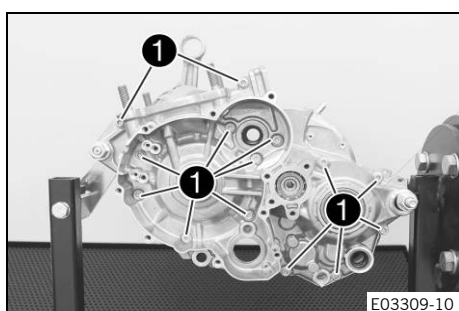
18.3.7 Dismantling the engine case

Preparatory work

- Clamp the engine into the engine work stand. (p. 174)
- Remove the cylinder head and the cylinder. (p. 174)
- Disassemble the alternator side. (p. 177)
- Drain the gear oil. (p. 177)
- Dismantle the clutch side. (p. 178)
- Prepare the engine for housing disassembly. (p. 181)

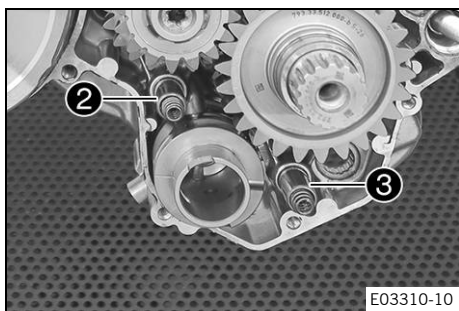
Removing the left engine case

- Remove screws **1**.
- Tilt the left section of the engine case upward and remove the fitting of the engine fixing arm.
- Loosen the left section of the engine case by striking it lightly with a plastic hammer and remove it.



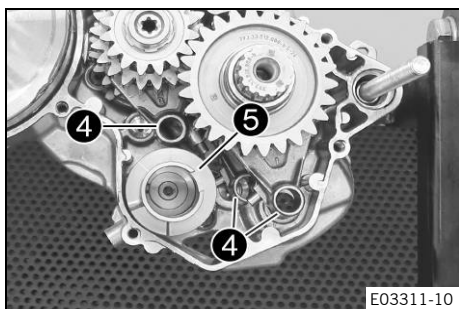
Info

Do not pry it apart with screwdrivers, since the sealing areas are easily damaged.

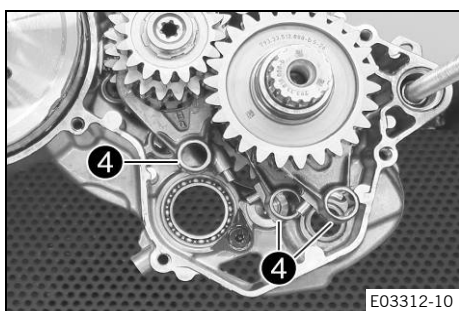


Removing shift rails, shift drum and shift forks

- Remove shift rail **2** with the springs.
- Remove shift rail **3** with the springs.

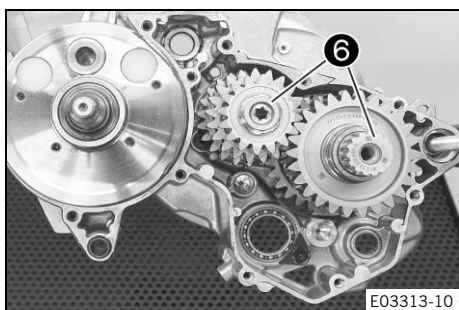


- Tilt shift forks **4** to the side.
- Remove shift drum **5**.



- Remove shift forks **4**.

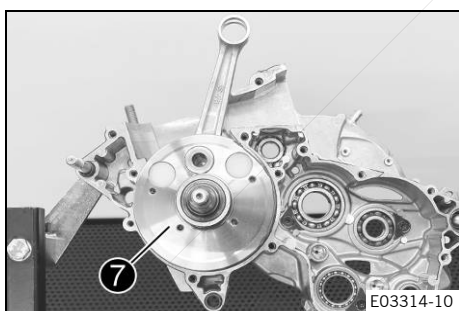
i Info
Do not misplace the shift rollers.



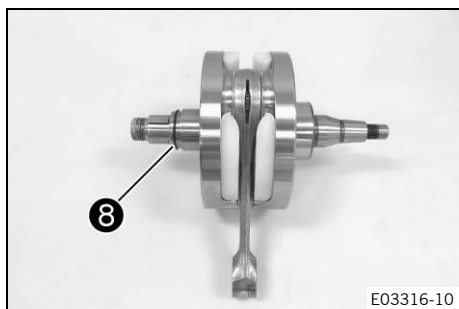
Removing the transmission shafts and crankshaft

- Pull both transmission shafts **6** out of the bearing seats together.

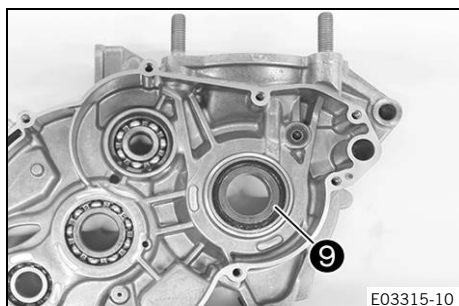
i Info
The stop disks of the transmission shafts usually stick to the bearings.



- Remove crankshaft **7**.



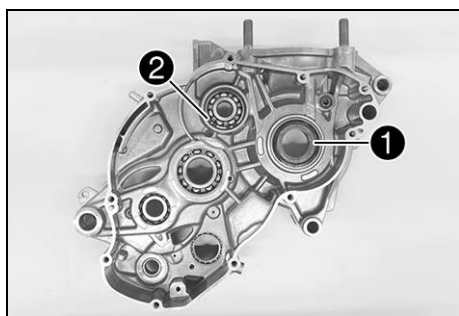
- Remove O-ring (8).



- Remove distance sleeve (9).

18.4 Working on individual parts

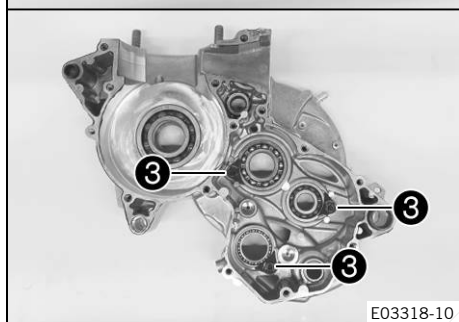
18.4.1 Working on the right section of the engine case



- Remove all dowels.
- Remove radial shaft seal ring (1) of the crankshaft.
- Remove lock ring (2).
- Remove screws (3). Remove the bearing retainers.
- Clean the section of the engine case thoroughly.
- Warm the section of the engine case in an oven.

Guideline

180 °C (356 °F)

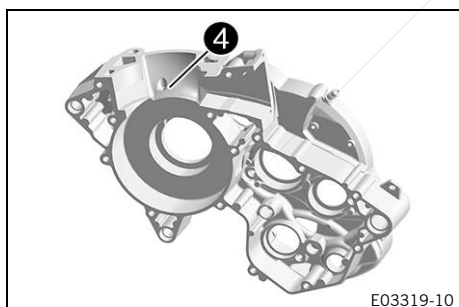


- Knock the section of the engine case against a level wooden board. This will cause the bearings to drop out of the bearing seats.



Info

Any bearings that remain in the section of the engine case must be removed using a suitable tool.



- Blow out lubrication bore (4) with compressed air and check that it is clear.
- Insert the new cold bearings in the bearing seats of the heated section of the engine case; if necessary, use a suitable pressing tool to push them all the way in and make them flush.

i

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.

i

Info

If the bearings are not firmly seated after cooling, it is likely that they will rotate in the engine case when warm. In this case, the engine case must be renewed.

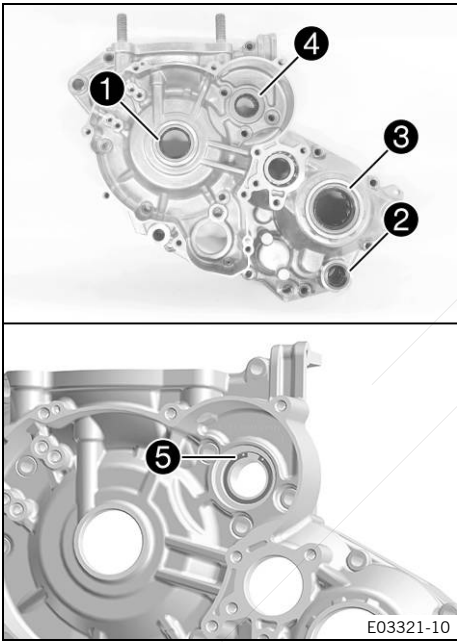
- Press in radial shaft seal ring ❶ of the crankshaft with the open side facing in so that it is flush.
- Mount lock ring ❷.
- Mount and tighten screws ❸ with the bearing retainers.

Guideline

Screw, bearing retainer	M5	6 Nm (4.4 lbf ft) Loctite®243™
-------------------------	----	--

- Mount the dowels.

18.4.2 Working on the left section of the engine case



- Remove all dowels.
- Press out radial shaft seal ring ❶ of the crankshaft from the outside toward the inside.
- Remove radial shaft seal ring ❷ from the shift shaft and ❸ from the countershaft.
- Remove radial shaft seal ring ❹ of the balancer shaft.
- Remove lock ring ❺.
- Clean the section of the engine case thoroughly.
- Warm the section of the engine case in an oven.

Guideline

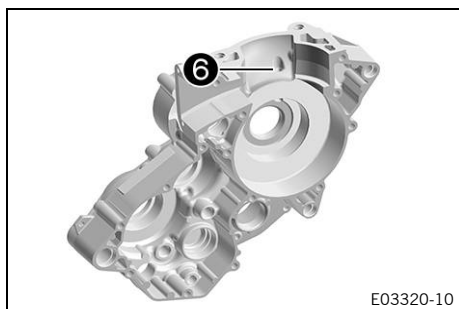
180 °C (356 °F)

- Knock the section of the engine case against a level wooden board. This will cause the bearings to drop out of the bearing seats.

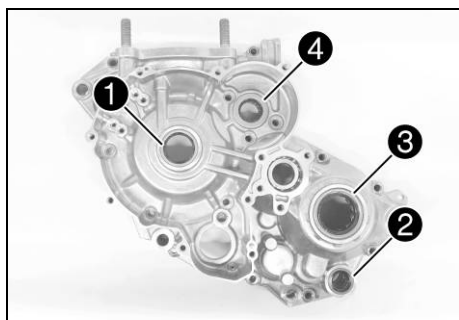
i

Info

Any bearings that remain in the section of the engine case must be removed using a suitable tool.



- Blow out lubrication bore 6 with compressed air and check that it is clear.

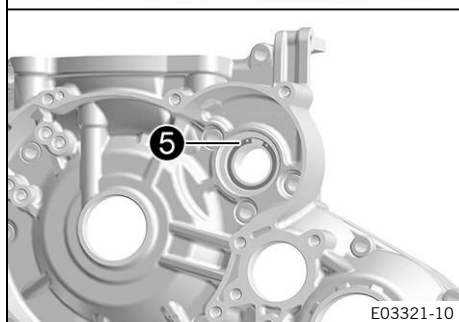


- Insert the new cold bearings in the bearing seats of the heated section of the engine case; if necessary, use a suitable mandrel to push them all the way in and make them flush.



Info

When pressing in, ensure that the section of the engine case lies flat in order to prevent damage. Only press the bearings in using the outer bearing race; otherwise, the bearings will be damaged when they are pressed in.



- After the section of the engine case has cooled, check that the bearings are firmly seated.



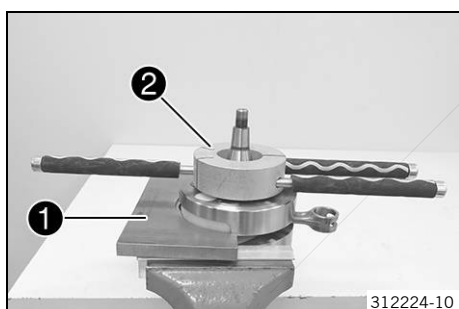
Info

If the bearings are not firmly seated after cooling, it is likely that they will rotate in the engine case when warm. In this case, the engine case must be replaced.

- Press in radial shaft seal ring 1 of the crankshaft with the open side facing inward so that it is flush.
- Press in radial shaft seal ring 2 of the shift shaft so it is flush with the open side facing inward.
- Press in radial shaft seal ring 3 of the countershaft so it is flush with the open side facing in.
- Mount lock ring 5.
- Press in radial shaft seal ring 4 of the balancer shaft so it is flush with the open side facing in.



18.4.3 Removing the crankshaft bearing inner race



- Fixate the crankshaft in the vice with special tool 1.

Guideline

Use soft jaws.

Separator plate (54829009000) (p. 320)

- Warm up special tool 2.

Guideline

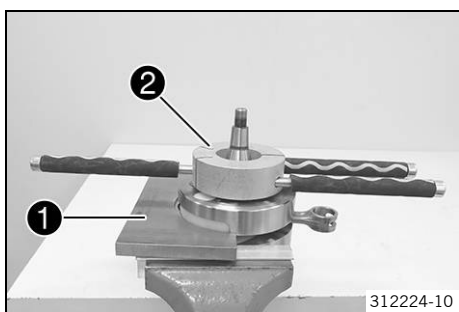
180 °C (356 °F)

Puller (58429037043) (p. 321)

- Push the warmed up special tool 2 onto the crankshaft bearing inner race, press firmly together, and pull jointly from the crankshaft.



18.4.4 Installing the crankshaft bearing inner race



- Fixate the crankshaft in the vice with special tool ①.

Guideline

Use soft jaws.

Separator plate (54829009000) (📖 p. 320)

- Heat the crankshaft bearing inner race in special tool ② and mount together.

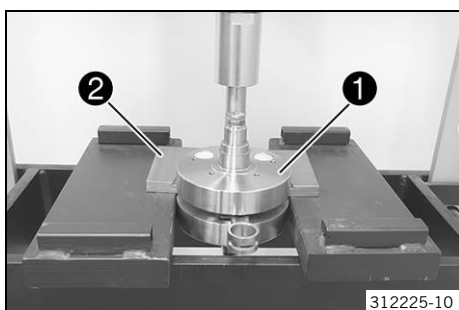
Guideline

120 °C (248 °F)

Puller (58429037043) (📖 p. 321)

- Ensure that the new crankshaft bearing inner race is flush.

18.4.5 Changing the connecting rod, conrod bearing and crank pin



Main work

- Position crankshaft ① in the press using special tool ②.

Separator plate (54829009000) (📖 p. 320)

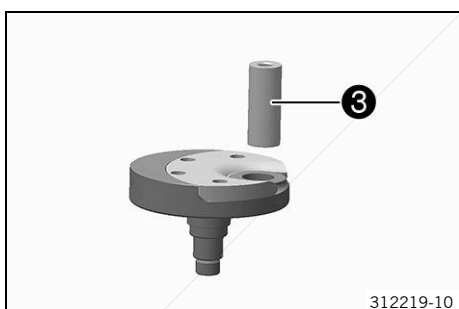
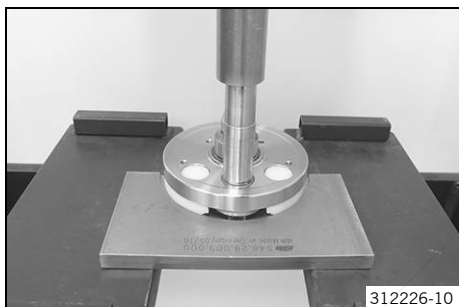
- Press the crank pin out of the upper crankweb with a suitable tool.



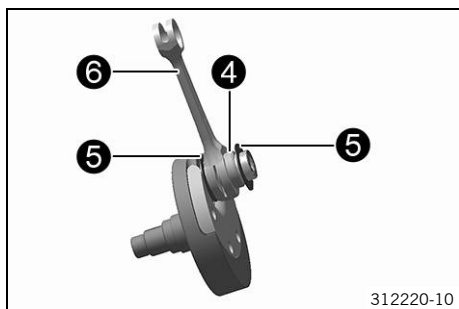
Info

Hold the lower crankweb.

- Take off the connecting rod and bearing.
- Press the crank pin out of the lower crankweb.



- Lubricate the new crank pin ③ and push in up to the stop.

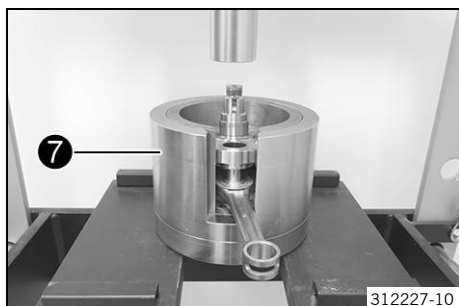


- Mount new bearing ④ with washers ⑤ and connecting rod ⑥.



Info

Thoroughly oil the bearing.

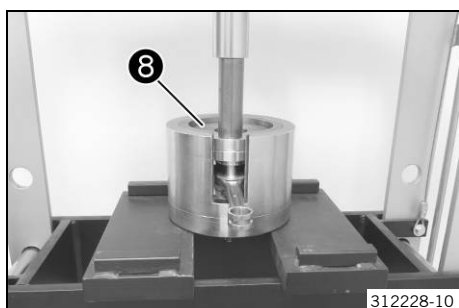


- Position special tool ⑦ on the press.

Crankshaft pressing tool (75029047000) (p. 324)

Insert for crankshaft pressing tool (54829108000)
(p. 321)

- Insert the crankweb with the connecting rod and bearing. Position the second crankweb.



- Position special tool ⑧ with the heel pointing down.

Insert for crankshaft pressing tool (54829108000)
(p. 321)

- Press in the upper crankweb as far as possible.



Info

The press mandrel must be positioned over the crank pin.

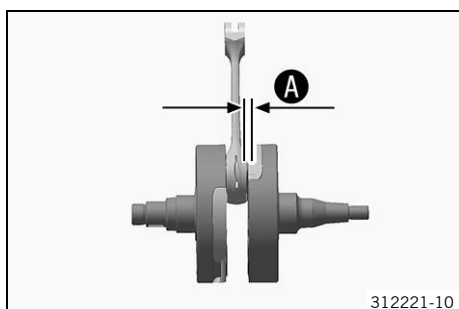
- Take the crankshaft out of the special tool and check that the connecting rod can move freely.

- Measure axial play A between the connecting rod and the crankwebs using the special tool.

Feeler gauge (79129941000) (p. 324)

Connecting rod - axial play of lower conrod bearing	0.60 ... 0.70 mm (0.0236 ... 0.0276 in)
---	---

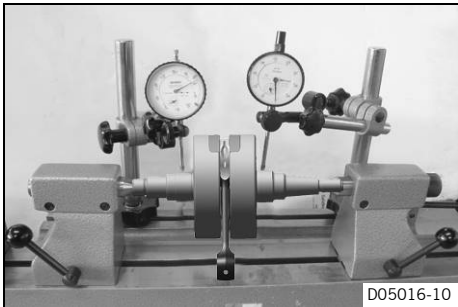
- » If the measured value is less than the specified value:
 - Correct it so the dimension is equal to the specified value.



Finishing work

- Check the crankshaft run-out at the bearing pin. (p. 190)

18.4.6 Checking the crankshaft run-out at the bearing pin

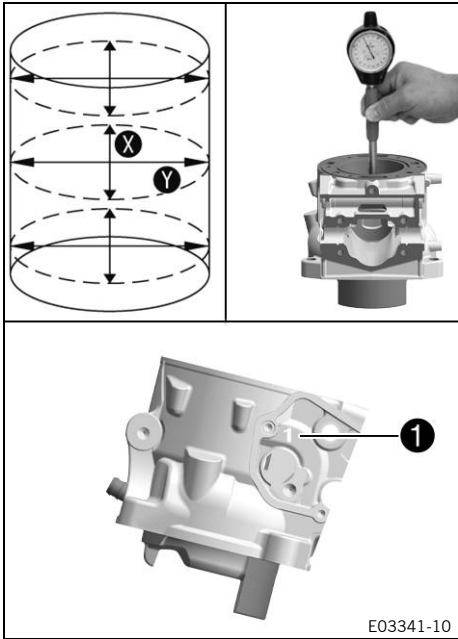


- Position the crankshaft on a roller block.
- Turn the crankshaft slowly.
- Check the crankshaft run-out on both bearing pins.

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.

18.4.7 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 250 models)	
Size I	66.400 ... 66.412 mm (2.61417 ... 2.61464 in)
Size II	66.412 ... 66.425 mm (2.61464 ... 2.61515 in)
Cylinder - drill hole diameter (All 300 models)	
Size I	72.000 ... 72.012 mm (2.83464 ... 2.83511 in)
Size II	72.012 ... 72.025 mm (2.83511 ... 2.83562 in)

**Info**

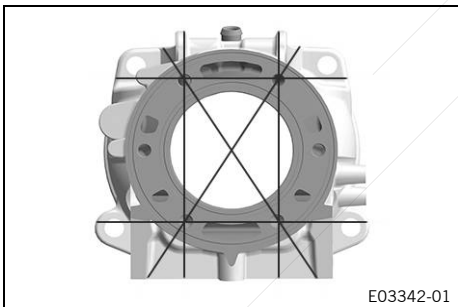
The cylinder size 1 is labeled on the right side of the cylinder.

- Using a straightedge and the special tool, check the sealing surface of the cylinder head for distortion.

Feeler gauge (79129941000) (📖 p. 324)

Cylinder/cylinder head - distortion of sealing surface	$\leq 0.10\text{ mm } (\leq 0.0039\text{ in})$
--	--

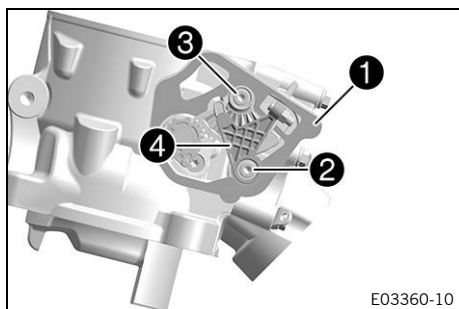
- » If the measured value does not meet specifications:
 - Change the cylinder.



18.4.8 Removing the exhaust control

**Info**

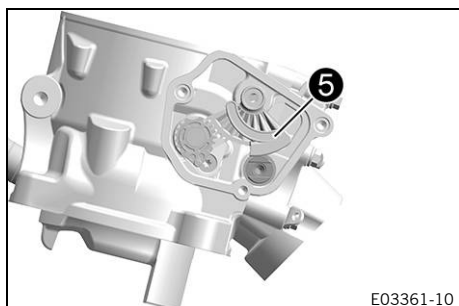
If work has been carried out on the exhaust control, the end positions must be reprogrammed.



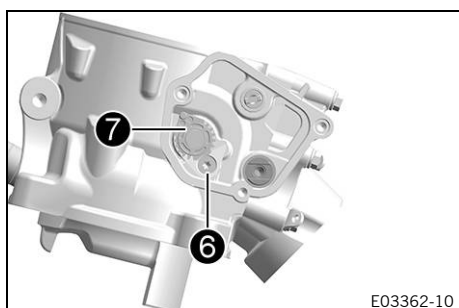
- Position special tool **1**.

Retaining bracket (A44029065000) (p. 329)

- Remove screw **2** with washer.
- Remove screw **3**.
- Take off the special tool.
- Take off control flap lever **4**.



- Take off right control gate **5**.



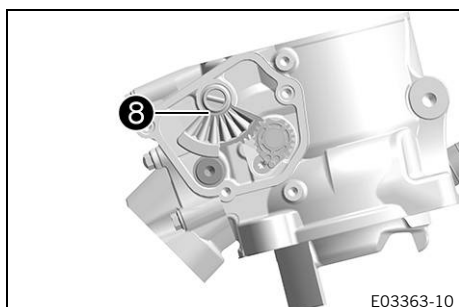
- Remove screw **6**.



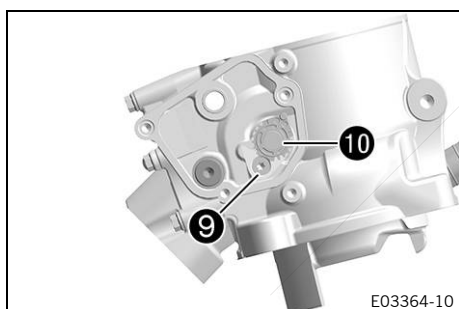
Info

The screw point of the retaining bracket may be in a different position.

- Take off the retaining bracket.
- Remove right control shaft **7**.



- Remove left control gate **8** with the idler shaft of the exhaust control.



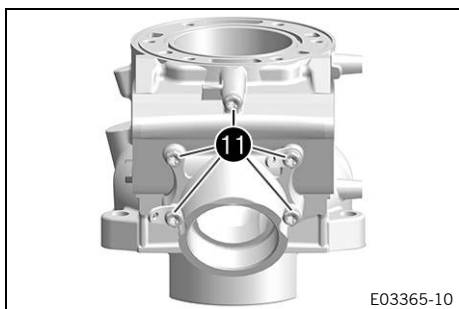
- Remove screw **9**.



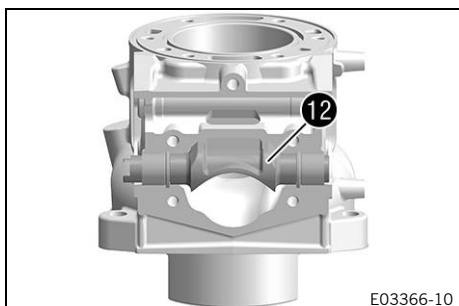
Info

The screw point of the retaining bracket may be in a different position.

- Take off the retaining bracket.
- Remove left control shaft **10**.



- Remove screws **11**.
- Take off the exhaust flange.



- Remove control flap **12** evenly from the grooves on both sides.



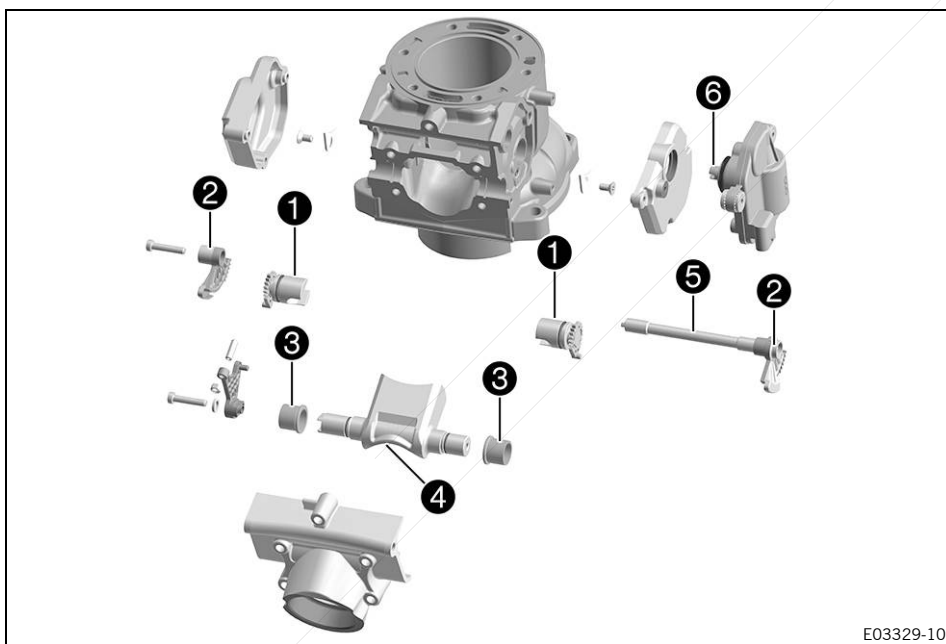
Info

If the control flap is tilted, the cylinder may be damaged.

18.4.9 Checking the exhaust control

Condition

Exhaust control removed.



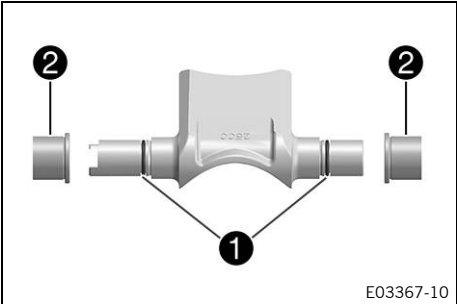
- Check control shafts **1** for damage and wear.
 - » If there is damage or wear:
 - Change the control shaft.
- Check control gates **2** for damage and wear.
 - » If there is damage or wear:
 - Change the control gates.
- Check bearing sleeves **3** for damage and wear.
 - » If there is damage or wear:
 - Change the bearing sleeves.

- Check control flap ④ for damage and wear.
 - » If there is damage or wear:
 - Change the control flap.
- Check idler shaft ⑤ of the exhaust control for damage and wear.
 - » If there is damage or wear:
 - Change the idler shaft of the exhaust control.
- Check inner clutch hub ⑥ of the actuator for damage and wear.
 - » If there is damage or wear:
 - Change the actuator.



18.4.10 Installing the exhaust control

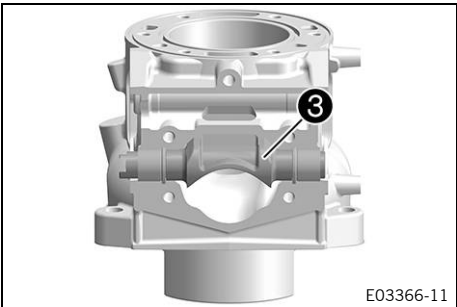
i Info
If work has been carried out on the exhaust control, the end positions must be reprogrammed.



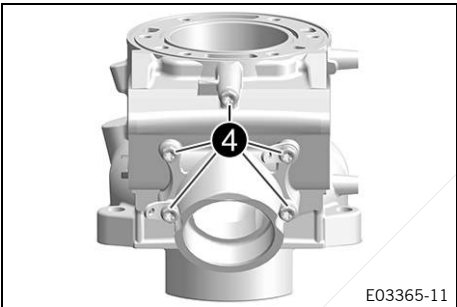
- Mount and grease O-rings ①.

Long-life grease (📖 p. 316)
- Mount and grease bearing sleeves ②.

Long-life grease (📖 p. 316)



- Set control flap ③ to the open position in the grooves.



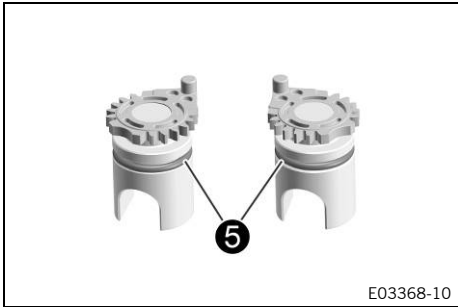
- Degrease the sealing surface and apply a thin coat of sealing compound.

Loctite® 5910
- Position the exhaust flange.
 - ✓ The control flap is still in the open position.
- Mount and tighten screws ④.

Guideline

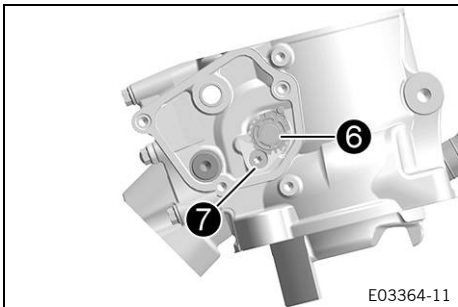
Screw, exhaust flange	M6	8 Nm (5.9 lbf ft)
-----------------------	----	-------------------

i Info
Do not forget the spring hangers.



- Mount and grease O-rings 5.

Long-life grease (📖 p. 316)



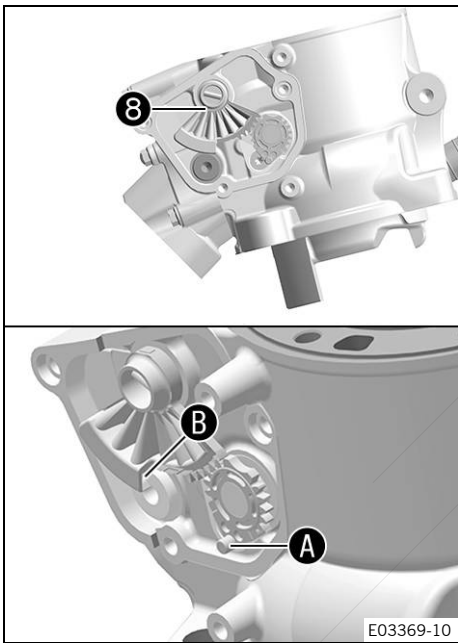
- Mount left control shaft 6.
✓ The control shaft with marking **L** is installed on the left.
- Mount the retaining bracket.
- Mount and tighten screw 7.

Guideline

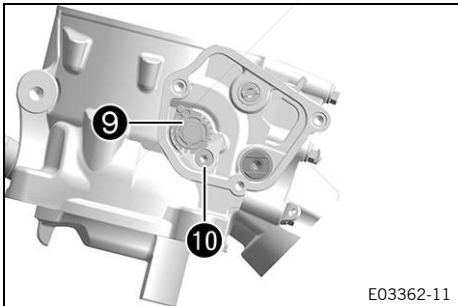
Screw, retaining bracket of exhaust control	M5	6 Nm (4.4 lbf ft) Loctite®2701™
---	----	---



Info
The screw point of the retaining bracket may be in a different position.



- Mount left control gate 8 with the idler shaft of the exhaust control.
✓ Pin **A** of the control shaft engages in guide **B** of the left control gate when the control flap is closed.

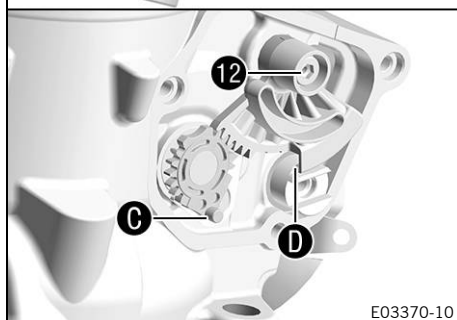
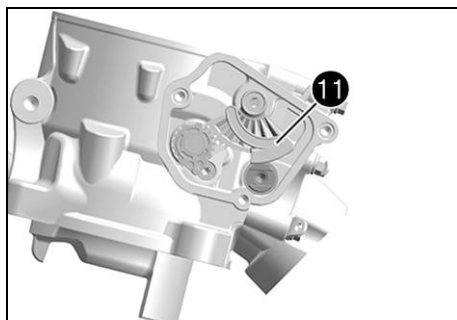


- Mount right control shaft 9.
✓ The control shaft with marking **R** is installed on the right.
- Mount the retaining bracket.
- Mount and tighten screw 10.

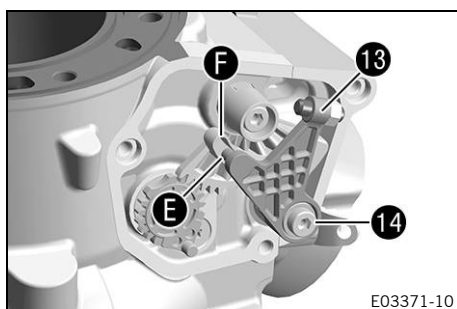
Guideline

Screw, retaining bracket of exhaust control	M5	6 Nm (4.4 lbf ft) Loctite®2701™
---	----	---

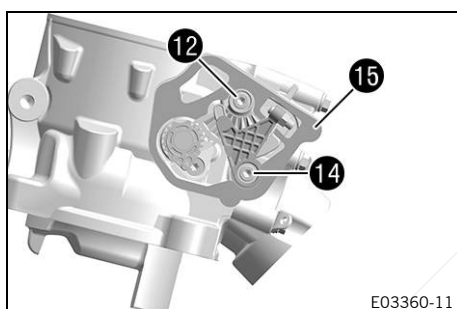
i Info
The screw point of the retaining bracket may be in a different position.



E03370-10



E03371-10



E03360-11

- Mount right control gate **11**.
 - ✓ The inner clutch hub of the idler shaft engages correctly in the control gate.
 - ✓ Pin **C** of the control shaft engages in guide **D** of the right control gate when the control flap is closed.

- Mount screw **12** but do not tighten yet.

Guideline

Screw, idler shaft, exhaust control	M5	8 Nm (5.9 lbf ft) Loctite®243™
-------------------------------------	----	--

- Mount control flap lever **13**.
 - ✓ The inner clutch hub of the control flap engages correctly in the control flap lever.
 - ✓ Pin **E** of the control flap lever engages in guide **F** of the right control gate.

- Mount screw **14** with washer but do not tighten yet.

Guideline

Screw, control flap, exhaust control	M5	8 Nm (5.9 lbf ft) Loctite®243™
--------------------------------------	----	--

- Position special tool **15**.

Retaining bracket (A44029065000) (p. 329)

- Tighten screw **12**.

Guideline

Screw, idler shaft, exhaust control	M5	8 Nm (5.9 lbf ft) Loctite®243™
-------------------------------------	----	--

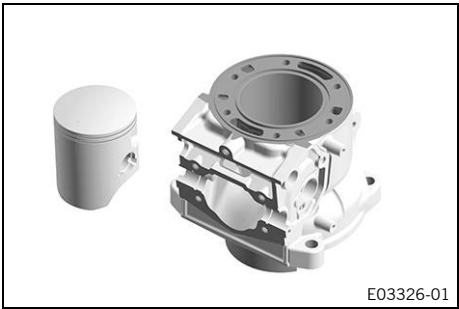
- Tighten screw **14**.

Guideline

Screw, control flap, exhaust control	M5	8 Nm (5.9 lbf ft) Loctite®243™
--------------------------------------	----	--

- Take off the special tool.

18.4.11 Checking/measuring the piston



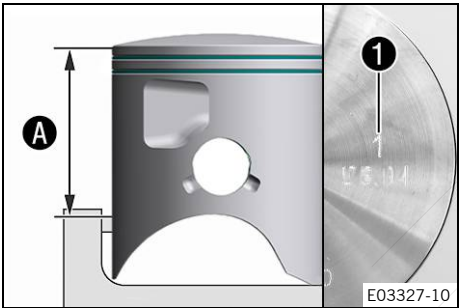
- Check the piston bearing surface for damage.
 - » If the piston bearing surface is damaged:
 - Replace the piston and, if necessary, the cylinder.
- Check that the piston rings move easily in the piston ring grooves.
 - » If the piston ring is stiff:
 - Clean the piston ring groove.

i Tip
An old piston ring can be used to clean the piston ring groove.

- Check the piston rings for damage.
 - » If the piston ring is damaged:
 - Change the piston ring.

i Info
Mount the piston ring with the marking facing upward.

- Check the piston pins for discoloration or signs of wear.
 - » If the piston pin shows severe discoloration/signs of wear:
 - Change the piston pin.
- Place the upper conrod bearing and piston pin in the connecting rod and check the seating for play.
 - » If the piston pin seating has excessive play:
 - Change the connecting rod, conrod bearing, and crank pin.

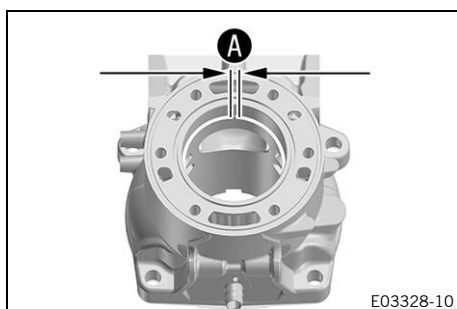


- Measure the piston at the piston skirt, at right angles to the piston pin, at a distance **A**.

Guideline	
Distance A	50 mm (1.97 in)
Piston - diameter (All 250 models)	
Size I	66.340 ... 66.350 mm (2.61181 ... 2.6122 in)
Size II	66.351 ... 66.360 mm (2.61224 ... 2.61259 in)
Piston - diameter (All 300 models)	
Size I	71.925 ... 71.934 mm (2.83169 ... 2.83204 in)
Size II	71.935 ... 71.944 mm (2.83208 ... 2.83244 in)

i Info
Piston dimensions **1** are marked on the piston head.

18.4.12 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.

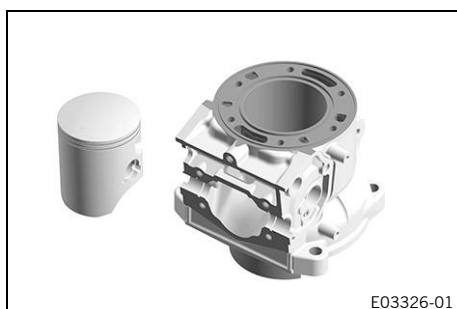
Guideline

Piston ring end gap (All 250 models)	
Ring 1	≤ 0.60 mm (≤ 0.0236 in)
Ring 2	≤ 0.60 mm (≤ 0.0236 in)
Piston ring end gap (All 300 models)	
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. 190)
- » If cylinder wear lies within the specified tolerance:
 - Change the piston ring.
- Mount the piston ring with the marking facing toward the piston head.



18.4.13 Measuring the piston/cylinder mounting clearance



- Check/measure the cylinder. (p. 190)
- Check/measure the piston. (p. 196)
- The smallest piston/cylinder mounting clearance equals the smallest cylinder bore diameter minus the largest piston diameter. The largest piston/cylinder mounting clearance equals the largest cylinder bore diameter minus the smallest piston diameter.

Guideline

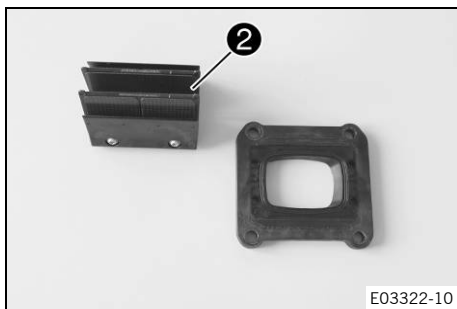
Piston/cylinder - mounting clearance (All 250 models)	
New condition	0.050 ... 0.074 mm (0.00197 ... 0.00291 in)
Wear limit	0.10 mm (0.0039 in)
Piston/cylinder - mounting clearance (All 300 models)	
New condition	0.066 ... 0.088 mm (0.0026 ... 0.00346 in)
Wear limit	0.10 mm (0.0039 in)



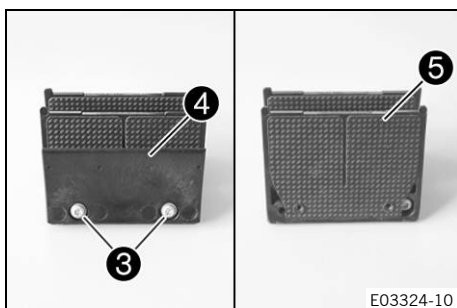
18.4.14 Disassemble the reed valve housing



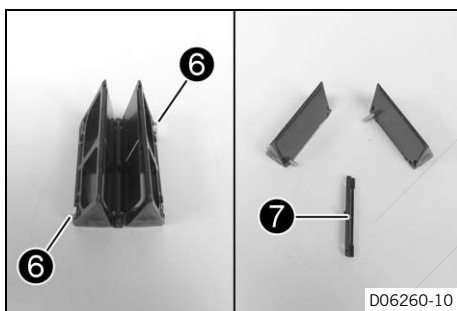
- Remove screws **1**.



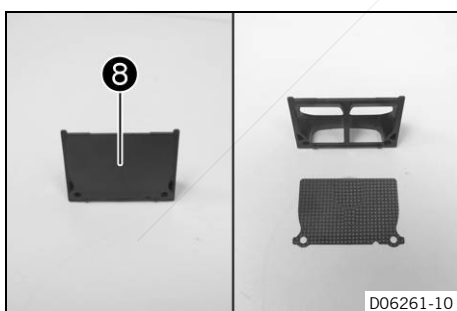
- Remove the reed valve housing **2** from the back plate.



- Remove screws **3** on both sides.
- Take off stop plate **4** on both sides.
- Remove the outer reed valve **5** on both sides.



- Remove screws **6**.
- Separate the reed valve holders. Remove holding strip **7**.

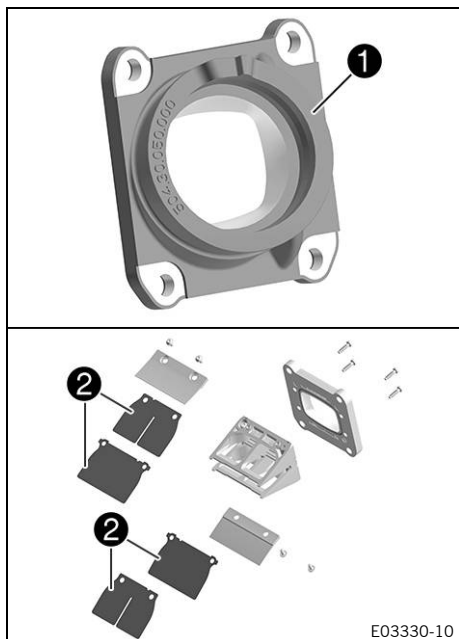


- Take off the inner reed valve **8** from both reed valve holders.

18.4.15 Checking the reed valve housing, reed valve and intake flange

Condition

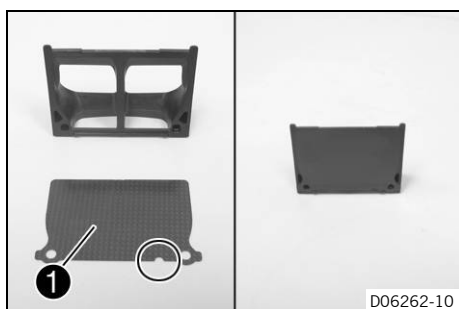
Reed valve housing has been removed.



- Check intake flange ❶ for damage and wear.
 - » If there is damage or wear:
 - Change the intake flange.
- Check reed valve ❷ for damage and wear.
 - » If there is damage or wear:
 - Change the reed valve.
- Check the reed valve housing for damage and wear.
 - » If there is damage or wear:
 - Change the reed valve housing.



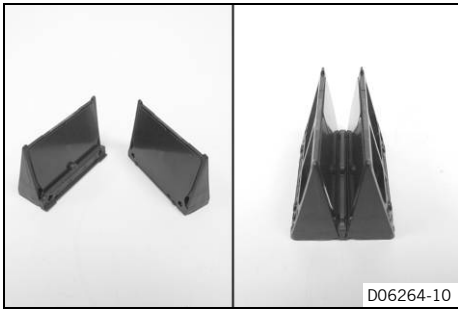
18.4.16 Assemble the reed valve housing



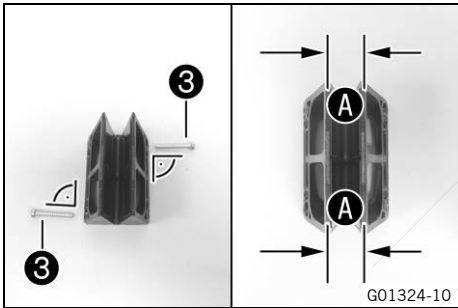
- Position the inner reed valve ❶ on both reed valve holders.
 - ✓ The recesses are located on the right side.



- 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.

**Info**

Mount the screws at right angles to prevent damage.

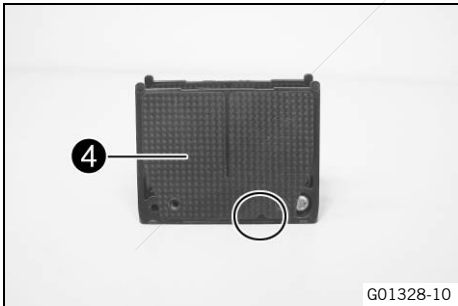
- Loosen screws 3 and tighten again.

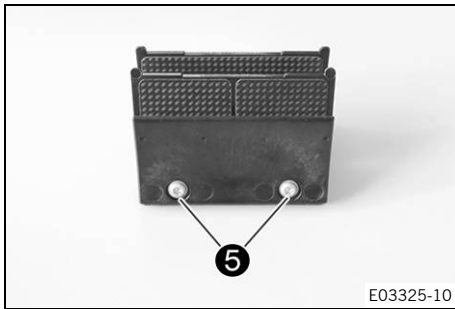
Guideline		
Screw, inner reed paddles	EJOT DELTA PT ® 3.5x25	1 Nm (0.7 lbf ft)

- ✓ Distance A is equal on both sides.

- Position the outer reed valve 4 on both sides.

- ✓ The recesses are located on the right side.

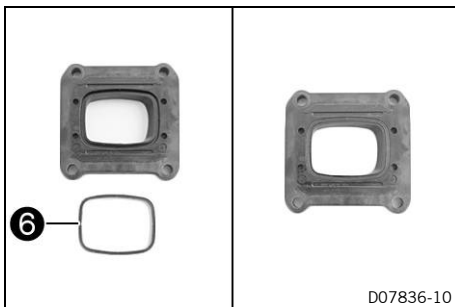




- Position the stop plates on both sides.
- Mount screws **5** on both sides and screw in all the way.
- Loosen screws **5** and tighten again.

Guideline

Screw, outer reed paddles	EJOT DELTA PT ® 3x6	1 Nm (0.7 lbf ft)
---------------------------	-------------------------------	-------------------



- Position gasket **6**.



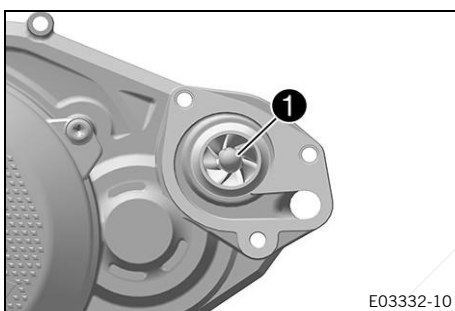
- Position the reed valve housing in the support plate.
- ✓ The outer recess is located on the right in the direction of travel when installed.
- Mount and tighten screws **7**.

Guideline

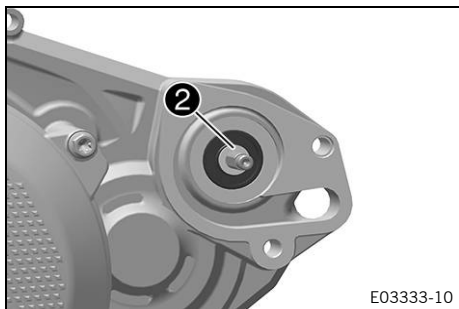
Screw, membrane support plate	EJOT DELTA PT ® 3x12	1 Nm (0.7 lbf ft)
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18.4.17 Working on the clutch cover

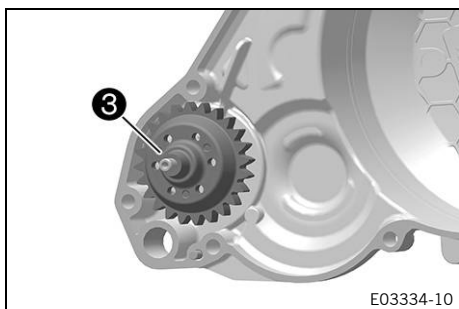
i Info
Remove the outer clutch cover to avoid damage.



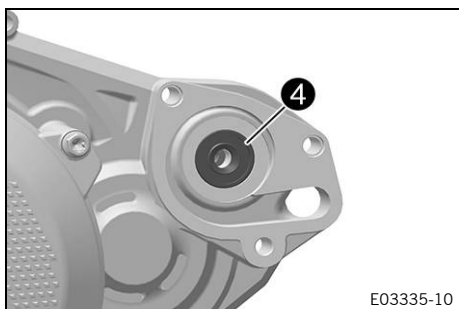
- Remove nut **1**.
- Take off the water pump impeller.



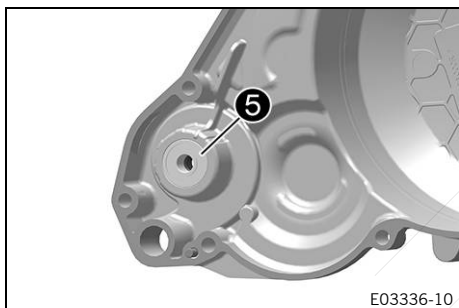
- Remove form washer **2**.



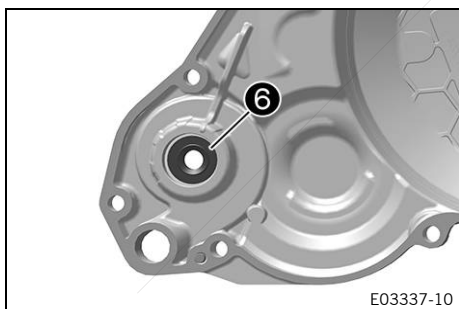
- Remove water pump gear wheel **3**.



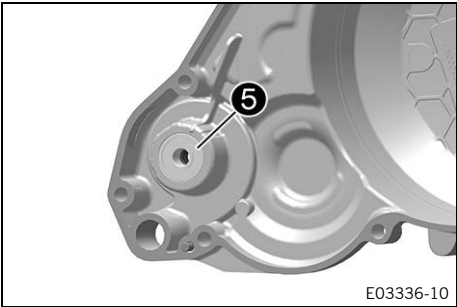
- Remove radial shaft seal ring **4**.



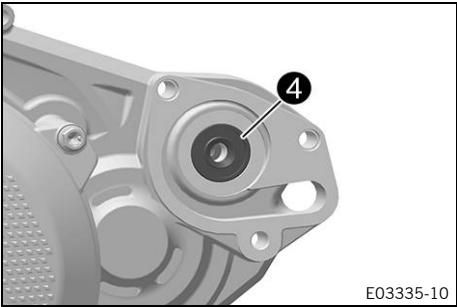
- Press out bearing **5** toward the inside.



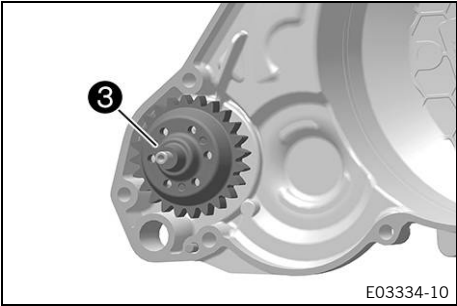
- Remove radial shaft seal ring **6**.
- Press the new radial shaft seal ring all the way in to the stop.



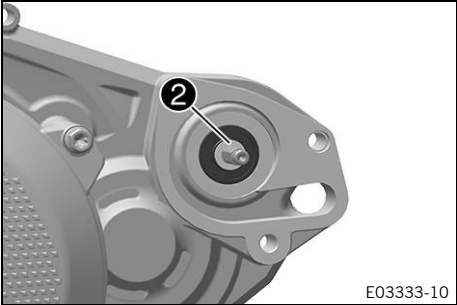
- Press bearing 5 all the way in to the stop from the inside.



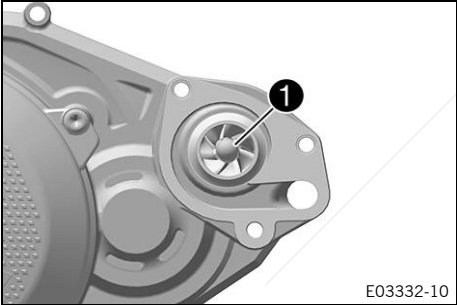
- Press in radial shaft seal ring 4 flush.
- Ensure that the bearing can turn freely and does not touch the radial shaft seal ring.



- Mount water pump gear wheel 3.



- Position form washer 2.

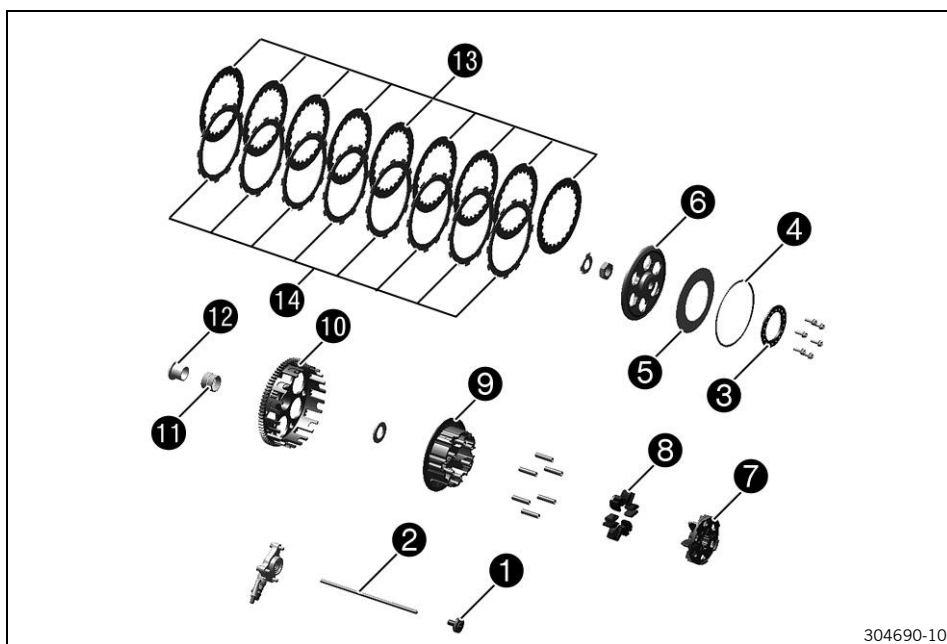


- Mount the water pump impeller.
- Mount and tighten nut 1.

Guideline

Nut, water pump impeller	M6	5 Nm (3.7 lbf ft) Loctite®243™
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18.4.18 Checking the clutch



- Check clutch throw-out **1** for damage and wear.
 - » If there is damage or wear:
 - Change the clutch push rod.
- Place the clutch push rod **2** on a flat surface and check for run-out.
 - » If there is run-out:
 - Change the clutch push rod.
- Check spring retainer **3** for damage and wear.
 - » If there is damage or wear:
 - Change the spring retainer.
- Check pretension ring **4** for damage and wear.
 - » If there is damage or wear:
 - Change the pretension ring.
- Check spring washer **5** for damage and wear.
 - » If there is damage or wear:
 - Change the spring washer.
- Check the contact surface of clutch pressure cap **6** for damage and wear.
 - » If there is damage or wear:
 - Change the clutch pressure cap.
- Check clutch center **7** for damage and wear.
 - » If there is damage or wear:
 - Change the clutch center.
- Check damping rubber pieces **8** for damage and wear.
 - » If there is damage or wear:
 - Change the damping rubber pieces.
- Check inner clutch hub **9** for damage and wear.
 - » If there is damage or wear:
 - Change the inner clutch hub.
- Check the thrust surfaces of the clutch facing discs in clutch basket **10** for damage and wear.

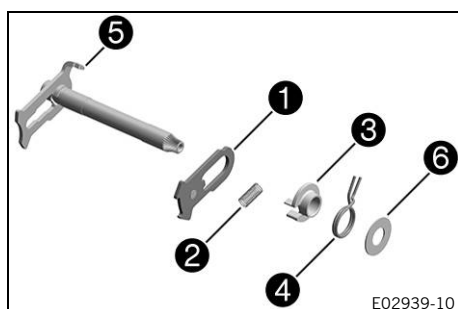
- » If there is damage or wear:
 - Change the clutch facing discs and the clutch basket.
- Check needle bearing ⑪ and collar bushing ⑫ for damage and wear.
 - » If there is damage or wear:
 - Change the needle bearing and collar bushing.
- Check intermediate discs ⑬ for damage and wear.
 - » If the intermediate discs are not flat or have punctiform outbreaks:
 - Change all intermediate discs.
- Check clutch facing discs ⑭ for discoloration and scoring.
 - » If there is discoloration or scoring:
 - Change all clutch facing discs.
- Check the thickness of clutch facing discs ⑭.

Clutch facing disc - thickness	$\geq 1.9 \text{ mm } (\geq 0.075 \text{ in})$
--------------------------------	--

- » If the clutch facing disc does not meet specifications:
 - Change all clutch facing discs.



18.4.19 Preassembling shift shaft



- Secure the short end of the shift shaft in the bench vise.

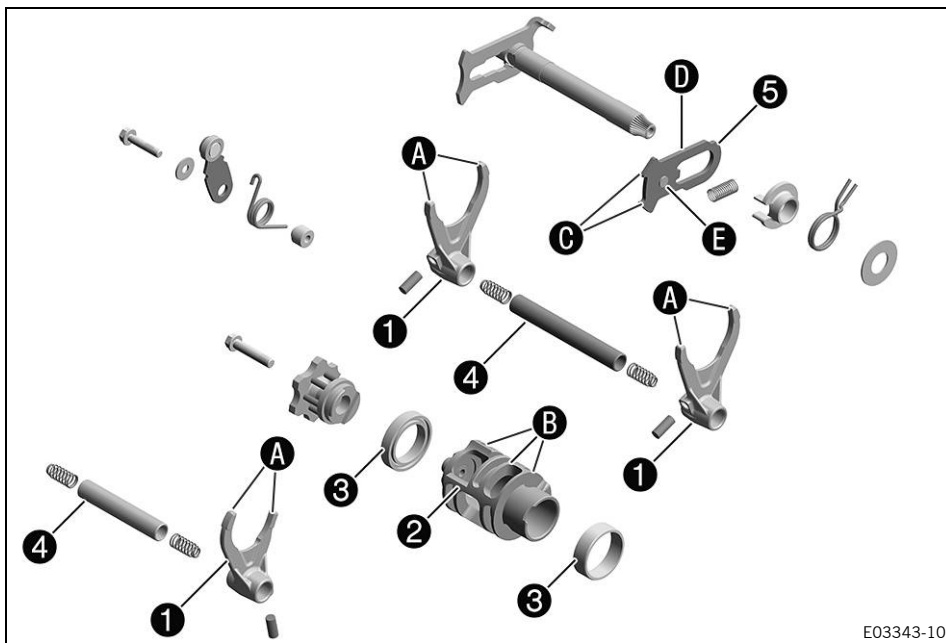
Guideline

Use soft jaws.

- Mount shift shaft sliding plate ① with the guide pin facing downwards and attach the guide pin on the shift quadrant.
- Mount pressure spring ②.
- Slide on spring guide ③, push return spring ④, with the offset end facing upward, over the spring guide and lift the offset end over abutment bolt ⑤.
- Mount stop disk ⑥.

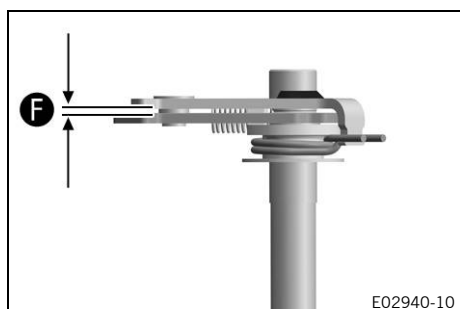


18.4.20 Checking the shift mechanism



- Check shift forks **1** on plate **A** for damage and wear (visual check).
 - » If there is damage or wear:
 - Change the shift fork.
- Check shift grooves **B** of shift drum **2** for wear.
 - » If the shift groove is worn:
 - Change the shift drum.
- Check the seat of the shift drum in bearings **3**.
 - » If the shift drum is not seated correctly:
 - Change the shift drum and/or the bearing.
- Check bearing **3** for stiffness and wear.
 - » If the bearings are stiff or are worn:
 - Change the bearings.
- Check the shift rollers for damage and wear.
 - » If there is damage or wear:
 - Change the shift rollers.
- Check shift rail **4** for run-out on a flat surface.
 - » If there is run-out:
 - Change the shift rail.
- Check the shift rails for scoring, wear and smooth operation in the shift forks.
 - » If there is scoring or corrosion, or if the shift rail in the shift forks is stiff:
 - Change the shift rail.
- Check shift shaft sliding plate **5** in contact areas **C** for wear.
 - » If the shift shaft sliding plate is worn:
 - Change the shift shaft sliding plate.
- Check return surface **D** on the shift shaft sliding plate for wear.
 - » If deep notches are present:
 - Change the shift shaft sliding plate.
- Check guide pin **E** for looseness and wear.

- » If the guide pin is loose and/or worn:
 - Change the shift shaft sliding plate.



- Preassemble the shift shaft. (📖 p. 205)
- Check clearance **F** between the shift shaft sliding plate and the shift quadrant.

Shift shaft - sliding plate/shift quadrant play	0.40 ... 0.80 mm (0.0157 ... 0.0315 in)
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- » If the measured value does not meet specifications:
 - Change the shift shaft sliding plate.

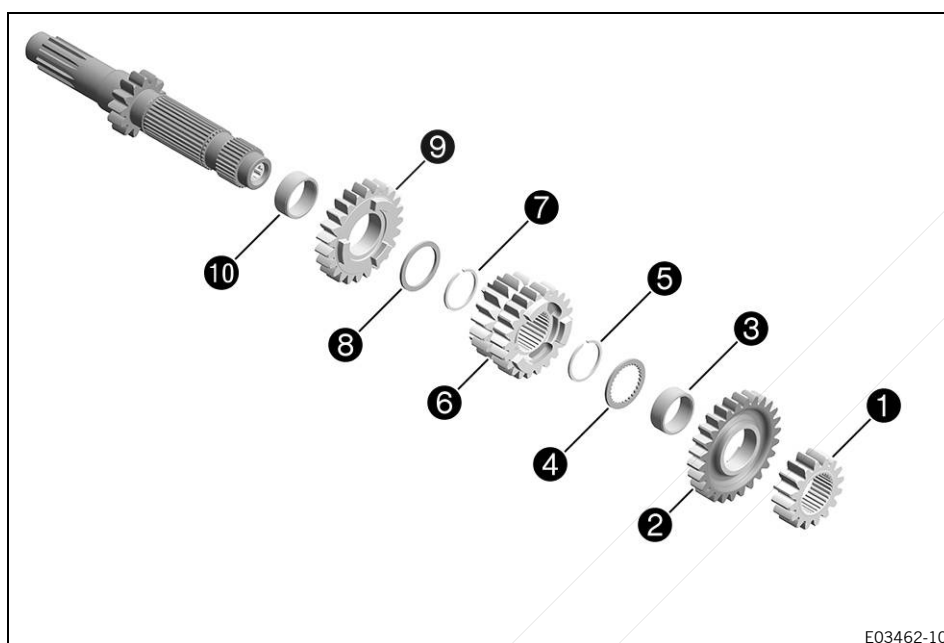


18.4.21 Disassembling the main shaft

- Secure the main shaft in the vise with the gear teeth facing downward.

Guideline

Use soft jaws.



- Remove second-gear fixed gear **1**.
- Remove sixth-gear idler gear **2**.
- Remove needle bearing **3** and stop disk **4**.
- Remove lock ring **5**.
- Remove third/fourth-gear sliding gear **6**.
- Remove lock ring **7**.
- Remove stop disk **8** and fifth-gear idler gear **9**.
- Remove needle bearing **10**.

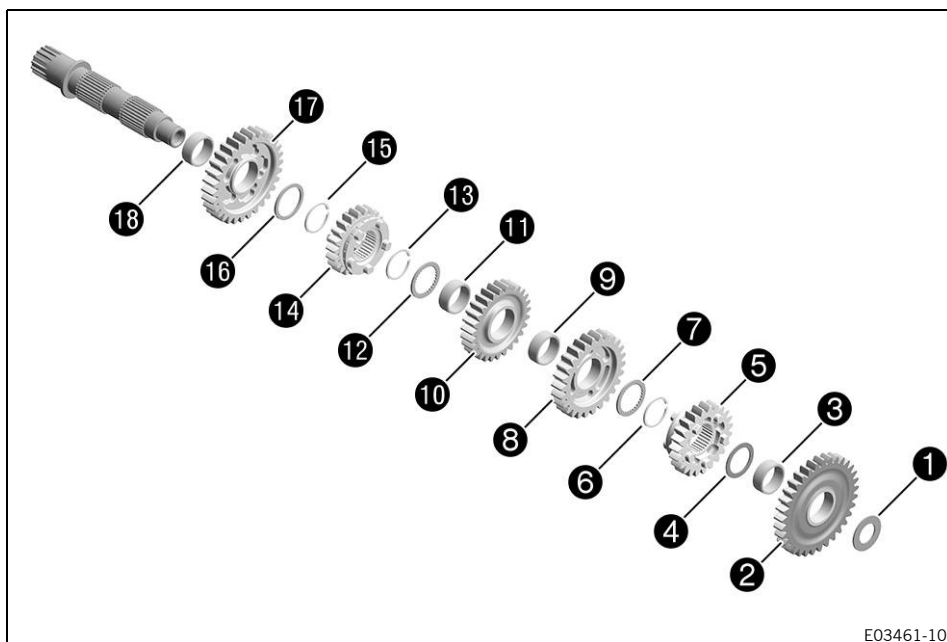


18.4.22 Disassembling the countershaft

- Secure the countershaft in the bench vise with the toothed end facing downward.

Guideline

Use soft jaws.

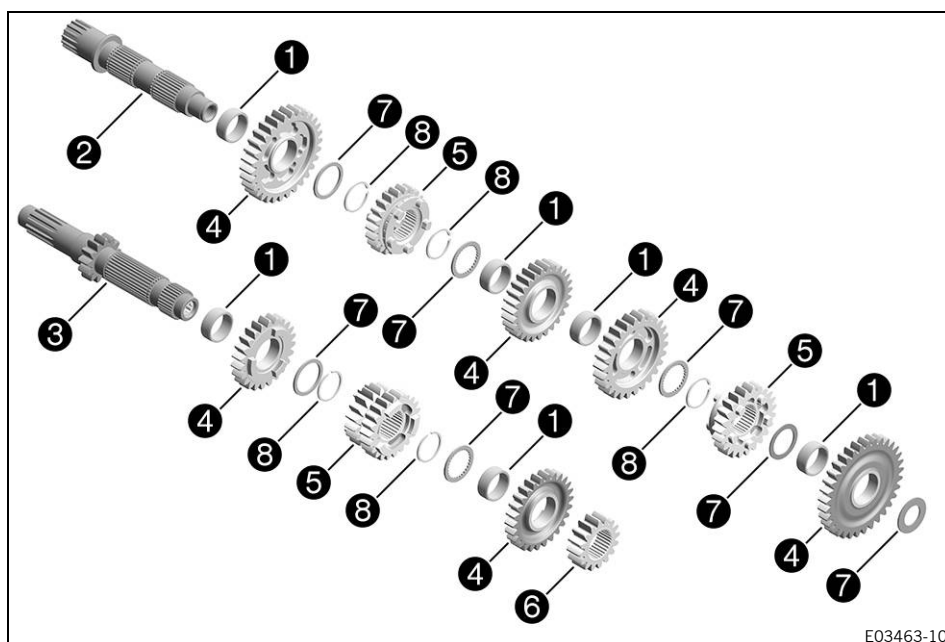


- Remove stop disk ① and first-gear idler gear ②.
- Remove needle bearing ③ and stop disk ④.
- Remove fifth-gear sliding gear ⑤.
- Remove lock ring ⑥.
- Remove stop disk ⑦.
- Remove third-gear idler gear ⑧ and needle bearing ⑨.
- Remove fourth-gear idler gear ⑩.
- Remove needle bearing ⑪.
- Remove stop disk ⑫.
- Remove lock ring ⑬.
- Remove sixth-gear sliding gear ⑭.
- Remove lock ring ⑮.
- Remove stop disk ⑯.
- Remove second-gear idler gear ⑰ and needle bearing ⑱.

18.4.23 Checking the transmission

Condition

The transmission has been disassembled.



- Check needle bearings **1** for damage and wear.
 - » If there is damage or wear:
 - Change the needle bearings.
- Check the pivot points of main shaft **2** and countershaft **3** for damage and wear.
 - » If there is damage or wear:
 - Change the main shaft and/or countershaft.
- Check the tooth profiles of main shaft **2** and countershaft **3** for damage and wear.
 - » If there is damage or wear:
 - Change the main shaft and/or countershaft.
- Check the pivot points of idler gears **4** for damage and wear.
 - » If there is damage or wear:
 - Change the gear wheel pair.
- Check the shift dogs of idler gears **4** and sliding gears **5** for damage and wear.
 - » If there is damage or wear:
 - Change the gear wheel pair.
- Check the tooth faces of idler gears **4**, sliding gears **5**, and fixed gear **6** for damage and wear.
 - » If there is damage or wear:
 - Change the gear wheel pair.
- Check the tooth profiles of sliding gears **5** for damage and wear.
 - » If there is damage or wear:
 - Change the gear wheel pair.
- Check sliding gears **5** for smooth operation in the profile of main shaft **3**.
 - » If the sliding gear does not move freely:
 - Change the sliding gear or the main shaft.
- Check sliding gears **5** for smooth operation in the profile of countershaft **3**.
 - » If the sliding gear does not move freely:
 - Change the sliding gear or the countershaft.
- Check stop disks **7** for damage and wear.
 - » If there is damage or wear:
 - Change the stop disks.

- Use new lock rings **8** in every repair.

18.4.24 Assembling the main shaft



Info

Use new lock rings with every repair.

Preparatory work

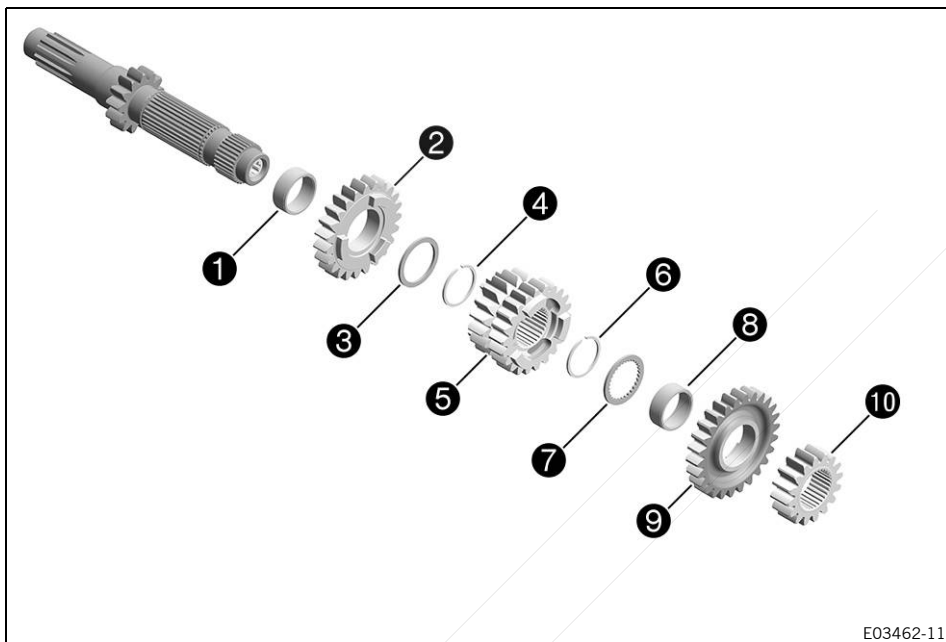
- Check the transmission. (📖 p. 208)
- Carefully lubricate all parts before assembling.

Main work

- Secure the main shaft in the vise with the gear teeth facing downward.

Guideline

Use soft jaws.



- Mount needle bearing **1**.
- Mount fifth-gear idler gear **2** with the shift dogs facing up.
- Mount stop disk **3** and lock ring **4**.
- Attach third/fourth-gear sliding gear **5** with the small gear wheel facing downward and mount lock ring **6**.
- Mount stop disk **7** and needle bearing **8**.
- Mount sixth-gear idler gear **9** with the shift dogs facing downward.
- Mount the second-gear fixed gear **10** with the collar facing downward.
- Finally, check all the gear wheels for smooth operation.

18.4.25 Assembling the countershaft



Info

Use new lock rings with every repair.

Preparatory work

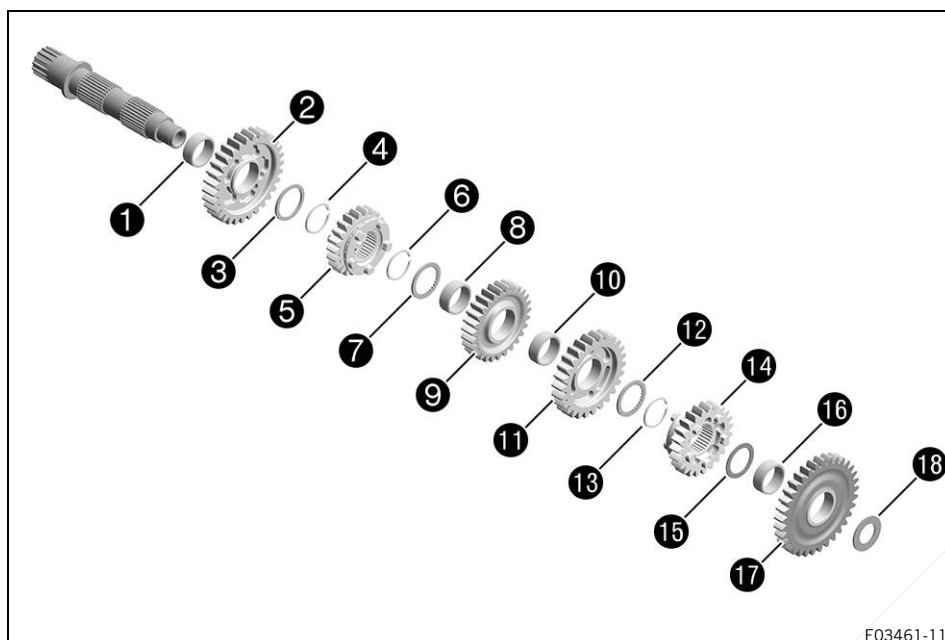
- Check the transmission. (📖 p. 208)
- Carefully lubricate all parts before assembling.

Main work

- Secure the countershaft in the bench vise with the toothed end facing downward.

Guideline

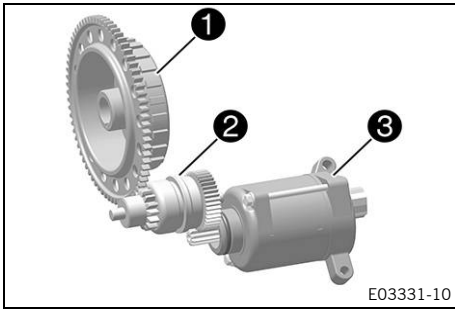
Use soft jaws.



E03461-11

- Mount needle bearing ① and second-gear idler gear ② onto the countershaft with the protruding collar facing downward.
- Mount stop disk ③ and lock ring ④.
- Mount the fifth-gear sliding gear ⑤ with the shift groove facing upward.
- Mount lock ring ⑥ and stop disk ⑦.
- Mount needle bearing ⑧ and the fourth-gear idler gear ⑨ with the collar facing up.
- Mount needle bearing ⑩ and the third-gear idler gear ⑪ with the collar facing down.
- Mount stop disk ⑫ and lock ring ⑬.
- Mount sixth-gear sliding gear ⑭ with the shift groove facing downward and stop disk ⑮.
- Mount needle bearing ⑯, first-gear idler gear ⑰ with the recess facing downward, and stop disk ⑱.
- Finally, check all the gear wheels for smooth operation.

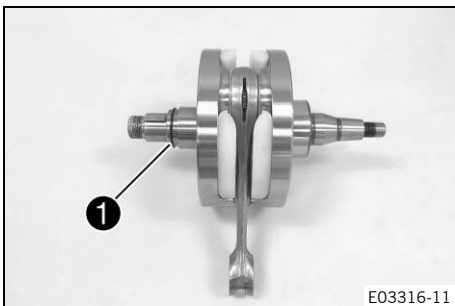
18.4.26 Checking the electric starter drive



- Check the gear teeth of rotor **1** for damage and wear.
 - » If there is damage or wear:
 - Change the rotor.
- Check the gear teeth and bearing of the Bendix **2** for smooth operation, damage, and wear.
 - » If damaged or worn, or if the Bendix does not move easily:
 - Change the Bendix.
- Check gear teeth of starter motor **3** for damage and wear.
 - » If there is damage or wear:
 - Change starter motor.
- Connect negative cable of a 12-V power supply to the housing of the starter motor. Connect positive cable of the power supply briefly with the connector of the starter motor.
 - » If the starter motor does not turn when the circuit is closed:
 - Change starter motor.

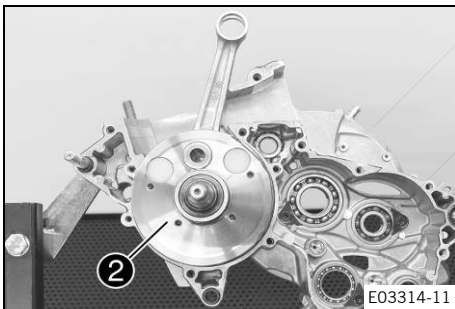
18.5 Engine assembly

18.5.1 Assembling the engine case



Installing the crankshaft and the transmission shaft

- Mount O-ring **1**.



- Position the right section of the engine case in the engine work stand.

Engine work stand (61229001000) (p. 323)
--

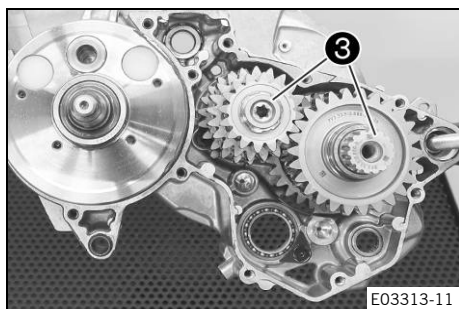
Holder and fitting for work stand (55429002000) (p. 321)
--

- Warm up the crankshaft bearing.

Guideline

100 °C (212 °F)

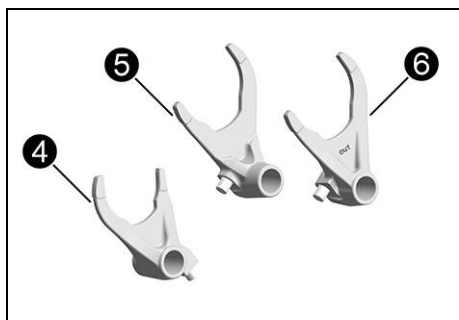
- Slide crankshaft **2** all the way into the bearing seat of the right section of the engine case.



- Oil all bearings.

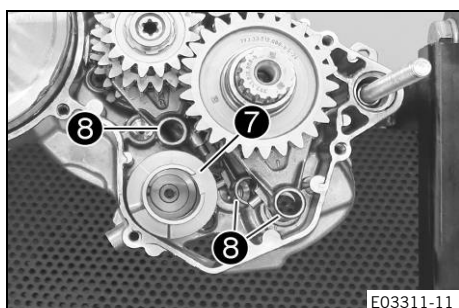
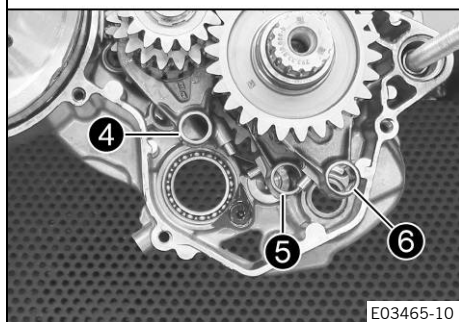
Engine oil (15W/50) (p. 314)

- Assemble the two transmission shafts (3) and slide them into the bearing seats together.



Installing the shift fork, shift drum and shift rails

- Shift fork (4) has a smaller inside diameter; mount this in the shift groove of the main shaft.
- Mount shift fork (5) in the lower shift groove of the countershaft.
 - ✓ The side of shift fork (5) with marking **out** faces the clutch side.
- Mount shift fork (6) in the upper shift groove of the countershaft.
 - ✓ The side of shift fork (6) with marking **out** faces to the alternator side.

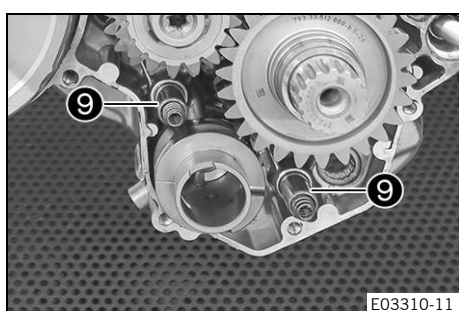


- Push shift drum (7) into the bearing seat.
- Position shift forks (8) in the shift grooves.

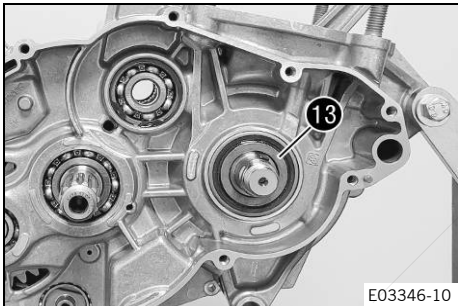
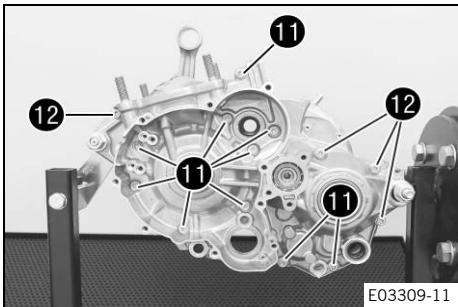
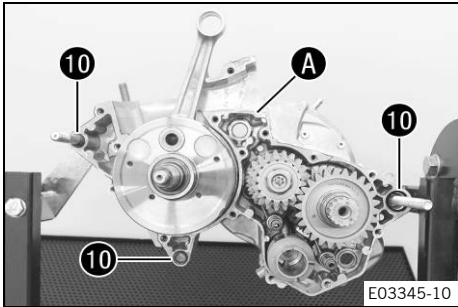


Info

Do not misplace the shift rollers.



- Mount shift rails (9) with the springs.



left engine case, assembling

- Clean and degrease the sealing surface.
- Thinly coat the sealing surface **A** of the right section of the engine case with sealing compound.

Loctite® 5910

- Check that dowels **10** are seated correctly.

- Mount the left section of the engine case.

i Info
Do not use the screws to pull the two sections of the engine case together.

- Mount screw **11** and, once all screws of the left section of the engine case have been mounted, tighten.

Guideline

Screw, engine case	M6x45	10 Nm (7.4 lbf ft)
--------------------	-------	--------------------

- Mount screws **12** and, once all screws of the left section of the engine case have been mounted, tighten.

Guideline

Screw, engine case	M6x60	10 Nm (7.4 lbf ft)
--------------------	-------	--------------------

- Secure the engine in the engine work stand.
- Remove the excess lengths of the engine case gasket in the area of the cylinder support and the reed valve housing.
- Grease the radial shaft seal ring and mount distance sleeve **13**.

18.5.2 Preparing the engine for assembly

Preparatory work

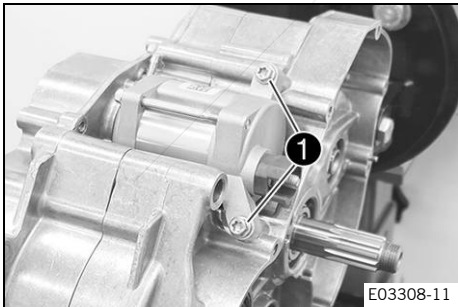
- Assemble the engine case. (📖 p. 212)

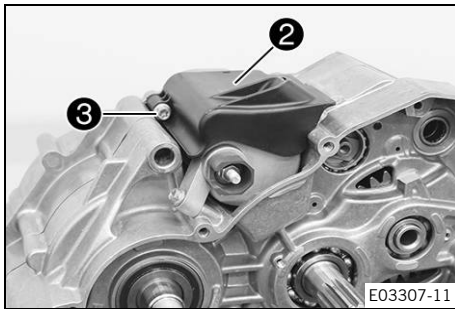
Installing the starter motor

- Position the starter motor.
- Mount and tighten screws **1**.

Guideline

Screw, starter motor	M6	10 Nm (7.4 lbf ft)
----------------------	----	--------------------

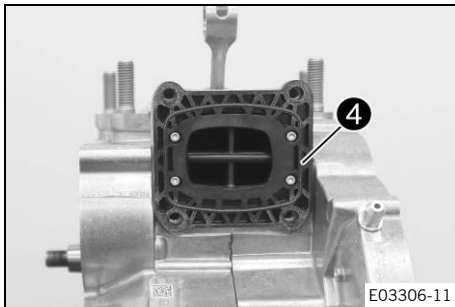




- Position cover ②.
- Mount and tighten screw ③.

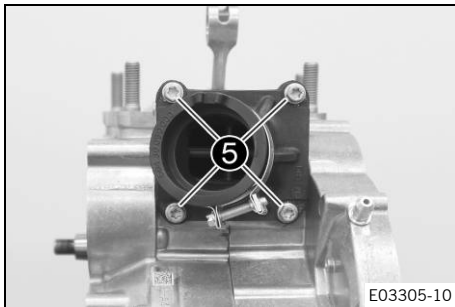
Guideline

Screw, cover, starter motor	M6	8 Nm (5.9 lbf ft)
-----------------------------	----	-------------------



Installing the reed valve housing

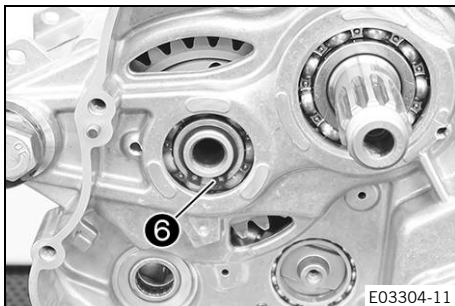
- Position the gasket.
- Position reed valve housing ④ in the engine case opening.



- Position the intake flange with the gasket.
- Mount screws ⑤ and tighten in a crisscross pattern.

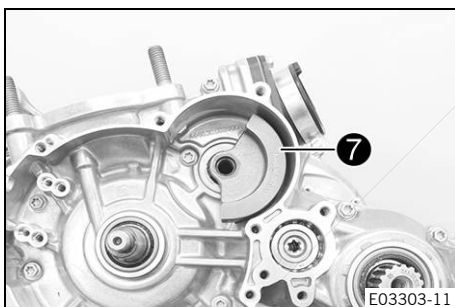
Guideline

Screw, intake flange/reed valve housing	M6	6 Nm (4.4 lbf ft)
---	----	-------------------

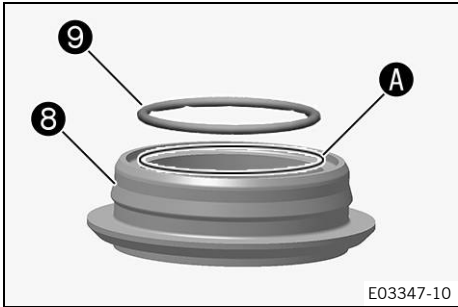


Installing the lock ring, balancer shaft and spacer

- Mount lock ring ⑥.



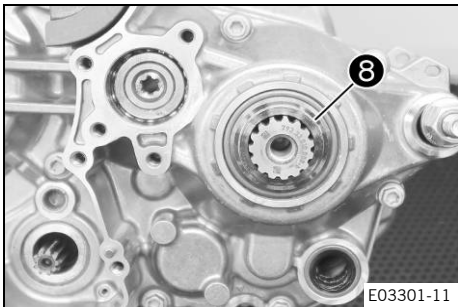
- Mount balancer shaft ⑦.



- Before mounting, grease spacer **8** in area **A** and O-ring **9**.

Long-life grease (📖 p. 316)

- Position the O-ring in the cut-out of the spacer.



- Grease the radial shaft seal ring.
Long-life grease (📖 p. 316)
- Push spacer **8** with the O-ring onto the countershaft with a twisting motion.
 - ✓ The cut-out with the O-ring must face inward.
 - ✓ The radial shaft seal ring rests against the spacer along its entire circumference.

18.5.3 Assembling the alternator side

Preparatory work

- Assemble the engine case. (📖 p. 212)
- Prepare the engine for assembly. (📖 p. 214)

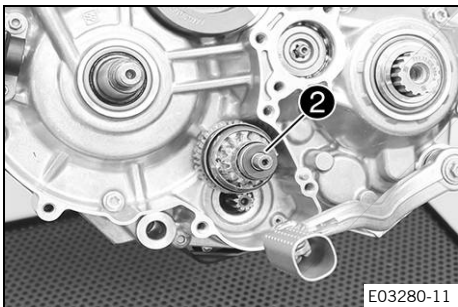
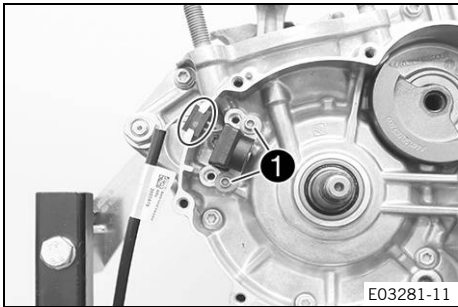
Installing the rotor

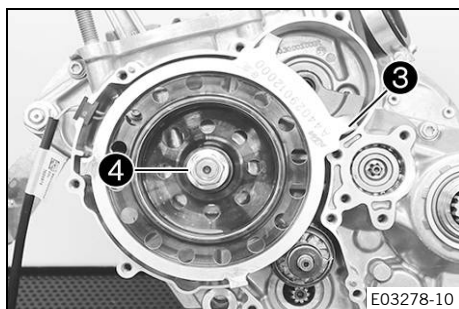
- Position the crankshaft speed sensor.
- Mount and tighten screws **1**.

Guideline

Screw, crankshaft speed sensor	M5	6 Nm (4.4 lbf ft) Loctite®243™
--------------------------------	----	--

- Position the rubber grommet in the engine case.
- Mount Bendix **2**.





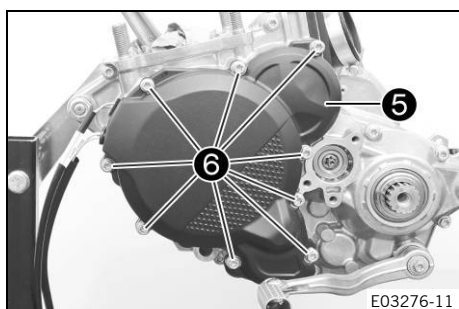
- Ensure that the woodruff key is seated correctly.
- Degrease the cone.
- Mount the rotor and hold it with special tool ③.

Holding wrench (A44029012000) (p. 329)

- Mount and tighten nut ④ with washer.

Guideline

Nut, rotor	M12x1	60 Nm (44.3 lbf ft)
------------	-------	------------------------



Installing the alternator cover

- Position alternator cover ⑤ with the gasket.



Info

Make sure the cylindrical pins are set correctly.

- Mount and tighten screws ⑥.

Guideline

Screw, alternator cover	M6	8 Nm (5.9 lbf ft)
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18.5.4 Assembling the clutch side

Preparatory work

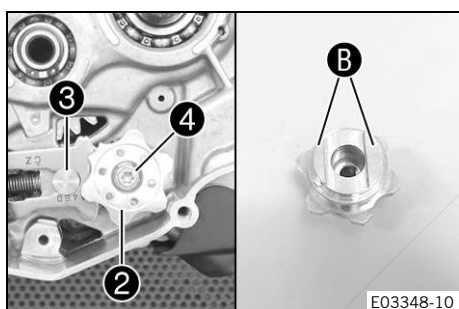
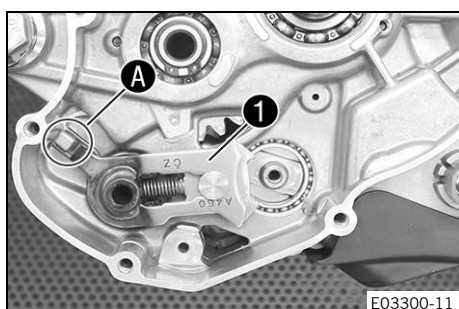
- Assemble the engine case. (p. 212)
- Prepare the engine for assembly. (p. 214)

Installing the shift shaft, shift drum locating unit and locking lever

- Slide shift shaft ① with the washer into the bearing seat.

Guideline

Ensure that the spring in area A engages correctly



- Position shift drum locating unit ②, pushing shift shaft sliding plate ③ away from the shift drum locating unit.



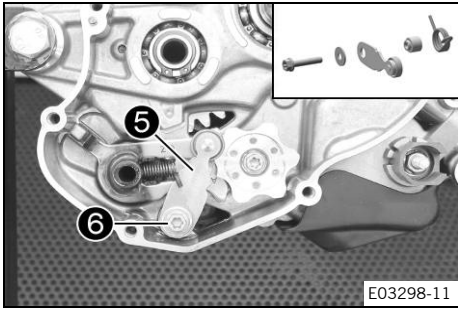
Info

Flat surfaces B of the shift drum locating unit are not symmetric.

- Let the shift shaft sliding plate engage in the shift drum locating unit.
- Mount and tighten screw ④.

Guideline

Screw, shift drum locating	M6	10 Nm (7.4 lbf ft) Loctite®243™
----------------------------	----	---



- Position locking lever **5** with sleeve and spring.

Guideline

Ensure that the spring of the locking lever engages correctly in the cut-out of the housing.

- Mount screw **6** with the washer and screw in approx. 2 full turns, but do not tighten it fully.

Guideline

Screw, locking lever	M5	6 Nm (4.4 lbf ft) Loctite®243™
----------------------	----	--

- Tension the locking lever and allow it to engage in the shift drum locating unit.
- Tighten screw **6**.

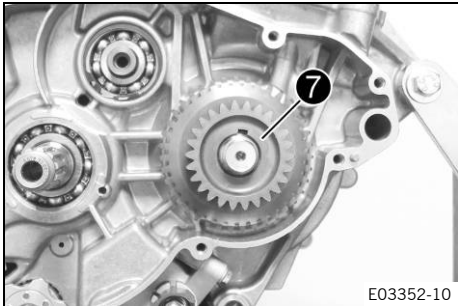
Guideline

Screw, locking lever	M5	6 Nm (4.4 lbf ft) Loctite®243™
----------------------	----	--

- Shift through the transmission.

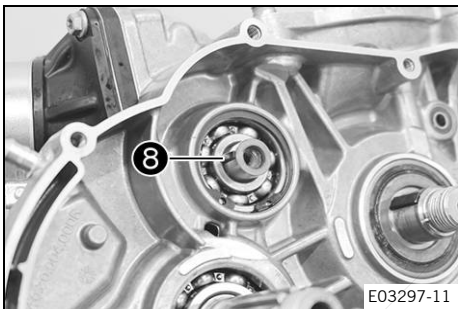
Mounting the balancer shaft drive wheel and primary gear

- Mount primary gear wheel **7**.

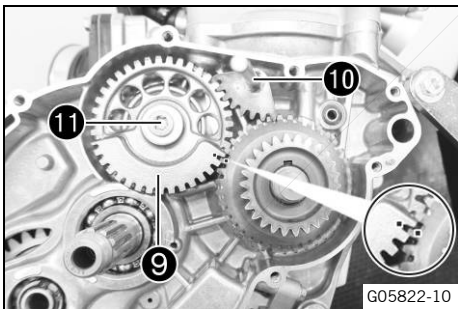


Info

Ensure that the woodruff key is seated properly.



- Mount woodruff key **8**.



- Mount balancer shaft drive wheel **9**.
- Hold the balancer shaft in place using the special tool **10**.

Gear segment (80029004000) (p. 325)



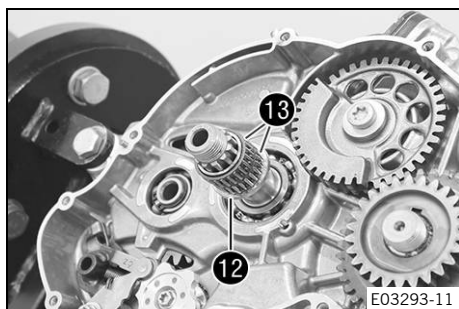
Info

The marking of the balancer shaft and the marking of the primary gear must align.

- Mount and tighten screw **11** with washer.

Guideline

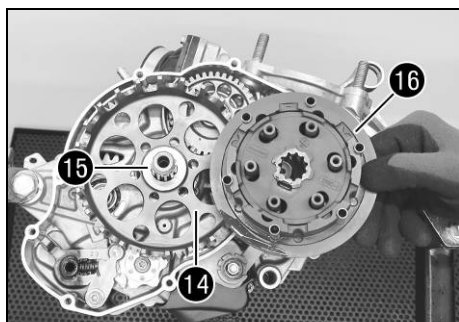
Screw, balancer shaft	M8	30 Nm (22.1 lbf ft) Loctite®243™
-----------------------	----	--



Installing the clutch basket

- Mount collar bushing 12.
- Oil and mount needle bearings 13.

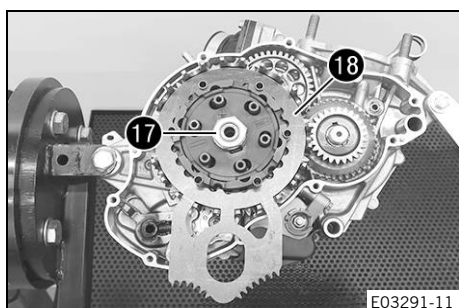
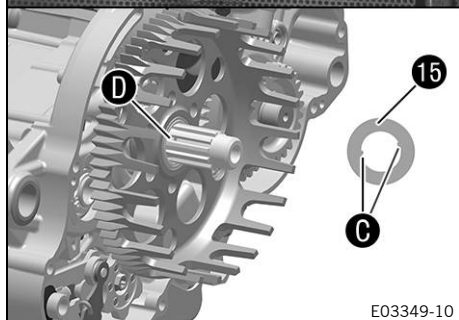
Engine oil (15W/50) (p. 314)



- Slide clutch basket 14 onto the gearbox main shaft.
- Slide on washer 15 and inner clutch hub 16.

Guideline

Teeth C of the washer must be aligned with drill hole D of the shaft.



- Mount nut 17 with wedge lock washer. Hold the inner clutch hub using special tool 18 and tighten the nut.

Guideline

Nut, inner clutch hub	M18x1.5	100 Nm (73.8 lbf ft)
-----------------------	---------	----------------------

Check the cams and gear teeth of the wedge lock washer for wear and tear before assembly and replace if necessary.

Holding wrench (59029003100) (p. 322)

Alternative 1

Holding wrench (51129003000) (p. 320)

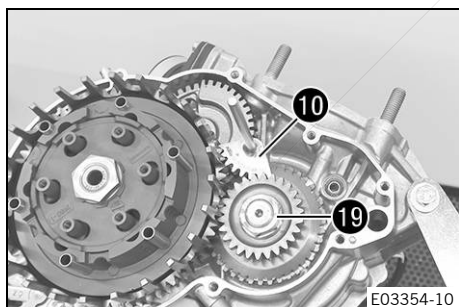
- Hold the primary gear wheel using special tool 10.

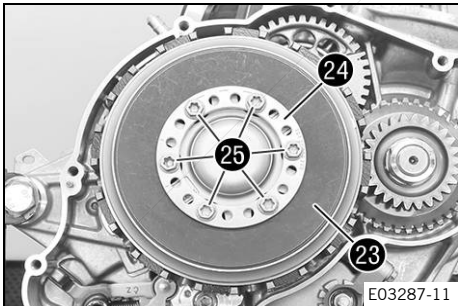
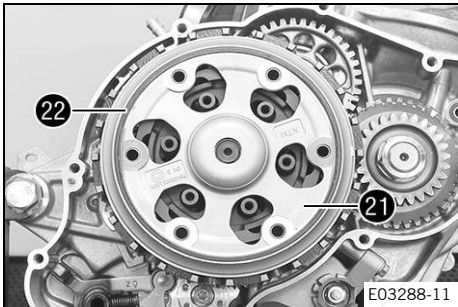
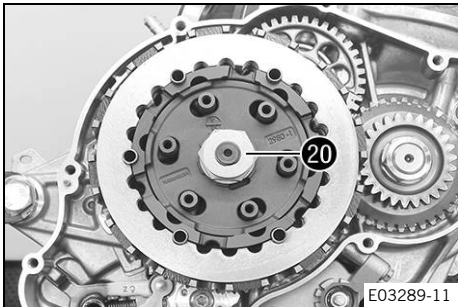
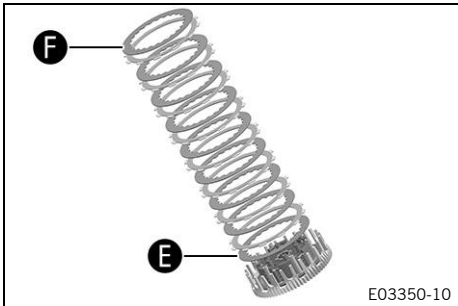
Gear segment (80029004000) (p. 325)

- Mount and tighten nut 19.

Guideline

Nut, primary gear wheel	M18LHx1.5	150 Nm (110.6 lbf ft) Loctite®243™
-------------------------	-----------	--





Info

LH thread!

- Crank the engine and check for smooth operation.

Installing the clutch discs

- Thoroughly oil the clutch facing discs.
- Mount intermediate clutch disc **E** with marking **S**.

Guideline

Thickness of intermediate clutch disc E	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 **F** into the clutch basket.

Guideline

Thickness of intermediate clutch disc F	1.0 mm (0.039 in)
--	-------------------

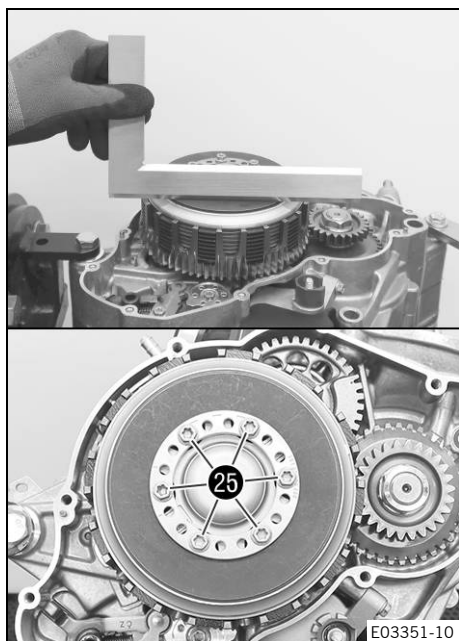
- Mount clutch throw-out **20**.

- Position clutch pressure cap **21**.
- Mount pretension ring **22** with marking **Top** facing up.

- Position spring washer **23**.
- Position spring retainer **24** with marking **1**.
- Mount screws **25** and tighten incrementally in a crisscross pattern.

Guideline

Screw, clutch spring retainer	M5	6 Nm (4.4 lbf ft)
-------------------------------	----	-------------------



E03351-10

- Using a straightedge and the special tool, check the spring washer for distortion.

Feeler gauge (79129941000) (📖 p. 324)

Spring washer distortion	0 ... 0.10 mm (0 ... 0.0039 in)
--------------------------	---------------------------------

- » If the specified value is not reached:
 - Remove screws **25** and mount the spring retainer with marking **2**.
- Using a straightedge and the special tool, check the spring washer for distortion.

Feeler gauge (79129941000) (📖 p. 324)

Spring washer distortion	0 ... 0.10 mm (0 ... 0.0039 in)
--------------------------	---------------------------------

- » If the specified value is not reached:
 - Remove screws **25** and mount the spring retainer with marking **3**.
- Using a straightedge and the special tool, check the spring washer for distortion.

Feeler gauge (79129941000) (📖 p. 324)

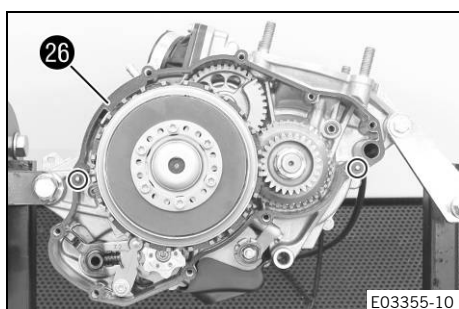
Spring washer distortion	0 ... 0.10 mm (0 ... 0.0039 in)
--------------------------	---------------------------------

- » If the specified value is not reached:
 - Change the clutch facing discs.

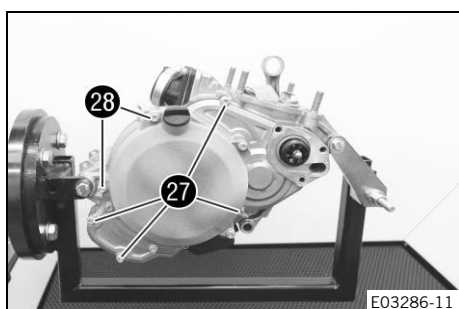
clutch and water pump cover, installing

- Mount clutch cover gasket **26**.

i Info
Make sure the cylindrical pins are set correctly.



E03355-10



E03286-11

- Position the clutch cover.
- Mount screws **27**, but do not tighten yet.

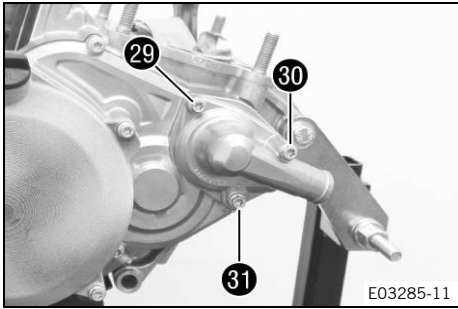
Guideline

Screw, clutch cover	M6x25	10 Nm (7.4 lbf ft)
---------------------	-------	--------------------

- Mount screws **28** and tighten all screws in a crisscross pattern.

Guideline

Screw, clutch cover	M6x60	10 Nm (7.4 lbf ft)
---------------------	-------	--------------------



- Position the water pump cover with the gasket.
- Mount and tighten screws 29.

Guideline

Bleeder screw, water pump cover	M6x25	8 Nm (5.9 lbf ft)
---------------------------------	-------	-------------------

- Mount and tighten screws 30.

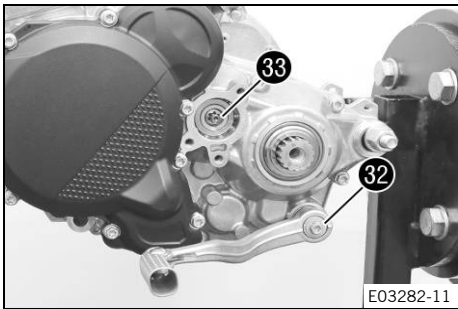
Guideline

Screw, water pump cover, long	M6x60	10 Nm (7.4 lbf ft)
-------------------------------	-------	--------------------

- Mount and tighten screw 31 with the seal ring.

Guideline

Bleeder screw, water pump cover	M6x25	8 Nm (5.9 lbf ft)
---------------------------------	-------	-------------------



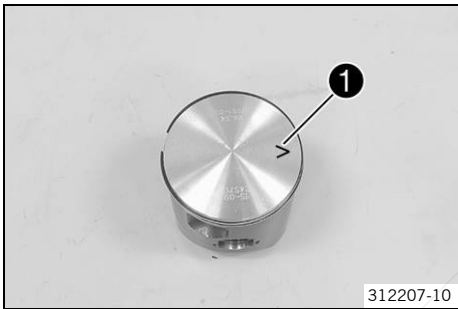
- Position the shift lever. Mount and tighten screw 32 with washers.

Guideline

Screw, shift lever	M6	14 Nm (10.3 lbf ft) Loctite®243™
--------------------	----	--

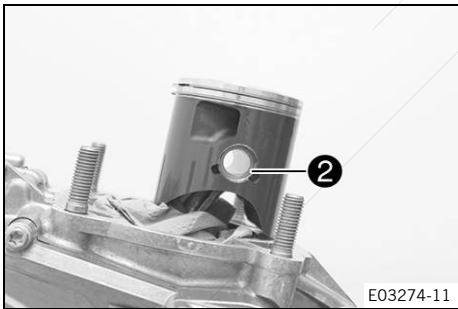
- Mount clutch push rod 33.
✓ The rounded side faces inwards.

18.5.5 Installing the cylinder and cylinder head

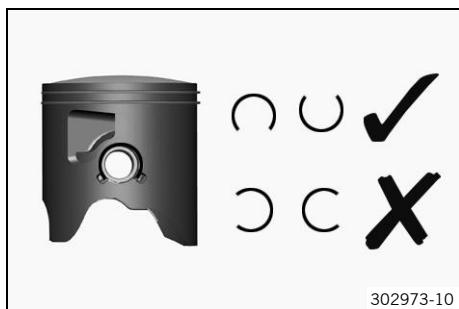


Installing the piston

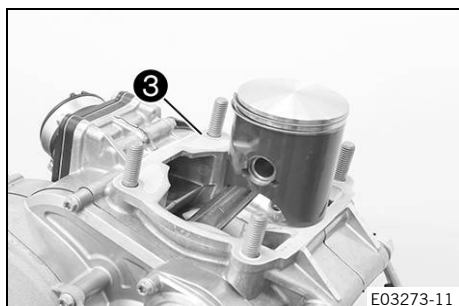
- Oil the upper conrod bearing and position it in the connecting rod.
- Position the piston.
✓ Piston marking 1 must face the exhaust side.



- Cover the engine case opening with a cloth.
- Slide piston pin 2 into the connecting rod by hand.



- Position the piston ring locks in the 6 o'clock or 12 o'clock position.
- Ensure that the piston ring lock is in the correct position on both sides.
- Remove the cloth.



Installing the cylinder

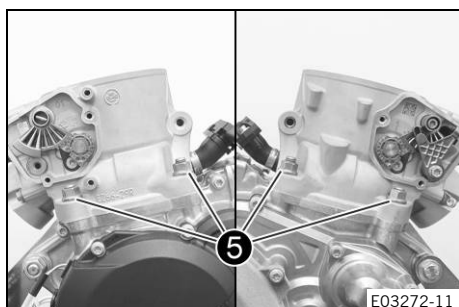
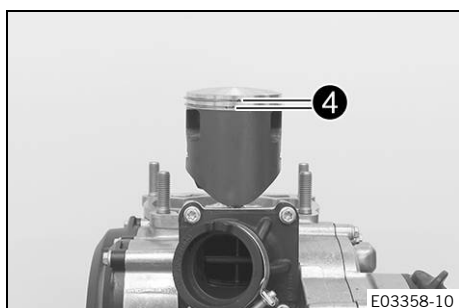
- Place new cylinder base gasket **3** in position.



Info

If neither the piston, cylinder, crankshaft, or engine case need to be changed, the same gasket thickness can be used as before.

- Oil the cylinder and piston.
- Position the piston ring.
- ✓ The anti-rotation lock engages in piston ring end **4**.



- Slide the cylinder over the piston.
- Push the cylinder down carefully.
- Mount nuts **5** on both sides and tighten in a crisscross pattern.

Guideline

Nut, cylinder base	M10	38 Nm (28 lbf ft)
--------------------	-----	-------------------



Info

Raise the cylinder slightly to be able to install the front nuts.

Checking the X-distance

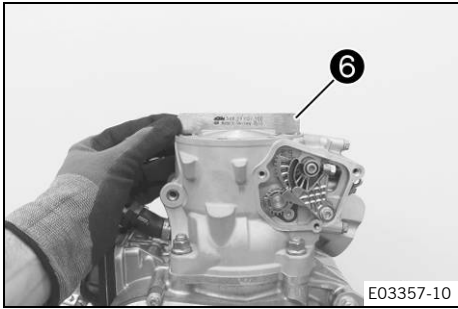


Info

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 position.

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.

The X-distance is adjusted by inserting cylinder base gaskets of various thicknesses.



(All 250 models)

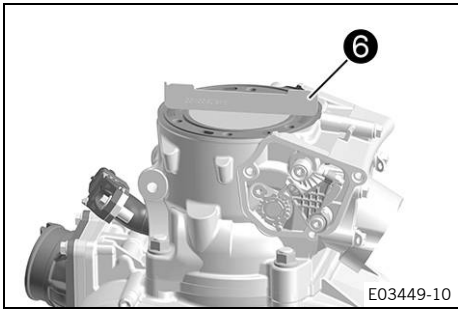
- Apply special tool **6** to the cylinder.
- Setting gauge (54829001100) (p. 320)
- ✓ The cut-out faces downward.
- Position the piston at top dead center.
- Check the X-distance using the special tool.

Feeler gauge (79129941000) (p. 324)

X-distance (upper edge of piston to special tool)	0 ... 0.10 mm (0 ... 0.0039 in)
---	---------------------------------

- » If the specified value is not reached:
 - Replace the cylinder base gasket with a cylinder base gasket of the required X-distance.

i Info
Multiple cylinder base gaskets can be combined.



(All 300 models)

- Apply special tool **6** to the cylinder.
- Setting gauge (54829001100) (p. 320)
- ✓ The cut-out faces upward.
- Position the piston at top dead center.
- Check the X-distance using the special tool.

Feeler gauge (79129941000) (p. 324)

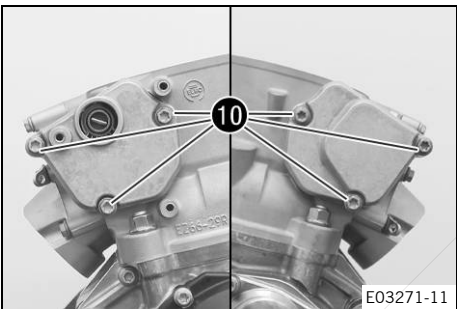
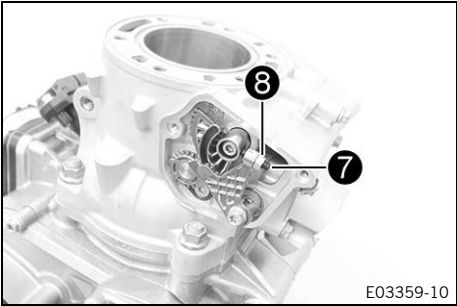
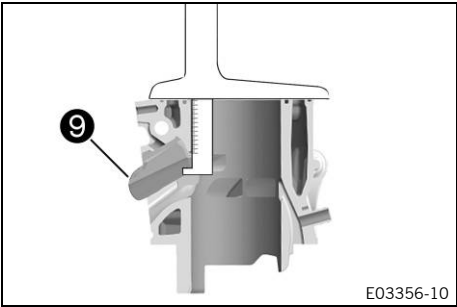
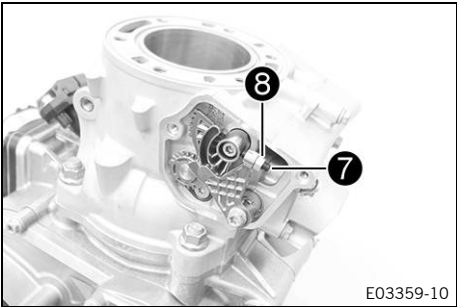
X-distance (upper edge of piston to special tool)	0 ... 0.10 mm (0 ... 0.0039 in)
---	---------------------------------

- » If the specified value is not reached:
 - Replace the cylinder base gasket with a cylinder base gasket of the required X-distance.

i Info
Multiple cylinder base gaskets can be combined.

Setting the Z-distance

i Info
The Z-distance is the distance from the lower edge of the control flap to the upper edge of the cylinder, measured in the middle of the exhaust port.



- Counterhold screw 7 and loosen nut 8.

- Adjust the Z-distance using the depth micrometer.

Guideline

Z distance (height of control flap) (All 250 models)	50.0 mm (1.969 in)
Z distance (height of control flap) (All 300 models)	50.0 mm (1.969 in)

- Position the depth micrometer and swivel control flap 9 downwards.

- Adjust the Z-distance by turning screw 7.

✓ The Z-distance is set correctly, the control flap is flush with the depth micrometer and screw 7 is in contact with the idler shaft.

- Hold screw 7 and tighten nut 8.

Guideline

Nut, axle for control flap	M5	5 Nm (3.7 lbf ft)
----------------------------	----	-------------------

- Check the Z dimension.

Guideline

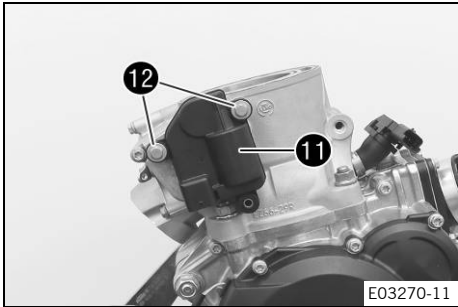
Z distance (height of control flap) (All 250 models)	50.0 mm (1.969 in)
Z distance (height of control flap) (All 300 models)	50.0 mm (1.969 in)

- Position both covers of the exhaust control with the gaskets.

- Mount and tighten screws 10.

Guideline

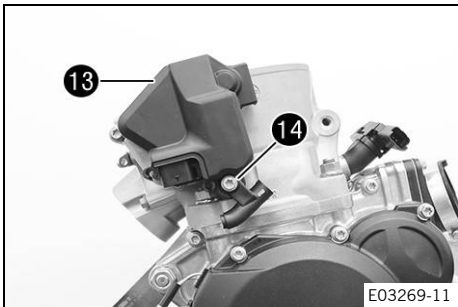
Screw, exhaust control cover	M5	6 Nm (4.4 lbf ft)
------------------------------	----	-------------------



- Position actuator 11.
- Mount and tighten screws 12.

Guideline

Screw, actuator, exhaust control	M5	5 Nm (3.7 lbf ft) Loctite®243™
----------------------------------	----	--



- Position cover 13.
- Mount and tighten screw 14.

Guideline

Screw, cover, actuator, exhaust control	M5	5 Nm (3.7 lbf ft) Loctite®243™
---	----	--

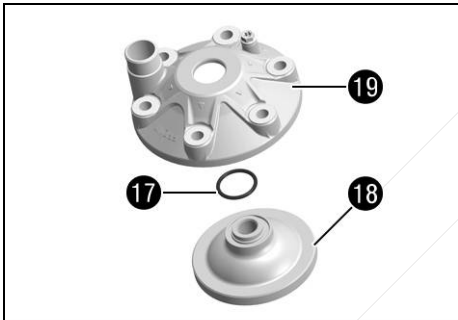
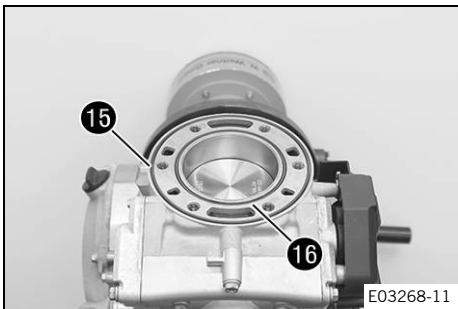


Info

If the actuator of the exhaust control has been removed, the end positions of the exhaust control must be reprogrammed.

Installing the cylinder head

- Position O-ring 15 and 16.



- Mount O-ring 17 on combustion chamber liner 18.

Guideline

Use the new O-ring.

- Mount combustion chamber liner 18 in cylinder head cover 19.
- Put the cylinder head in place.

Guideline

Ensure that the combustion chamber liner is correctly seated in the cylinder head cover.
--

- Mount screws 20 with washers and tighten them in a crisscross pattern.

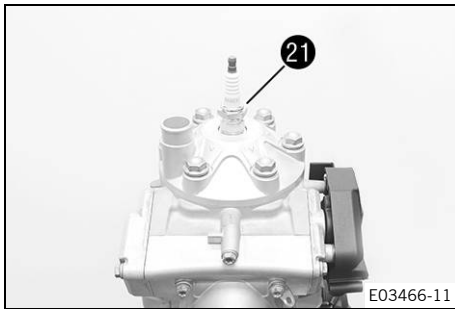
Guideline

Screw, cylinder head	M8	27 Nm (19.9 lbf ft)
----------------------	----	---------------------



Info

Use new washers.



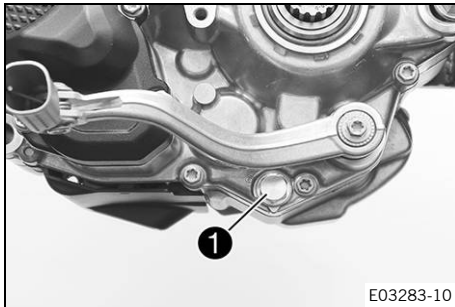
- Mount and tighten spark plug 21.

Guideline

Spark plug	M14x1.25	25 Nm (18.4 lbf ft)
------------	----------	------------------------



18.5.6 Gear oil drain plug, installing



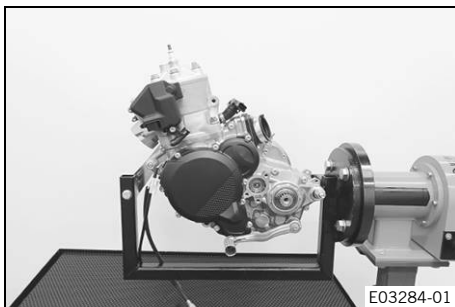
- Mount and tighten gear oil drain plug 1 with the magnet and a new seal ring.

Guideline

Gear oil drain plug with magnet	M12x1.5	20 Nm (14.8 lbf ft)
---------------------------------	---------	---------------------



18.5.7 Removing the engine from the engine work stand



- Remove the fitting from the special tool.

Holder and fitting for work stand (55429002000)
(p. 321)

- Remove the engine from the engine work stand.



19.1 Checking/correcting the fluid level of hydraulic clutch



Warning

Skin irritation Brake fluid is a harmful substance.

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



Note

Environmental hazard Hazardous substances cause environmental damage.

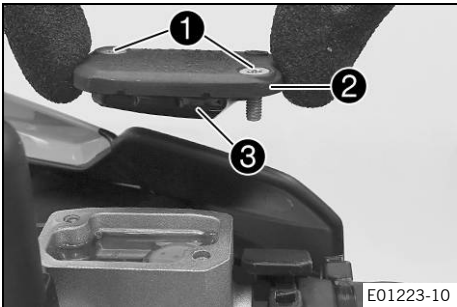
- Dispose of oils, grease, filters, fuel, cleaning agents, brake fluid, etc., correctly and in compliance with the applicable regulations.



Info

The fluid level rises with increasing wear of the clutch facing discs.

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



- Move the hydraulic clutch fluid reservoir mounted on the handlebar into a horizontal position.
- Remove screws ❶.
- Take off cover ❷ with membrane ❸.
- Check the fluid level.

Fluid level below container rim	4 mm (0.16 in)
---------------------------------	----------------

- » If the level of the fluid does not meet specifications:
 - Correct the fluid level of the hydraulic clutch.
- Position the cover with the membrane. Mount and tighten the screws.

Brake fluid DOT 4 / DOT 5.1 (📖 p. 314)
--



Info

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

19.2 Changing the hydraulic clutch fluid



Warning

Skin irritation Brake fluid is a harmful substance.

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



Note

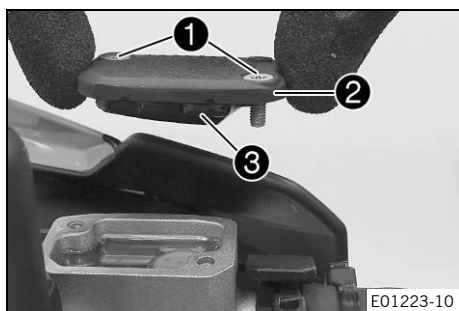
Environmental hazard Hazardous substances cause environmental damage.

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

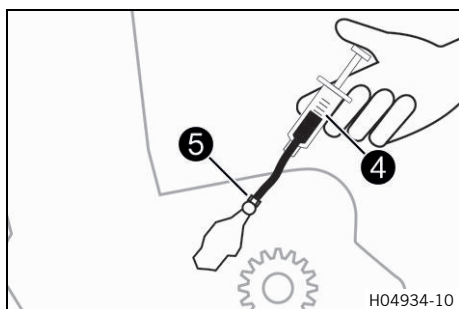


Info

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



- Move the hydraulic clutch fluid reservoir mounted on the handlebar into a horizontal position.
- Remove screws **1**.
- Take off cover **2** with membrane **3**.

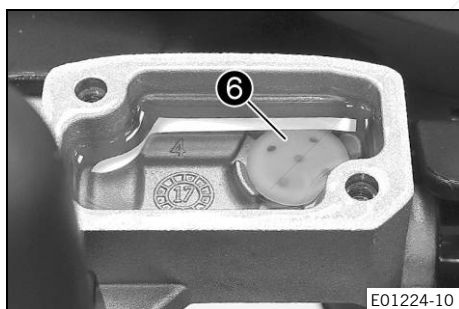


- Fill bleeding syringe **4** with the appropriate hydraulic fluid.

Syringe (50329050000) (p. 320)

Brake fluid DOT 4 / DOT 5.1 (p. 314)

- On the clutch slave cylinder, remove bleeder protection cap, release the bleeder screw **5** and mount bleeding syringe **4**.



- Now press the fluid into the system until it emerges from hole **6** of the master cylinder without bubbles.
- Occasionally extract the fluid from the master cylinder reservoir to prevent overflowing.
- Remove the bleeding syringe. Tighten the bleeder screw. Mount the protection cap.
- Correct the fluid level of the hydraulic clutch.

Guideline

Fluid level below container rim	4 mm (0.16 in)
---------------------------------	----------------

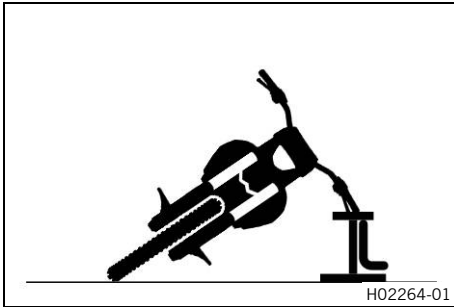
- Position the cover with the membrane. Mount and tighten the screws.



Info

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

19.3 Checking the clutch



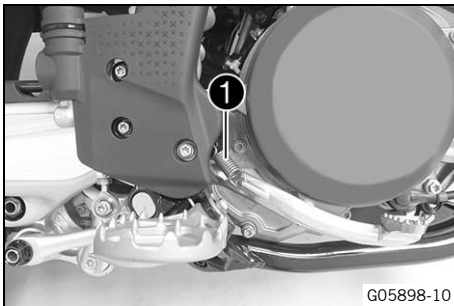
Main work

- Drain the fuel from the fuel tank into a suitable container.
- Lay the vehicle on its side on the work stand.

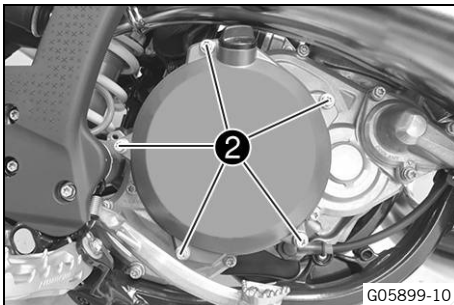


Info

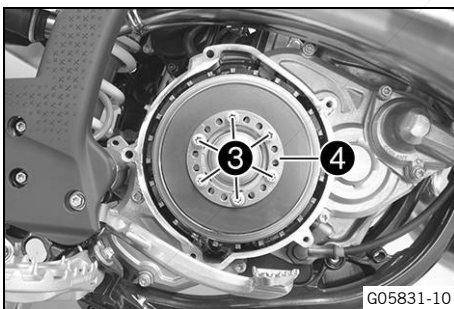
Cover the components to protect them against damage. Remaining fuel may flow out of the fuel tank.



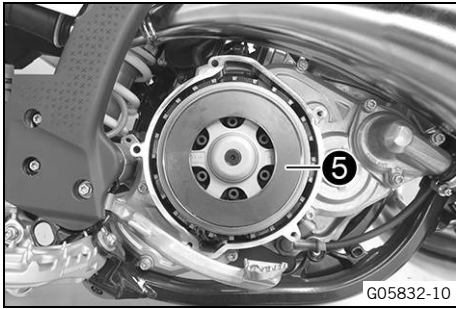
- Detach spring **1**.



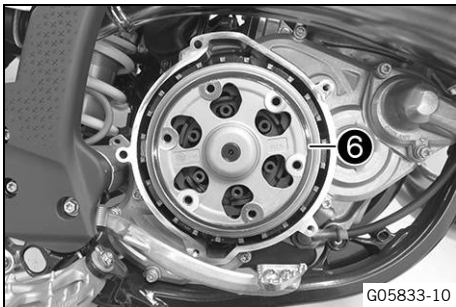
- Remove screws **2**.
- Take off the clutch cover with the gasket.



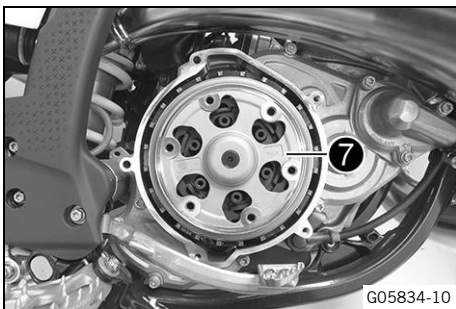
- Loosen screws **3** in a crisscross pattern and remove them.
- Take off spring retainer **4**.



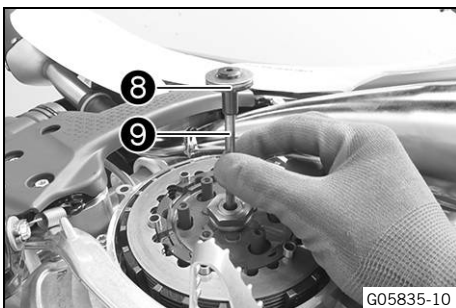
- Take off spring washer **5**.



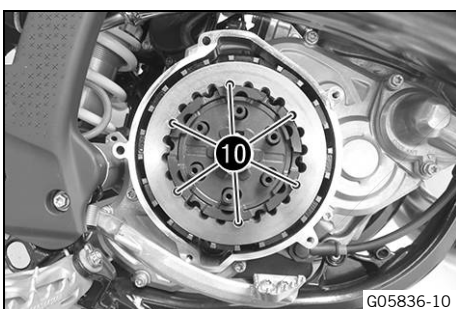
- Take off pretension ring **6**.



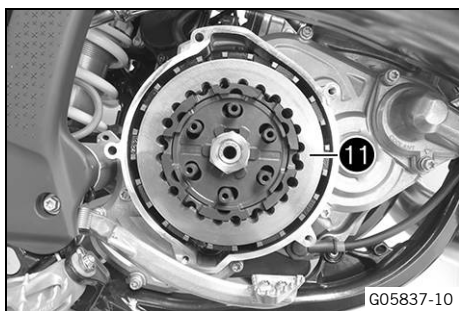
- Take off clutch pressure cap **7**.



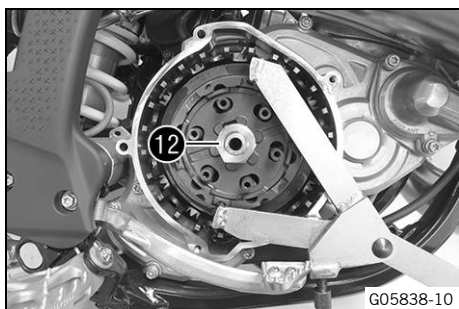
- Take off clutch throw-out **8** with clutch push rod **9**.



- Remove sleeves **10**.



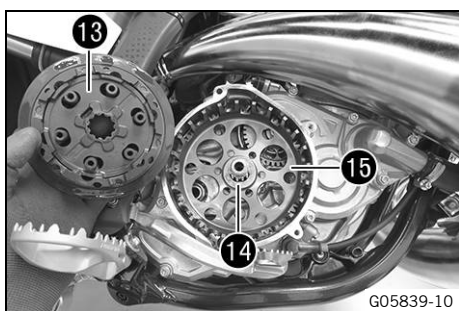
- Remove clutch discs **11** completely.



- Hold the inner clutch hub with the special tool. Loosen nut **12**.

Holding wrench (51129003000) (📖 p. 320)

- Remove the nut with the wedge lock washers.



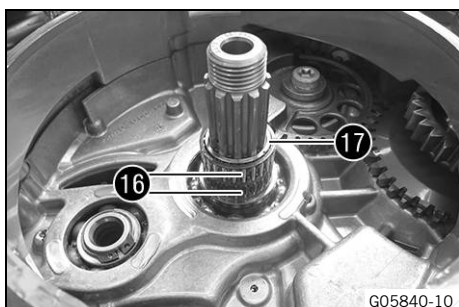
- Take off inner clutch hub **13** and washer **14**.



Info

The washer usually sticks to the inner clutch hub.

- Take off clutch basket **15**.

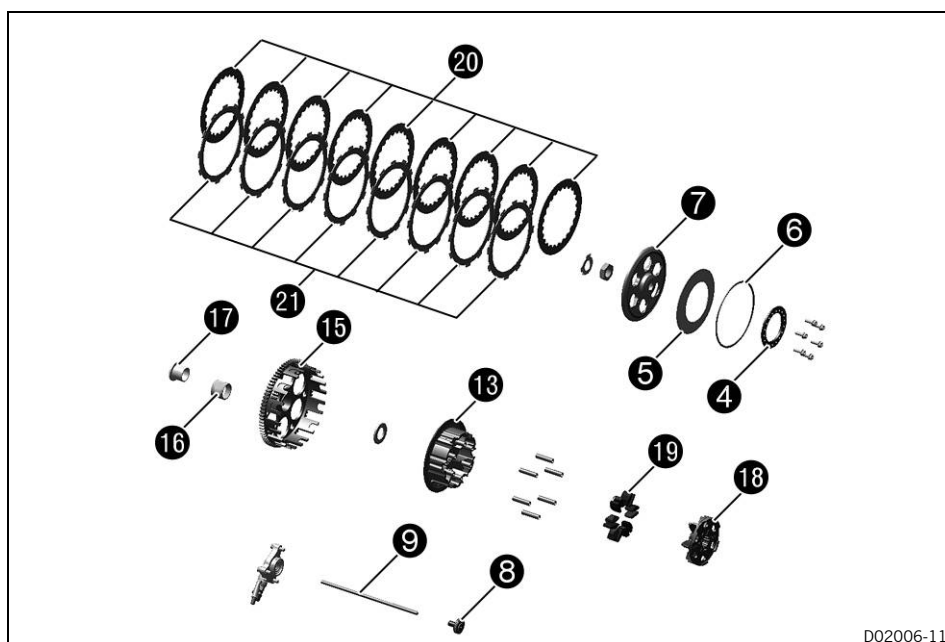


- Take off needle bearing **16** and collar bushing **17**.



Info

The needle bearing and collar bushing may be in the clutch basket.



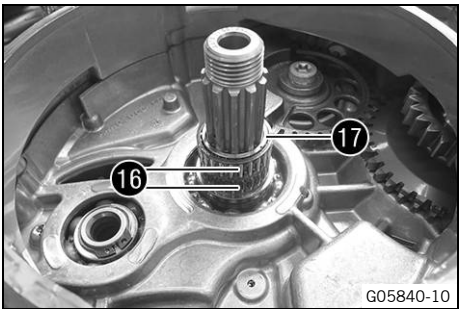
D02006-11

- Check clutch throw-out **8** for damage and wear.
 - » If there is damage or wear:
 - Change the clutch throw-out.
- Place the clutch push rod **9** on a flat surface and check for run-out.
 - » If there is run-out:
 - Change the clutch push rod.
- Check spring retainer **4** for damage and wear.
 - » If there is damage or wear:
 - Change the spring retainer.
- Check pretension ring **6** for damage and wear.
 - » If there is damage or wear:
 - Change the pretension ring.
- Check spring washer **5** for damage and wear.
 - » If there is damage or wear:
 - Change the spring washer.
- Check the contact surface of clutch pressure cap **7** for damage and wear.
 - » If there is damage or wear:
 - Change the clutch pressure cap.
- Check clutch center **18** for damage and wear.
 - » If there is damage or wear:
 - Change the clutch center.
- Check damping rubber pieces **19** for damage and wear.
 - » If there is damage or wear:
 - Change the damping rubber pieces.
- Check inner clutch hub **13** for damage and wear.
 - » If there is damage or wear:
 - Change the inner clutch hub.
- Check the thrust surfaces of the clutch facing discs in clutch basket **15** for damage and wear.
 - » If there is damage or wear:
 - Change the clutch facing discs and the clutch basket.

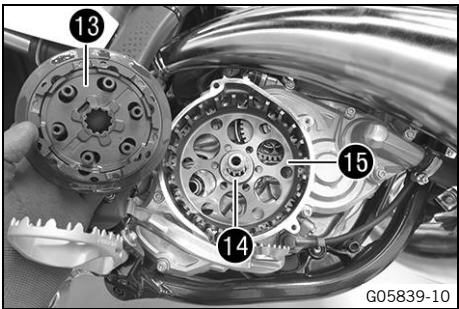
- Check needle bearings 16 and collar bushing 17 for damage and wear.
 - » If there is damage or wear:
 - Change the needle bearings and collar bushing.
- Check intermediate clutch discs 20 for damage and wear.
 - » If the intermediate clutch discs are not level and are pitted:
 - Change all intermediate clutch discs.
- Check clutch facing discs 21 for discoloration and scoring.
 - » If there is discoloration or scoring:
 - Change all clutch facing discs.
- Check the thickness of clutch facing discs 21.

Clutch facing disc - thickness	≥ 1.9 mm (≥ 0.075 in)
--------------------------------	-----------------------

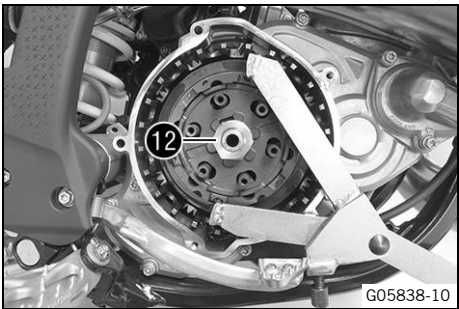
- » If the clutch facing disc does not meet specifications:
 - Change all clutch facing discs.



- Mount collar bushing 17 and needle bearings 16.



- Mount clutch basket 15.
 - ✓ Turn the clutch basket until the gear teeth of the kick starter intermediate gear mesh.
- Mount washer 14 and inner clutch hub 13.



- Mount nut 12 with wedge lock washer. Hold the inner clutch hub with the special tool and tighten the nut.

Guideline

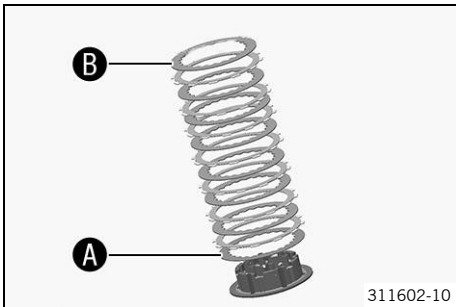
Nut, inner clutch hub	M18x1.5	100 Nm (73.8 lbf ft)
-----------------------	---------	-------------------------

Check the cams and gear teeth of the wedge lock washer for wear and tear before assembly and replace if necessary.

Holding wrench (51129003000) (p. 320)



- Mount sleeves 10.



- Thoroughly oil the clutch facing discs.
- Mount intermediate clutch disc A with marking S.

Guideline

Thickness of intermediate clutch disc A	1.0 mm (0.039 in)
---	-------------------

- Alternately place the clutch facing and 7 intermediate discs into the clutch basket.

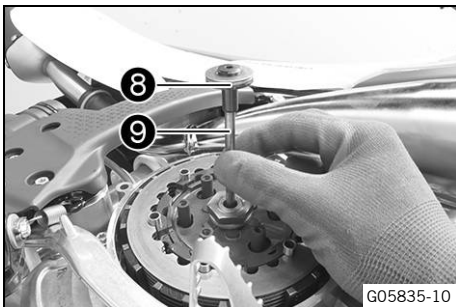
Guideline

Thickness of intermediate clutch discs	1.4 mm (0.055 in)
--	-------------------

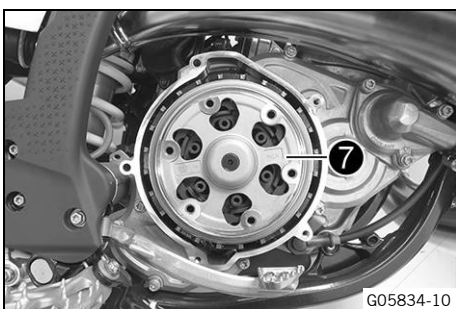
- Place intermediate clutch disc B into the clutch basket.

Guideline

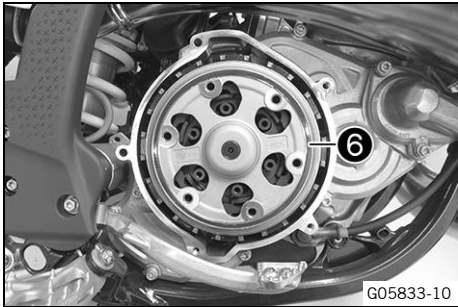
Thickness of intermediate clutch disc B	1.0 mm (0.039 in)
---	-------------------



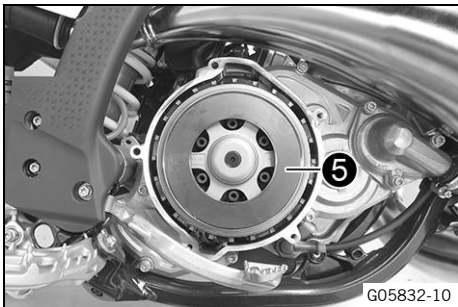
- Mount clutch throw-out 8 with clutch push rod 9.



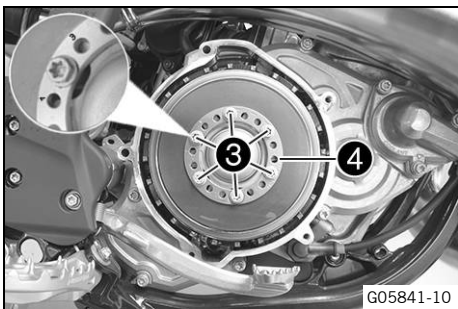
- Position clutch pressure cap 7.



- Mount pretension ring **6** with marking **Top** facing up.



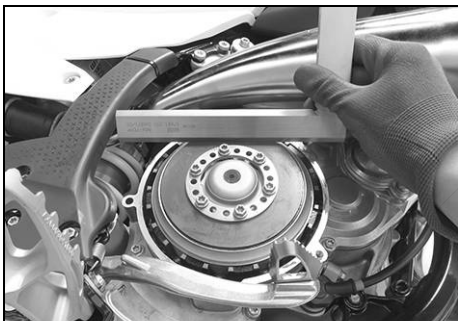
- Position spring washer **5**.



- Position spring retainer **4** with marking **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 (79129941000) (p. 324)	
-------------------------------------	--

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 (79129941000) (p. 324)	
-------------------------------------	--

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 (79129941000) (p. 324)	
-------------------------------------	--

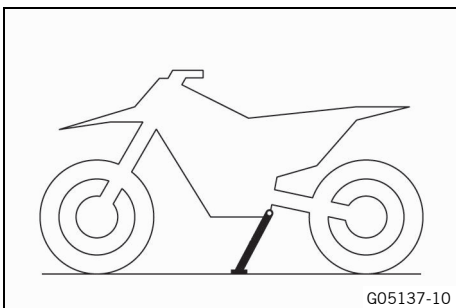
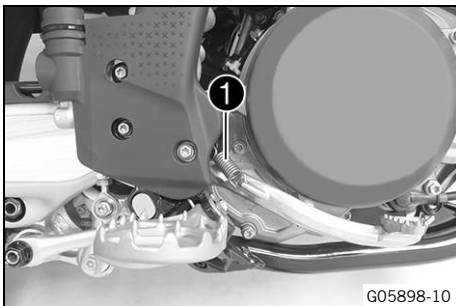
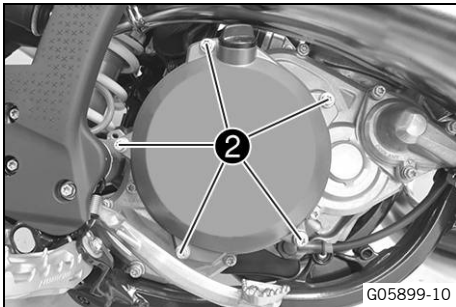
Spring washer distortion	0 ... 0.10 mm (0 ... 0.0039 in)
--------------------------	---------------------------------

- » If the specified value is not reached:
 - Change the clutch facing discs.

- Position the clutch cover with the gasket.
- Mount and tighten screws ❷.

Guideline

Screw, outer clutch cover	M6	8 Nm (5.9 lbf ft)
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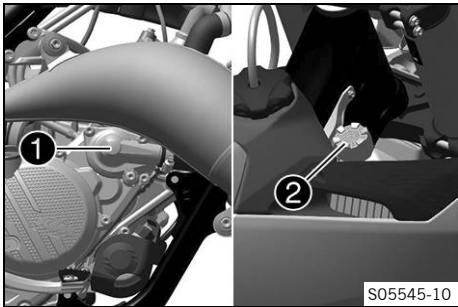
- Attach spring ❶.
- Place vehicle in upright position and lean on the side stand.

Finishing work

- Check the gear oil level. (📖 p. 262)



20.1 Cooling system



Water pump ❶ 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 ❷. 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 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 harmful to health.

- 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.

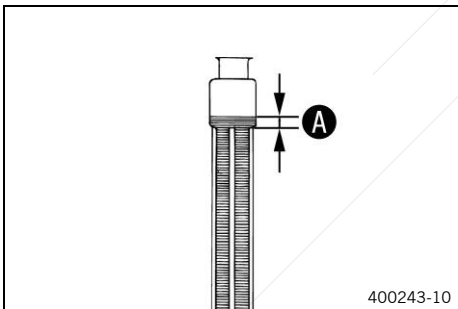
- Check the coolant level in the radiator.

Coolant level ❶ 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. 314)

- Mount the radiator cap.



20.3 Checking the coolant level



Warning

Danger of scalding During motorcycle operation, the coolant gets 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.



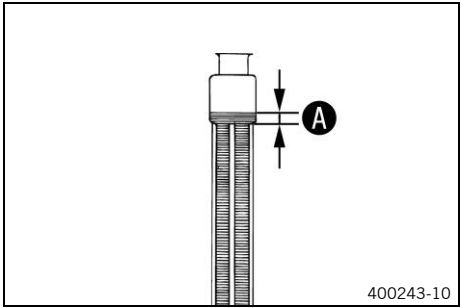
Warning

Danger of poisoning Coolant is harmful to health.

- 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. 314)

- Mount the radiator cap.



20.4 Draining the coolant



Warning

Danger of scalding During motorcycle operation, the coolant gets 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 harmful to health.

- 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.

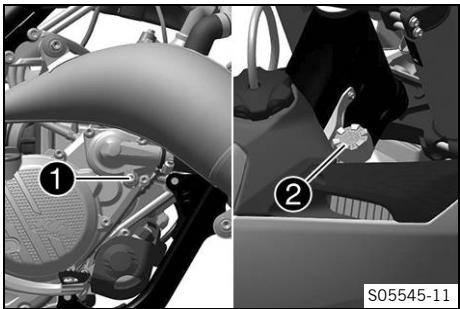
Condition

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

Bleeder screw, water pump cover	M6x25	8 Nm (5.9 lbf ft)
---------------------------------	-------	-------------------



20.5 Refilling with coolant

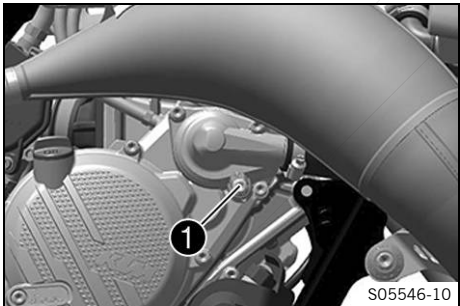


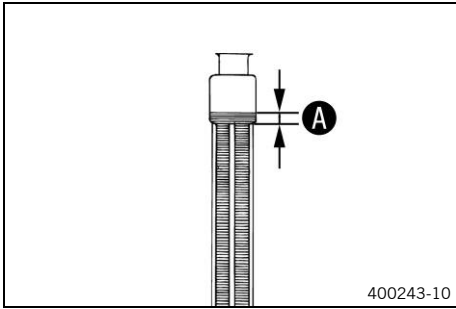
Warning
Danger of poisoning Coolant is harmful to health.

- Keep coolant out of the reach of children.
- Do not allow coolant to come into contact with the skin, the eyes and clothing.
- Consult a doctor immediately if coolant is swallowed.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly with water and consult a doctor immediately if coolant gets into the eyes.
- Change clothing if coolant spills onto your clothing.

Main work

- Make sure that screw ❶ is tightened.
- Position the motorcycle upright.

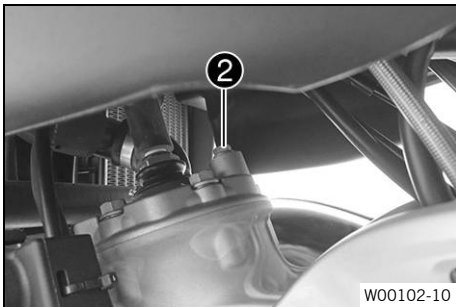




- Pour coolant in up to level **A** above the radiator fins.

Guideline

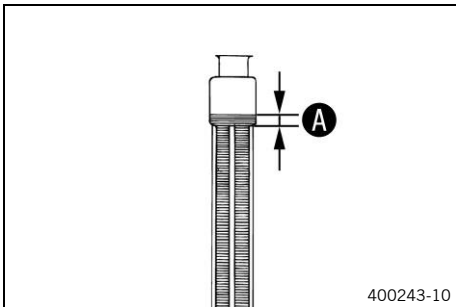
10 mm (0.39 in)		
Coolant	1.2 l (1.3 qt.)	Coolant (📖 p. 314)



- Remove screw **2** and wait until coolant emerges without bubbles.
- Mount and tighten screw **2**.

Guideline

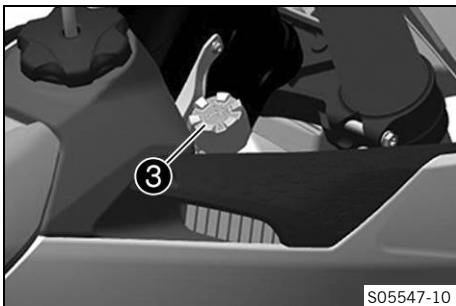
Bleeder screw, cylinder head	M6	10.5 Nm (7.74 lbf ft)
------------------------------	----	--------------------------



- Pour coolant in up to level **A** above the radiator fins.

Guideline

10 mm (0.39 in)		
Coolant (📖 p. 314)		



- 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.

Finishing work

- Check the coolant level. (📖 p. 239)



20.6 Changing the coolant



Warning

Danger of scalding During motorcycle operation, the coolant gets 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.

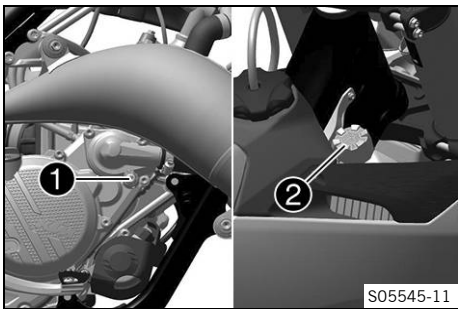


Warning

Danger of poisoning Coolant is harmful to health.

- Keep coolant out of the reach of children.
- Do not allow coolant to come into contact with the skin, the eyes and clothing.
- Consult a doctor immediately if coolant is swallowed.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly with water and consult a doctor immediately if coolant gets into the eyes.
- Change clothing if coolant spills onto your clothing.

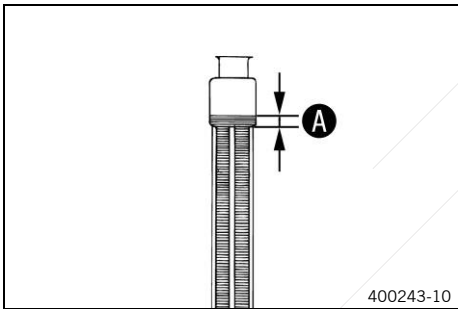
Condition
The engine is cold.



- Remove screw 1. Take off radiator cap 2.
- Place an appropriate container under the water pump cover.
- Completely drain the coolant.
- Mount and tighten screw 1 with a new seal ring.

Guideline

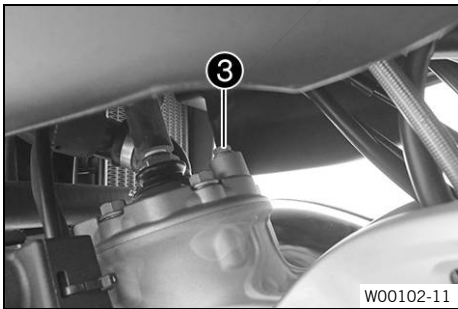
Bleeder screw, water pump cover	M6x25	8 Nm (5.9 lbf ft)
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- Position the motorcycle upright.
- Pour coolant in up to level A above the radiator fins.

Guideline

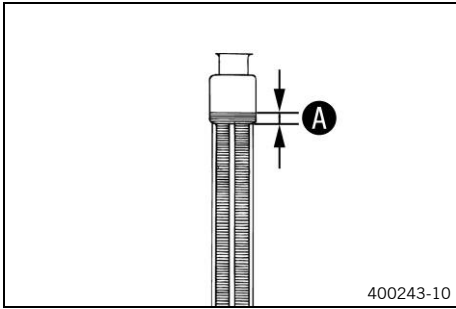
10 mm (0.39 in)
Coolant (📖 p. 314)



- Remove screw 3 and wait until coolant emerges without bubbles.
- Mount and tighten screw 3.

Guideline

Bleeder screw, cylinder head	M6	10.5 Nm (7.74 lbf ft)
------------------------------	----	-----------------------

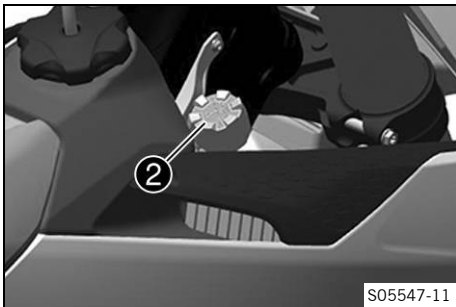


- Pour coolant in up to level **A** above the radiator fins.

Guideline

10 mm (0.39 in)

Coolant (📖 p. 314)



- Mount radiator cap **2**.



Danger

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

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

- Allow the engine to warm up and cool down again.
- Check the cooling system for leaks.
- Check the coolant level. (📖 p. 239)

20.7 Changing the coolant pipe

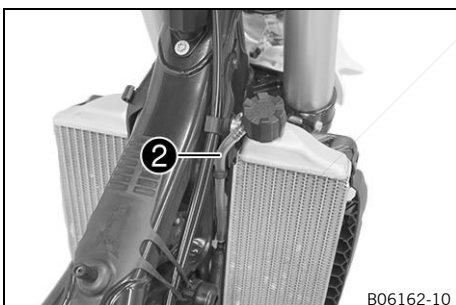
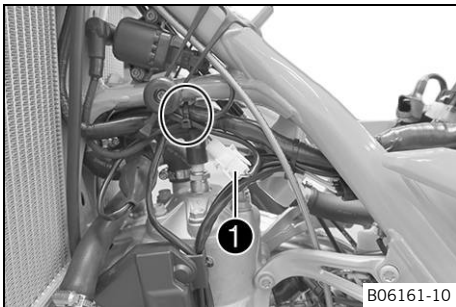
Preparatory work

- Drain the coolant. (📖 p. 239)
- Remove the seat. (📖 p. 95)
- Remove the fuel tank. (📖 p. 96)

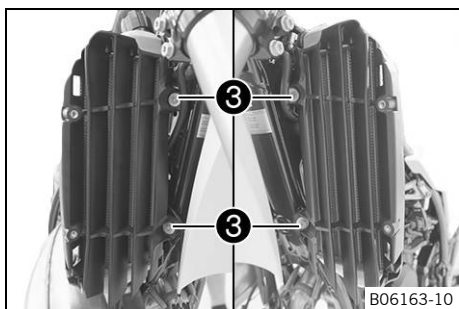
Main work

(All special models)

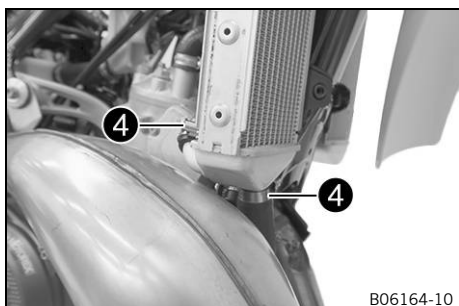
- Remove the cable ties.
- Unplug connector **1**.



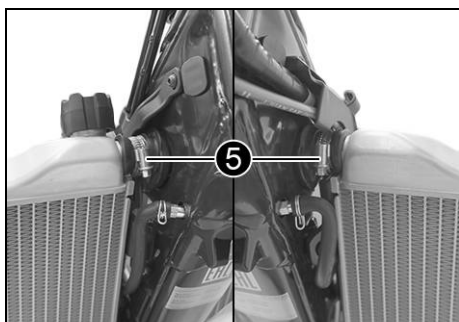
- Slip overflow hose **2** out of the hose guide.



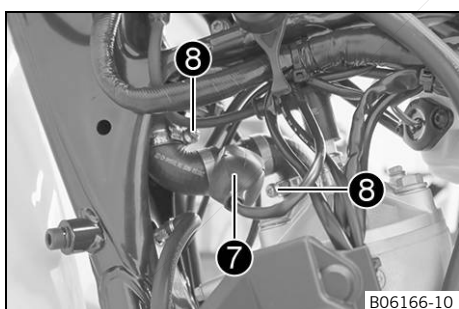
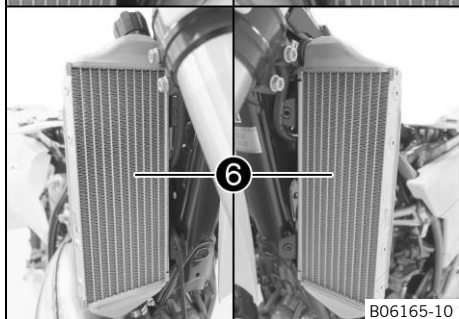
- Remove screws ③.
- Remove radiator shield on both sides.



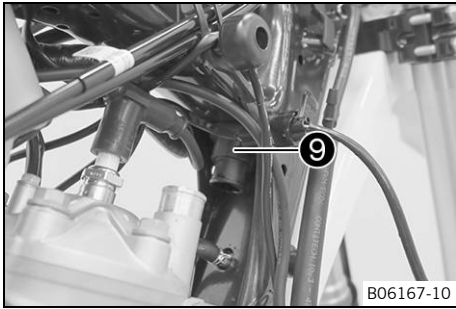
- Release hose clips ④.
- Pull off the radiator hoses.



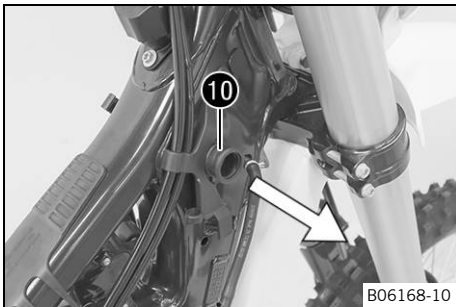
- Remove hose clips ⑤.
- Detach radiator ⑥ and remove to the side.



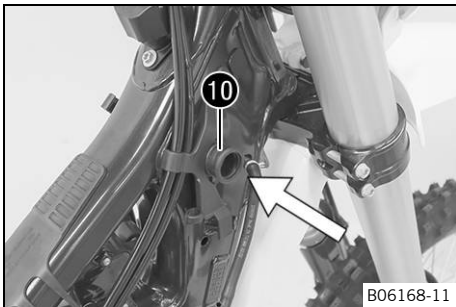
- Push back protection cap ⑦ and remove the connector.
- Release hose clips ⑧.
- Pull off the radiator hose.



- Remove coolant pipe 9.



- Pull off connecting piece 10 to the side and remove.



- Mount new connecting piece 10 in the frame.



- Mount and new coolant pipe 9 with new O-ring 11 and tighten.

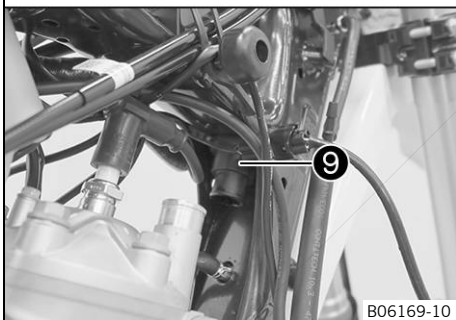
Guideline

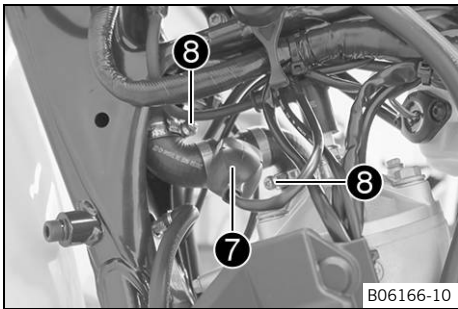
Screw-in fitting, cooling system	M24x1.5	7.5 Nm (5.53 lbf ft) Loctite®243™
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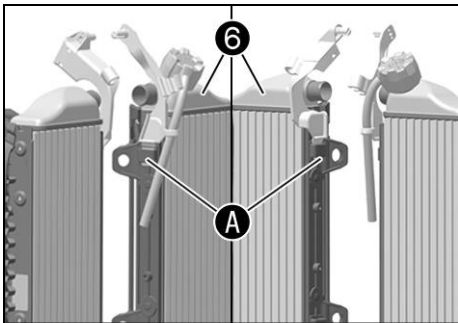
Info

Ensure that the O-ring is seated properly.

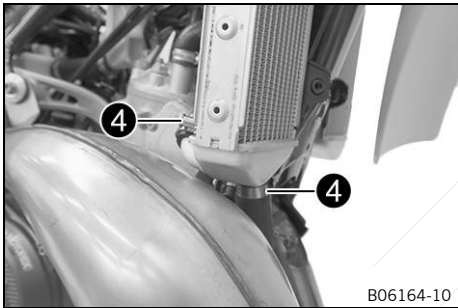
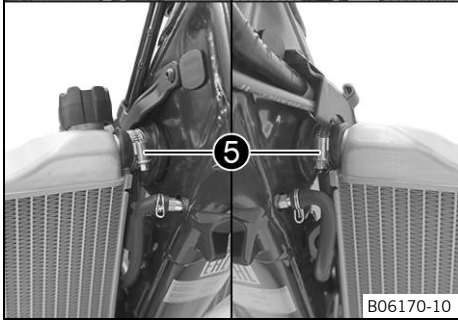




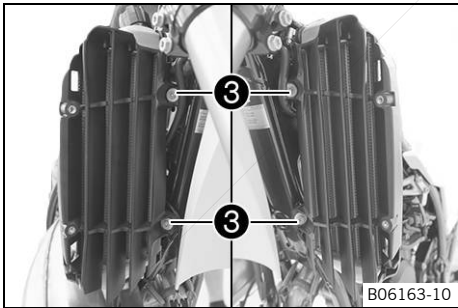
- Mount the radiator hose.
- Position and tighten hose clips 8.
- Plug in connector 7 and mount the protection cap.



- Detach the radiator 6 and position.
- Ensure that the cable guides in area A are correctly hooked into the radiator.
- Position and tighten hose clips 5.



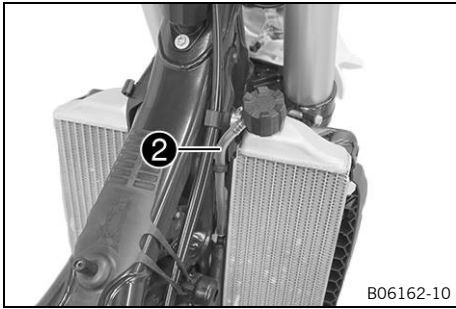
- Mount the radiator hoses.
- Position and tighten hose clips 4.



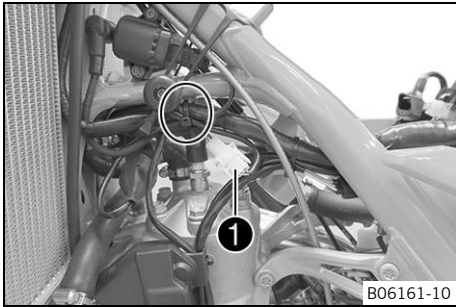
- Position the radiator shield on both sides.
- Mount and tighten screws 3.

Guideline

Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
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- Slip overflow hose **2** into the hose guide.



(All special models)

- Plug in connector **1**.
- Mount the cable ties.

Finishing work

- Install the fuel tank. (📖 p. 97)
- Mount the seat. (📖 p. 95)
- Refill with coolant. (📖 p. 240)
- Check the coolant level. (📖 p. 239)

21.1 Programming ambient air pressure



Danger

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

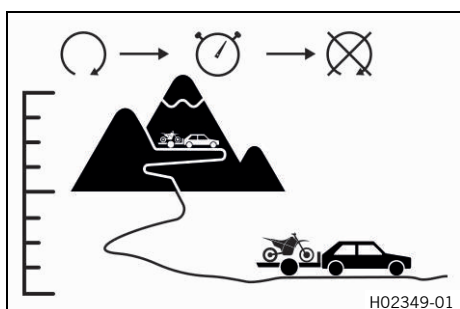
- Always make sure there is sufficient ventilation when running the engine.
- Use effective exhaust extraction when starting or running the engine in an enclosed space.



Info

If the vehicle is ridden with the engine running at various heights above sea level, the ambient pressure is programmed on an ongoing basis.

If the vehicle is transported over great differences in height, the ambient pressure must be reprogrammed.



- Start the vehicle at the new height above sea level and switch off the engine again.
- Wait for at least five seconds.
- Start the vehicle again and check the response of the vehicle.
 - » If the response has not improved:
 - Repeat the procedure.

21.2 Changing the throttle valve body



Note

Environmental hazard Hazardous substances cause environmental damage.

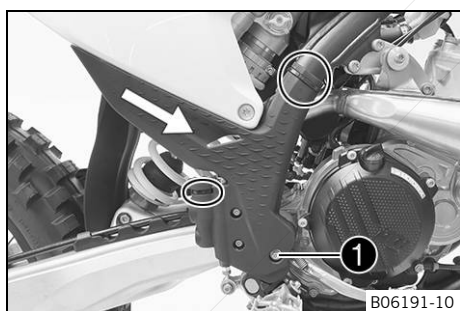
- Dispose of oils, grease, filters, fuel, cleaning agents, brake fluid, etc., correctly and in compliance with the applicable regulations.

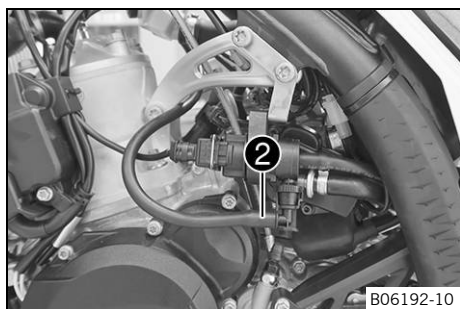
Preparatory work

- Remove the seat. (📖 p. 95)
- Remove the fuel tank. (📖 p. 96)
- Remove the air filter box cover. (📖 p. 91)
- Remove main silencer. (📖 p. 86)

Main work

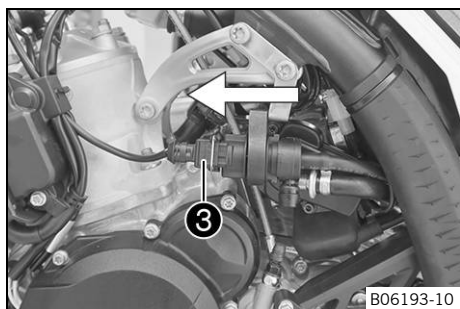
- Remove the cable ties.
- Remove screw ❶.
- Push the frame protector to the front and take off at the bottom.



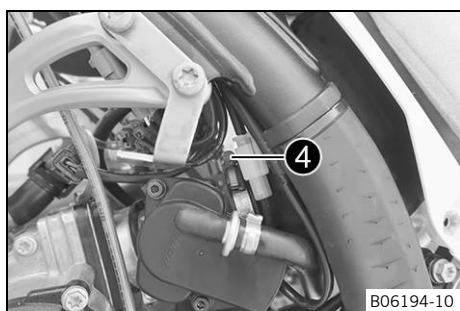


(All EU/ASEAN models)

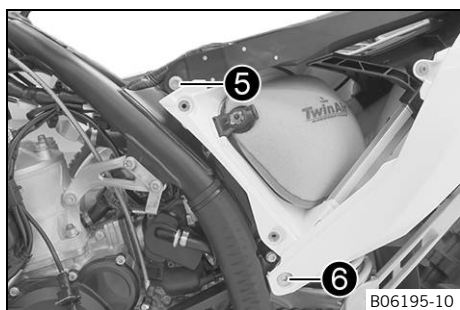
- Unplug hose piece ②.



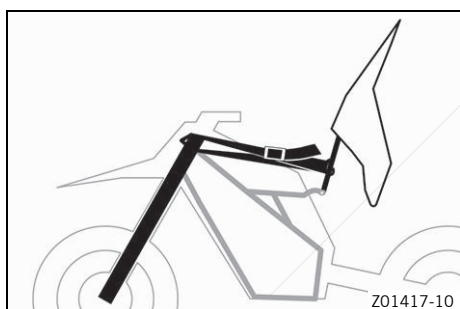
- Unplug connector ③.
- Pull fuel vapor valve off the holder and hang it to the side.



- Loosen hose clip ④.

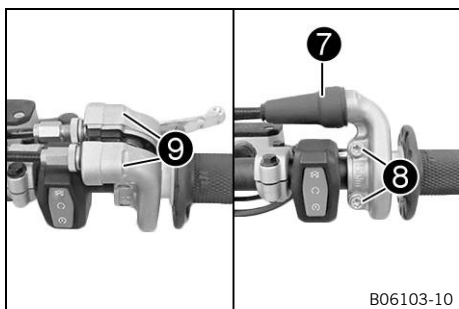


- Loosen screw ⑤.
- Remove screw ⑥.
- Repeat these steps on the opposite side.

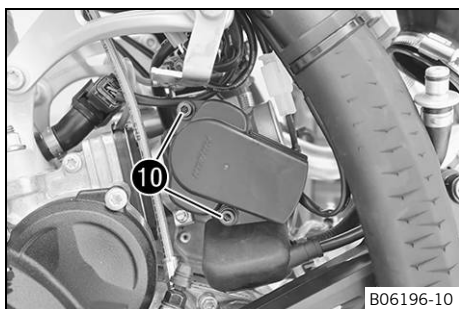


- Pivot the subframe up and secure it.

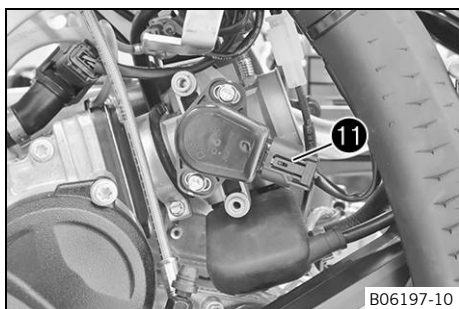
21 THROTTLE VALVE BODY



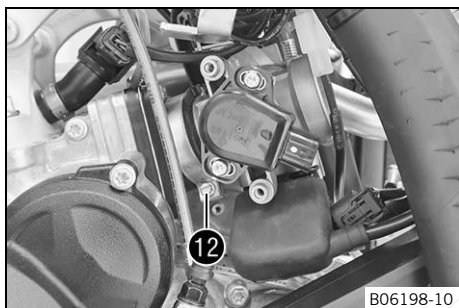
- Push back sleeve 7.
- Remove screws 8 and half-shells 9.
- Detach the throttle cables and take off the grip tube.



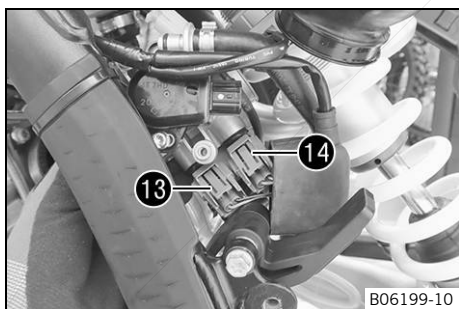
- Remove screws 10.
- Take off the cover.



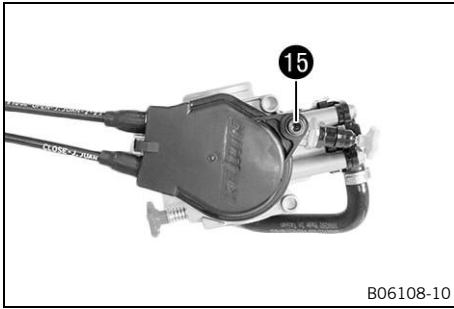
- Unplug connector 11.



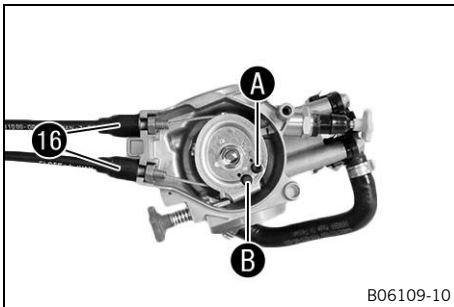
- Loosen hose clip 12.
- Pull off the throttle valve body.



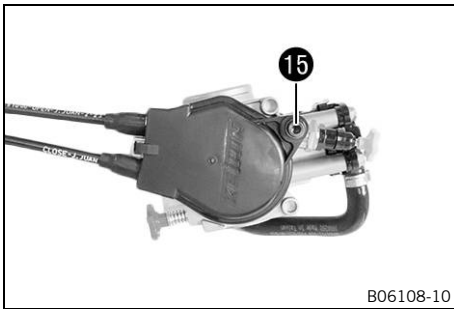
- Push back the cover.
- Unplug connectors 13 and 14.
- Slip out the throttle valve body with the throttle cable to the side.



- Remove screw 15.
- Remove the cover.



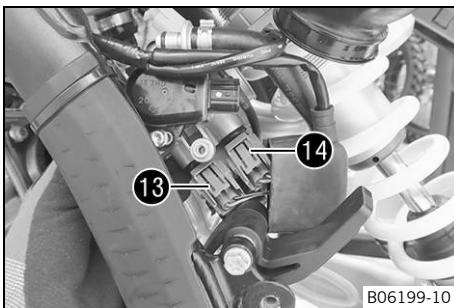
- Push back sleeves 16.
- Loosen nuts.
- Detach and remove throttle cables A and B.
- Attach throttle cables A and B to the new throttle valve body and route them correctly.
 - ✓ Throttle cable A of the opening cable is hooked in on the left.
 - ✓ Throttle cable B of the closing cable is hooked in on the right.



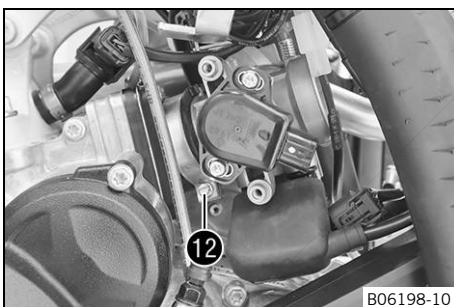
- Mount the cover.
- Mount and tighten screw 15.

Guideline

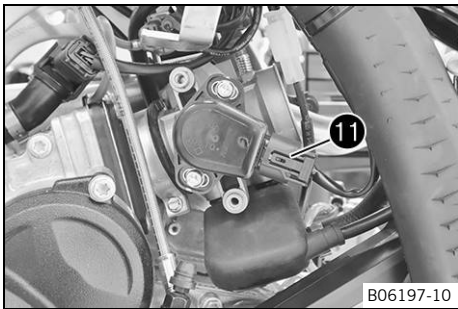
Screw, throttle valve body cover	M5	2.6 Nm (1.92 lbf ft)
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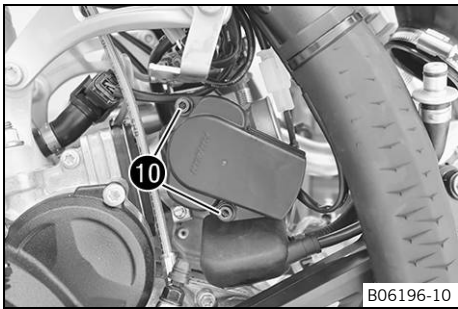
- Plug in connectors 14 and 13.
- Slide on the cover.



- Position the throttle valve body in the intake flange.
- Position and tighten hose clip 12.



- Plug in connector 11.



- Position the cover.
- Mount and tighten screws 10.

Guideline

Screw, throttle valve body cover	M5	2.6 Nm (1.92 lbf ft)
----------------------------------	----	-------------------------



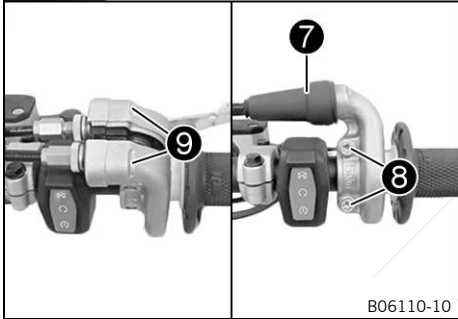
- Clean the outside of the handlebar and the inside of the grip tube. Mount the grip tube on the handlebar.
- Attach the throttle cables to the guide plate and route correctly.

- Position half-shells 9, mount and tighten screws 8.

Guideline

Screw, throttle grip	M6	5 Nm (3.7 lbf ft)
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- Slide on sleeve 7 and check the throttle grip for ease of movement.



- Remove the locking piece and position the subframe.



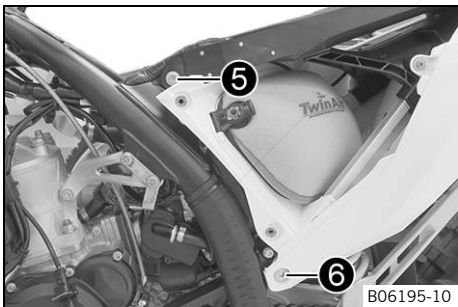
Info
Watch out for the intake flange.

- Position the inlet sleeve on the throttle valve body.
- Mount and tighten screw 6.

Guideline

Screw, sub-frame bottom	M8	30 Nm (22.1 lbf ft) Loctite®2701™
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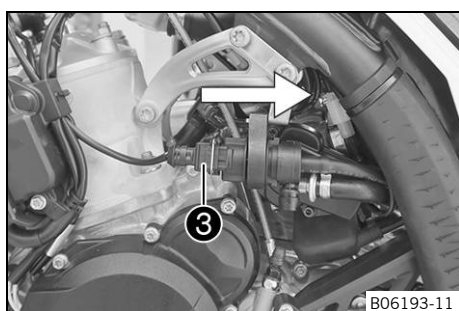
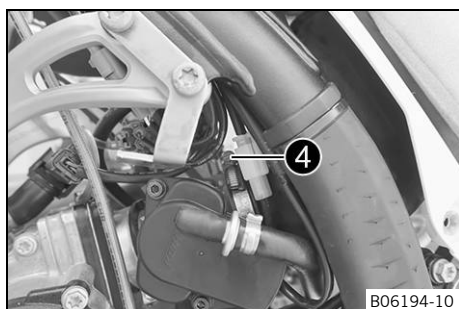
- Remove screw 5.
- Mount and tighten screw 5.



Guideline

Screw, sub-frame, top	M8	35 Nm (25.8 lbf ft) Loctite®243™
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- Repeat these steps on the opposite side.
- Position and tighten hose clip ④.



(All EU/ASEAN models)

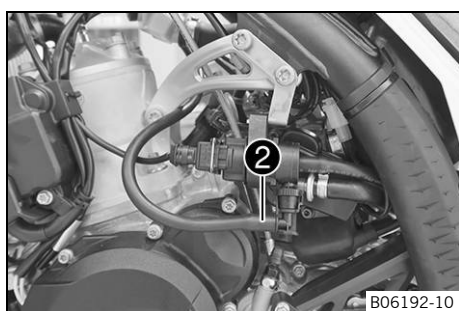
- Mount fuel vapor valve on the holder.



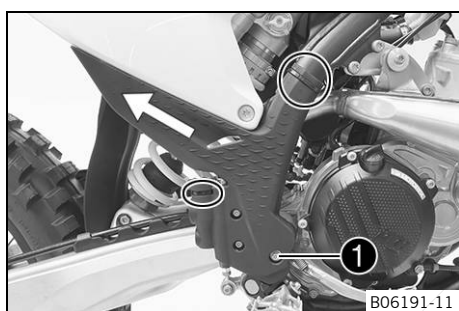
Info

Make sure the cables and wiring are routed correctly.

- Plug in connector ③.



- Plug in hose piece ②.



- Insert the frame protector from below and push it to the rear.
- Mount and tighten screw ① with washer.

Guideline

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

- Mount the cable ties.

Finishing work

- Check the throttle cable routing. (📖 p. 49)
- Install the fuel tank. (📖 p. 97)
- Mount the seat. (📖 p. 95)
- Check the play in the throttle cable. (📖 p. 50)
- Install the air filter box cover. (📖 p. 91)
- Install the main silencer. (📖 p. 86)

- Check the basic throttle valve position sensor setting. (📖 p. 254)

21.3 Checking the basic throttle valve position sensor setting

Condition

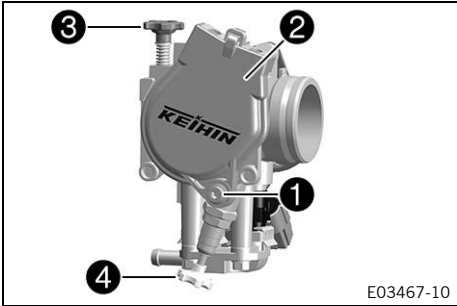
The diagnostics tool is connected and running.

Preparatory work

- Remove the seat. (📖 p. 95)
- Remove the fuel tank. (📖 p. 96)

Main work

- Remove screw ❶ and take off cover ❷.
- Turn idle speed adjusting screw ❸ counterclockwise all the way out.
- Pull cold start button ❹ and turn it counterclockwise all the way out.
 - ✓ Neither the idle speed adjusting screw nor the cold start button touch the cable disk.
- Open the throttle grip 2 times all the way and release.
- Select "Engine control unit" > "Measured values" > **Angepasste vollständig geschlossene Drosselklappenstellung, Drosselklappensensor Spannung** and "Throttle valve position".



Throttle valve position sensor circuit A	
"Adapted fully closed throttle valve position"	0.32 ... 0.42 V

Throttle valve position sensor circuit A	
Throttle valve position	0°

- » If the displayed value of **Drosselklappensensor Spannung** does not match the value of **Angepasste vollständig geschlossene Drosselklappenstellung**:
 - Perform the basic setting of the throttle valve with the KTM diagnostics tool. (📖 p. 256)
- Adjust the idle speed. (📖 p. 256)
- Set the cold start rev speed increase. (📖 p. 257)
- Mount cover ❷, mount and tighten screw ❶.

Guideline

Screw, throttle valve body cover	M5	2.6 Nm (1.92 lbf ft)
----------------------------------	----	-------------------------

21.4 Adjusting the basic throttle position sensor setting

Condition

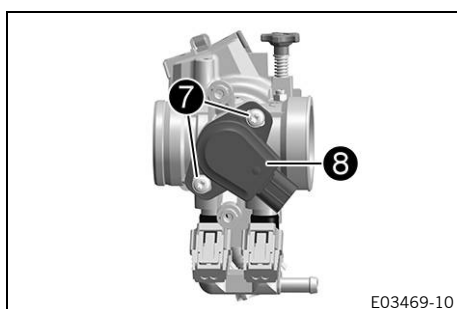
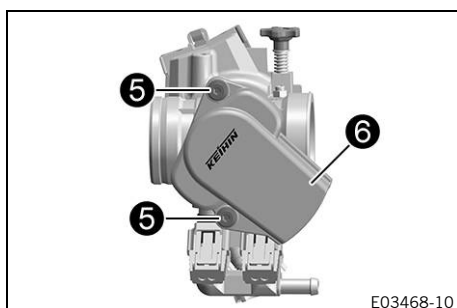
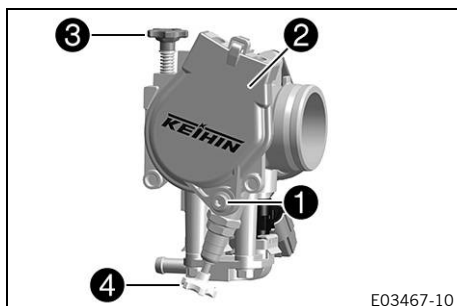
The diagnostics tool is connected and running.

Preparatory work

- Remove the seat. (📖 p. 95)
- Remove the fuel tank. (📖 p. 96)

Main work

- Remove screw ❶ and take off cover ❷.
- Turn idle speed adjusting screw ❸ counterclockwise all the way out.
- Pull cold start button ❹ and turn it counterclockwise all the way out.
- ✓ Neither the idle speed adjusting screw nor the cold start button touch the cable disk.



- Select **"Engine control unit" > "Measured value"**
> **"Adapted fully closed throttle valve position"**,
"Throttle position sensor voltage" and **"Throttle valve position"**.
- Remove screws ❺ and cover ❻.

- Loosen screws ❼.
- Set the **"throttle position sensor voltage"** by carefully turning throttle valve position sensor ❸ to the setpoint value. Tighten screws ❼.

Guideline

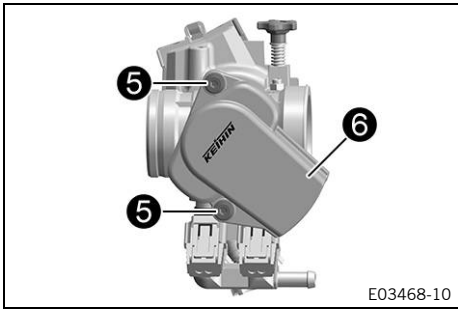
Screw, throttle valve position sensor	M5	3.5 Nm (2.58 lbf ft)
Throttle valve position sensor circuit A		
"Throttle position sensor voltage"	0.40 V	

- » If the displayed value is equal to the setpoint value:
 - Unplug the VCI and wait until you hear a click from the power relay.
 - Plug in the VCI, open the throttle grip 3 times all the way and release.
 - ✓ The set value is saved under **"Adjusted fully closed throttle valve position"**.

Info

The teaching procedure only works for up to 25 seconds after the VCI has been plugged in. The newly saved value is only displayed after the measured value block has been restarted.

- Check measured values of "throttle position sensor voltage" and "adjusted fully closed throttle valve position" again and adjust if necessary.

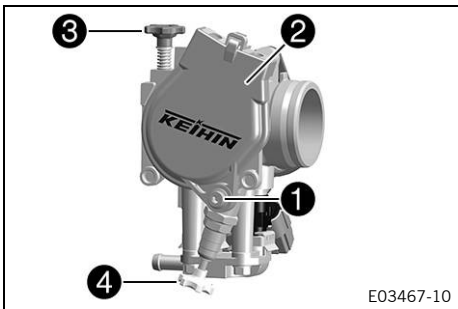


- Position cover ⑥.
- Mount and tighten screws ⑤.

Guideline

Screw, throttle valve position sensor cover	M4	2.1 Nm (1.55 lbf ft)
---	----	-------------------------

- Adjust the idle speed. (📖 p. 256)
- Set the cold start rev speed increase. (📖 p. 257)



- Mount cover ②, mount and tighten screw ①.

Guideline

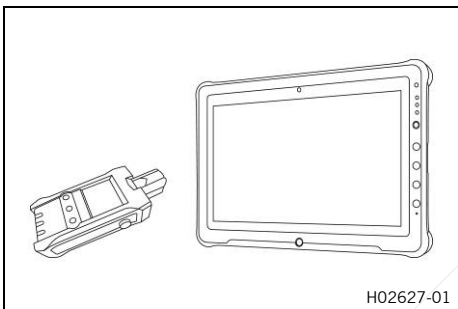
Screw, throttle valve body cover	M5	2.6 Nm (1.92 lbf ft)
----------------------------------	----	-------------------------

21.5 Performing the basic setting of the throttle valve with the KTM diagnostics tool

Condition

The diagnostics tool is connected and running.

- Perform "Engine control unit" > "Control unit functions" > **Basic adjustment throttle body.**



Info

The instructions must be followed precisely.

- » If the specified value is reached:
 - Clear the fault memory using the KTM diagnostics tool.
 - Take a test ride.
 - Read out the fault memory using the KTM diagnostics tool.

21.6 Adjusting the idle speed



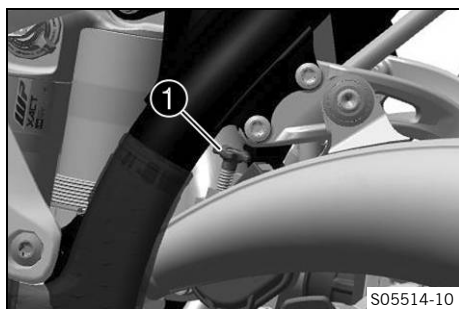
Warning

Danger of accidents The engine may go out spontaneously if the idle speed is set too low.

- Set the idle speed to the specified value.

Condition

The diagnostics tool is connected and running.



- Select **"Engine control unit" > "Measured values" > "Throttle valve position"**.
- Adjust the opening angle of the throttle valve by turning idle speed adjusting screw **1**.



Info

Turning counterclockwise decreases the opening angle of the throttle valve.

Turning clockwise increases the opening angle of the throttle valve.

Make the setting in small steps.

(All 250 models)

Throttle valve position sensor circuit A	
Opening angle throttle valve position idle	2.5 ... 3.5°

(All 300 models)

Throttle valve position sensor circuit A	
Opening angle throttle valve position idle	3.0 ... 4.0°

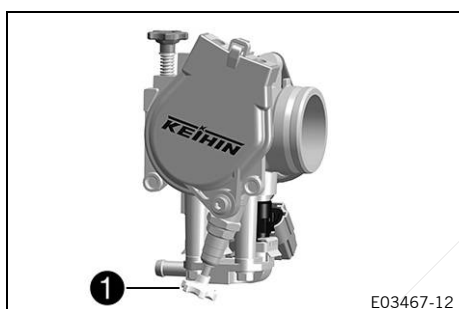
- » If the displayed value is equal to the setpoint value:
 - Open the throttle grip all the way and close it.
 - Check the measured value from **"throttle valve position"** again and adjust if necessary.



Info

Fine adjustments to the idle speed can be made in the speed range when the engine is at operating temperature.

21.7 Setting the cold start rev speed increase



Condition

The diagnostics tool is connected and running.

- Select **"Engine control unit" > "Measured values" > "Throttle valve position"**.
- Press cold start button **1**, turn it clockwise and set the rev speed increase until **"throttle valve position"** attains the specified value.



Info

Turning counterclockwise decreases the opening angle of the throttle valve.

Turning clockwise increases the opening angle of the throttle valve.

Throttle valve position sensor circuit A	
Cold start opening angle throttle valve position	4 ... 8°

- » If the displayed value is equal to the setpoint value:
 - Open the throttle grip all the way and close it.

- Check the measured value from **"throttle valve position"** again and adjust if necessary.
- Pull out the cold start button.

21.8 Cold start button



The cold start button ① is fitted to the bottom of the throttle valve body.

The electronic fuel injection system extends the injection time if the engine is cold and the ambient temperature is low. To help the engine burn the increased fuel quantity, it must be supplied with additional oxygen by pushing the cold start button.



Info

Check whether the cold start button has returned to its basic position.

Possible states

- The cold start button is activated – The cold start button is pushed in all the way.
- The cold start button is deactivated – The cold start button is in its basic position.

22.1 Programming the end positions of the exhaust control

Info

If work has been carried out on the exhaust control, the end positions must be reprogrammed.

Condition

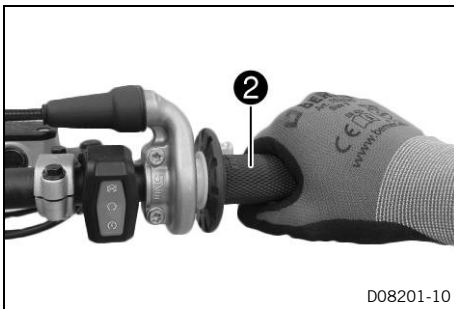
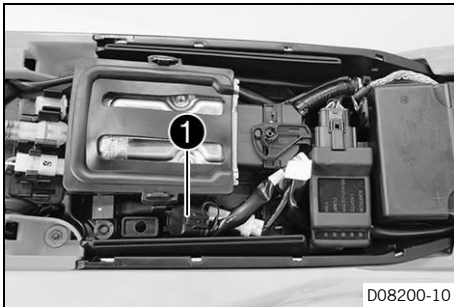
The engine is off.

Preparatory work

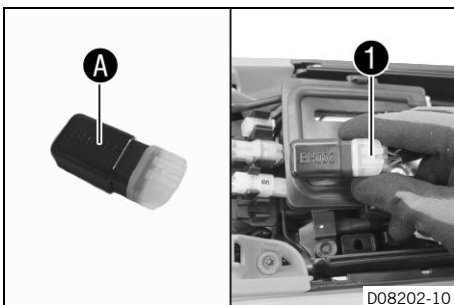
- Remove the seat. ( p. 95)

Main work

- Pull diagnostics connector **1** off the holder.



- Move throttle grip **2** to where it is half open and hold in position.

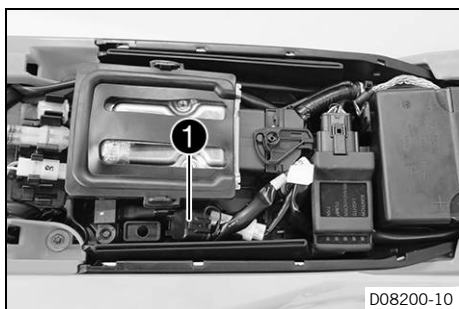


- Plug wake-up connector **A** into diagnostics connector **1**.

Info

Wake-up connector **A** is in the motorcycle's separate enclosure.

- Wait for at least five seconds.
 - ✓ The end positions of the exhaust control are read. The procedure is clearly audible.
 - ✓ The combination instrument lighting is activated, the combination switch lights up green.
- Release the fixing from the throttle grip.
 - ✓ The end positions of the exhaust control are programmed.
- Wait until you can no longer hear the exhaust control engine operating.
- Disconnect wake-up connector **A** from diagnostics connector **1**.



- Mount diagnostics connector ① on the holder.

Finishing work

- Mount the seat. (📖 p. 95)

22.2 Programming the end positions of the exhaust control with a diagnostics tool

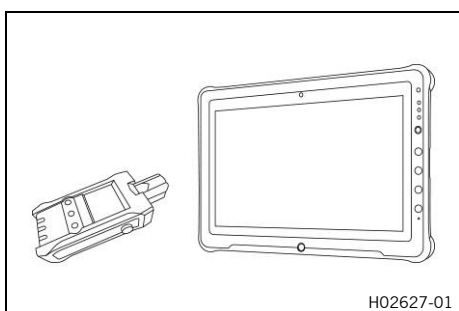
i Info

If work has been carried out on the exhaust control, the end positions must be reprogrammed.

Condition

Ensure that the battery voltage does not drop below 12.5 V.
The diagnostics tool is connected and running.

- Execute **"Engine control unit" > "Control unit functions" > "Teach in exhaust control actuator"**.



i Info

The instructions must be followed precisely.

- » If the specified value is reached:
 - Clear the fault memory using the KTM diagnostics tool.
 - Take a test ride.
 - Read out the fault memory using the KTM diagnostics tool.

23.1 Changing the gear oil



Warning

Danger of scalding Engine and gear oil get hot when the motorcycle is operated.

- Wear suitable protective clothing and safety gloves.
- In the event of scalding, rinse the area affected immediately with lukewarm water.



Note

Environmental hazard Hazardous substances cause environmental damage.

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



Info

Drain the gear oil while the engine is at operating temperature.

Preparatory work

(All XC-W and special models)

- Remove the engine guard. (📖 p. 55)
- Park the motorcycle on a level surface.
- Position an appropriate container under the engine.

Main work

- Remove gear oil drain plug ❶ with magnet.
- Let the gear oil drain fully.
- Thoroughly clean the gear oil drain plug with magnet.
- Clean the sealing surface on the engine.
- Mount and tighten gear oil drain plug ❶ with the magnet and a new seal ring.

Guideline

Gear oil drain plug with magnet	M12x1.5	20 Nm (14.8 lbf ft)
---------------------------------	---------	---------------------

- Remove filler plug ❷ with the O-ring, and fill up with gear oil.

Gear oil	0.80 l (0.85 qt.)	Engine oil (15W/50) (📖 p. 314)
----------	----------------------	--------------------------------------

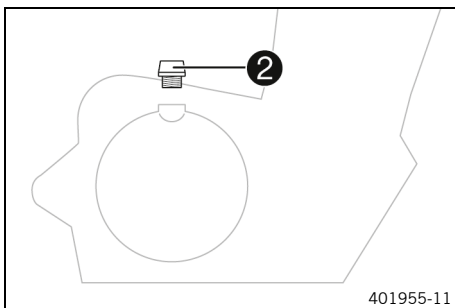
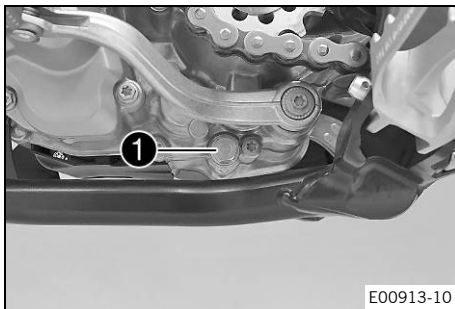
- Mount and tighten the filler plug together with the O-ring.



Danger

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

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



- Start the engine and check it for leaks.

Finishing work

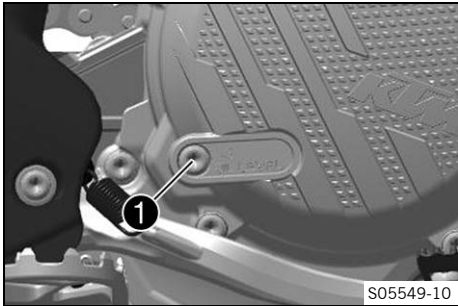
- Check the gear oil level. (📖 p. 262)

(All XC-W and special models)

- Install the engine guard. (📖 p. 55)

23.2 Checking the gear oil level

i Info
The gear oil level must be checked when the engine is cold.



- Preparatory work**
- Stand the motorcycle upright on a horizontal surface.

- Main work**
- Remove gear oil level monitoring screw ①.
 - Check the gear oil level.

A small quantity of gear oil must run out of the drilled hole.

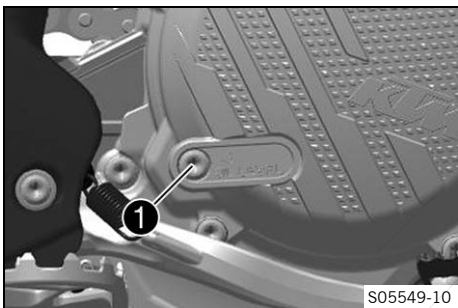
- » If no gear oil runs out:
 - Add the gear oil. (📖 p. 262)
- Mount and tighten the gear oil level monitoring screw.

Guideline

Screw, gear oil level monitoring	M6	8 Nm (5.9 lbf ft)
----------------------------------	----	-------------------

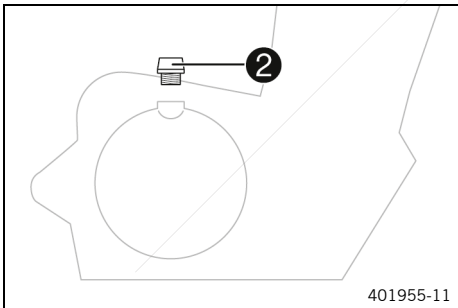
23.3 Adding the gear oil

i Info
Too little gear oil or poor-quality gear oil results in premature wear to the transmission. Gear oil must only be topped up when the engine is cold.



- Preparatory work**
- Park the motorcycle on a level surface.

- Main work**
- Detach the foot brake lever spring.
 - Remove gear oil level monitoring screw ①.



- Remove filler plug ② with the O-ring.
- Add gear oil until it emerges from the drill hole of the gear oil level monitoring screw.

Engine oil (15W/50) (📖 p. 314)

- Mount and tighten the gear oil level monitoring screw.

Guideline

Screw, gear oil level monitoring	M6	8 Nm (5.9 lbf ft)
----------------------------------	----	-------------------

- Mount and tighten filler plug ② with the O-ring.
- Attach the foot brake lever spring.



Danger

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

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

- Start the engine and check it for leaks.

Finishing work

- Check the gear oil level. (📖 p. 262)



23.4 Checking 2-stroke oil level



Warning

Engine failure The engine will not be lubricated unless there is 2-stroke oil in the oil tank.

If the oil level warning light lights up, the 2-stroke oil is sufficient for the remaining tank of fuel.

- As soon as the oil level warning light lights up, ride for no longer than until the remaining fuel in the tank is depleted.
- At the next opportunity add 2-stroke oil before you refuel.
- Time the oil pump if the 2-stroke oil hose has been removed or the 2-stroke oil tank has been fully depleted in error.

Preparatory work

- Stand the motorcycle upright on a horizontal surface.

Main work

- Check the 2-stroke oil level in the oil tank.

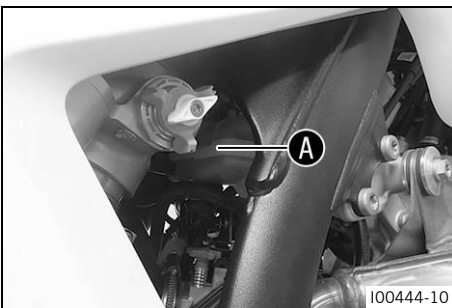


Info

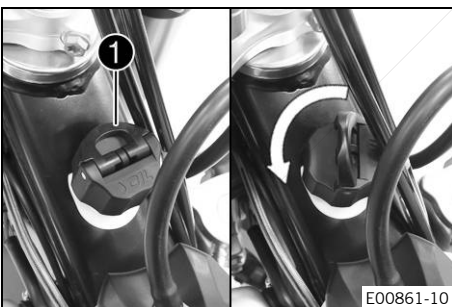
For a full tank of fuel, the 2-stroke oil tank must be filled up to at least the upper abutting edge **A**.

The 2-stroke oil tank must be completely filled if possible.

- » If the 2-stroke oil level is too low:
 - Add 2-stroke oil. (📖 p. 264)



23.5 Opening 2-stroke oil tank cap



- Fold loop **1** upward.
- Turn the 2-stroke oil tank cap counterclockwise and pull it up.



23.6 Adding 2-stroke oil

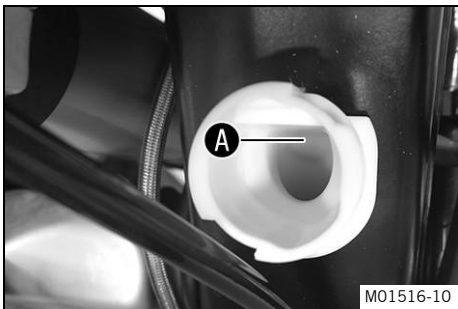


Warning

Engine failure The engine will not be lubricated unless there is 2-stroke oil in the oil tank.

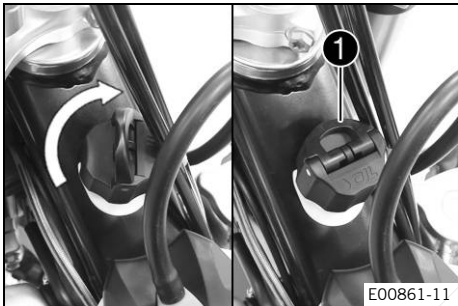
If the oil level warning light lights up, the 2-stroke oil is sufficient for the remaining tank of fuel.

- As soon as the oil level warning light lights up, ride for no longer than until the remaining fuel in the tank is depleted.
- At the next opportunity add 2-stroke oil before you refuel.
- Time the oil pump if the 2-stroke oil hose has been removed or the 2-stroke oil tank has been fully depleted in error.



- Open 2-stroke oil tank cap. (📖 p. 263)
 - Fill the 2-stroke oil tank up to the lower edge **A** of the filler neck.
- Guideline
- Only use 2-stroke oil which is appropriate for separate lubrication.
- | | | |
|-----------------------------------|-----------------|---------------------------------|
| 2-stroke oil tank content approx. | 0.8 l (0.8 qt.) | Engine oil, 2-stroke (📖 p. 314) |
|-----------------------------------|-----------------|---------------------------------|
- Close 2-stroke oil tank cap. (📖 p. 264)

23.7 Closing 2-stroke oil tank cap



- Put the 2-stroke oil tank cap on and turn it clockwise.
 - Fold loop **1** down.
- ✓ The 2-stroke oil tank cap engages.

23.8 Priming oil pump



Warning

Engine failure The engine will not be lubricated unless there is 2-stroke oil in the oil tank.

If the oil level warning light lights up, the 2-stroke oil is sufficient for the remaining tank of fuel.

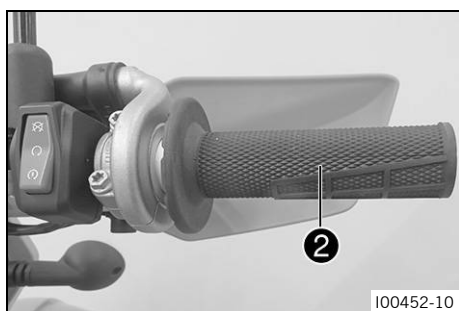
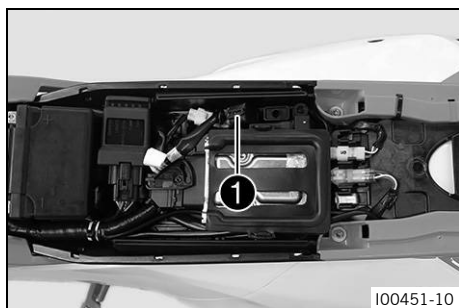
- As soon as the oil level warning light lights up, ride for no longer than until the remaining fuel in the tank is depleted.
- At the next opportunity add 2-stroke oil before you refuel.
- Time the oil pump if the 2-stroke oil hose has been removed or the 2-stroke oil tank has been fully depleted in error.

- Condition**
- The engine is off.
- Preparatory work**
- Remove the seat. (📖 p. 95)
 - Stand the motorcycle upright on a horizontal surface.

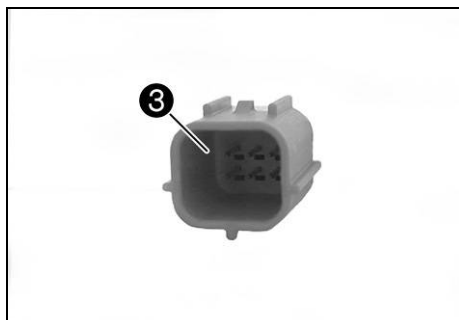
- Check 2-stroke oil level. (📖 p. 263)

Main work

- Pull diagnostics connector ① off the holder.



- Put throttle grip ② into full throttle position and secure.



- Plug in wake-up connector ③ for priming the oil pump to the diagnostics connector ④.

✓ The combination instrument lighting is activated.



Info

The connector is included as part of the motorcycle's separate enclosure.

- Wait for at least five seconds.
- Release the fixing from the throttle grip.

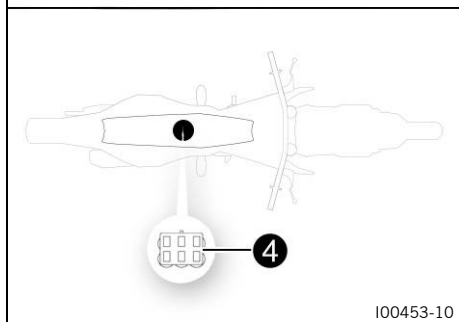
✓ The oil pump is timed.



Info

The oil pump is actuated at various speeds. The procedure is clearly audible.

- Wait until you can no longer hear the oil pump operating.
- Disconnect the wake-up connector from the diagnostics connector.



- Check whether air bubbles are visible in the hose ⑤.
 - » If air bubbles are visible:
 - Repeat the entire procedure until air bubbles are no longer visible.
- Mount the diagnostics connector on the holder.

Finishing work

- Mount the seat. (📖 p. 95)



23.9 Cleaning the oil screen in the oil tank



Note

Environmental hazard Hazardous substances cause environmental damage.

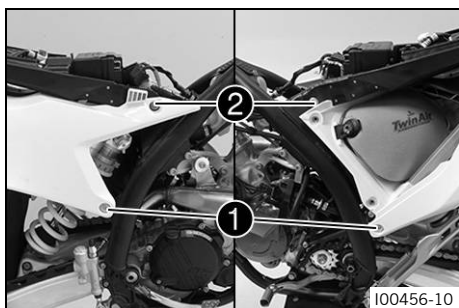
- Dispose of oils, grease, filters, fuel, cleaning agents, brake fluid, etc., correctly and in compliance with the applicable regulations.

Preparatory work

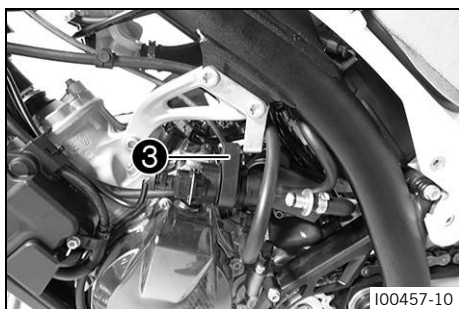
- Raise the motorcycle with a lift stand. (📖 p. 13)
- Remove main silencer. (📖 p. 86)
- Remove the seat. (📖 p. 95)
- Remove the fuel tank. (📖 p. 96)
- Remove the air filter box cover. (📖 p. 91)

Main work

- Remove screws ①.
- Loosen screws ②.



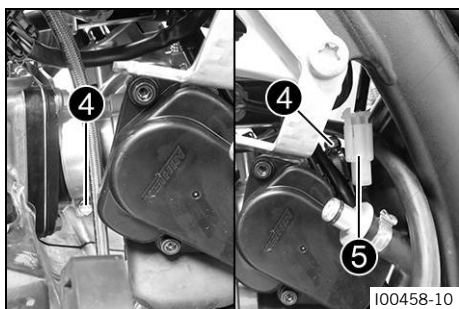
- Remove fuel vapor valve ③ from the bracket and hang it to the side.



- Loosen clamps ④ of the throttle valve body.

(All EXC models)

- Disconnect plug-in connector ⑤ of the rear brake light switch.



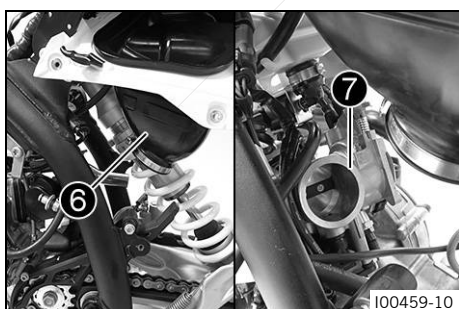
- Lift the subframe slightly and secure it.

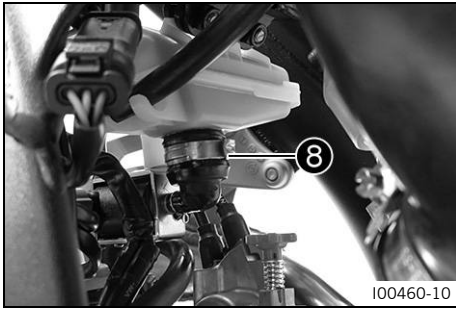


Info

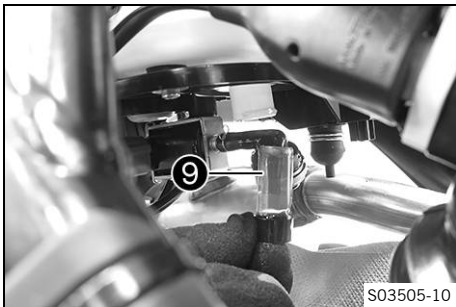
Pay attention to intake flange ⑥.

- Pull throttle valve body ⑦ towards the rear, out of the intake flange, and hang it to the side.

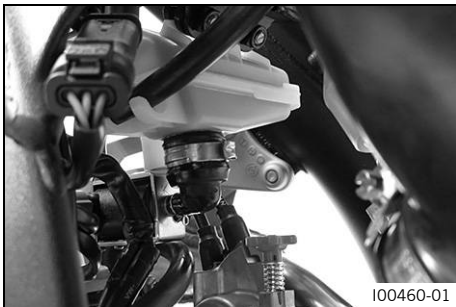




- Open hose clamp ⑧ using a screwdriver.
- Pull off the angle piece and collect the 2-stroke oil in a suitable container.

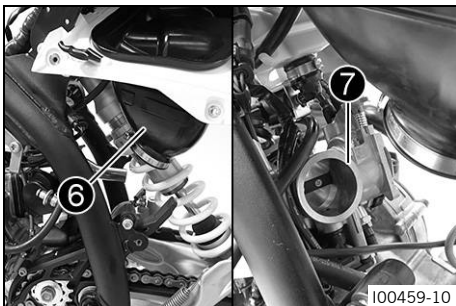


- Remove oil screen ⑨ and clean it.
- Check the oil screen for damage.
 - » If the oil screen is damaged:
 - Change the oil screen.



- Insert the oil screen and mount the angle piece with a new hose clamp.

Hose clamp pliers (60029057000) (📖 p. 323)



- Mount throttle valve body ⑦.
- Remove the locking piece and position the subframe.



Info

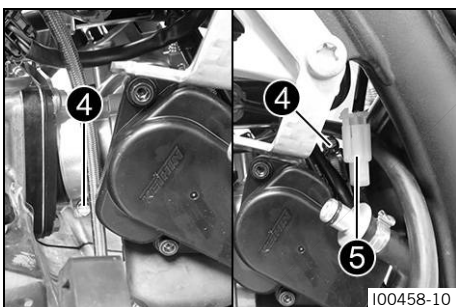
Pay attention to intake flange ⑥.

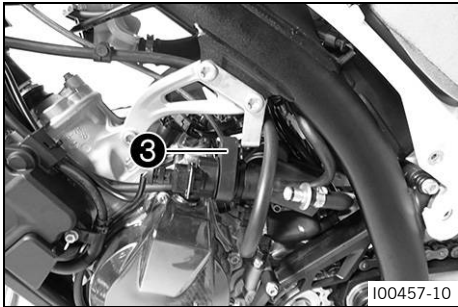
(All EXC models)

- Join plug-in connector ⑤ of the rear brake light switch.
- Position and tighten clamps ④ of the throttle valve body.

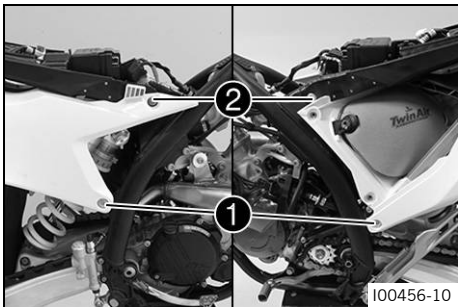
Guideline

Screw, intake flange/reed valve housing	M6	6 Nm (4.4 lbf ft)
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- Mount fuel vapor valve 3.



- Mount and tighten screws 1.

Guideline

Screw, sub-frame bottom	M8	30 Nm (22.1 lbf ft) Loctite®2701™
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- Remove screws 2.

- Mount and tighten screws 2.

Guideline

Screw, sub-frame, top	M8	35 Nm (25.8 lbf ft) Loctite®243™
-----------------------	----	--

Finishing work

- Install the air filter box cover. (📖 p. 91)
- Install the fuel tank. (📖 p. 97)
- Add 2-stroke oil. (📖 p. 264)
- Prime the oil pump. (📖 p. 264)
- Mount the seat. (📖 p. 95)
- Install the main silencer. (📖 p. 86)
- Remove the motorcycle from the lift stand. (📖 p. 13)

23.10 Changing the oil pump, cleaning the oil screen



Note

Environmental hazard Hazardous substances cause environmental damage.

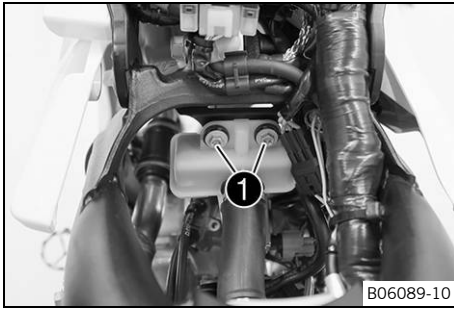
- Dispose of oils, grease, filters, fuel, cleaning agents, brake fluid, etc., correctly and in compliance with the applicable regulations.

Condition

Oil tank is empty.

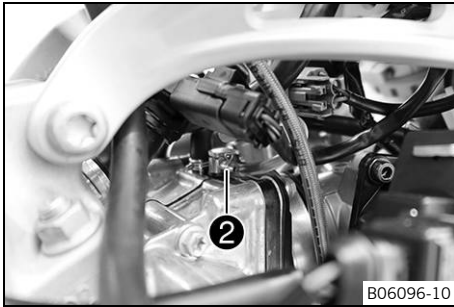
Preparatory work

- Remove the seat. (📖 p. 95)
- Remove the fuel tank. (📖 p. 96)



Main work

- Remove screws ①.

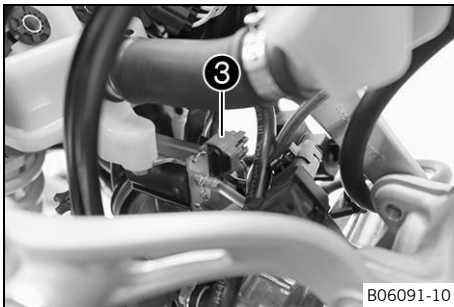


- Push back hose clamp ②.
- Pull the hose off the reed valve housing.

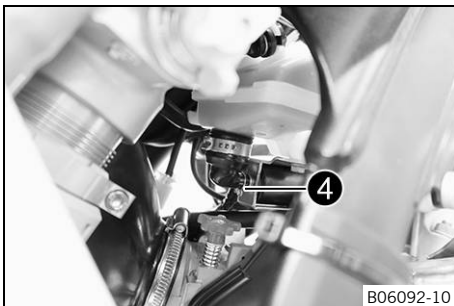


Info

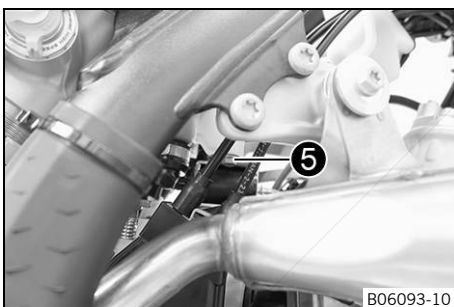
Residual oil may escape from the hose.



- Unplug connector ③.



- Push back hose clamp ④.



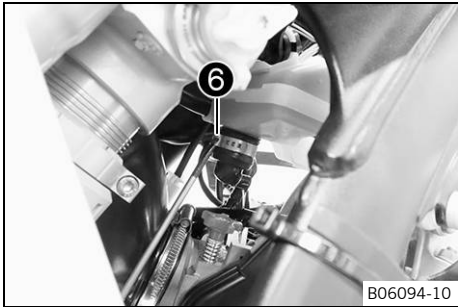
- Swivel the oil tank slightly to the side and hold it there.
- Remove screw ⑤.
- Pull off the hose from the oil tank.



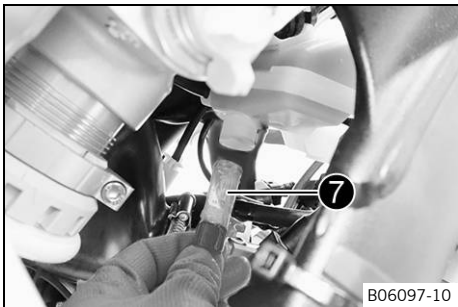
Info

Residual oil may escape from the oil tank.

- Remove the oil pump with the hose.



- Open hose clamp **6** using a screwdriver and pull off the angle piece.

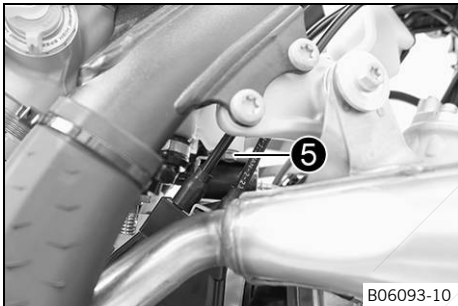


- Remove oil screen **7** and clean it.
- Check the oil screen for damage.
 - » If the oil screen is damaged:
 - Change the oil screen.



- Insert the oil screen and mount the angle piece with a new hose clamp.

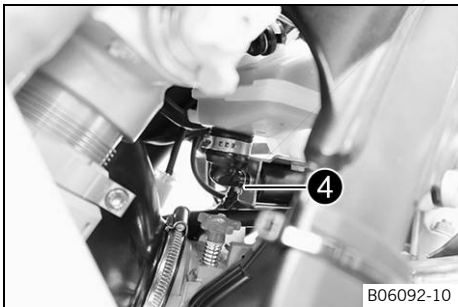
Hose clamp pliers (60029057000) (p. 323)



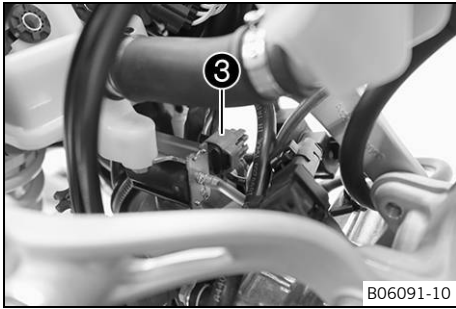
- Position the new oil pump with the hose.
- Mount the hose from the oil tank.
- Swivel the oil tank slightly to the side and hold it there.
- Mount and tighten screw **5**.

Guideline

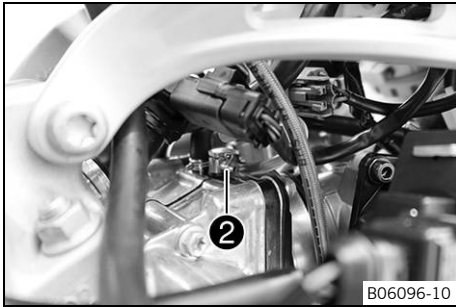
Screw, oil pump	M6	6 Nm (4.4 lbf ft)
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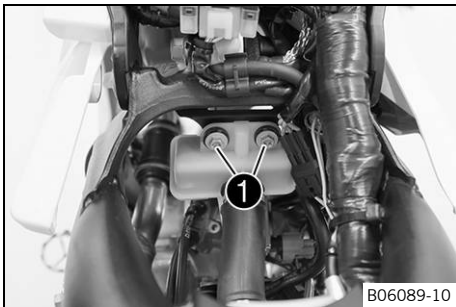
- Position hose clamp **4**.



- Plug in connector ③.



- Mount hose on the reed valve housing.
- Position hose clamp ②.



- Position the oil tank.
- Mount and tighten screws ①.

Guideline

Screw, oil tank on frame	M6	5 Nm (3.7 lbf ft)
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Finishing work

- Install the fuel tank. (📖 p. 97)
- Add 2-stroke oil. (📖 p. 264)
- Prime the oil pump. (📖 p. 264)
- Mount the seat. (📖 p. 95)



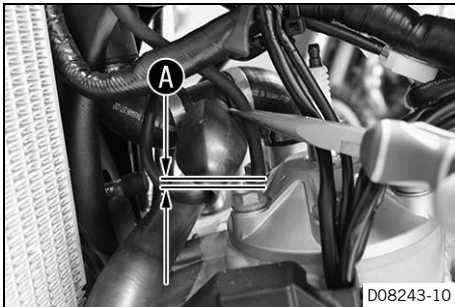
24.1 Checking the ignition system



Warning

Risk of injury The ignition system is under high voltage.

- Do not touch any affected metal parts or the ends of the connection cables during and immediately after the measurement.



Preparatory work

- Remove the seat. (📖 p. 95)
- Remove the fuel tank. (📖 p. 96)

Main work

- Shift the transmission to neutral position.
- Unplug the spark plug connector and remove it from the ignition wire.
- Remove the spark plug.

Guideline

Close the spark plug thread in the cylinder head, e.g., with a suitable spare spark plug.

- Hold the free end of the ignition wire at distance **A** from ground.

Guideline

Distance A	5 mm (0.2 in)
-------------------	---------------

- Press the start button.



Info

Do not open the throttle.

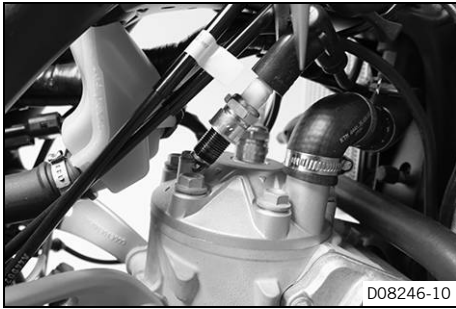
- Check the ignition spark.
 - » If no ignition spark is visible:
 - Check the emergency OFF switch.
 - Check the wiring harness to the emergency OFF switch.
 - Check the stop button.
 - Check the ground connection of the engine control unit and ignition coil.
 - Check the cable from the engine control unit to the ignition coil.



Info

The engine control unit cannot be tested using simple methods; only using an ignition test bench.

- Ignition coil - check the primary winding. (📖 p. 273)
- Check the crankshaft speed sensor. (📖 p. 275)
- Check the stator winding of the alternator. (📖 p. 274)



- Mount the spark plug connector on the ignition wire again. Mount the spark plug in the spark plug connector. Hold the spark plug to ground.
- Press the start button.



Info

Do not open the throttle.

- Check the ignition spark.
 - » If no ignition spark is visible:
 - Check the spark plug connector. (📖 p. 273)
 - Change the spark plug. (📖 p. 276)

Finishing work

- Install the fuel tank. (📖 p. 97)
- Mount the seat. (📖 p. 95)



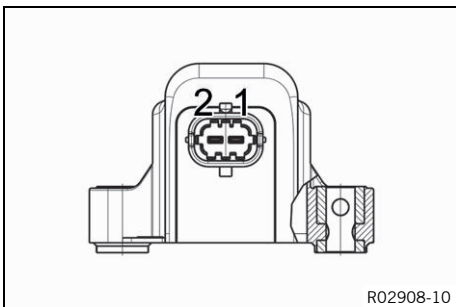
24.2 Ignition coil - checking the primary winding



Warning

Risk of injury The ignition system is under high voltage.

- Do not touch any affected metal parts or the ends of the connection cables during and immediately after the measurement.



Condition

Ignition coil cylinder 1 is disconnected.

Ignition coil, cylinder 1 - check the primary winding resistance.

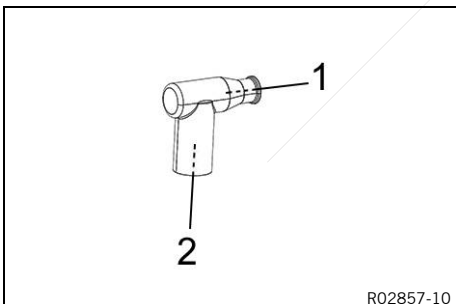
-  Measure the resistance between the specified points.
Ignition coil pin 1 (-) – Ignition coil pin 2 (+)

Ignition coil	
Primary winding resistance at: 20 °C (68 °F)	0.337 ... 0.412 Ω

- » If the displayed value does not correspond to the nominal value:
 - Change the ignition coil.



24.3 Checking the spark plug connector



Condition

Spark plug connector cylinder 1 has been removed.

-  Measure the resistance between the specified points.
Measuring point 1 – Measuring point 2

Spark plug connector	
Resistance at: 20 °C (68 °F)	4.3 ... 5.7 kΩ

- » If the specification is not reached:
 - Change the spark plug connector.



24.4 Alternator – checking the stator winding

Condition
The stator is disconnected.

Preparatory work
– Remove the seat. (📖 p. 95)

Main work

Stator winding measurement I - check the resistance.

-  Measure the resistance between the specified points.
Stator, connector **EZ** pin **1** – Stator, connector **EZ** pin **2**

Alternator	
Stator winding resistance at: 20 °C (68 °F)	0.368 ... 0.552 Ω

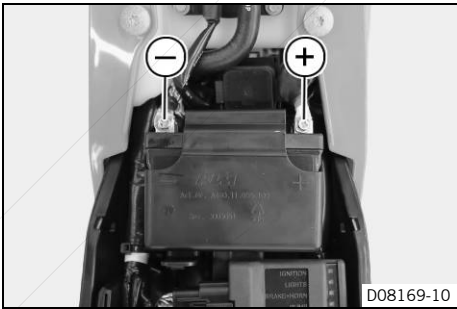
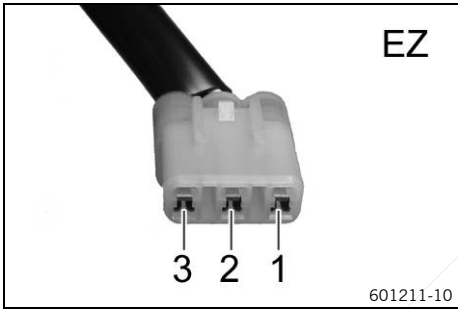
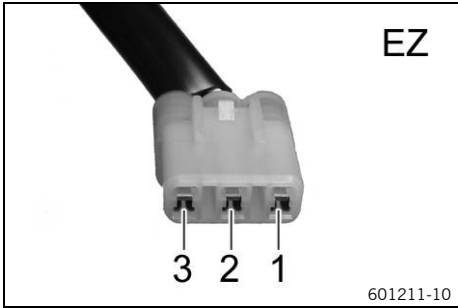
- » If the indicated value does not correspond to the setpoint value:
 - Change the stator.

Stator winding measurement II - check the resistance.

-  Measure the resistance between the specified points.
Stator, connector **EZ** pin **1** – Stator, connector **EZ** pin **3**

Alternator	
Stator winding resistance at: 20 °C (68 °F)	0.368 ... 0.552 Ω

- » If the indicated value does not correspond to the setpoint value:
 - Change the stator.



Stator winding - checking the short circuit to ground (terminal 31).

-  Measure the resistance between the specified points.
Stator, connector **EZ** pin **1** – Measuring point **Ground (-)**

Resistance	∞ Ω
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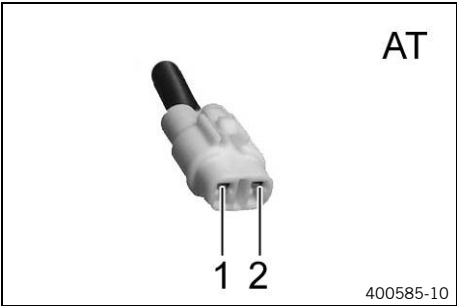
- » If the indicated value does not correspond to the setpoint value:
 - Change the stator.

Finishing work

- Mount the seat. (📖 p. 95)

24.5 Checking the crankshaft speed sensor

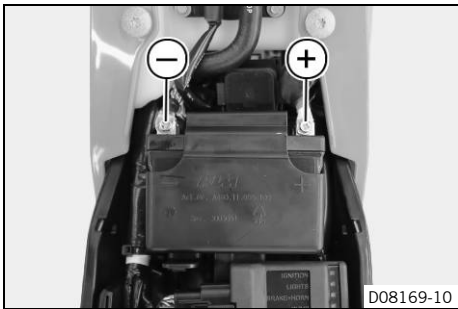
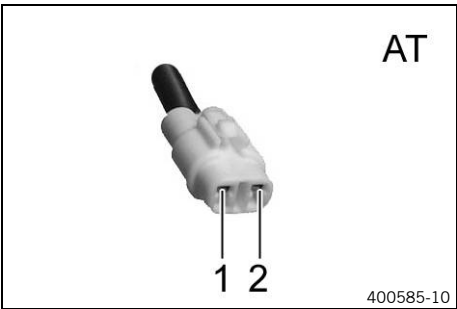
Condition
Crankshaft speed sensor is disconnected.



- Measure the resistance between the specified points.
Crankshaft speed sensor, connector **AT** pin 1 –
Crankshaft speed sensor, connector **AT** pin 2

Crankshaft speed sensor	
Resistance at: 20 °C (68 °F)	80 ... 120 Ω

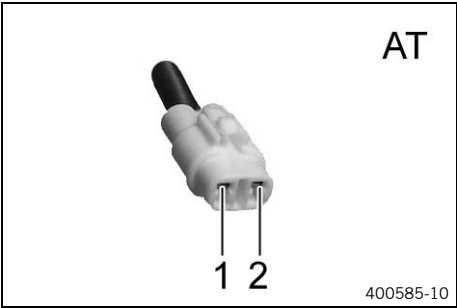
- » If the specification is not reached:
 - Change the crankshaft speed sensor.



- Measure the resistance between the specified points.
Crankshaft speed sensor, connector **AT** pin 1 – Measuring point **Ground (-)**

Resistance	∞ Ω
------------	------------

- » If the specification is not reached:
 - Change the crankshaft speed sensor.
- Connect the multimeter.
- Start the motorcycle to check the function. (📖 p. 14)



- Check the crankshaft speed sensor voltage.**
- Measure the voltage between the specified points.
Crankshaft speed sensor, connector **AT** pin 1 –
Crankshaft speed sensor, connector **AT** pin 2

Crankshaft speed sensor	
Voltage at starting engine speed	2 ... 4 V

- » If the specification is not reached:
 - Change the crankshaft speed sensor.

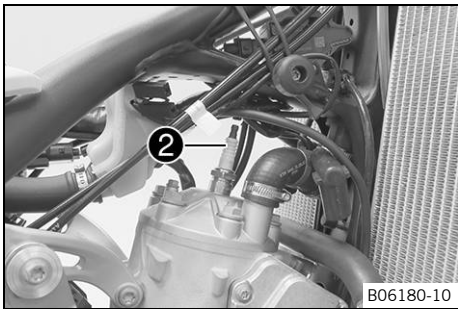
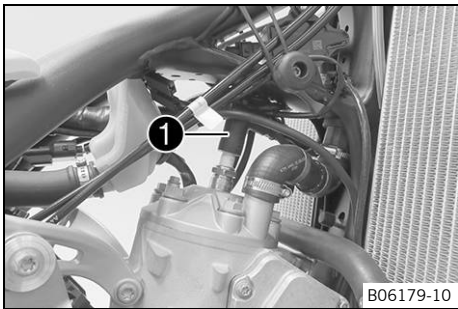
24.6 Changing the spark plug

Preparatory work

- Remove the seat. (📖 p. 95)
- Remove the fuel tank. (📖 p. 96)

Main work

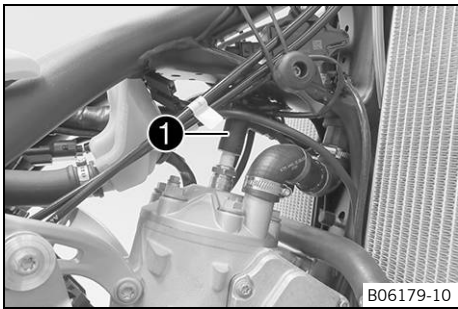
- Disconnect spark plug connector ❶.



- Remove spark plug ❷ 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 ❶.

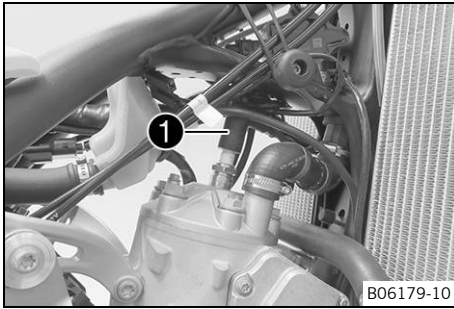
Finishing work

- Install the fuel tank. (📖 p. 97)
- Mount the seat. (📖 p. 95)

24.7 Changing the spark plug and spark plug connector

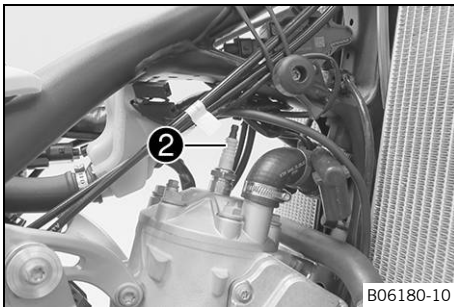
Preparatory work

- Remove the seat. (📖 p. 95)
- Remove the fuel tank. (📖 p. 96)



Main work

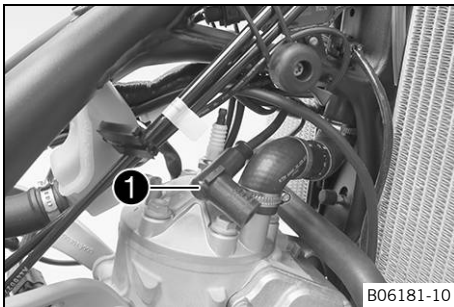
- Disconnect spark plug connector ①.



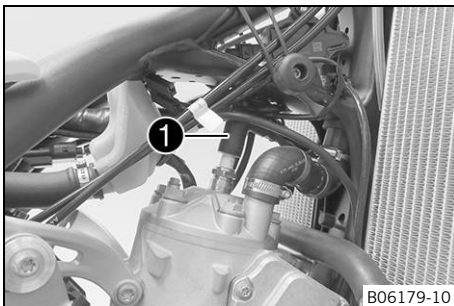
- Remove spark plug ② using a suitable tool.
- Mount and tighten the new spark plug using a suitable tool.

Guideline

Spark plug	M14x1.25	25 Nm (18.4 lbf ft)
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- Remove spark plug connector ①.
- Mount new spark plug connector ①.



- Plug in spark plug connector ①.

Finishing work

- Install the fuel tank. (p. 97)
- Mount the seat. (p. 95)

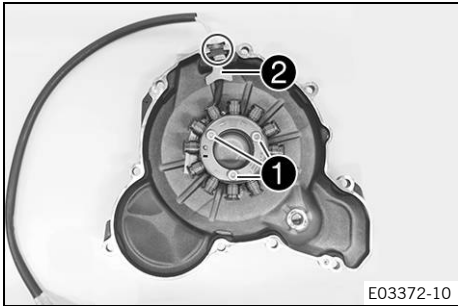


24.8 Removing the stator

Condition

The alternator cover has been removed.

- Remove screws ❶.
- Remove cable retainer plate ❷ from the alternator cover.
- Remove the stator together with the rubber grommet from the alternator cover.



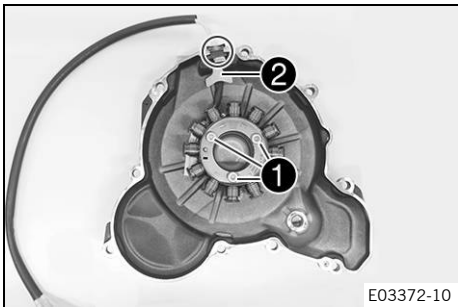
24.9 Installing the stator

- Position the stator in the alternator cover.
- Mount and tighten screws ❶.

Guideline

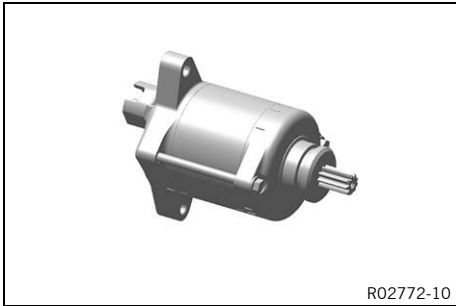
Screw, stator	M5	6 Nm (4.4 lbf ft) Loctite®243™
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- Position the rubber grommet in the alternator cover.
- Mount cable retainer plate ❷ in the alternator cover.



25.1 Checking the starter motor**Condition**

The starter motor has been removed.



- Connect negative cable of a 12-V power supply to the housing of the starter motor. Connect positive cable of the power supply briefly with the connector of the starter motor.
 - » If the starter motor does not turn when the circuit is closed:
 - Change starter motor.



26.1 Engine

Design	1-cylinder 2-stroke engine, water-cooled, with reed intake and exhaust control
Displacement (All 250 models)	249 cm ³ (15.19 cu in)
Displacement (All 300 models)	293.15 cm ³ (17.8892 cu in)
Stroke	72 mm (2.83 in)
Hole (All 250 models)	66.4 mm (2.614 in)
Hole (All 300 models)	72 mm (2.83 in)
Crankshaft bearing	1 grooved ball bearing/1 roller bearing
Conrod bearing	Needle bearing
Piston pin bearing	Needle bearing
Piston	Cast aluminum
Piston rings (All 250 models)	2 half keystone rings
Piston rings (All 300 models)	2 rectangular rings
X-distance (upper edge of piston to special tool)	0 ... 0.10 mm (0 ... 0.0039 in)
Z distance (height of control flap) (All 250 models)	50.0 mm (1.969 in)
Z distance (height of control flap) (All 300 models)	50.0 mm (1.969 in)
Primary transmission	26:72
Clutch	Multidisc clutch in oil bath/hydraulically activated
Transmission	6-gear transmission, claw shifted
Transmission ratio	
first-gear	13:33
second-gear	16:30
third-gear	18:26
fourth-gear	22:26
fifth-gear	23:23
sixth-gear	26:22
Ignition system	Electronic ignition
Spark plug	NGK BR 7 ES
Spark plug electrode gap	0.60 mm (0.0236 in)
Starting aid	Electric starter system

26.2 Tolerance, engine wear limits

Piston - diameter (All 250 models)	
Size I	66.340 ... 66.350 mm (2.61181 ... 2.6122 in)
Size II	66.351 ... 66.360 mm (2.61224 ... 2.61259 in)
Piston - diameter (All 300 models)	
Size I	71.925 ... 71.934 mm (2.83169 ... 2.83204 in)
Size II	71.935 ... 71.944 mm (2.83208 ... 2.83244 in)
Cylinder - drill hole diameter (All 250 models)	
Size I	66.400 ... 66.412 mm (2.61417 ... 2.61464 in)
Size II	66.412 ... 66.425 mm (2.61464 ... 2.61515 in)
Cylinder - drill hole diameter (All 300 models)	
Size I	72.000 ... 72.012 mm (2.83464 ... 2.83511 in)
Size II	72.012 ... 72.025 mm (2.83511 ... 2.83562 in)

Piston/cylinder - mounting clearance (All 250 models)	
New condition	0.050 ... 0.074 mm (0.00197 ... 0.00291 in)
Wear limit	0.10 mm (0.0039 in)
Piston/cylinder - mounting clearance (All 300 models)	
New condition	0.066 ... 0.088 mm (0.0026 ... 0.00346 in)
Wear limit	0.10 mm (0.0039 in)
Piston ring end gap (All 250 models)	
Ring 1	≤ 0.60 mm (≤ 0.0236 in)
Ring 2	≤ 0.60 mm (≤ 0.0236 in)
Piston ring end gap (All 300 models)	
Ring 1	≤ 0.40 mm (≤ 0.0157 in)
Ring 2	≤ 0.40 mm (≤ 0.0157 in)
Cylinder/cylinder head - distortion of sealing surface	≤ 0.10 mm (≤ 0.0039 in)
Connecting rod - axial play of lower conrod bearing	0.60 ... 0.70 mm (0.0236 ... 0.0276 in)
Crankshaft - run-out at bearing pin	≤ 0.03 mm (≤ 0.0012 in)
Clutch facing disc - thickness	≥ 1.9 mm (≥ 0.075 in)
Shift shaft - sliding plate/shift quadrant play	0.40 ... 0.80 mm (0.0157 ... 0.0315 in)

26.3 Engine tightening torques

Screw, inner reed paddles	EJOT DELTA PT® 3.5x25	1 Nm (0.7 lbf ft)	
Screw, membrane support plate	EJOT DELTA PT® 3x12	1 Nm (0.7 lbf ft)	
Screw, outer reed paddles	EJOT DELTA PT® 3x6	1 Nm (0.7 lbf ft)	
Nut, axle for control flap	M5	5 Nm (3.7 lbf ft)	
Screw, actuator, exhaust control	M5	5 Nm (3.7 lbf ft)	Loctite®243™
Screw, bearing retainer	M5	6 Nm (4.4 lbf ft)	Loctite®243™
Screw, clutch spring retainer	M5	6 Nm (4.4 lbf ft)	
Screw, control flap, exhaust control	M5	8 Nm (5.9 lbf ft)	Loctite®243™
Screw, cover, actuator, exhaust control	M5	5 Nm (3.7 lbf ft)	Loctite®243™
Screw, crankshaft speed sensor	M5	6 Nm (4.4 lbf ft)	Loctite®243™
Screw, exhaust control cover	M5	6 Nm (4.4 lbf ft)	
Screw, idler shaft, exhaust control	M5	8 Nm (5.9 lbf ft)	Loctite®243™
Screw, locking lever	M5	6 Nm (4.4 lbf ft)	Loctite®243™
Screw, retaining bracket of exhaust control	M5	6 Nm (4.4 lbf ft)	Loctite®2701™
Screw, stator	M5	6 Nm (4.4 lbf ft)	Loctite®243™
Bleeder screw, cylinder head	M6	10.5 Nm (7.74 lbf ft)	
Bleeder screw, water pump cover	M6x25	8 Nm (5.9 lbf ft)	
Nut, water pump impeller	M6	5 Nm (3.7 lbf ft)	Loctite®243™

Screw, alternator cover	M6	8 Nm (5.9 lbf ft)
Screw, clutch cover	M6	10 Nm (7.4 lbf ft)
Screw, clutch cover	M6x25	10 Nm (7.4 lbf ft)
Screw, clutch cover	M6x60	10 Nm (7.4 lbf ft)
Screw, cover, starter motor	M6	8 Nm (5.9 lbf ft)
Screw, engine case	M6x45	10 Nm (7.4 lbf ft)
Screw, engine case	M6x60	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 flange	M6	8 Nm (5.9 lbf ft)
Screw, outer clutch cover	M6	8 Nm (5.9 lbf ft)
Screw, shift drum locating	M6	10 Nm (7.4 lbf ft) Loctite®243™
Screw, shift lever	M6	14 Nm (10.3 lbf ft) Loctite®243™
Screw, starter motor	M6	10 Nm (7.4 lbf ft)
Screw, water pump cover, long	M6x60	10 Nm (7.4 lbf ft)
Screw, balancer shaft	M8	30 Nm (22.1 lbf ft) Loctite®243™
Screw, cylinder head	M8	27 Nm (19.9 lbf ft)
Nut, cylinder base	M10	38 Nm (28 lbf ft)
Screw, drive chain engine sprocket	M10	60 Nm (44.3 lbf ft) Loctite®2701™
Stud, cylinder base	M10	12 Nm (8.9 lbf ft)
Nut, rotor	M12x1	60 Nm (44.3 lbf ft)
Gear oil drain plug with magnet	M12x1.5	20 Nm (14.8 lbf ft)
Spark plug	M14x1.25	25 Nm (18.4 lbf ft)
Nut, inner clutch hub	M18x1.5	100 Nm (73.8 lbf ft)
Nut, primary gear wheel	M18LHx1.5	150 Nm (110.6 lbf ft) Loctite®243™

26.4 Capacities

26.4.1 Gear oil

Gear oil	0.80 l (0.85 qt.)	Engine oil (15W/50) (📖 p. 314)
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26.4.2 Engine oil

2-stroke oil tank content approx.	0.8 l (0.8 qt.)	Engine oil, 2-stroke (📖 p. 314)
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26.4.3 Coolant

Coolant	1.2 l (1.3 qt.)	Coolant (📖 p. 314)
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26.4.4 Fuel

Total fuel tank capacity, approx.	9 l (2.4 US gal)	Super unleaded (ROZ 95) (📖 p. 315)
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Fuel reserve, approx.	1.5 l (1.6 qt.)
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26.5 Chassis

Frame	Central tube frame made of chrome molybdenum steel tubing
Fork	WP XPLOR CC
Shock absorber	WP PDS
Suspension travel	
front	300 mm (11.81 in)
Suspension travel	
rear	310 mm (12.2 in)
Fork offset	22 mm (0.87 in)
Brake system	Disc brakes, floating brake calipers
Brake discs - diameter	
front	260 mm (10.24 in)
rear	220 mm (8.66 in)
Brake discs - wear limit (All standard models)	
front	2.5 mm (0.098 in)
rear	3.5 mm (0.138 in)
Brake discs - wear limit (All special models)	
front	2.5 mm (0.098 in)
rear	3.7 mm (0.146 in)
Street tire pressure (All EXC models)	
front	2.0 bar (29 psi)
rear	2.0 bar (29 psi)
Offroad tire pressure	
front	1.0 bar (15 psi)
rear	1.0 bar (15 psi)
Secondary ratio	14:45 (13:45)
Chain	5/8 x 1/4"
Rear sprockets available	45, 48, 49, 50, 51, 52
Steering head angle	63.5°
Wheelbase	1,890 ± 10 mm (74.41 ± 0.39 in)
Seat height unloaded	963 mm (37.91 in)
Ground clearance unloaded	347 mm (13.66 in)
Weight without fuel, approx. (All standard models)	104.6 kg (230.6 lb.)
Weight without fuel, approx. (All SIX DAYS models)	104.9 kg (231.3 lb.)
Weight without fuel, approx. (All HARDENDURO models)	106.1 kg (233.9 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.)

26.6 Electrical system

12-V battery	HJTZ5S-FP-C	Lithium-ion battery Battery voltage: 12 V Nominal capacity: 2.0 Ah Maintenance-free
Combination instrument battery	CR 2430	Battery voltage: 3 V
Fuse	58011109120	20 A
Headlight	LED	
Parking light	LED	
Indicator lamps (All EU/ASEAN models, All XC-W and special models)	W2.3W / socket W2x4.6d	12 V 2.3 W
Turn signal (All EXC models)	R10W / socket BA15s	12 V 10 W
Brake/tail light	LED	
License plate lamp (All EXC models)	LED	

26.7 Tires

Validity	Front tire	Rear tire
(All standard EXC models)	90/90 - 21 M/C 54R M+S TT MAXXIS Maxx Enduro	140/80 - 18 M/C 70R M+S TT MAXXIS Maxx Enduro
(All special models)	90/90 - 21 M/C 54M M+S TT Metzeler MCE 6 DAYS EXTREME	140/80 - 18 M/C 70M M+S TT Metzeler MCE 6 DAYS EXTREME
(All XC-W models)	80/100 - 21 51M TT Dunlop GEOMAX MX 33 F	110/100 - 18 64M TT Dunlop GEOMAX MX 33
The tires specified represent one of the possible series production tires. For alternative manufacturers, if any, contact an authorized dealer or qualified tire dealership. If local road approval regulations apply, these and the respective technical specifications must be observed. Additional information is available in the Service section under: KTM.COM		

26.8 Fork

Fork article number	A490C163X402000
Fork	WP XPLOR CC
Compression damping	
Comfort	17 clicks
Standard	15 clicks
Sport	7 clicks
Rebound damping	
Comfort	19 clicks
Standard	17 clicks
Sport	9 clicks
Spring length with preload spacer(s)	476 mm (18.74 in)
Spring rate	
Weight of rider: 65 ... 75 kg (143 ... 165 lb.)	4.2 N/mm (24 lb/in)
Weight of rider: 75 ... 85 kg (165 ... 187 lb.)	4.4 N/mm (25.1 lb/in)

Weight of rider: 85 ... 95 kg (187 ... 209 lb.)		4.6 N/mm (26.3 lb/in)
Fork length		940 mm (37.01 in)
Oil capacity, cartridge	175 ml (5.92 fl. oz.)	Fork oil (SAE 4) (48601166S1) ( p. 315)
Oil capacity, external mechanism	390 ml (13.19 fl. oz.)	Fork oil (SAE 4) (48601166S1) ( p. 315)

26.9 Shock absorber

Shock absorber article number	A490C463X305000
Shock absorber	WP PDS
Lowspeed compression damping	
Comfort	18 clicks
Standard	15 clicks
Sport	12 clicks
Highspeed compression damping	
Comfort	2.5 turns
Standard	2 turns
Sport	1.5 turns
Rebound damping	
Comfort	18 clicks
Standard	15 clicks
Sport	12 clicks
Spring preload	7 mm (0.28 in)
Spring rate	
Weight of rider: 65 ... 75 kg (143 ... 165 lb.)	66 N/mm (377 lb/in)
Weight of rider: 75 ... 85 kg (165 ... 187 lb.)	69 N/mm (394 lb/in)
Weight of rider: 85 ... 95 kg (187 ... 209 lb.)	72 N/mm (411 lb/in)
Spring length	225 mm (8.86 in)
Gas pressure	10 bar (145 psi)
Static sag	38 mm (1.5 in)
Riding sag	110 mm (4.33 in)
Fitted length	402.7 mm (15.854 in)
Shock absorber fluid ( p. 315)	SAE 2.5

26.10 Chassis tightening torques

Hose connector, active carbon filter	-	3.8 Nm (2.8 lbf ft)
Mushroom head screw for spoiler and seat		2.5 Nm (1.84 lbf ft)
Remaining screws, chassis	EJOT PT® K60x25-Z	2 Nm (1.5 lbf ft)
Screw, emergency OFF switch (All EXC models)	EJOT PT® K50x18 T20	2 Nm (1.5 lbf ft)
Screw, fuel pump	EJOT PT® K60x30 Z	2.5 Nm (1.84 lbf ft)
Screw, hose clip, inlet sleeve		2.8 Nm (2.07 lbf ft)
Screw, intake air temperature sensor	EJOT DELTA PT® K50x18 T20	0.7 Nm (0.52 lbf ft)

Screw, oil fill level sensor	EJOT PT® 50x18 T25	7 Nm (5.2 lbf ft)
Screw, oil pump holder on oil tank	EJOTDELTA PT 45x12-Z	0.7 Nm (0.52 lbf ft)
Screw, pressure regulator	EJOT PT® K60x25-Z	2.3 Nm (1.7 lbf ft)
Screw, radiator hoses clip		2.4 Nm (1.77 lbf ft)
Screw, subframe with filter box	EJOT PT® K60x20AL	5 Nm (3.7 lbf ft)
Screw, fixed grip	M4	5 Nm (3.7 lbf ft) Loctite®243™
Spoke nipple, front wheel	M4.5	6 Nm (4.4 lbf ft)
Spoke nipple, rear wheel	M4.5	6 Nm (4.4 lbf ft)
Remaining nuts, chassis	M5	5 Nm (3.7 lbf ft)
Remaining screws, chassis	M5	5 Nm (3.7 lbf ft)
Screw, battery terminal	M5	2.5 Nm (1.84 lbf ft)
Screw, frame protector	M5	3 Nm (2.2 lbf ft)
Screw, light switch (All EXC models)	M5	1 Nm (0.7 lbf ft)
Screw, shock absorber adjusting ring	M5	5 Nm (3.7 lbf ft)
Screw, throttle valve body cover	M5	2.6 Nm (1.92 lbf ft)
Screw, turn signal switch (All EXC models)	M5	1 Nm (0.7 lbf ft)
Nut, cable on starter motor	M6	4 Nm (3 lbf ft)
Nut, throttle cable wire on throttle valve body	M6	3 Nm (2.2 lbf ft)
Remaining nuts, chassis	M6	10 Nm (7.4 lbf ft)
Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
Screw, battery support bracket	M6	6 Nm (4.4 lbf ft)
Screw, brake lever	M6	5 Nm (3.7 lbf ft)
Screw, brake line guide for link fork	M6	4.5 Nm (3.32 lbf ft)
Screw, cable on starter relay	M6	6 Nm (4.4 lbf ft)
Screw, chain guide	M6	10 Nm (7.4 lbf ft)
Screw, chain sliding guard	M6	6 Nm (4.4 lbf ft) Loctite®243™
Screw, clutch lever	M6	5 Nm (3.7 lbf ft)
Screw, connector board incl. combination instrument	M6	5 Nm (3.7 lbf ft)
Screw, fender to triple clamp	M6	12 Nm (8.9 lbf ft)
Screw, front brake disc	M6	14 Nm (10.3 lbf ft) Loctite®243™
Screw, fuel tank spoiler on radiator	M6	6 Nm (4.4 lbf ft)
Screw, ground wire in tail section	M6	10 Nm (7.4 lbf ft)
Screw, manifold on silent block	M6	6 Nm (4.4 lbf ft)
Screw, oil pump	M6	6 Nm (4.4 lbf ft)
Screw, oil tank cap	M6	6 Nm (4.4 lbf ft)
Screw, oil tank on frame	M6	5 Nm (3.7 lbf ft)
Screw, push rod ball joint on the rear brake cylinder	M6	10 Nm (7.4 lbf ft) Loctite®243™

Screw, rear brake disc	M6	14 Nm (10.3 lbf ft) Loctite®243™
Screw, seat fixing	M6	8 Nm (5.9 lbf ft)
Screw, silent block on frame	M6	6 Nm (4.4 lbf ft)
Screw, throttle grip	M6	5 Nm (3.7 lbf ft)
Fuel connection on fuel pump	M8	15 Nm (11.1 lbf ft)
Nut, foot brake lever	M8	20 Nm (14.8 lbf ft)
Nut, pull switch (All XC-W models)	M8	0.8 Nm (0.59 lbf ft)
Nut, rear sprocket screw	M8	35 Nm (25.8 lbf ft) Loctite®2701™
Nut, rim lock	M8	12 Nm (8.9 lbf ft)
Rear brake lever stop nut	M8	20 Nm (14.8 lbf ft)
Remaining nuts, chassis	M8	25 Nm (18.4 lbf ft)
Remaining screws, chassis	M8	25 Nm (18.4 lbf ft)
Screw, bottom triple clamp (All standard models)	M8	15 Nm (11.1 lbf ft)
Screw, bottom triple clamp (All special models)	M8	12 Nm (8.9 lbf ft)
Screw, chain sliding piece	M8	15 Nm (11.1 lbf ft)
Screw, engine brace	M8x15	25 Nm (18.4 lbf ft) Loctite®2701™
Screw, engine brace	M8x20	25 Nm (18.4 lbf ft) Loctite®243™
Screw, engine sprocket cover	M8	15 Nm (11.1 lbf ft)
Screw, fork stub	M8	15 Nm (11.1 lbf ft)
Screw, front brake caliper	M8	25 Nm (18.4 lbf ft) Loctite®243™
Screw, handlebar clamp	M8	20 Nm (14.8 lbf ft)
Screw, manifold	M8	15 Nm (11.1 lbf ft)
Screw, side stand fixing	M8x26	33 Nm (24.3 lbf ft) Loctite®2701™
Screw, subframe bottom	M8	30 Nm (22.1 lbf ft) Loctite®2701™
Screw, subframe, top	M8	35 Nm (25.8 lbf ft) Loctite®243™
Screw, top steering stem (All standard models)	M8	20 Nm (14.8 lbf ft)
Screw, top steering stem (All special models)	M8	17 Nm (12.5 lbf ft) Loctite®243™
Screw, top triple clamp (All standard models)	M8	20 Nm (14.8 lbf ft)
Screw, top triple clamp (All special models)	M8	17 Nm (12.5 lbf ft)
Screw, wheel speed sensor on axle clamp	M8	4.5 Nm (3.32 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, brake caliper on brake caliper bracket	M10	45 Nm (33.2 lbf ft) Loctite®243™
Screw, handlebar support	M10	40 Nm (29.5 lbf ft) Loctite®243™
Temperature sensor water to t-plate	M10	10 Nm (7.4 lbf ft)
Nut, fuel pump	M12	15 Nm (11.1 lbf ft)
Screw, bottom shock absorber	M12	80 Nm (59 lbf ft) Loctite®2701™
Screw, top shock absorber	M12	80 Nm (59 lbf ft) Loctite®2701™
Nut, fork pivot	M16x1.5	100 Nm (73.8 lbf ft)
Screw, front wheel spindle	M20x1.5	35 Nm (25.8 lbf ft)
Screw, top steering head	M20x1.5	12 Nm (8.9 lbf ft)
Nut, wheel spindle, rear	M22x1.5	80 Nm (59 lbf ft)
Screw-in fitting, cooling system	M24x1.5	7.5 Nm (5.53 lbf ft) Loctite®243™

27.1 Cleaning the motorcycle

Note

Material damage Components become damaged or destroyed if a pressure cleaner is used incorrectly.

The high pressure forces water into the electrical components, connectors, throttle cables, and bearings, etc. Pressure which is too high causes malfunctions and destroys components.

- Do not direct the water jet directly on to electrical components, connectors, throttle cables or bearings.
- Maintain a minimum distance between the nozzle of the pressure cleaner and the component.
Minimum clearance 60 cm (23.6 in)



Note

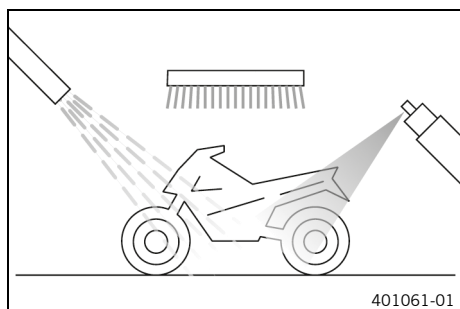
Environmental hazard Hazardous substances cause environmental damage.

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



Info

To maintain the value and appearance of the motorcycle over a long period, clean it regularly. Avoid direct sunshine when cleaning the motorcycle.



- Close off exhaust system to keep water from entering.
- Remove the coarse dirt particles with a gentle water jet.
- Spray the heavily soiled parts with a normal commercial motorcycle cleaner and clean using a brush.

Motorcycle cleaner (📖 p. 317)



Info

Use warm water containing normal motorcycle cleaner and a soft sponge.

Never apply motorcycle cleaner to a dry vehicle; always rinse the vehicle with water first.

- After rinsing the motorcycle with a gentle spray of water, allow it to dry thoroughly.
- Remove the closure of the exhaust system.



Warning

Danger of accidents Moisture and dirt impair the brake system.

- Brake carefully several times to dry out and remove dirt from the brake linings and the brake discs.

- After cleaning, ride the vehicle a short distance until the engine warms up.



Info

The heat produced causes water at inaccessible locations in the engine and on the brake system to evaporate.

- After the motorcycle has cooled down, lubricate all moving parts and pivot points.
- Clean the chain. (📖 p. 124)

- Treat bare metal (except for brake discs and the exhaust system) with a corrosion inhibitor.

Preserving materials for paints, metal and rubber
(📖 p. 317)

- 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. 317)

(All EXC models)

- Oil the steering lock.

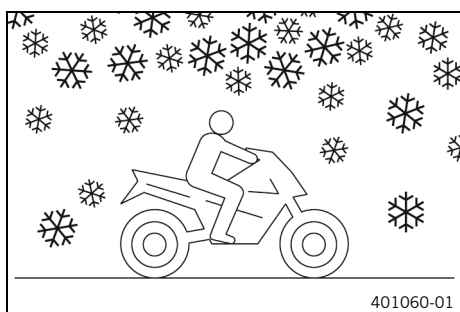
Universal oil spray (📖 p. 317)

27.2 Checks and maintenance steps for winter operation

i Info

If you use the motorcycle in winter, salt can be expected on the roads. You should therefore take precautions against aggressive road salt.

If the vehicle has been used on salted roads, use cold water for cleaning after riding. Warm water enhances the corrosive effects of salt.



- Clean the motorcycle. (📖 p. 289)
- Clean the brakes.

i Info

After **EVERY** trip on salted roads, thoroughly clean the brake calipers and brake linings, after they have cooled down and without removing them, with cold water and dry them carefully.

After riding on salted roads, thoroughly clean the vehicle with cold water and dry it well.

- Treat engine, link fork, and all other bare or zinc-plated parts (except the brake discs) with a wax-based corrosion inhibitor.

i Info

Corrosion inhibitor must not come in contact with the brake discs as this would greatly reduce the braking force.

- Clean the chain. (📖 p. 124)

28.1 Storage

**Warning**

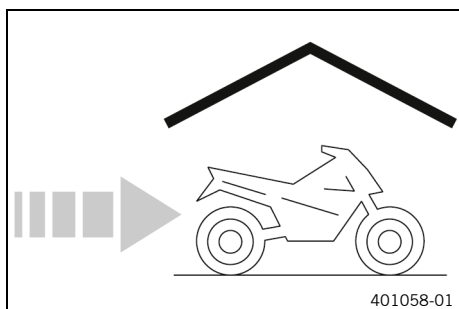
Danger of poisoning Fuel is harmful to health.

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

**Info**

If you plan to garage the motorcycle for a longer period, perform the following steps or have them performed.

Before storing the motorcycle, check all parts for function and wear. If service, repairs, or replacements are necessary, you should do this during the storage period (less workshop overload). In this way, you can avoid long workshop waiting times at the start of the new season.



- Clean the motorcycle. (📖 p. 289)
- Change the gear oil. (📖 p. 261)
- Check the antifreeze and coolant level. (📖 p. 238)
- When refueling for the last time before taking the motorcycle out of service, add fuel additive.

Fuel additive (📖 p. 316)

- Refuel.

**Tip**

Fill the fuel tank completely as specified, using fuel with the lowest possible ethanol content.

- Add 2-stroke oil. (📖 p. 264)
- Check tire pressure. (📖 p. 111)
- Remove the 12-V battery. (📖 p. 133)
- Charge the 12-V battery.

Guideline

Ideal charging and storage temperature of the lithium-ion battery	10 ... 20 °C (50 ... 68 °F)
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- Store the vehicle in a dry location that is not subject to large fluctuations in temperature.

**Info**

KTM recommends jacking up the motorcycle.

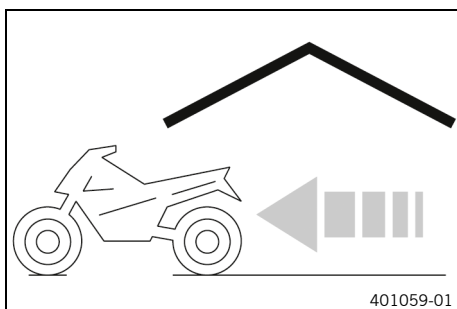
- Raise the motorcycle with a lift stand. (📖 p. 13)
- Cover the vehicle with a tarp or a similar cover that is permeable to air.



Info

Do not use non-porous materials since they prevent humidity from escaping, thus causing corrosion. Avoid running the engine for a short time only. Because the engine will not warm up sufficiently, the water vapor produced during combustion will condense, causing engine parts and the exhaust system to rust.

28.2 Preparing for use after storage



- Remove the motorcycle from the lift stand. (📖 p. 13)
- Install the 12-V battery. (📖 p. 134)
- Perform checks and maintenance measures when preparing for use.
- Make a test ride.

29.1 Additional information

Any further work that results from the service work must be ordered separately and invoiced separately. Different service intervals may apply in your country, depending on the local operating conditions. Individual service intervals and scopes may change in the course of technical developments. The most up-to-date service schedule can always be found on KTM Dealer.net. Your authorized KTM dealer will be happy to advise you.

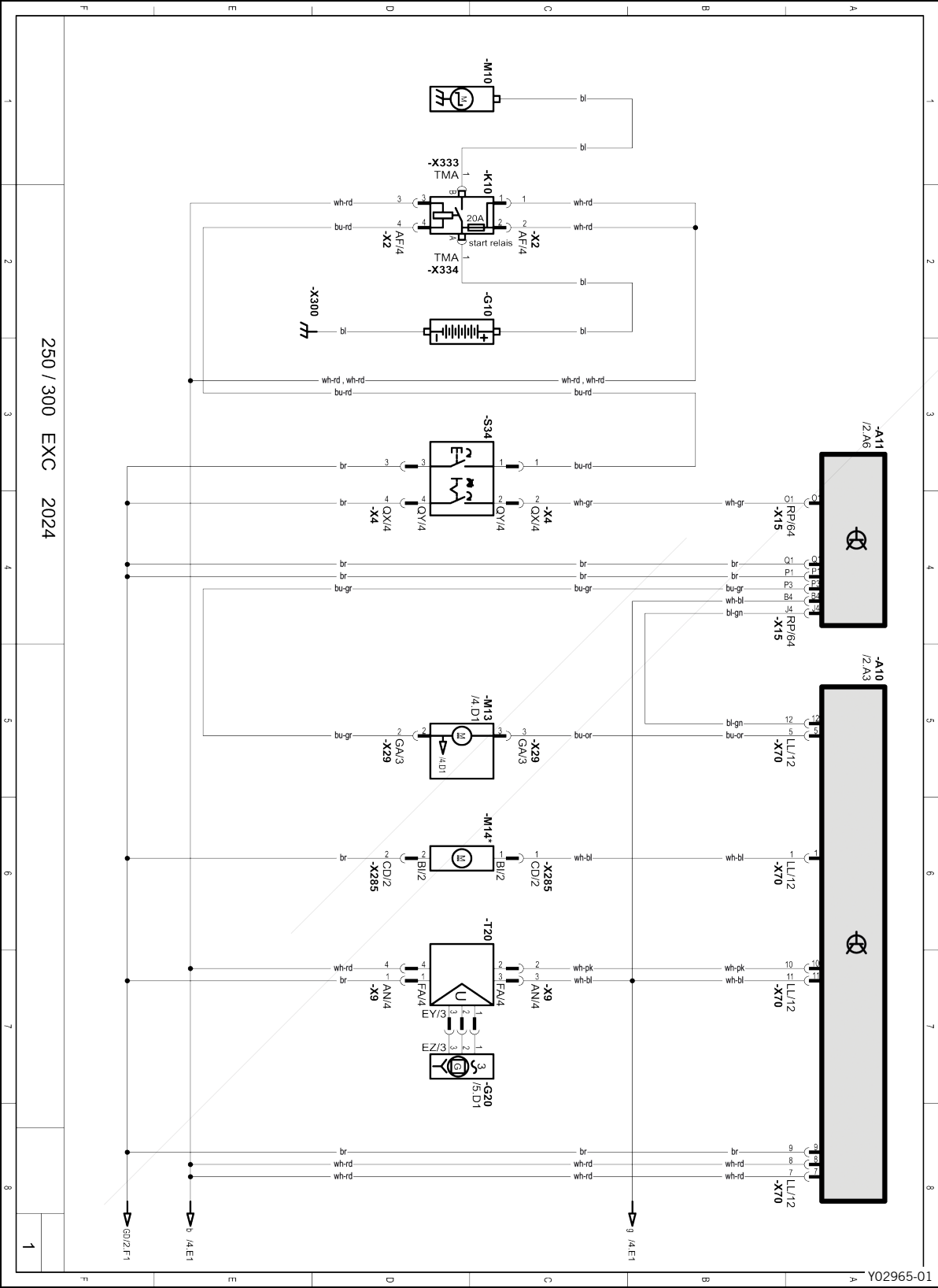
29.2 Service schedule

	every 24 months				
	Every 90 operating hours				
	Every 45 operating hours				
	After 15 operating hours / Every 15 operating hours				
	After 1 operating hour				
Read out the fault memory using the KTM diagnostics tool.	○	●	●	●	●
Check that the electrical system is functioning properly.	○	●	●	●	●
Check and charge the 12-V battery.	○	●	●	●	●
Check that the brake linings of the front brake are secured. (📖 p. 140)		●	●	●	●
Check that the brake linings of the rear brake are secured. (📖 p. 147)		●	●	●	●
Check the brake discs. (📖 p. 112)		●	●	●	●
Check the brake lines for damage and tightness.		●	●	●	●
Check the front brake fluid level. (📖 p. 143)		●	●		
Change the front brake fluid. (📖 p. 145)				●	●
Check the rear brake fluid level. (📖 p. 151)		●	●		
Change the rear brake fluid. (📖 p. 152)				●	●
Check/correct the fluid level of hydraulic clutch. (📖 p. 228)			●		
Change the hydraulic clutch fluid. (📖 p. 229)				●	●
Check the free travel of the hand brake lever. (📖 p. 142)	○	●	●	●	●
Check the free travel of the foot brake lever. (📖 p. 149)		●	●	●	●
Check the idle speed.	○	●	●	●	●
Change the gear oil. (📖 p. 261)	○		●	●	●
Check all hoses (e.g. fuel, cooling, bleeder, drainage hoses, etc.) and sleeves for cracking, tightness, and correct routing.	○	●	●	●	●
Check the cables for damage and that there are no kinks in the routing.		●	●	●	●
Check that the throttle cables are undamaged, routed without kinks, and set correctly.		●	●	●	●
Check the frame. (📖 p. 53)		●	●	●	
Check the link fork. (📖 p. 79)		●	●	●	
Check the fork bearing for play. (📖 p. 79)			●	●	
Check the shock absorber heim joint for play. (📖 p. 79)			●	●	
Check the tire condition. (📖 p. 111)		●	●	●	●
Check tire pressure. (📖 p. 111)		●	●	●	●
Check the wheel bearing for play. (📖 p. 112)		●	●	●	
Check the wheel hubs.		●	●	●	
Check the rim run-out. (📖 p. 113)	○	●	●	●	
Check the spoke tension. (📖 p. 114)	○	●	●	●	
Check the chain, rear sprocket, engine sprocket, and chain guide. (📖 p. 125)	○	●	●	●	
Check the chain tension. (📖 p. 125)	○	●	●	●	●

	every 24 months				
	Every 90 operating hours				
	Every 45 operating hours				
	After 15 operating hours / Every 15 operating hours				
	After 1 operating hour				
Grease all moving parts (e.g. side stand, hand lever, chain, etc.) and check for smooth operation.	○	●	●	●	●
Check the basic throttle valve position sensor setting. (📖 p. 254)		○	●	●	●
Change the spark plug and spark plug connector. (📖 p. 276)			●	●	
Change the fuel filter. (📖 p. 100)				●	●
Check the clutch. (📖 p. 230)			●	●	
Clean the air filter and air filter box. (📖 p. 93)		●	●	●	●
Change the glass fiber yarn filling of the main silencer. (📖 p. 89)				●	
Service the fork. (📖 p. 19)			●	●	
Perform the shock absorber service. (📖 p. 63)			●	●	
Check all screws, nuts, and hose clips for a tight fit.	○	●	●	●	●
Change the fuel screen. (📖 p. 99)	○	●	●	●	●
Check the fuel pressure. (📖 p. 105)	○	●	●	●	●
Check the antifreeze and coolant level. (📖 p. 238)			●	●	
Check the coolant level. (📖 p. 239)	○	●			
Change the coolant. (📖 p. 242)					●
Check that the radiator fan is functioning properly. (All special models)	○	●	●	●	
Check the headlight setting. (📖 p. 156)	○	●	●	●	
Check the steering head bearing for play. (📖 p. 43)	○	●			
Lubricate the steering head bearing. (📖 p. 39)			●	●	●
Check the reed valve housing, reed valve and intake flange. (📖 p. 199)			●	●	
Check the electric starter drive. (📖 p. 212)			●	●	●
Change the oil pump; clean the oil screen. (📖 p. 268)				●	
Clean the oil screen in the oil tank. (📖 p. 266)				●	
Perform minor engine service. (Change the piston. Check the cylinder head. Change the O-rings of the manifold and the cylinder head. Check the cylinder and Z dimension. Check the exhaust control for function and smooth operation. Check and clean the crank chamber pressure sensor hose and clean.)			●	●	
Perform major engine service including removing and installing the engine. (Change the connecting rod, conrod bearing, and crank pin. Check the transmission and the shift mechanism. Change all the engine bearings, the radial shaft seal rings and the seals.)				●	
Final check: Check the vehicle for operating safety and take for a test ride.	○	●	●	●	●
Read out the error memory after the test ride using the KTM diagnostics tool.	○	●	●	●	●
Make a service entry in KTM Dealer.net .	○	●	●	●	●

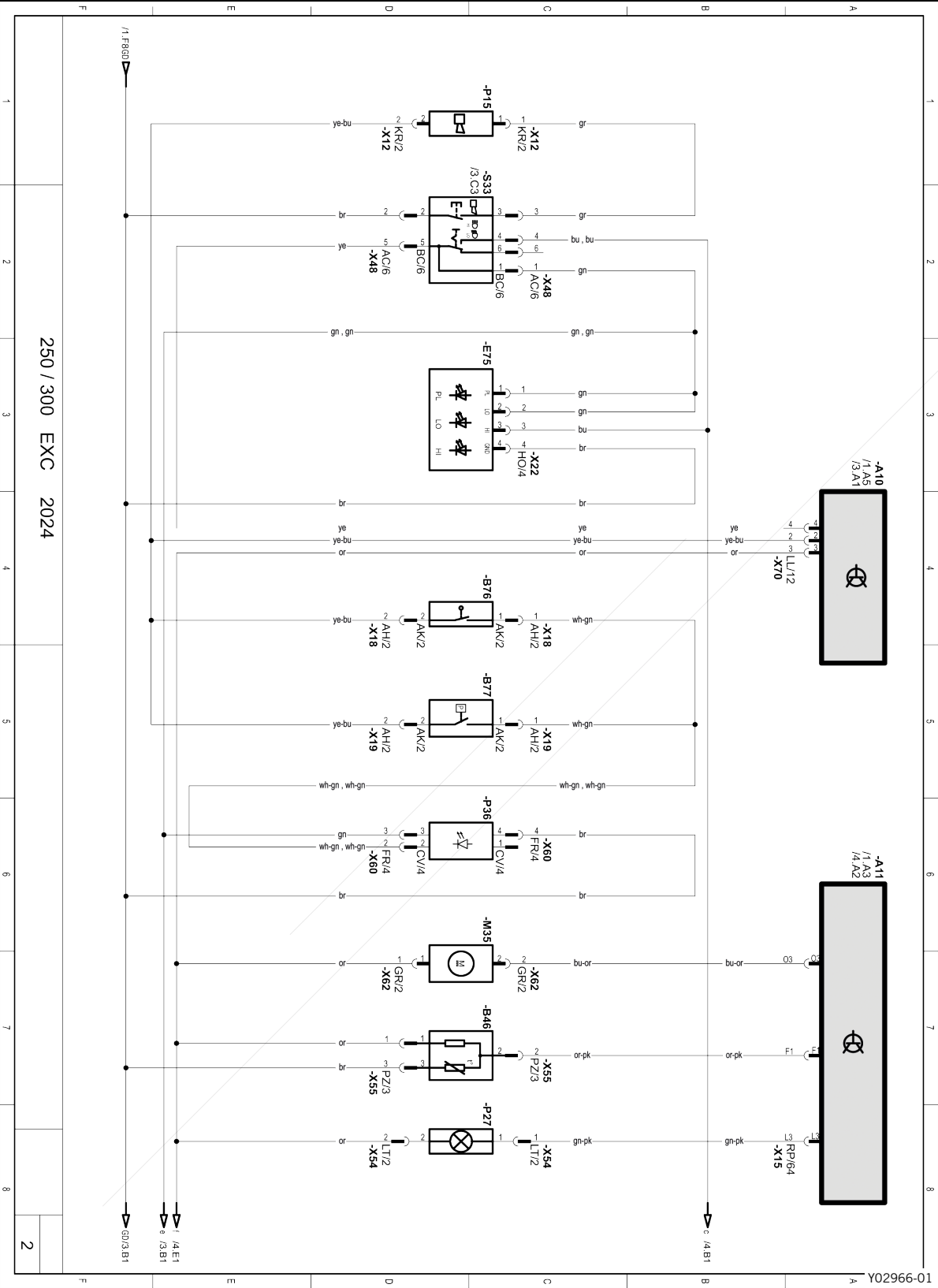
- One-time interval
- Periodic interval





Components:

A10	Vehicle system control unit
A11	Engine control unit
G10	12-V battery
G20	Alternator
K10	Starter relay with main fuse
M10	Starter motor
M13	Fuel pump
M14	Radiator fan (if installed)
S34	Combination switch, right
T20	Voltage regulator

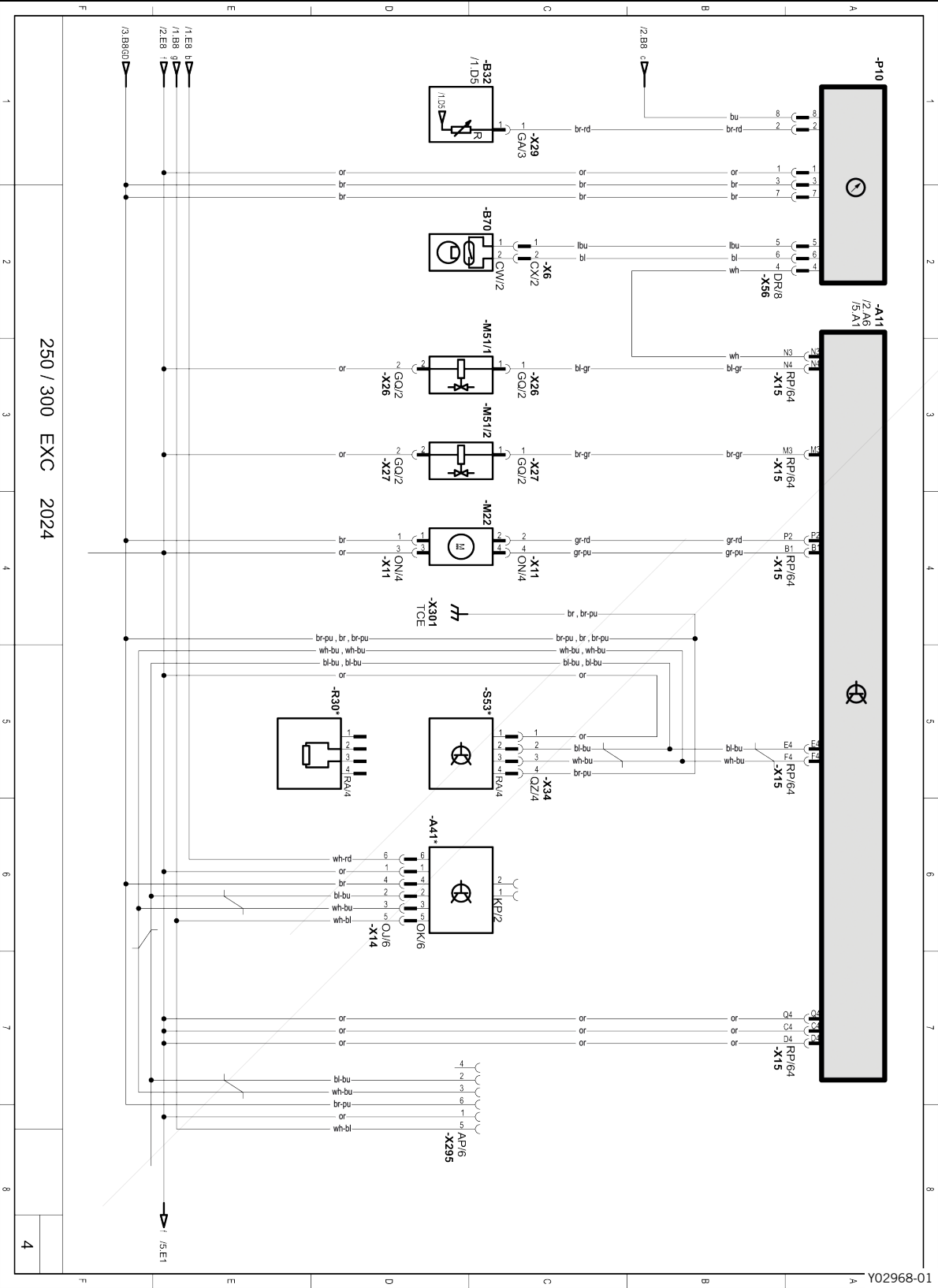


Components:

A10	Vehicle system control unit
A11	Engine control unit
B46	Oil level sensor
B76	Front brake light switch
B77	Rear brake light switch
E75	Headlight unit
M35	Oil pump
P15	Horn
P27	Oil level warning lamp
P36	Brake/tail light
S33	Combination switch, left

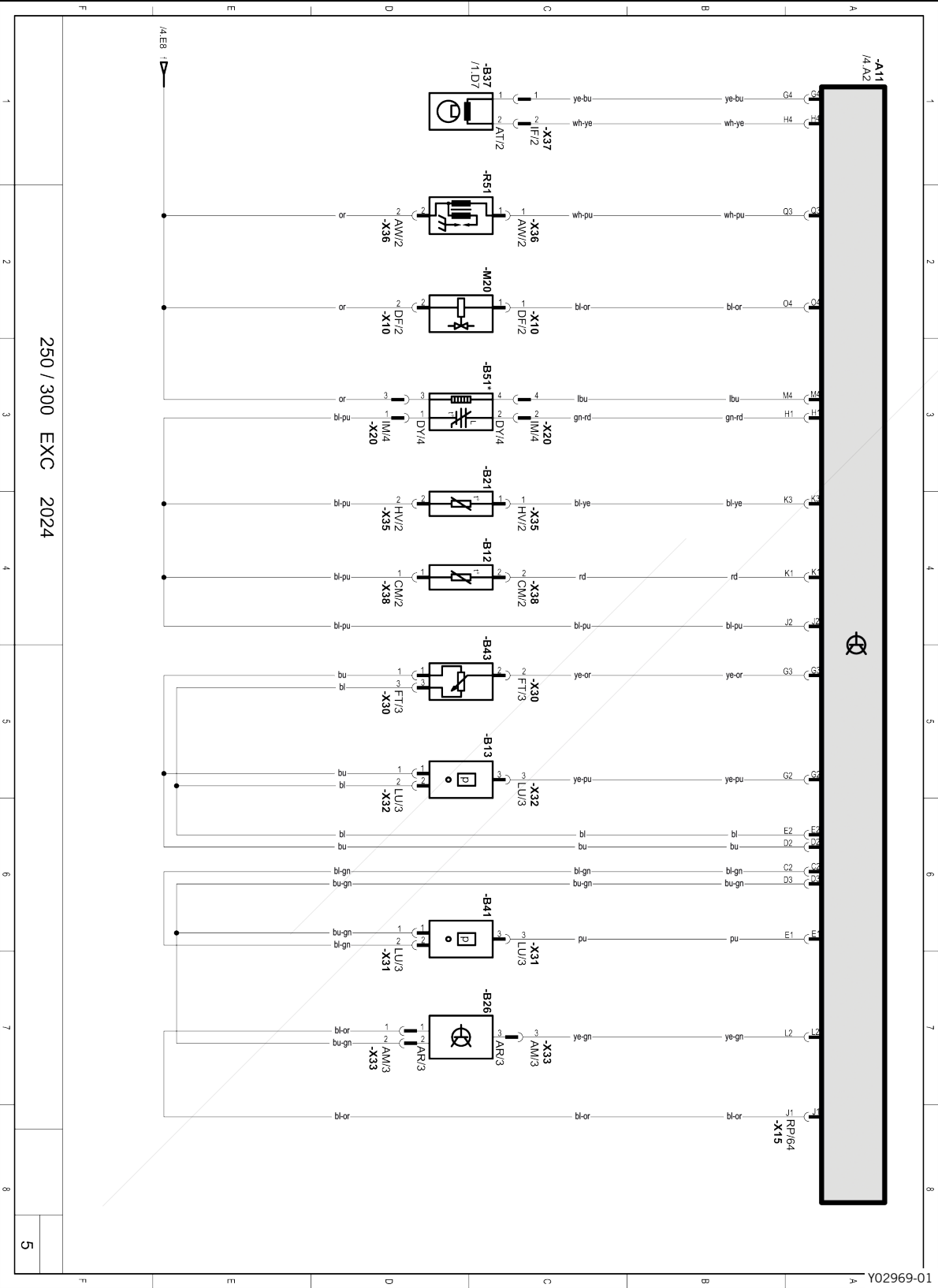
Components:

A10	Vehicle system control unit
E60	License plate lamp
P21	Turn signal indicator lamp
P41	Turn signal, front left
P42	Turn signal, front right
P45	Turn signal, rear left
P46	Turn signal, rear right
S33	Combination switch, left



Components:

A11	Engine control unit
A41	Connectivity Unit (if installed)
B32	Fuel level sensor
B70	Front wheel speed sensor
M51/1	Injection valve 1, cylinder 1
M51/2	Injection valve 2, cylinder 1
P10	Combination instrument
P36	Brake/tail light
R30	Terminating resistor (if installed)
S53	Map Select switch (if installed)
X295	Diagnostics connector

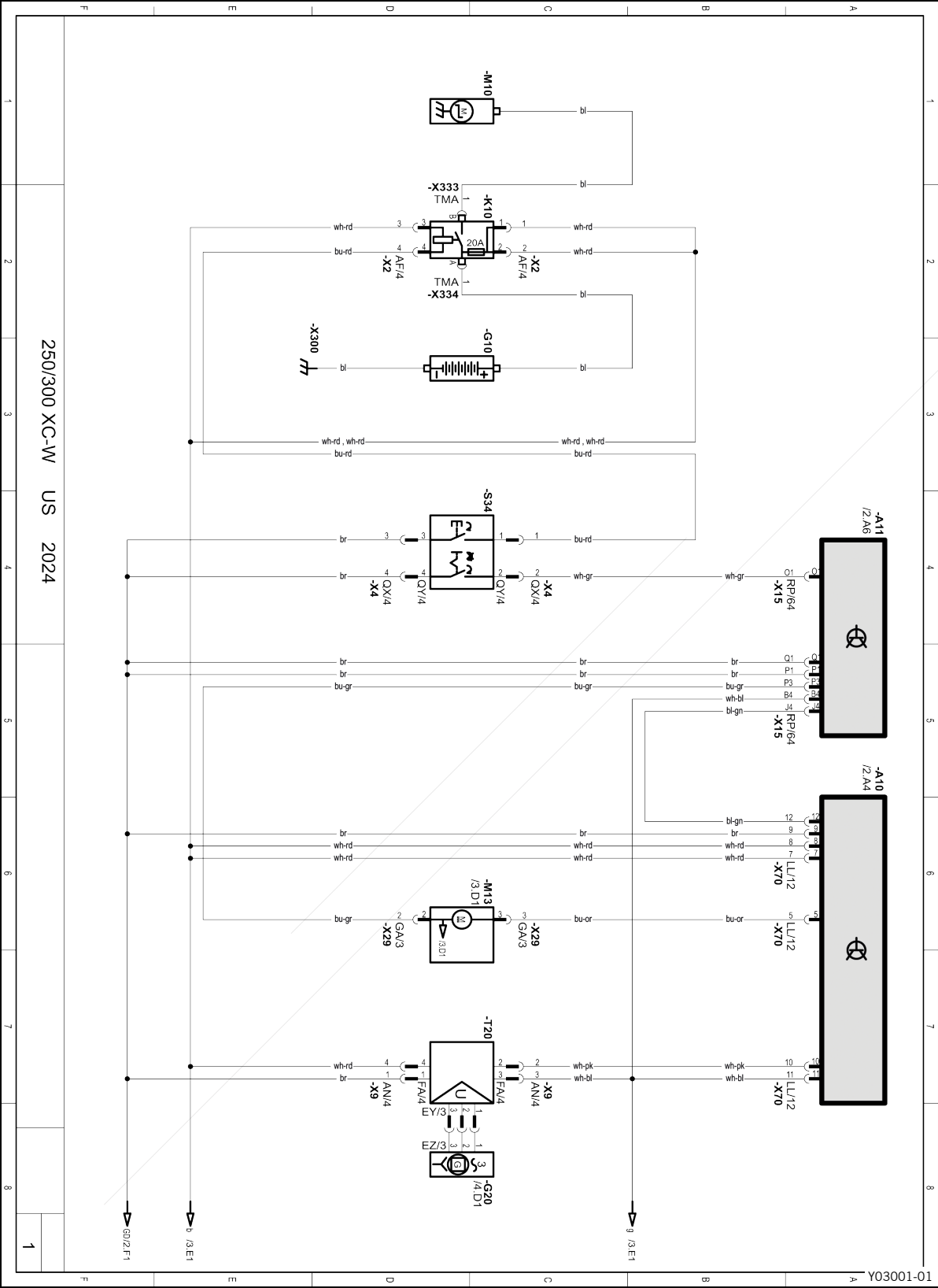


Components:

A11	Engine control unit
B12	Intake air temperature sensor
B13	Ambient air pressure sensor
B21	Coolant temperature sensor
B26	Tilt sensor
B37	Crankshaft speed sensor
B41	Induction manifold pressure sensor
B43	Throttle valve position sensor
B51	Lambda sensor (if installed)
M20	Fuel vapor valve
R51	Ignition coil

Cable colors:

bl	Black
br	Brown
bu	Blue
gn	Green
gr	Gray
lbu	Light blue
or	Orange
pk	Pink
pu	Violet
rd	Red
wh	White
ye	Yellow

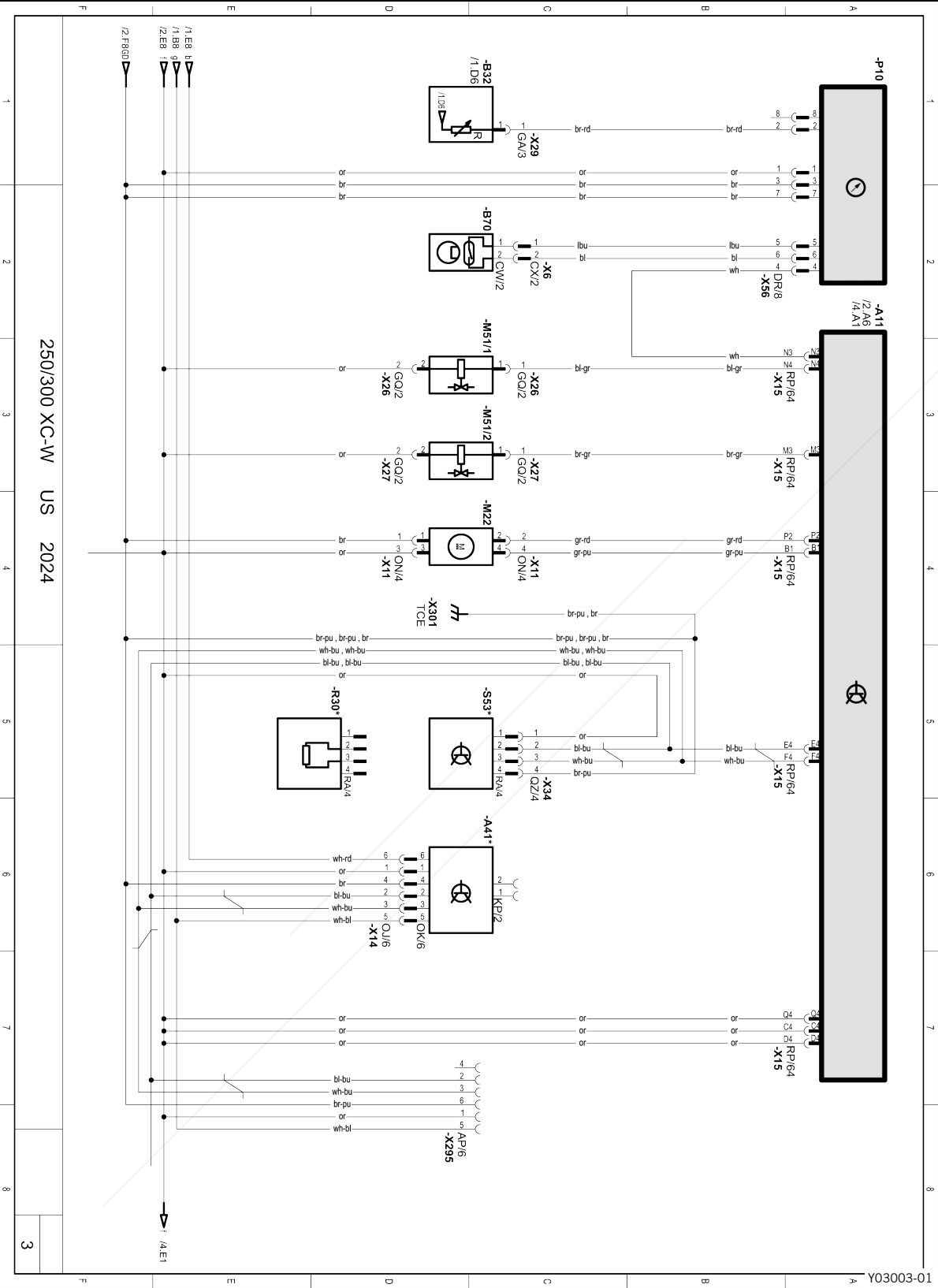


Components:

A10	Vehicle system control unit
A11	Engine control unit
G10	12-V battery
G20	Alternator
K10	Starter relay with main fuse
M10	Starter motor
M13	Fuel pump
S34	Combination switch, right
T20	Voltage regulator

Components:

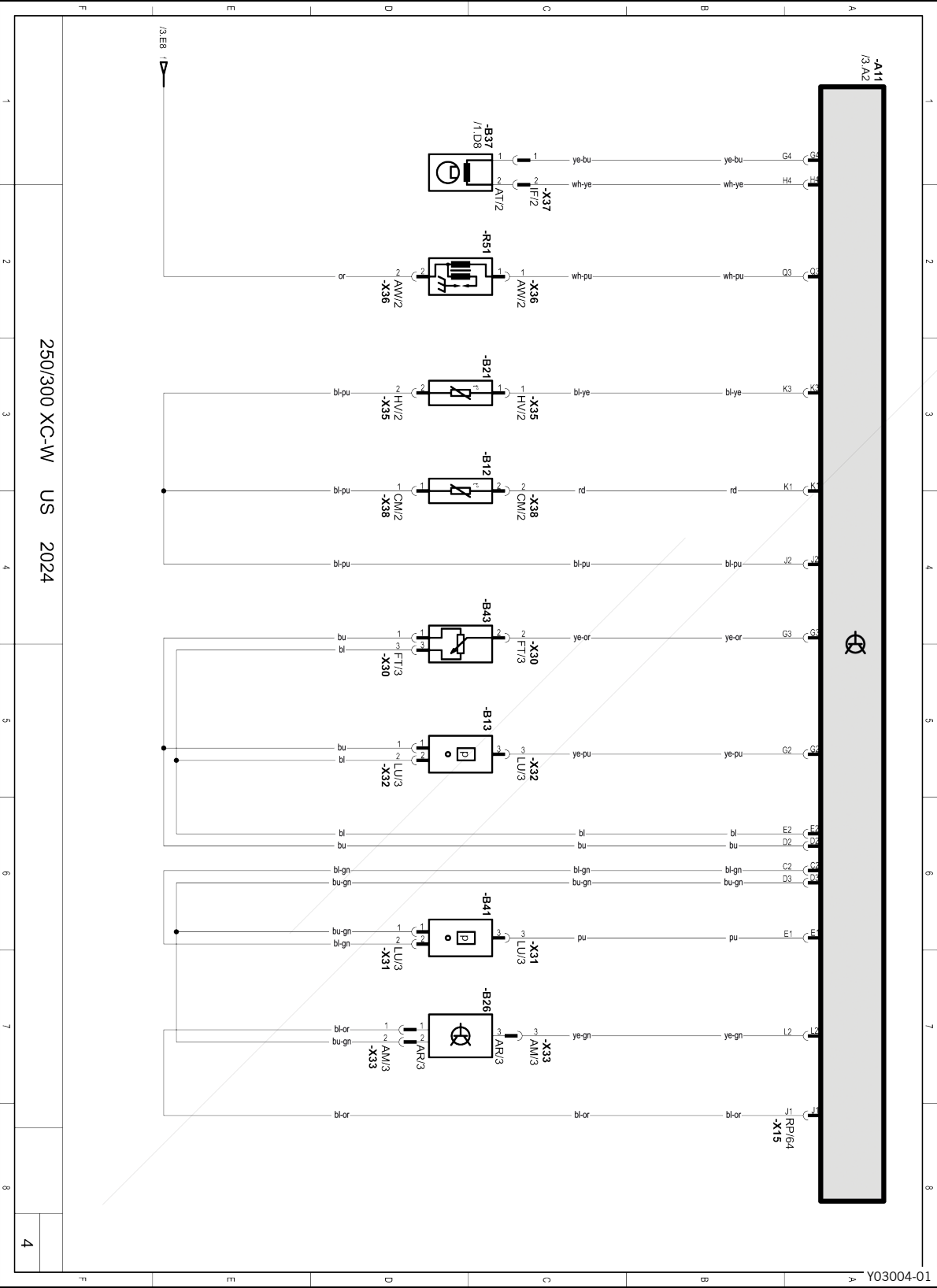
A10	Vehicle system control unit
A11	Engine control unit
B46	Oil level sensor
E75	Headlight unit
M14	Radiator fan (if installed)
M35	Oil pump
P27	Oil level warning lamp
P37	Tail light
S30	Light switch



Components:

A11	Engine control unit
A41	Connectivity Unit (if installed)
B32	Fuel level sensor
B70	Front wheel speed sensor
M22	Exhaust control actuator
M51/1	Injection valve 1, cylinder 1
M51/2	Injection valve 2, cylinder 1
P10	Combination instrument
R30	Terminating resistor (if installed)
S53	Map Select switch (if installed)
X295	Diagnostics connector

30.9 Page 4 of 4 (All XC-W models)



Components:

A11	Engine control unit
B12	Intake air temperature sensor
B13	Ambient air pressure sensor
B21	Coolant temperature
B26	Tilt sensor
B37	Crankshaft speed sensor
B41	Induction manifold pressure sensor
B43	Throttle valve position sensor
R51	Ignition coil

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)
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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. 335)
- SAE (📖 p. 335) (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. 335)

Guideline

- Only use high-grade 2-stroke engine oil from a reputable brand.

fully synthetic

Recommended supplier**MOTOREX®**

- Cross Power 2T

Fork oil (SAE 4) (48601166S1)**Standard/classification**

- SAE (📖 p. 335) (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. 335) (SAE 2.5)

Guideline

- Use only oils that comply with the specified standards (see specifications on the container) and that exhibit the corresponding properties.

Super unleaded (ROZ 95)**Standard/classification**

- DIN EN 228 (ROZ 95)

Guideline

- Only use super unleaded fuel that matches or is equivalent to the specified standard.
- Fuel with an ethanol content of up to 10% (E10 fuel) is safe to use.

**Info**

Do **not** use fuel containing methanol (e.g., M15, M85, M100) or more than 10% ethanol (e.g., E15, E25, E85, E100).

Air filter cleaner

Recommended supplier

MOTOREX®

- Racing Bio Dirt Remover

Chain cleaner

Recommended supplier

MOTOREX®

- Chain Clean

Fuel additive

Recommended supplier

MOTOREX®

- Fuel Stabilizer

High viscosity grease

Recommended supplier

SKF®

- LGHB 2

Long-life grease

Recommended supplier

MOTOREX®

- Bike Grease 2000

Lubricant (T14034)

Recommended supplier

WP Performance Systems

- WP Racing Grease IPR 2

Lubricant (T159)

Recommended supplier

Bel-Ray®

- MC-11®

Lubricant (T625)

Recommended supplier

Molykote®

- 33 Medium

Lubricant (T158)

Recommended supplier

Lubcon®

- Turmogrease® PP 300

Motorcycle cleaner

Recommended supplier

MOTOREX®

- Moto Clean

Off-road chain spray

Recommended supplier

MOTOREX®

- Chainlube Offroad

Oil for foam air filter

Recommended supplier

MOTOREX®

- Racing Bio Liquid Power

Preserving materials for paints, metal and rubber

Recommended supplier

MOTOREX®

- Moto Protect

Silicone spray

Recommended supplier

MOTOREX®

- Silicone Spray

Special cleaner for glossy and matte paint finishes, metal and plastic surfaces

Recommended supplier

MOTOREX®

- Quick Cleaner

Special grease (00062010053)

Recommended supplier

Klüber Lubrication®

- Klüberfood NH1 34-401

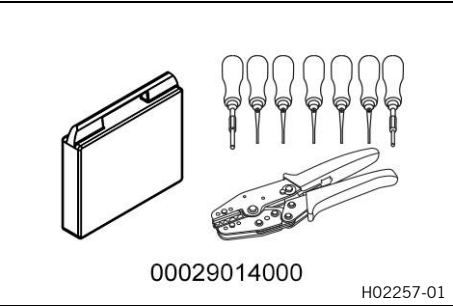
Universal oil spray

Recommended supplier

MOTOREX®

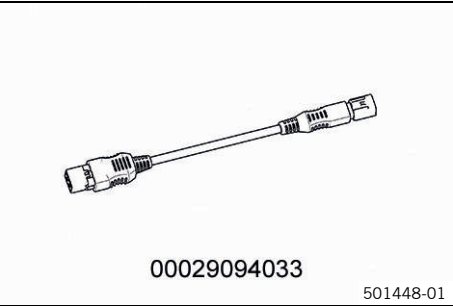
- Joker 440 Synthetic

Cable connector unlocking kit



Art. no.: 00029014000

Diagnostics adapter cable



Art. no.: 00029094033

Feature

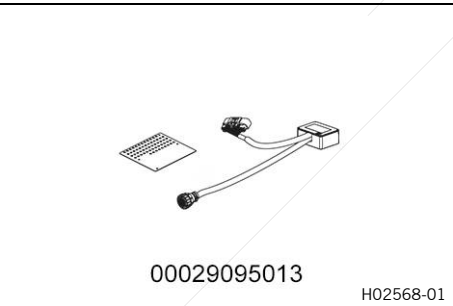
Length approx.	25.8 cm (10.16 in)
----------------	--------------------

Break out box

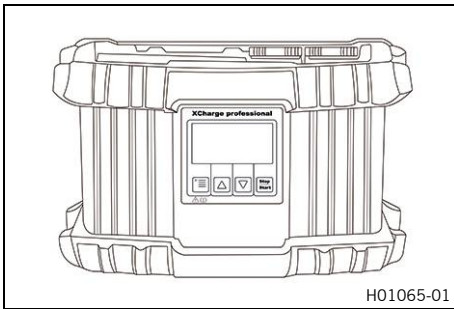


Art. no.: 00029095001

Adapter and template M3C



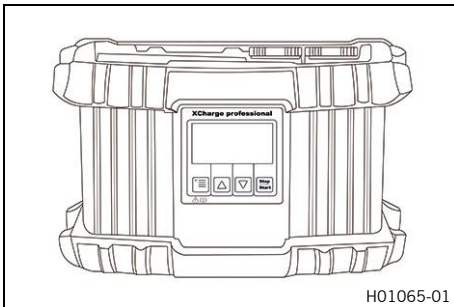
Art. no.: 00029095013

EU battery charger XCharge-professional

Art. no.: 00029095050

Feature

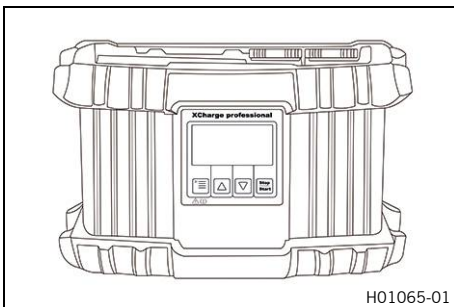
EU safety plug	
Nominal voltage	230 V
Mains fuse	16 A
Power cable length approx.	5 m (16 ft)
Charger cable length approx.	5 m (16 ft)

US battery charger XCharge-professional

Art. no.: 00029095051

Feature

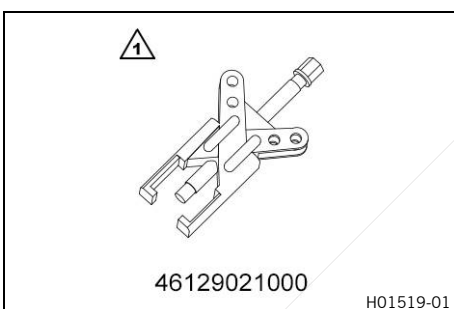
US plug	
Nominal voltage	120 V
Mains fuse	32 A
Power cable length approx.	5 m (16 ft)
Charger cable length approx.	5 m (16 ft)

UK battery charger XCharge-professional

Art. no.: 00029095052

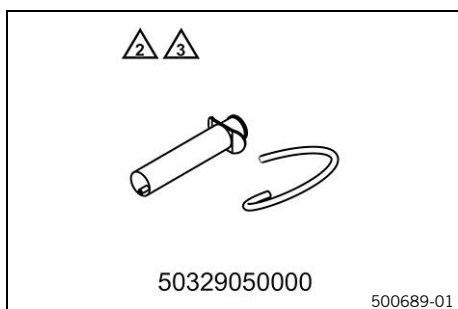
Feature

UK safety plug	
Nominal voltage	230 V
Mains fuse	16 A
Power cable length approx.	5 m (16 ft)
Charger cable length approx.	5 m (16 ft)

Puller

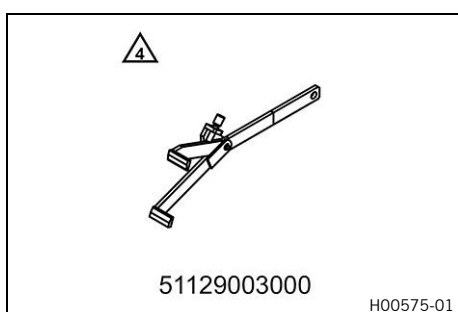
Art. no.: 46129021000

Syringe



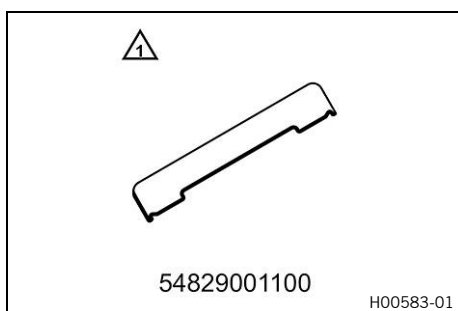
Art. no.: 50329050000

Holding wrench



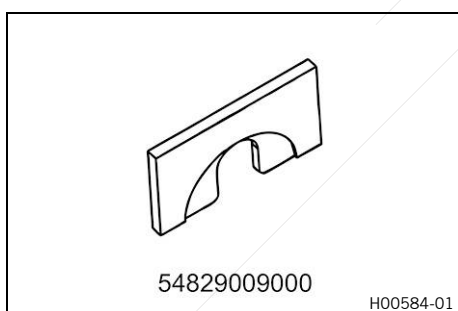
Art. no.: 51129003000

Setting gauge

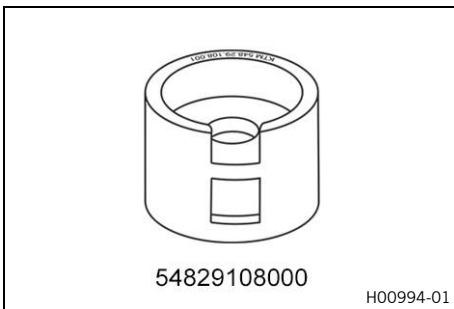


Art. no.: 54829001100

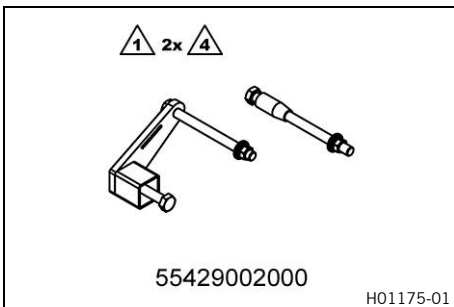
Separator plate



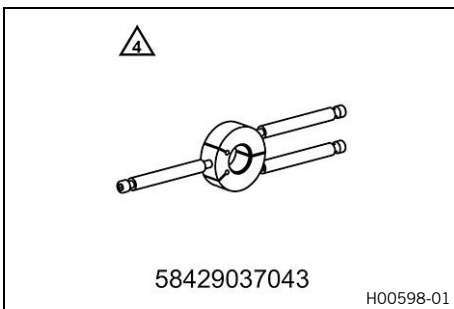
Art. no.: 54829009000

Insert for crankshaft pressing tool

Art. no.: 54829108000

Holder and fitting for work stand

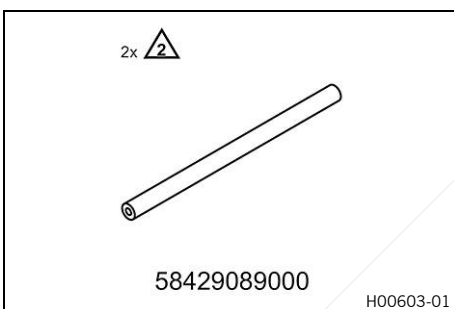
Art. no.: 55429002000

Puller

Art. no.: 58429037043

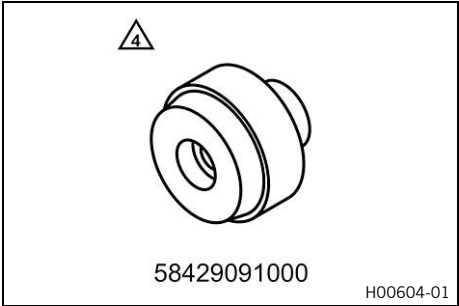
Feature

Inside diameter	43.9 mm (1.728 in)
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Tool bracket

Art. no.: 58429089000

Pressing tool



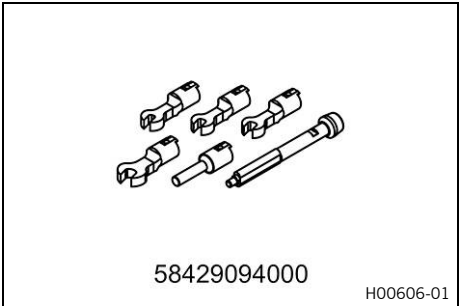
Art. no.: 58429091000

Pressing tool



Art. no.: 58429092000

Torque wrench kit

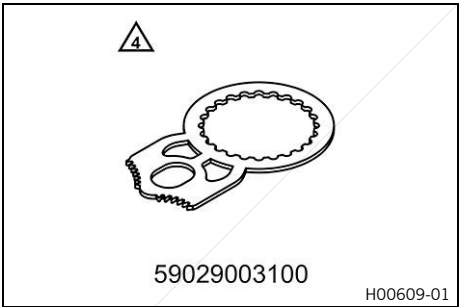


Art. no.: 58429094000

Feature

Torque	3 ... 15 Nm (2.2 ... 11.1 lbf ft)
Open ended bit	3.9 mm (0.154 in)
Open ended bit	4.9 mm (0.193 in)
Open ended bit	5.5 mm (0.217 in)
Open ended bit	6.0 mm (0.236 in)
Open ended bit	6.8 mm (0.268 in)
Bit diameter	5.9 mm (0.232 in)

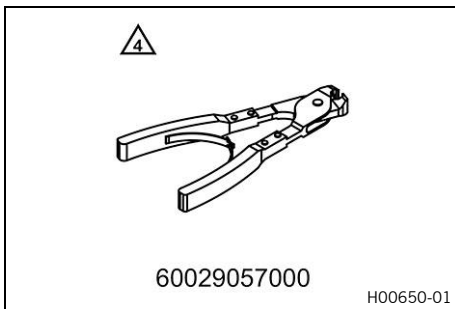
Holding wrench



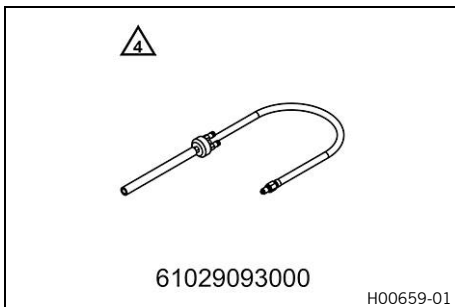
Art. no.: 59029003100

Hose clamp pliers

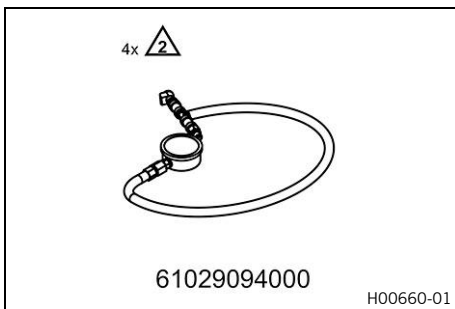
Art. no.: 60029057000

**Testing hose**

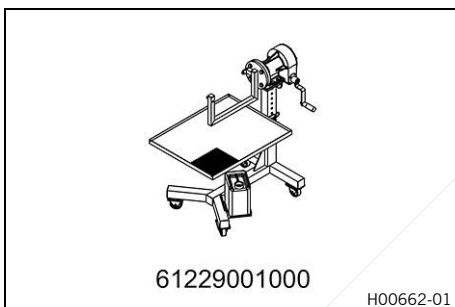
Art. no.: 61029093000

**Pressure testing tool**

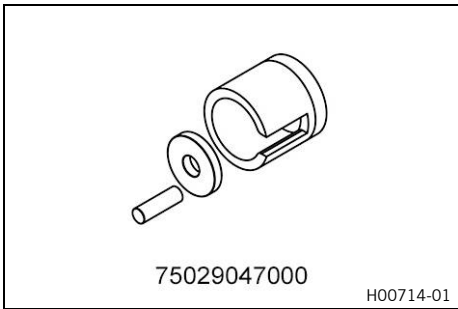
Art. no.: 61029094000

**Engine work stand**

Art. no.: 61229001000

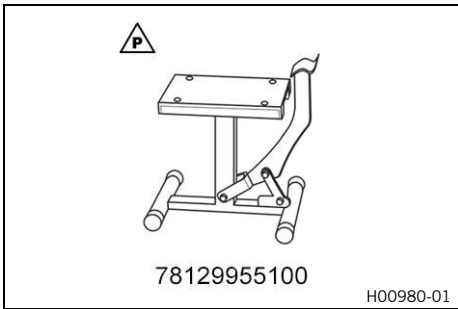


Crankshaft pressing tool



Art. no.: 75029047000

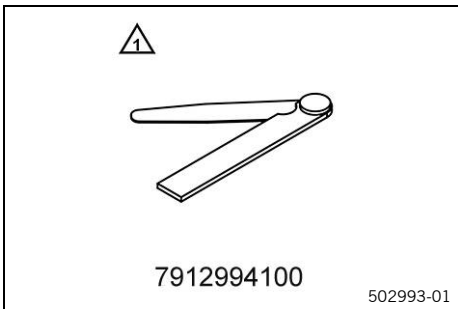
Lift stand



Art. no.: 78129955100

Feature	
Height	315 ... 425 mm (12.4 ... 16.73 in)
Load	≤ 150 kg (≤ 331 lb.)

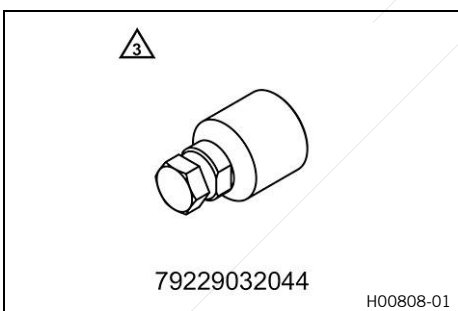
Feeler gauge



Art. no.: 79129941000

Feature	
20 pieces	0.05 ... 1.00 mm (0.002 ... 0.0394 in)

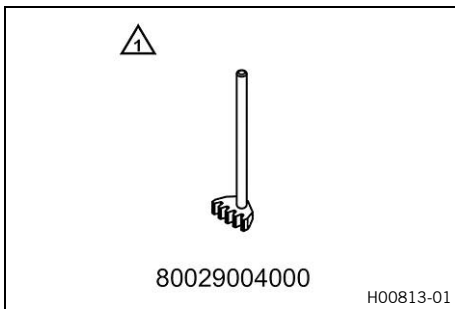
Puller



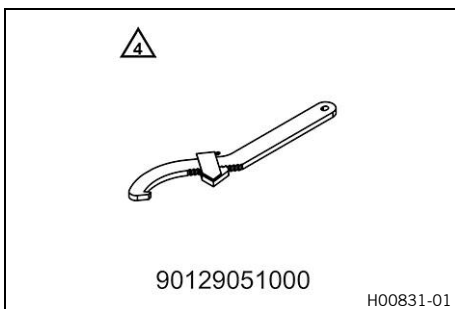
Art. no.: 79229032044

Gear segment

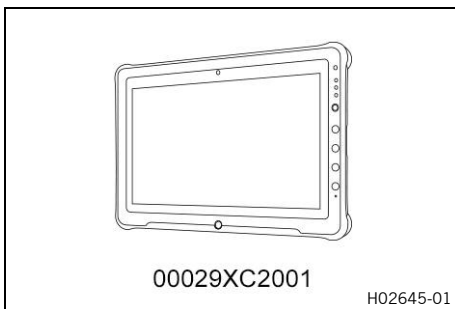
Art. no.: 80029004000

**Hook wrench**

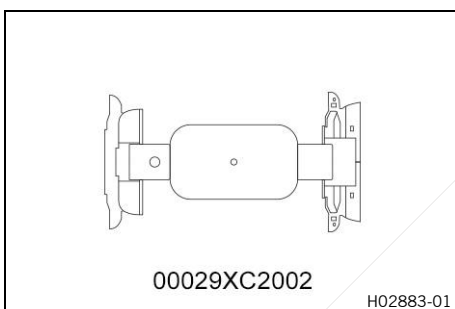
Art. no.: 90129051000

**Diagnostics tablet**

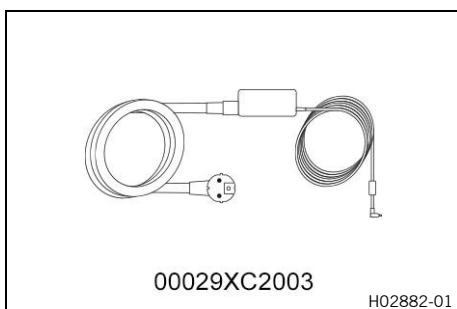
Art. no.: 00029XC2001

**Hand strap**

Art. no.: 00029XC2002

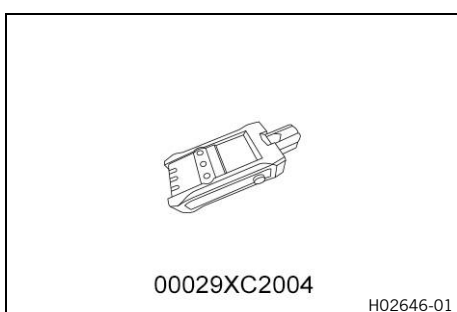


Battery charger



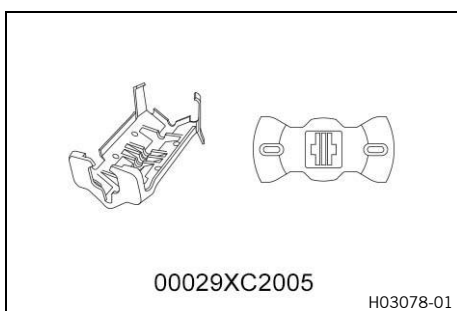
Art. no.: 00029XC2003

VCI



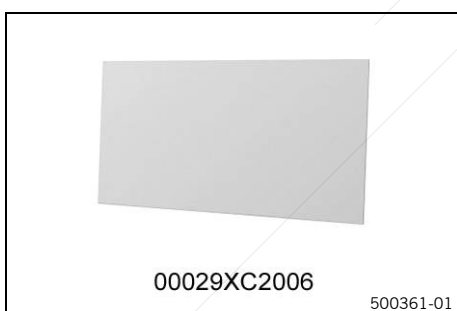
Art. no.: 00029XC2004

VCI attachment

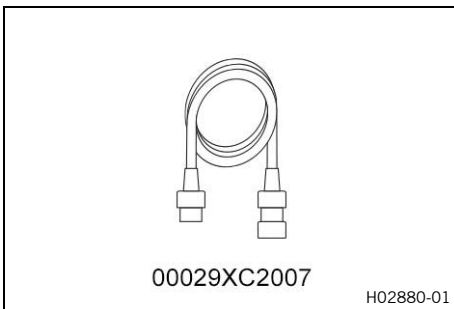


Art. no.: 00029XC2005

Protective film



Art. no.: 00029XC2006

Diagnostics cable extension

Art. no.: 00029XC2007

Feature

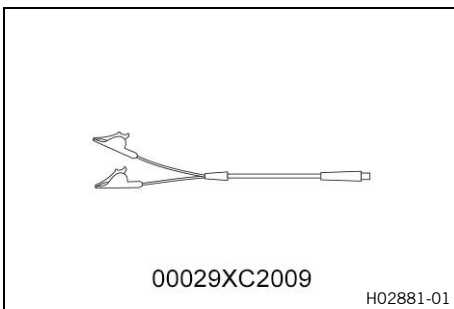
Length approx.	1.15 m (3.77 ft)
----------------	------------------

USB cable

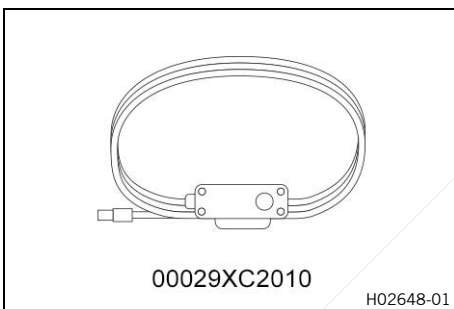
Art. no.: 00029XC2008

Feature

Length approx.	5 m (16 ft)
----------------	-------------

12-V power supply cable

Art. no.: 00029XC2009

RideRecorder trigger

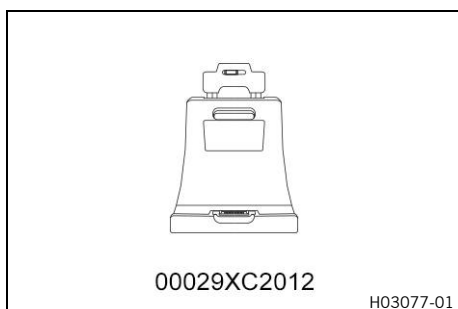
Art. no.: 00029XC2010

Case



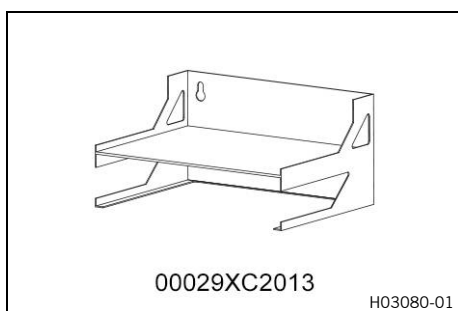
Art. no.: 00029XC2011

Docking station



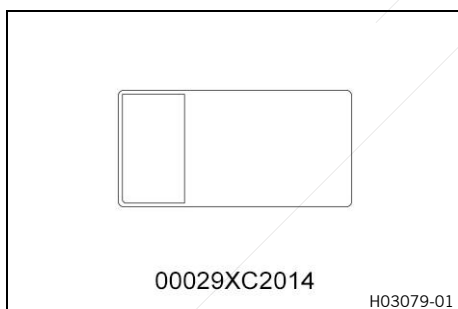
Art. no.: 00029XC2012

Wall attachment



Art. no.: 00029XC2013

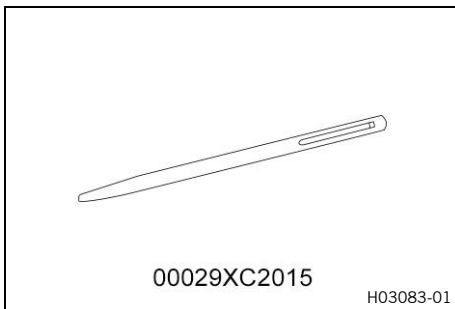
Battery



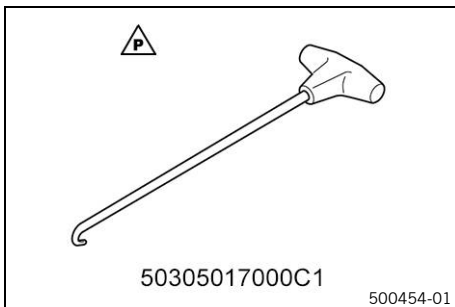
Art. no.: 00029XC2014

Input stylus

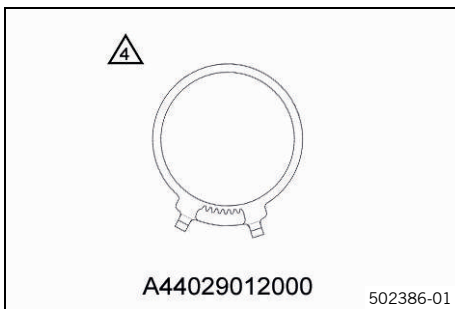
Art. no.: 00029XC2015

**Spring hook**

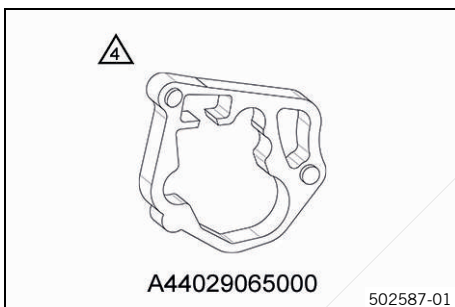
Art. no.: 50305017000C1

**Holding wrench**

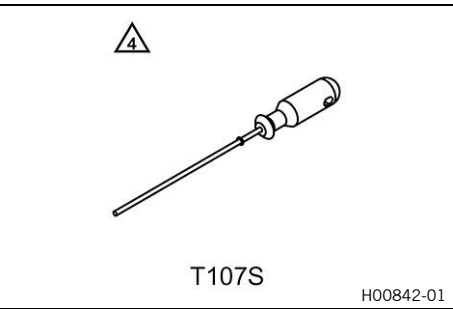
Art. no.: A44029012000

**Retaining bracket**

Art. no.: A44029065000

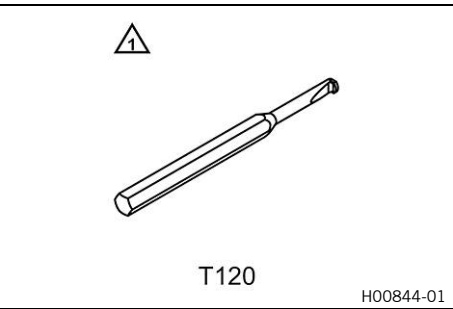


Depth micrometer



Art. no.: T107S

Drift

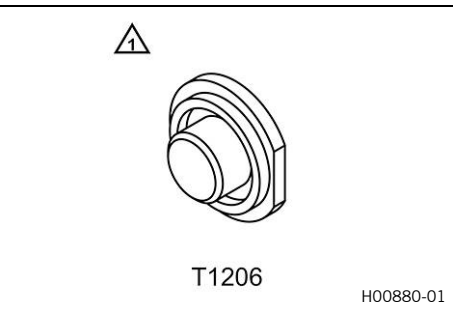


Art. no.: T120

Feature

Diameter	8 mm (0.31 in)
----------	----------------

Pressing tool

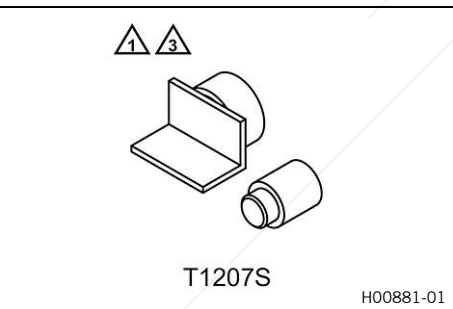


Art. no.: T1206

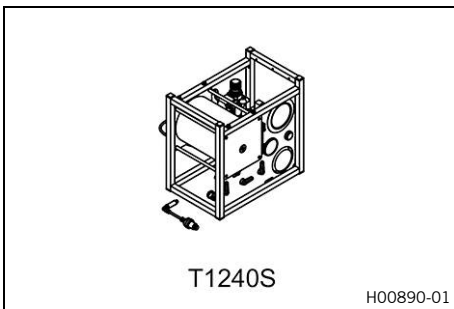
Feature

Diameter	15 ... 30 mm (0.59 ... 1.18 in)
----------	---------------------------------

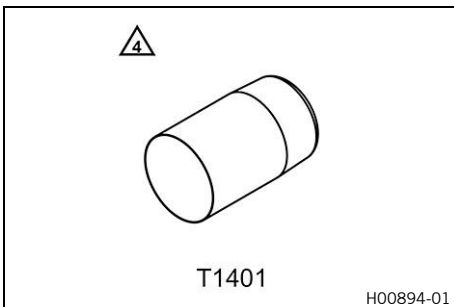
Pressing tool



Art. no.: T1207S

Vacuum pump

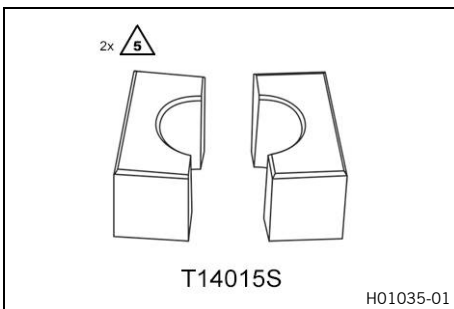
Art. no.: T1240S

Protecting sleeve

Art. no.: T1401

Feature

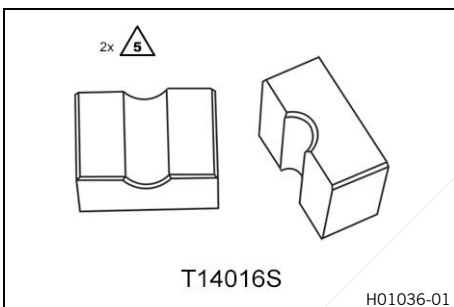
Diameter	48 mm (1.89 in)
----------	-----------------

Clamping stand

Art. no.: T14015S

Feature

Diameter	27 mm (1.06 in)
----------	-----------------

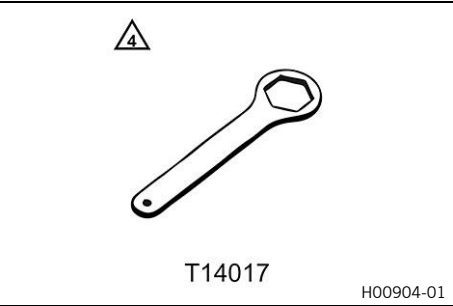
Clamping stand

Art. no.: T14016S

Feature

Diameter	12 mm (0.47 in)
----------	-----------------

Ring wrench

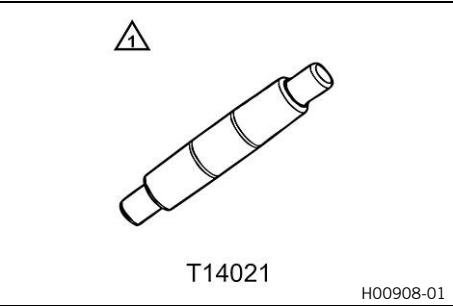


Art. no.: T14017

Feature

Hexagonal part	50 mm (1.97 in)
----------------	-----------------

Calibrating unit

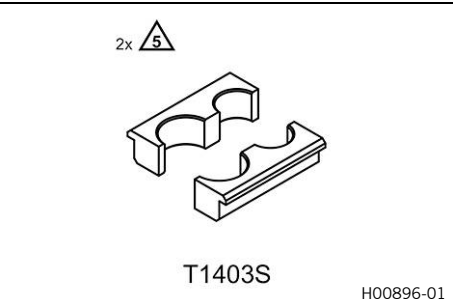


Art. no.: T14021

Feature

Diameter	12 mm (0.47 in)
----------	-----------------

Clamping stand

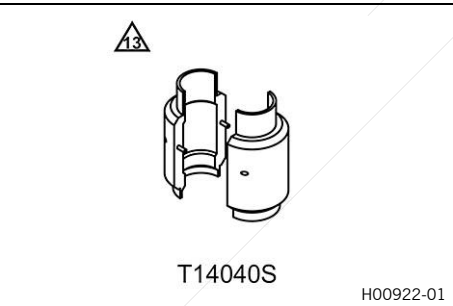


Art. no.: T1403S

Feature

Diameter	48 mm (1.89 in)
Diameter	60 mm (2.36 in)

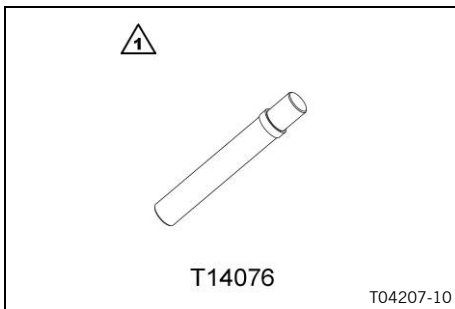
Mounting tool



Art. no.: T14040S

Feature

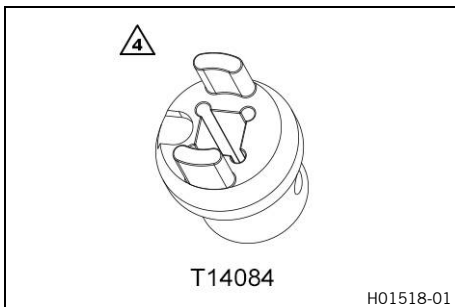
Diameter	48 mm (1.89 in)
----------	-----------------

Pressing tool

Art. no.: T14076

Feature

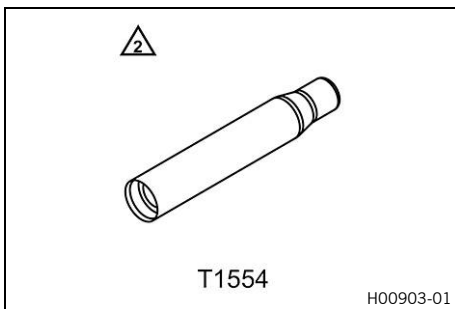
Diameter	11.95 ... 14 mm (0.4705 ... 0.55 in)
----------	--------------------------------------

Special socket

Art. no.: T14084

Feature

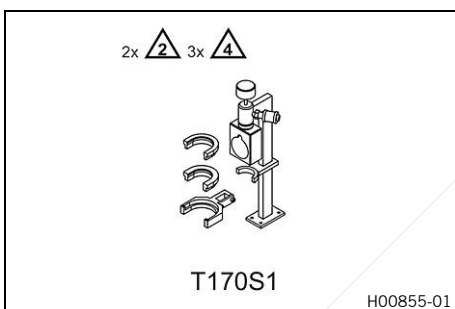
Drive	1/2 in
Diameter	24 mm (0.94 in)

Mounting sleeve

Art. no.: T1554

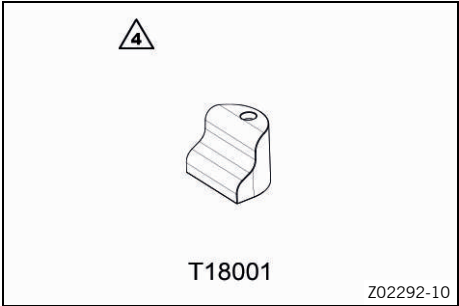
Feature

Diameter	18 mm (0.71 in)
----------	-----------------

Filling tool

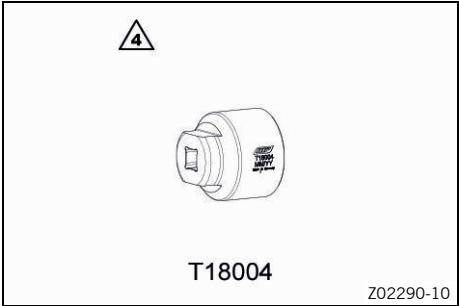
Art. no.: T170S1

Filling adapter



Art. no.: T18001

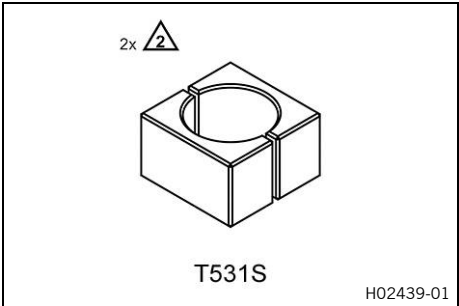
Socket



Art. no.: T18004

Feature	
Drive	1/2 in

Clamping stand



Art. no.: T531S

Feature	
Diameter	38 mm (1.5 in)

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.

35 LIST OF ABBREVIATIONS

Art. no.	Article number
ca.	circa
cf.	compare
e.g.	for example
etc.	et cetera
i.a.	inter alia
no.	number
poss.	possibly

1	
12-V battery	
charging	135
negative cable, connecting	133
12-V battery	
installing	134
negative cable, disconnecting	132
removing	133
2	
2-stroke oil level	
checking	263
2-stroke oil tank cap	
closing	264
opening	263
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