

890 ADVENTURE R



890 ADVENTURE R EU
890 ADVENTURE R US
890 ADVENTURE R ASEAN
890 ADVENTURE R CN

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1 MEANS OF REPRESENTATION

1.1 Symbols used

The meaning of specific symbols is described below.



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



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



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



Indicates information with more details or tips.



Indicates the result of a testing step.



Indicates a voltage measurement.



Indicates a current measurement.



Indicates a resistance measurement.



Indicates the end of an activity including potential rework.

1.2 Formats used

The typographical formats used in this document are explained below.

Proprietary name

Indicates a proprietary name.

Name®

Indicates a protected name.

Brand™

Indicates a brand available on the open market.

Underlined terms

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

2.1 Repair Manual

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

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

2.2 Safety advice

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



Info

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

2.3 Degrees of risk and symbols



Danger

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



Warning

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



Caution

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

Note

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



Note

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

2.4 Work rules

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

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

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.

2 SAFETY ADVICE

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

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

3.1 Manufacturer warranty, implied warranty

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

3.2 Fuel, auxiliary substances



Note

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

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

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

3.3 Spare parts, technical accessories

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

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

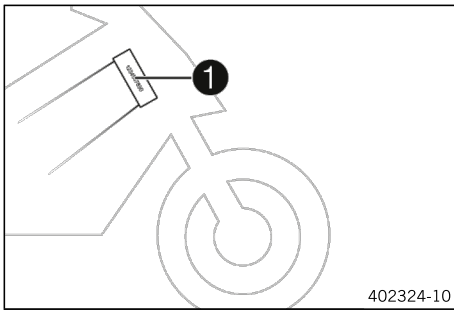
3.4 Figures

The figures contained in the manual may depict special equipment.

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

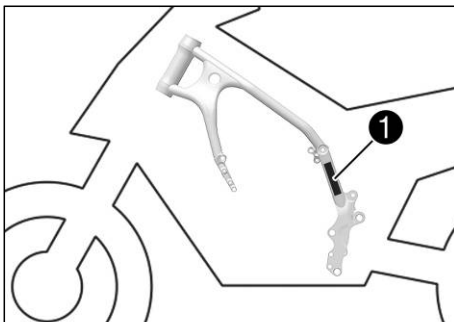
4 SERIAL NUMBERS

4.1 Vehicle identification number



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

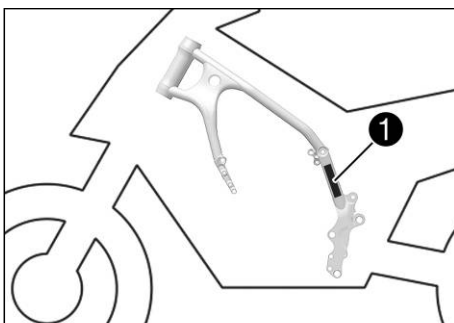
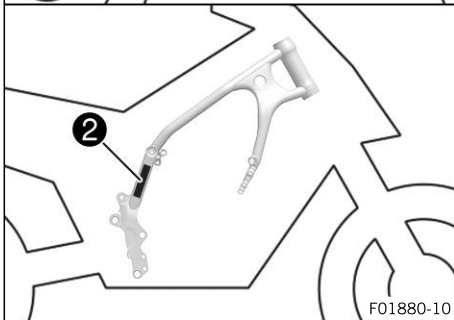
4.2 Type label



(EU/ASEAN/CN)

The type label **1** is located on the frame on the left.

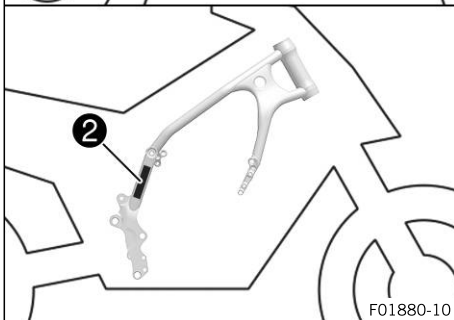
The type label for Australia **2** is located on the frame on the right.



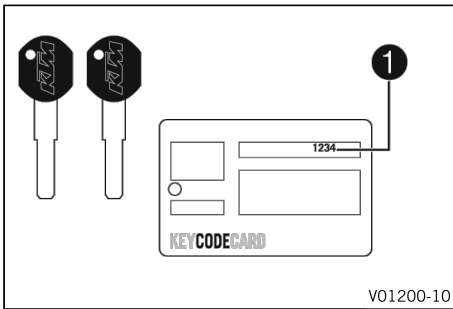
(US)

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

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



4.3 Key number



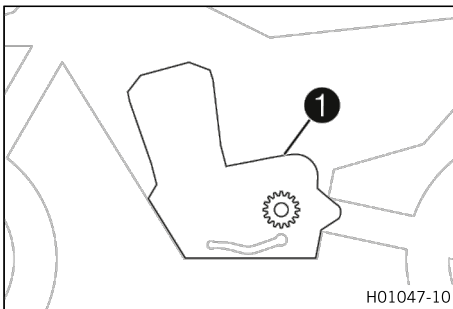
The key number **1** can be found on the **KEYCODECARD**.



Info

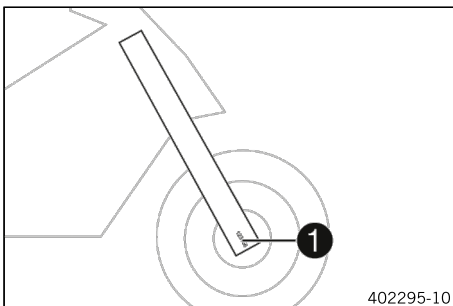
You need the key number to order a spare key. Keep the **KEYCODECARD** in a safe place.

4.4 Engine number



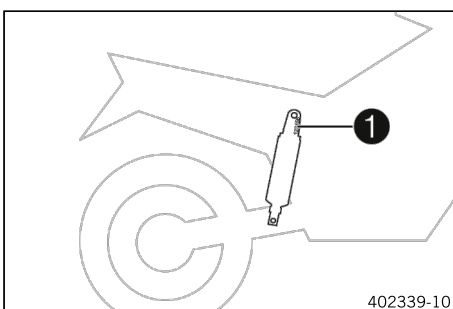
The engine number **1** is stamped onto the engine case at the top.

4.5 Fork part number



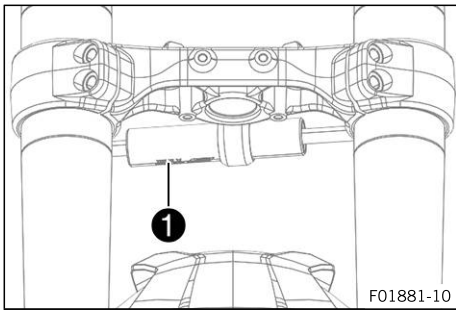
The fork part number **1** is stamped on the inner side of the fork stub.

4.6 Shock absorber article number



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

4.7 Steering damper article number



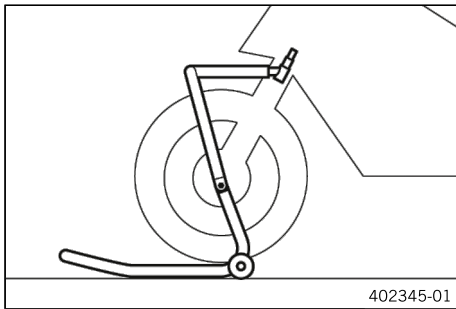
Steering damper article number **1** is embossed on the underside of the steering damper.

5.1 Lifting the motorcycle with the front lifting gear

Note

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

- Park the vehicle on a firm and level surface.



Preparatory work

- Raise motorcycle with rear lifting gear. (📖 p. 15)
- Remove the front fender. (📖 p. 144)

Main work

- Move the handlebar to the straight-ahead position.
- Use suitable lifting gear when attaching the steering stem.
- Align the front lifting gear with the fork legs.



Info

Always raise the motorcycle at the rear first.

- Lift the motorcycle at the front.

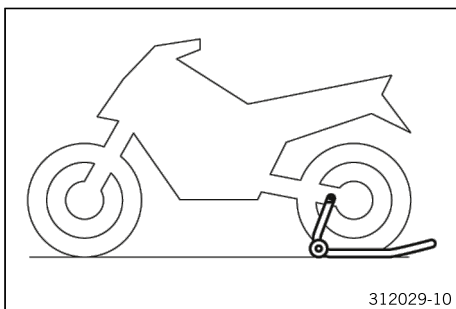


5.2 Taking the motorcycle off the front lifting gear

Note

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

- Park the vehicle on a firm and level surface.



Main work

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

Finishing work

- Install the front fender. (📖 p. 145)

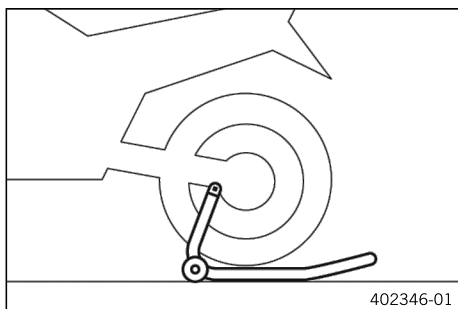


5.3 Raising the motorcycle with rear lifting gear

Note

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

- Park the vehicle on a firm and level surface.



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

Retaining adapter (61029955144) (📖 p. 467)

Rear wheel work stand (69329955000) (📖 p. 471)

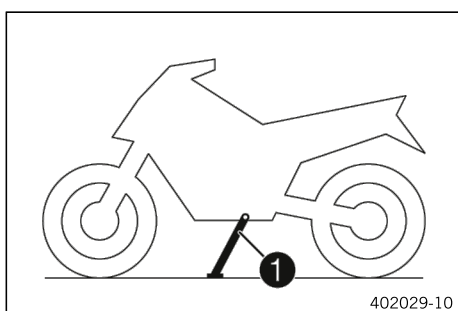
- Stand motorcycle upright, align lifting gear to the link fork with the adapters, and raise motorcycle.

5.4 Removing the rear of the motorcycle from the lifting gear

Note

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

- Park the vehicle on a firm and level surface.



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

5.5 Raising the motorcycle with the work stand (center)

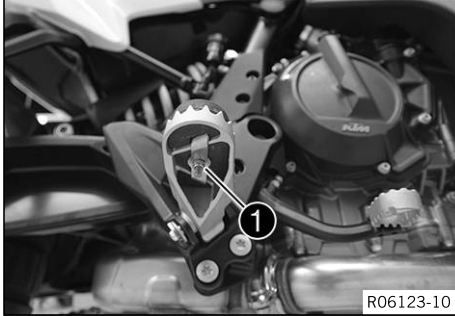
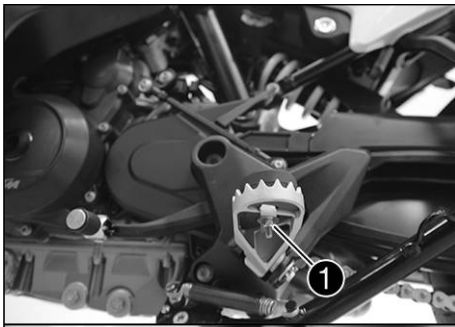
Note

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

- Park the vehicle on a firm and level surface.

Preparatory work

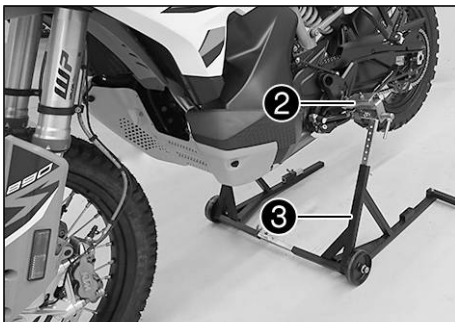
- Remove main silencer. (📖 p. 106)



Main work

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

R06123-10



- Mount special tool ②.

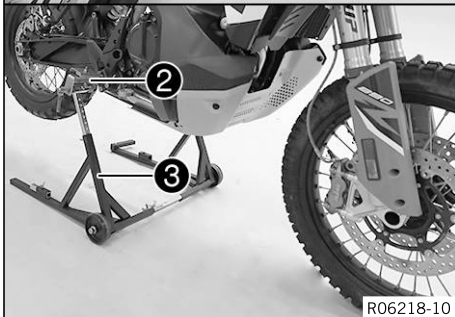
Work stand attachments (75029036000) (📖 p. 472)

- Repeat these steps on the opposite side.

- Mount special tool ③.

Work stand (62529055200) (📖 p. 469)

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



R06218-10

5.6 Removing the motorcycle from the work stand (center)

Note

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

- Park the vehicle on a firm and level surface.

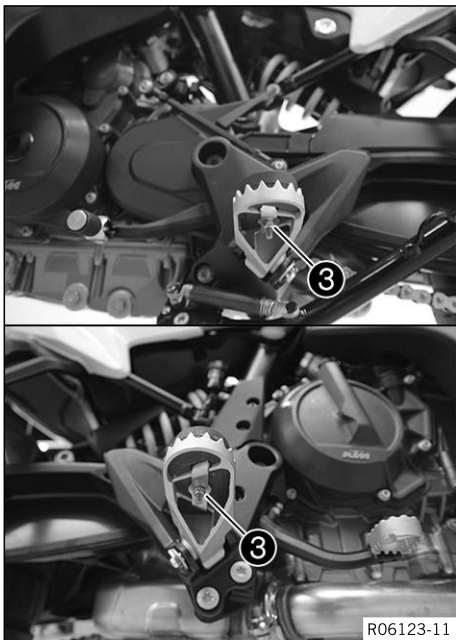


Main work

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

Work stand (62529055200) (📖 p. 469)

Work stand attachments (75029036000) (📖 p. 472)



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

Guideline

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

- Repeat these steps on the opposite side.

Finishing work

- Install the main silencer. (📖 p. 106)

5.7 Raising the motorcycle at the front using the work stand

Note

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

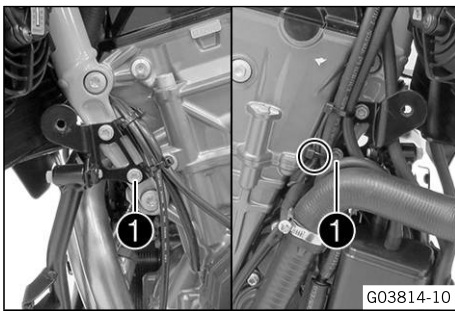
- Park the vehicle on a firm and level surface.

Preparatory work

- Remove the seat. (📖 p. 120)
- Remove the left side cover. (📖 p. 137)
- Remove the battery cover. (📖 p. 138)
- Remove left fuel tank spoiler. (📖 p. 139)
- Remove the right side cover. (📖 p. 137)
- Remove right fuel tank spoiler. (📖 p. 141)
- Remove the engine guard. (📖 p. 143)
- Remove the fuel tank. (📖 p. 120)

Main work

- Remove the cable ties.
- Remove screws ❶.



- Mount the special tool.

Work stand (62529055200) (📖 p. 469)

- Stand the motorcycle upright, align the special tool, and raise the motorcycle.

5.8 Removing the motorcycle from the work stand at the front

Note

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

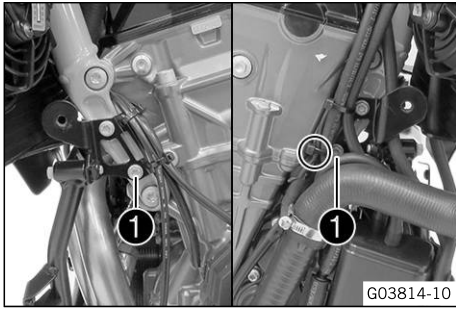
- Park the vehicle on a firm and level surface.

Main work

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

Work stand (62529055200) (📖 p. 469)





- Mount and tighten screws ①.

Guideline

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

- Mount the cable ties.

Finishing work

- Install the fuel tank. (📖 p. 123)
- Install the engine guard. (📖 p. 143)
- Install the right fuel tank spoiler. (📖 p. 142)
- Install the right side cover. (📖 p. 138)
- Install the left fuel tank spoiler. (📖 p. 140)
- Install the battery cover. (📖 p. 139)
- Install the left side cover. (📖 p. 137)
- Mount the seat. (📖 p. 120)

5.9 Starting the vehicle



Danger

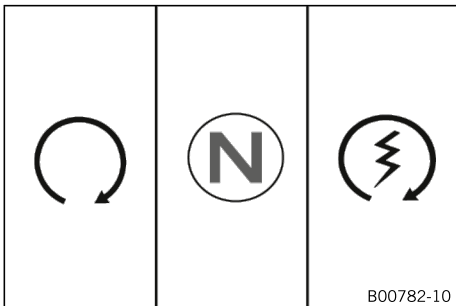
Danger of poisoning Exhaust gases are toxic and inhaling them may result in unconsciousness and death.

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

Note

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

- Always run the engine warm at a low speed.



- Take the motorcycle off the side stand and sit on the motorcycle.
- Make sure that the start button/emergency OFF switch is in the middle position ○.
- Switch on the ignition by turning the ignition key to the position ○.

Guideline

To avoid malfunctions in the control unit communication, do not switch the ignition off and on in rapid succession.

- ✓ After you switch on the ignition, you can hear the fuel pump working for about two seconds. The function check of the combination instrument is run at the same time.
- ✓ The ABS warning lamp lights up and goes back out after starting off.
- Shift the transmission into neutral **N**.
- ✓ The green idle indicator lamp **N** lights up.
- Briefly press the start button/emergency OFF switch into the lower position Ⓣ.



Info

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

Do not open the throttle to start.

If the starting attempt is unsuccessful, wait for 15 seconds before making another attempt at starting.

After 6 unsuccessful starting attempts, do not try again, and check the vehicle for other malfunctions instead.

This motorcycle is equipped with a safety starting system. You can only start the engine if the transmission is in neutral or if the clutch lever is pulled when a gear is engaged. If the side stand is folded out and you shift into gear and release the clutch lever, the engine stops.



5.10 Starting the motorcycle to check the function



Danger

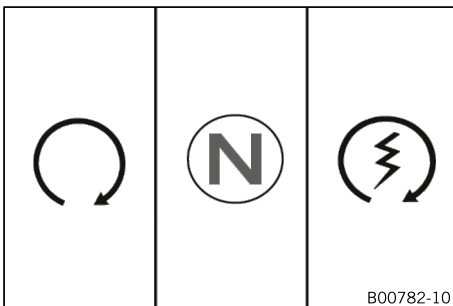
Danger of poisoning Exhaust gases are toxic and inhaling them may result in unconsciousness and death.

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



Info

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



- Make sure that the start button/emergency OFF switch is in the middle position O.
- Switch on the ignition by turning the ignition key to the position O.

Guideline

To avoid malfunctions in the control unit communication, do not switch the ignition off and on in rapid succession.

- Shift the transmission into neutral N.
- Briefly press the start button/emergency OFF switch into the lower position ③.



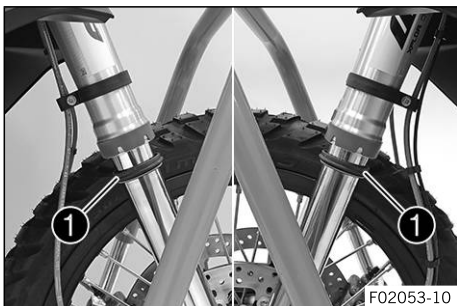
Info

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

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



6.1 Cleaning the dust boots of the fork legs



Preparatory work

- Raise motorcycle with rear lifting gear. (📖 p. 15)
- Remove the front fender. (📖 p. 144)
- Lift the motorcycle with the front lifting gear. (📖 p. 15)

Main work

- Push dust boots ❶ 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 inside fork tubes of both fork legs.

Universal oil spray (📖 p. 461)

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

Finishing work

- Take the motorcycle off the front lifting gear. (📖 p. 15)
- Install the front fender. (📖 p. 145)
- Remove the rear of the motorcycle from the lifting gear. (📖 p. 16)

6.2 Adjusting the compression damping of the fork

Info

The hydraulic compression damping determines the fork suspension behavior.



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

Info

The adjusting screw ❶ is located at the upper end of the left fork leg.

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

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

Guideline

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

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



6.3 Adjusting the rebound damping of the fork

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



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

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

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

Guideline

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

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

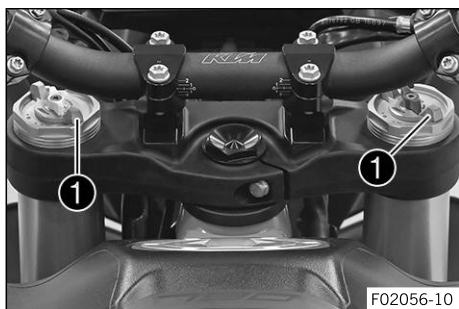


6.4 Adjusting the spring preload of the fork

Preparatory work

- Raise motorcycle with rear lifting gear. (📖 p. 15)
- Remove the front fender. (📖 p. 144)
- Lift the motorcycle with the front lifting gear. (📖 p. 15)

6 FORK, TRIPLE CLAMP



Main work

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



Info

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

- Turn the T-grips clockwise.

Guideline

Spring preload - Preload Adjuster	
Comfort	+0
Standard	+0
Sport	+0
Full payload	+3

- ✓ The T-grips engage noticeably at the numerical values.



Info

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

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

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

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

Finishing work

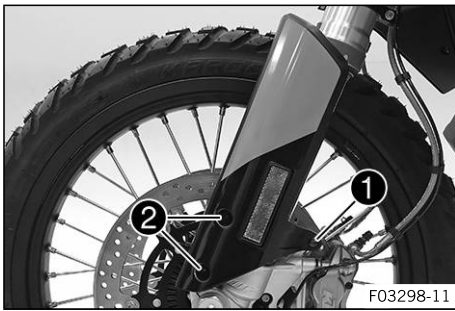
- Take the motorcycle off the front lifting gear. (📖 p. 15)
- Install the front fender. (📖 p. 145)
- Remove the rear of the motorcycle from the lifting gear. (📖 p. 16)

6.5 Removing fork protector



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

6.6 Installing the fork protector



- Position the fork protector. Mount screw **1**, but do not tighten yet.

Guideline

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

- Mount screws **2**, but do not tighten yet.

Guideline

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

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

- Tighten all screws of the fork protector.

Guideline

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

- Repeat these steps on the opposite side.



6.7 Removing the fork legs

Preparatory work

- Remove main silencer. (📖 p. 106)
- Raise motorcycle with the work stand (center). (📖 p. 16)
- Remove fork protector. (📖 p. 24)
- Place a load on the rear of the vehicle.
- ✓ The front wheel is not in contact with the ground.

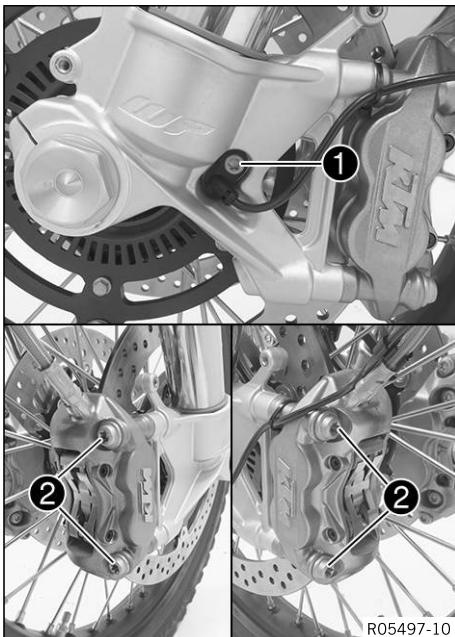
Main work

- Remove screw **1**.
- Hang the wheel speed sensor to the side.
- Remove screws **2**.
- Press back the brake linings by slightly tilting the brake calipers laterally on to the brake discs. Pull brake calipers carefully back from the brake discs and hang to the side.

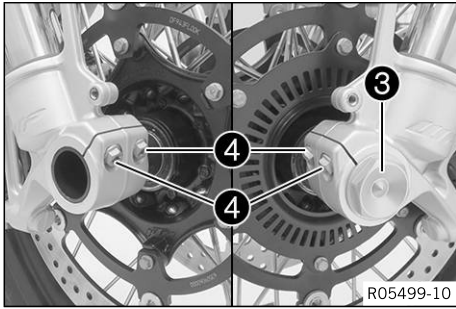


Info

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



6 FORK, TRIPLE CLAMP



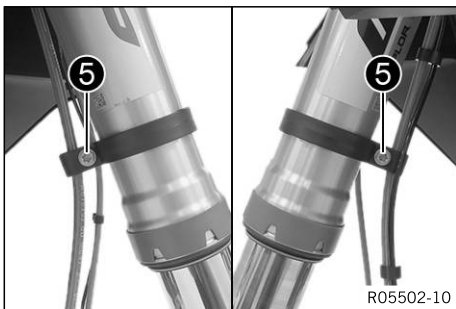
- Loosen screw ③ by several rotations.
- Loosen screws ④.
- Press on screw ③ to push the wheel spindle out of the axle clamp.
- Remove screw ③.



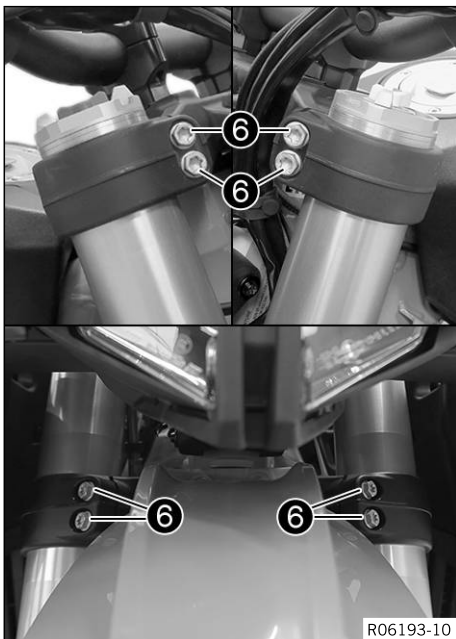
Warning

Danger of accidents Damaged brake discs reduce the braking effect.

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



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



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

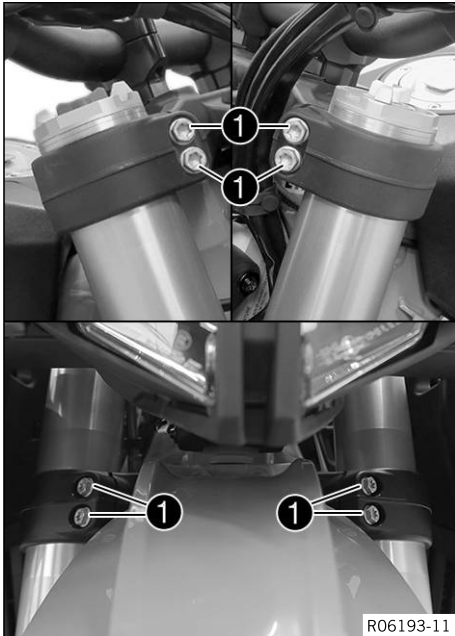
6.8 Installing the fork legs



Warning

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

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

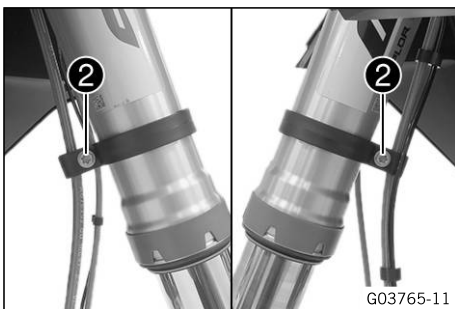


Main work

- Push the fork legs into the triple clamps.
 - ✓ The bleeder screws face forward.
 - ✓ The left-hand fork leg has a white adjuster; the right-hand fork leg has a red adjuster.
- Align the fork legs in the required position using the fork rings.
- Tighten screws ①.

Guideline

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

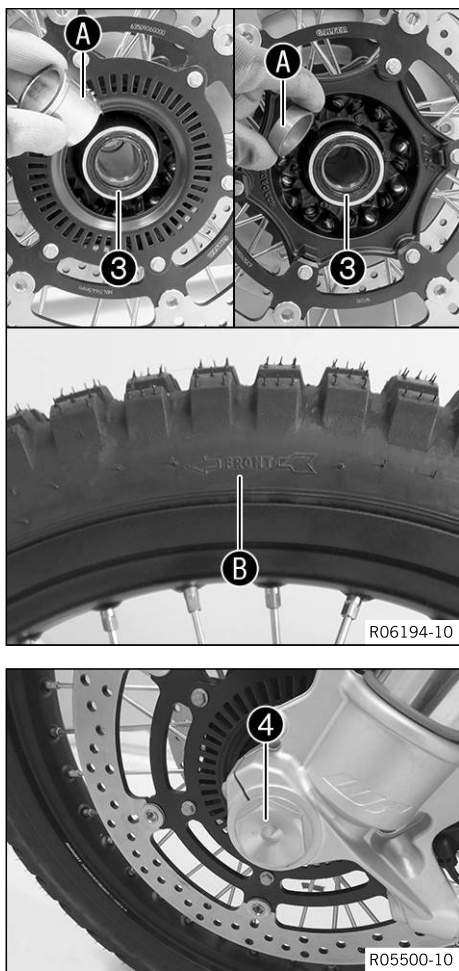


- Position the brake lines in the clamps.
- Tighten screws ②.

Guideline

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

6 FORK, TRIPLE CLAMP



- Check the wheel bearing for damage and wear.
 - » If the wheel bearing is damaged or worn:
 - Change front wheel bearing. (📖 p. 154)
- Remove the spacers.
- Clean and grease shaft seal rings (3) and contact surfaces (A) of the spacers.

Long-life grease (📖 p. 460)

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

i Info
 Arrow (B) indicates the direction of travel of the front wheel.
 The wheel speed sensor wheel is on the left viewed in the direction of travel.

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

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

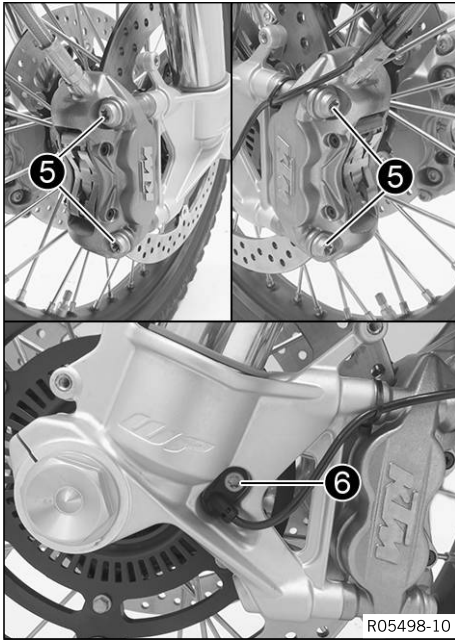
- Clean screw (4) and the wheel spindle.
- Grease wheel spindle lightly.

Long-life grease (📖 p. 460)

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

Guideline

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



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

Guideline

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

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

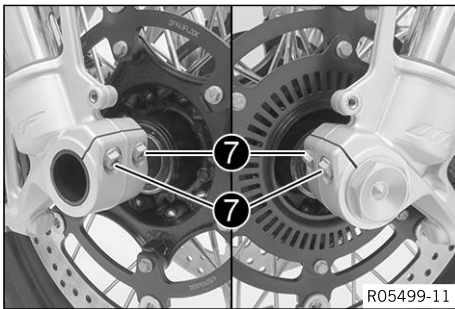
Guideline

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

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

Guideline

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



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

Guideline

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

Finishing work

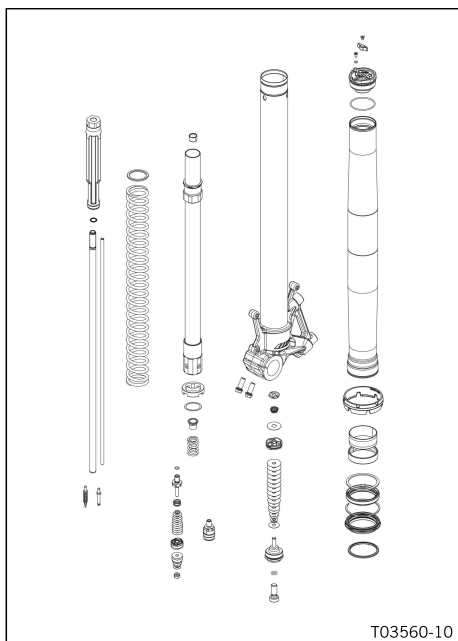
- Install the front fender. (📖 p. 145)
- Remove the motorcycle from the work stand (center). (📖 p. 17)
- Install the main silencer. (📖 p. 106)
- Install the fork protector. (📖 p. 25)

6.9 Servicing the fork

Condition

The fork legs have been removed.

6 FORK, TRIPLE CLAMP



- Disassemble the fork legs. (📖 p. 30)
- Disassemble the cartridge. (📖 p. 33)
- Disassemble the tap compression. (📖 p. 36)
- Check the fork legs. (📖 p. 37)
- Assemble the tap compression. (📖 p. 39)
- Assemble the cartridge. (📖 p. 39)
- Assemble the fork legs. (📖 p. 43)

6.10 Disassembling the fork legs

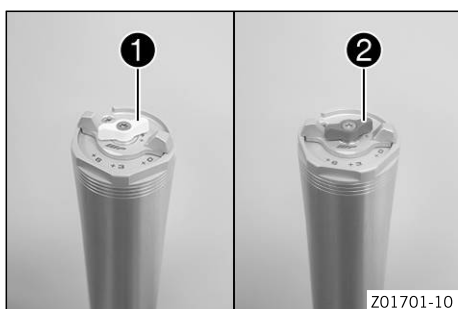


Info

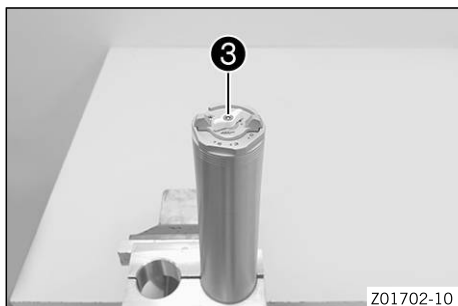
The operations are the same on both fork legs.

Condition

The fork legs have been removed.



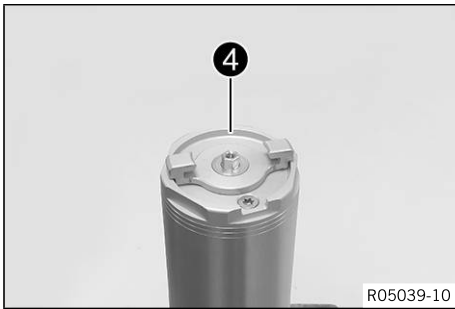
- Note down the current state of compression damping **1 COMP** (white adjuster on the left fork leg).
- Note down the current state of rebound damping **2 REB** (red adjuster on the right fork leg).
- Open the adjusters of the rebound and compression damping completely.



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

Clamping stand (T1403S) (📖 p. 480)

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



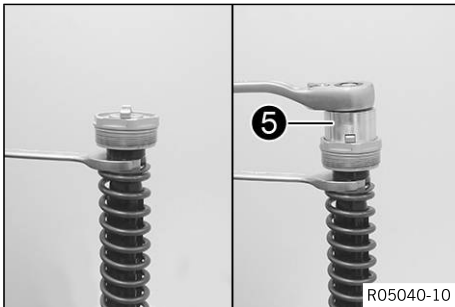
- Loosen screw cover 4.

Ring wrench (T14017) (📖 p. 479)



Info

The screw cover cannot be removed yet.

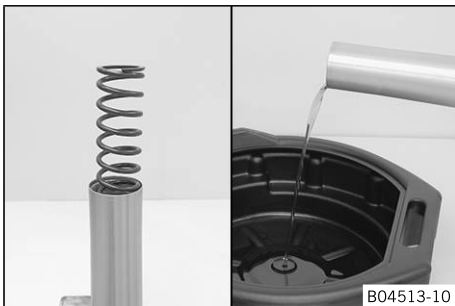


- Extract the fork leg and push the outside fork tube downward.
- Pull the spring downward and push the open end wrench onto the hexagonal part.
- Hold the hexagonal part and loosen the Preload Adjuster with special tool 5, but do not take it off yet.

Special socket (T14087) (📖 p. 481)



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

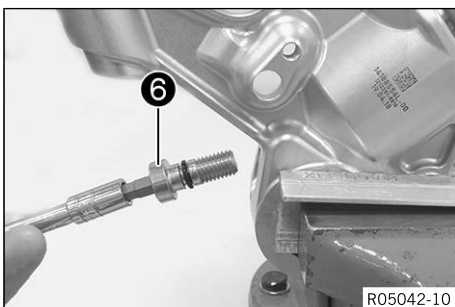


- Remove the spring.
- Drain the fork oil.



Info

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



- Clamp the fork leg with the axle clamp.

Guideline

Use soft jaws.

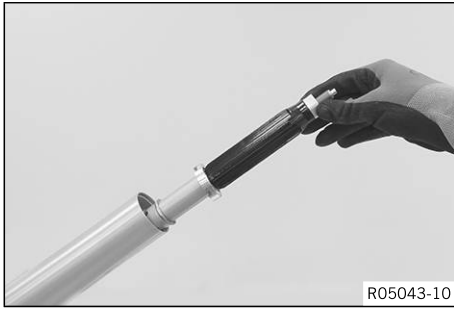
- Loosen screw 6 with O-ring and remove.



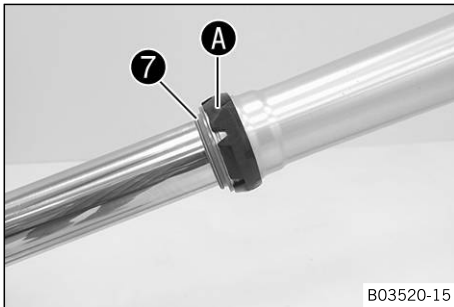
Info

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

6 FORK, TRIPLE CLAMP



- Remove the cartridge.

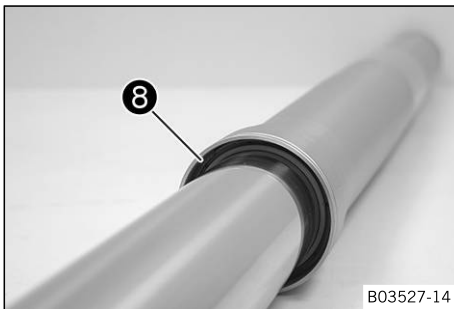


- Remove dust boot 7.
- Remove fork protector ring A.



Info

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

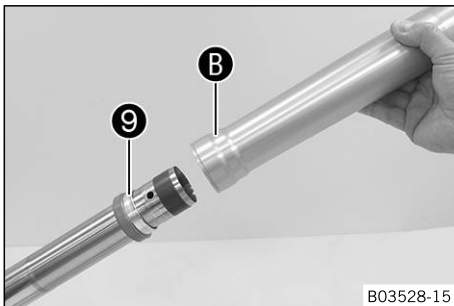


- Remove lock ring 8.



Info

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



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

Guideline

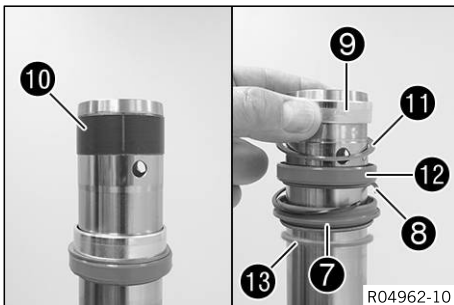
50 °C (122 °F)

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



Info

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



- Remove upper sliding bushing 10.



Info

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

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

- Unclamp the fork leg.



6.11 Disassembling the cartridge

Preparatory work

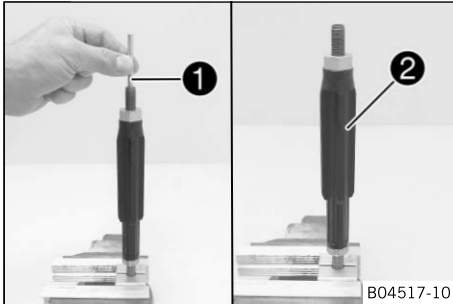
- Disassemble the fork legs. (📖 p. 30)

Right cartridge

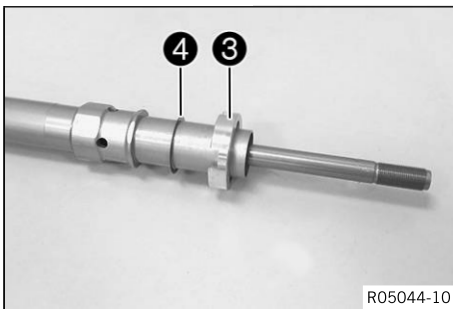
- Clamp the piston rod using the special tool.

Clamping stand (T14016S) (📖 p. 479)

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



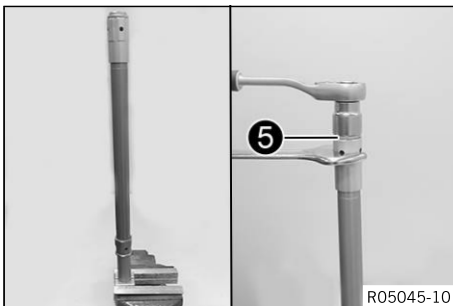
- Take spring seat ③ and washer ④ off the cartridge.



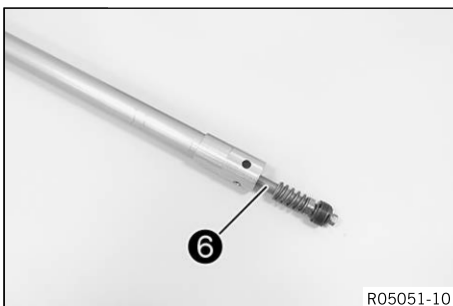
- Clamp the piston rod as shown.

Clamping stand (T14016S) (📖 p. 479)

- Unscrew and remove compression holder ⑤.



- Take piston rod ⑥ out of the cartridge.

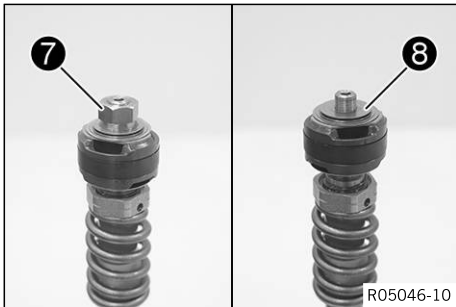


6 FORK, TRIPLE CLAMP

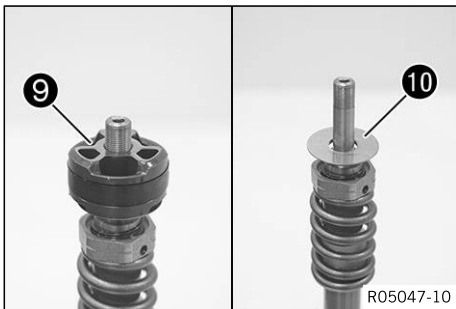


- Degrease the piston rod.
- Clamp the piston rod using the special tool.

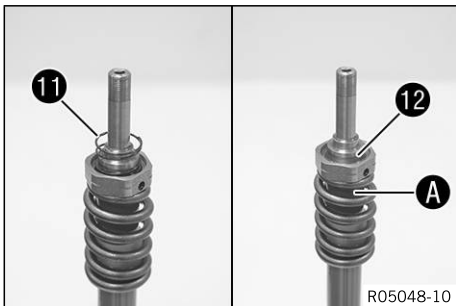
Clamping stand (T14016S) (📖 p. 479)



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



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

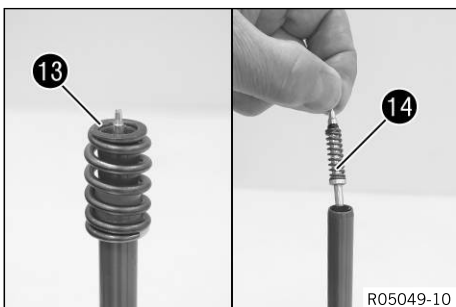


- Remove spring 11.
- Warm up the piston rod in area A.

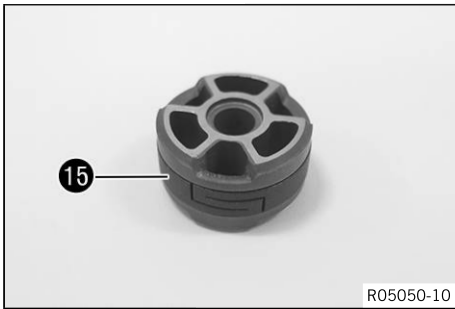
Guideline

50 °C (122 °F)

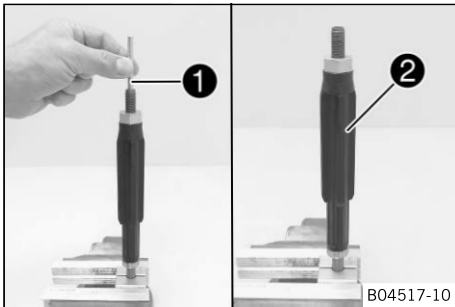
- Remove tap rebound 12.



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



- Remove piston ring 15.

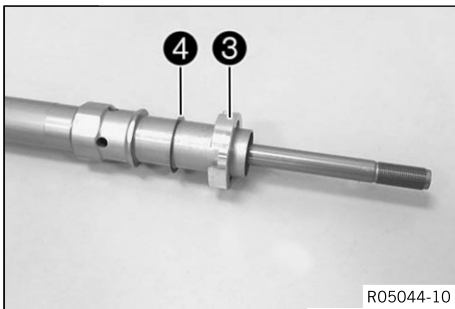


Left cartridge

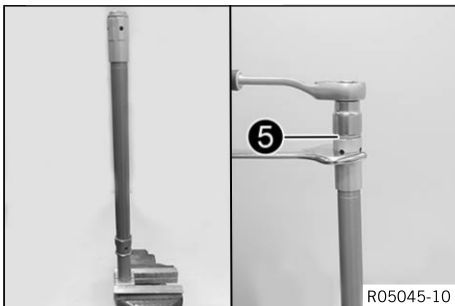
- Clamp the piston rod using the special tool.

Clamping stand (T14016S) (📖 p. 479)

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



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



- Clamp the piston rod as shown.

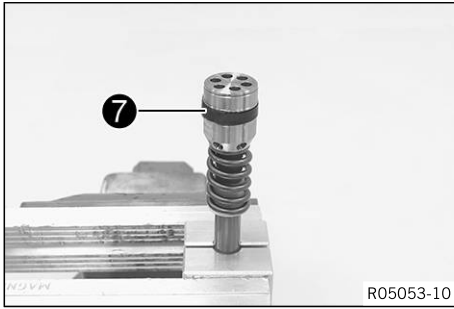
Clamping stand (T14016S) (📖 p. 479)

- Unscrew and remove compression holder 5.



- Take piston rod 6 out of the cartridge.

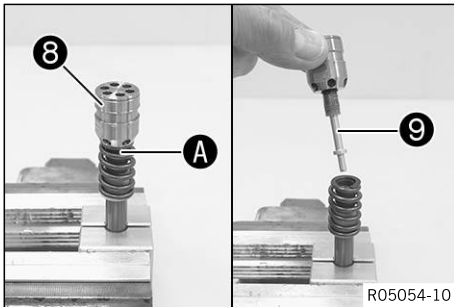
6 FORK, TRIPLE CLAMP



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

Clamping stand (T14016S) (📖 p. 479)

- Remove piston ring 7.

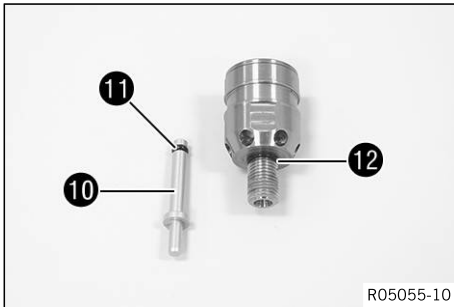


- Warm up the piston rod in area A.

Guideline

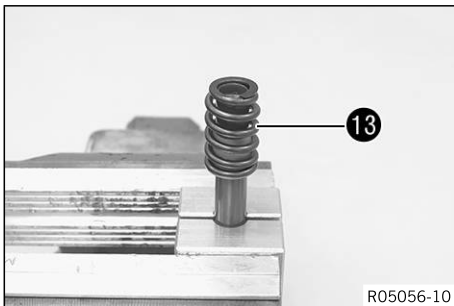
50 °C (122 °F)

- Remove piston 8 with setting needle 9.



- Pull setting needle 10 out of the piston.

- Remove O-rings 11 and 12.



- Remove spring 13.

- Unclamp the piston rod.

6.12 Disassembling the tap compression

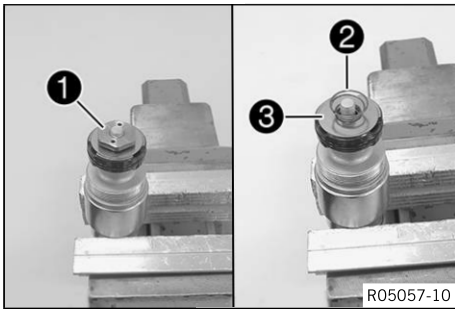


Info

The operations are the same on both fork legs.

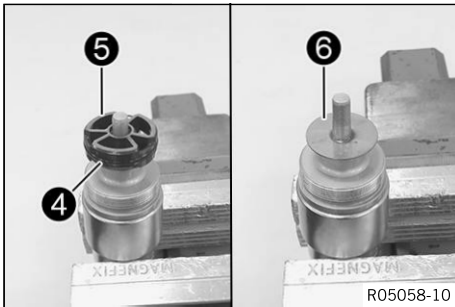
Preparatory work

- Disassemble the fork legs. (📖 p. 30)



Main work

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



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

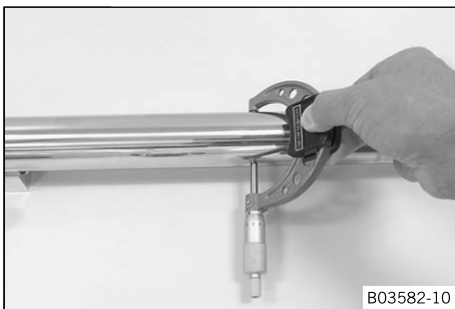
6.13 Checking the fork legs

Condition

The fork legs have been disassembled.



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

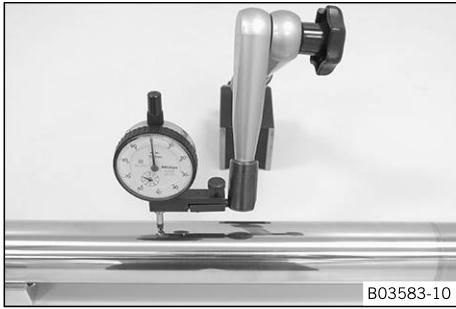


- Measure the outside diameter of the inside fork tube at several places.

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

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

6 FORK, TRIPLE CLAMP



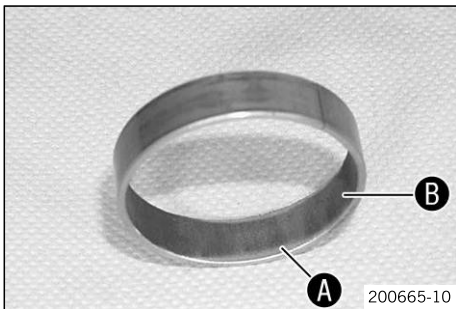
- Measure the run-out of the inside fork tube.

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

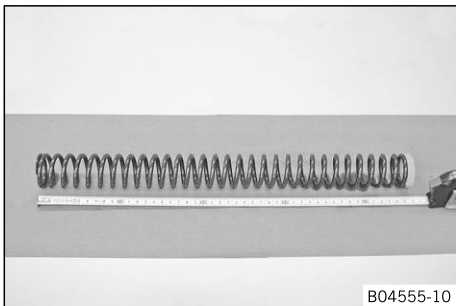
- » If the measured value is greater than the specified value:
 - Change the inside fork tube.



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



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



- Check the spring length.

Guideline

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

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



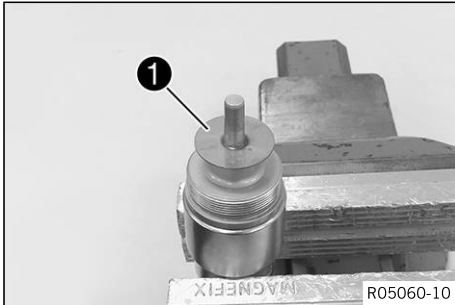
Info

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

6.14 Assembling the tap compression

i **Info**

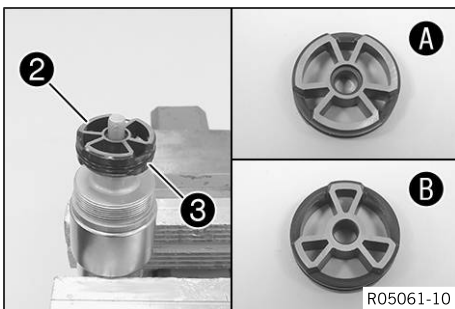
The operations are the same on both fork legs.



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

i **Info**

Mount the smaller shims at the bottom.



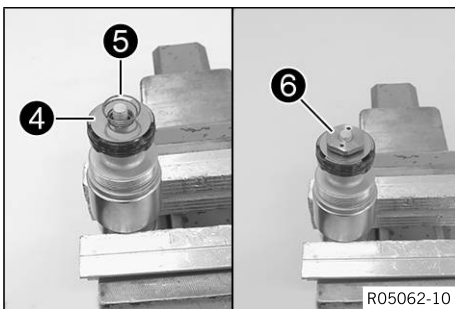
- Mount piston **2**.

Guideline

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

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

Fork oil (SAE 4) (48601166S1) (📖 p. 459)



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

Guideline

Nut, tap compression	M6x0.5	5 Nm (3.7 lbf ft)
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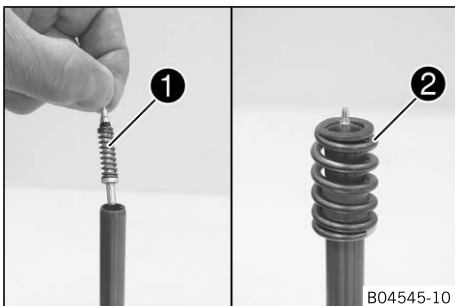
i **Info**

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

- Extract the tap compression.



6.15 Assembling the cartridge



Right cartridge

- Clamp in the piston rod.

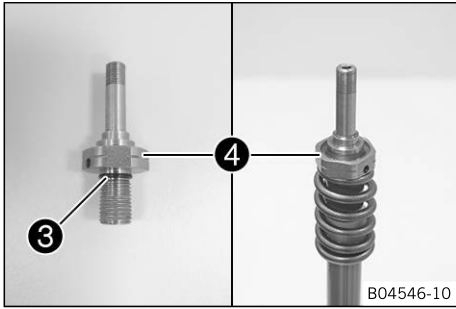
Clamping stand (T14016S) (📖 p. 479)

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

Lubricant (T158) (📖 p. 460)

- Mount spring **2**.

6 FORK, TRIPLE CLAMP



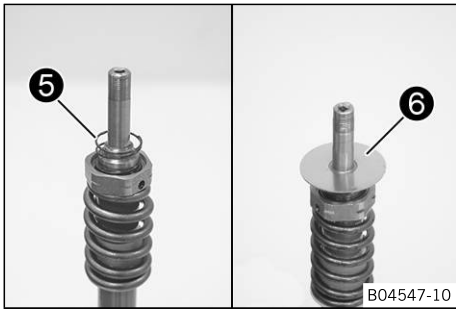
- Mount and grease O-ring ③ in tap rebound ④.

Lubricant (T158) (📖 p. 460)

- Mount and tighten the tap rebound.

Guideline

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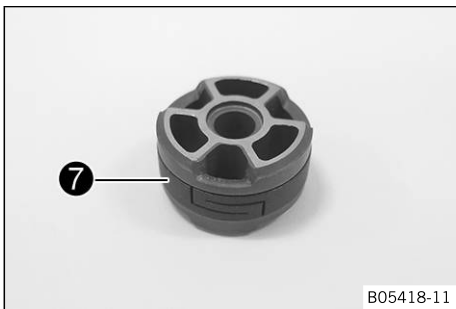


- Position spring ⑤.
- Mount shim stack ⑥.

i Info
Mount the smaller shims at the bottom.

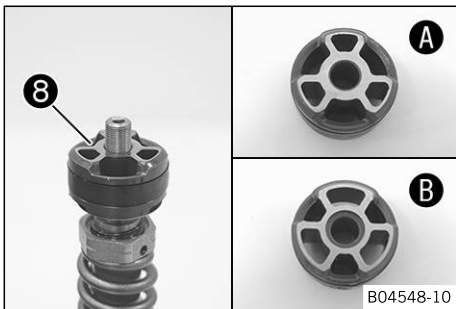
- Press the shim stack downward against the spring force.

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



- Mount and lubricate piston ring ⑦.

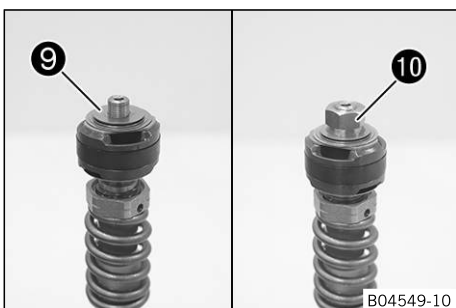
Fork oil (SAE 4) (48601166S1) (📖 p. 459)



- Mount piston ⑧ with the piston ring.

Guideline

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



- Mount shim stack ⑨.

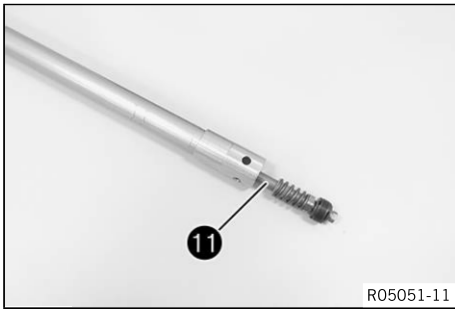
i Info
Align the triangular plate exactly with the piston opening.

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

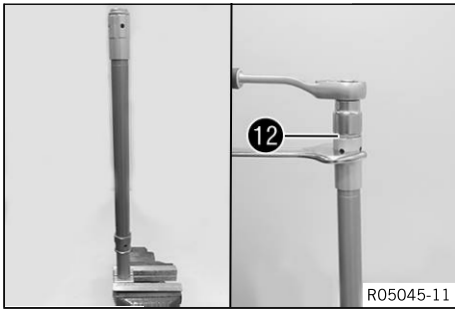
Guideline

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

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



- Lock the nut by center punching it.
- Slide piston rod 11 into the cartridge.



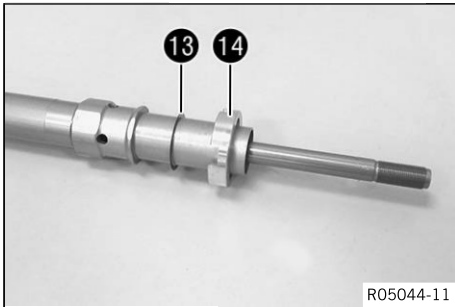
- Clamp the piston rod as shown.

Clamping stand (T14016S) (📖 p. 479)

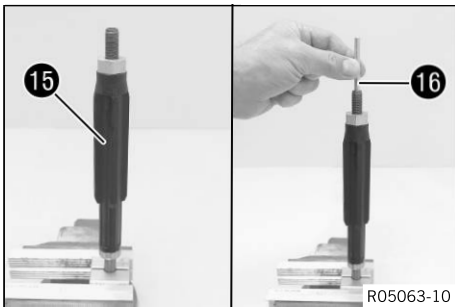
- Mount and tighten tap compression 12.

Guideline

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



- Mount washer 13 and spring seat 14.



- Mount fluid barrier 15 all the way on.

i Info

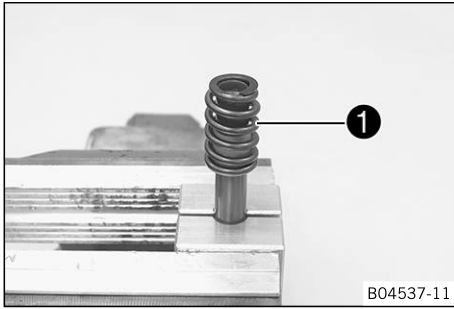
The fluid barrier must be tightened all the way. Do not use a tool.

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

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

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

6 FORK, TRIPLE CLAMP

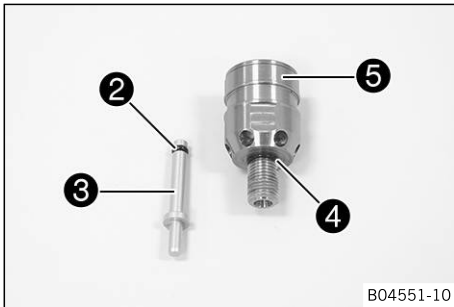


Left cartridge

- Clamp in the piston rod.

Clamping stand (T14016S) (📖 p. 479)

- Mount spring 1.

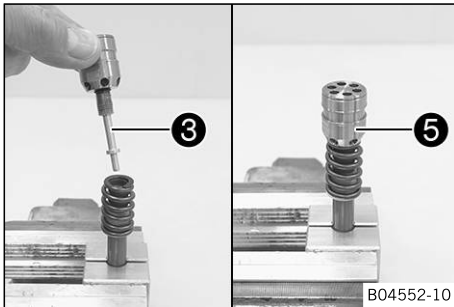


- Mount and lubricate O-ring 2 for setting needle 3.

Lubricant (T158) (📖 p. 460)

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

Lubricant (T158) (📖 p. 460)

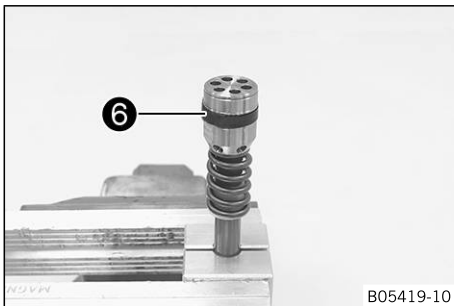


- Insert setting needle 3 in the piston.

- Mount and tighten piston 5.

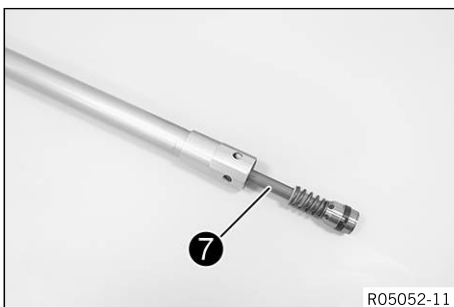
Guideline

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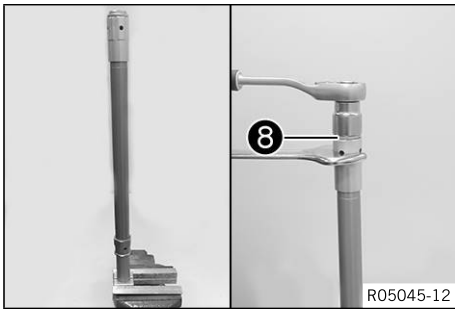


- Mount and lubricate piston ring 6.

Fork oil (SAE 4) (48601166S1) (📖 p. 459)



- Slide piston rod 7 into the cartridge.



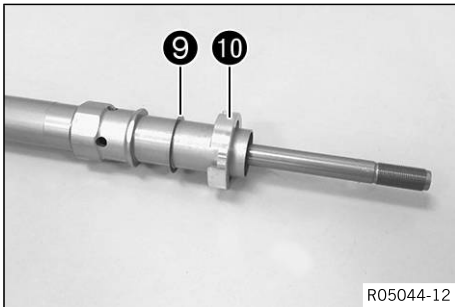
- Clamp the piston rod as shown.

Clamping stand (T14016S) (📖 p. 479)

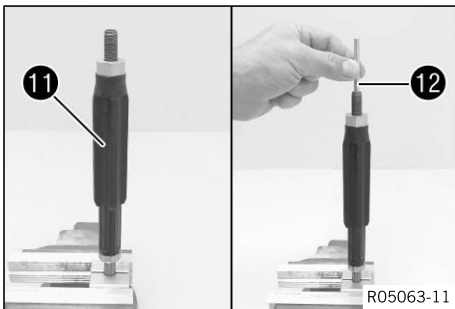
- Mount and tighten tap compression ⑧.

Guideline

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



- Mount washer ⑨ and spring seat ⑩.



- Mount fluid barrier ⑪ all the way on.

i Info

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

- Mount adjusting tube ⑫ for the rebound damping in the cartridge.

✓ The adjusting tube protrudes approx. 3 mm (0.197 in) out of the cartridge and can be pressed in against the spring force.

✗ The adjusting tube protrudes more than 5 mm (0.275 in) from the cartridge and cannot be pressed in against the spring force.

6.16 Assembling the fork legs

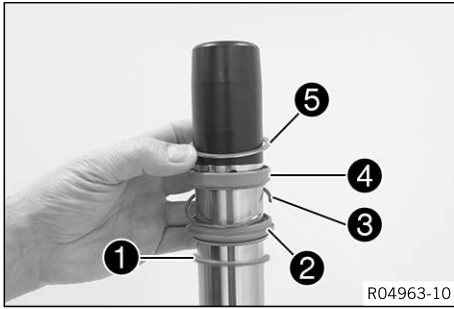
i Info

The operations are the same on both fork legs.

Preparatory work

- Check the fork legs. (📖 p. 37)
- Assemble the cartridge. (📖 p. 39)
- Assemble the tap compression. (📖 p. 39)

6 FORK, TRIPLE CLAMP



Main work

- Clamp the inside fork tube using an axle clamp.

Guideline

Use soft jaws.

- Mount the special tool.

Protecting sleeve (T1401) (📖 p. 479)

- Push on lift indicator ①.

- Grease and push on dust boot ②.

Lubricant (T14034) (📖 p. 460)

i Info

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

Mount the sealing lip with the spring expander facing down.

- Push on lock ring ③.

- Grease and push on seal ring ④.

Lubricant (T14034) (📖 p. 460)

i Info

Sealing lip downward, open side upward.

- Push on support ring ⑤.

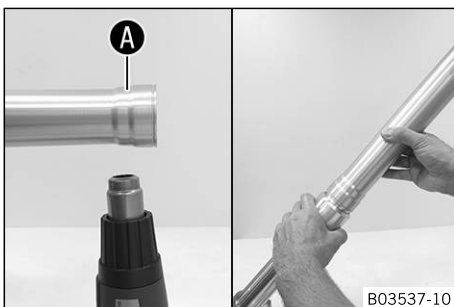
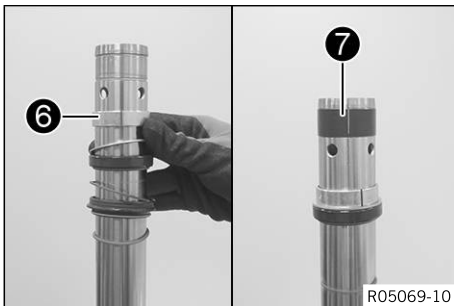
- Remove the special tool.

- Push on lower sliding bushing ⑥.

- Mount upper sliding bushing ⑦.

i Info

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



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

Guideline

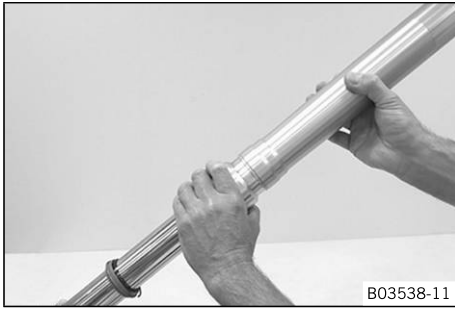
50 °C (122 °F)

- Slide on the outside fork tube.

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

Mounting tool (T14040S) (📖 p. 480)

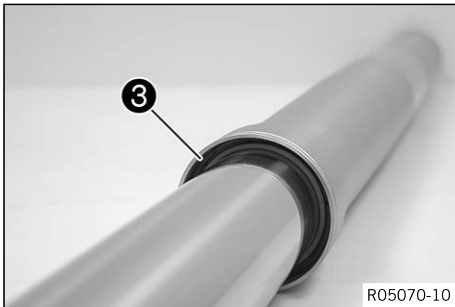
- Press the outside fork tube all the way in.



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

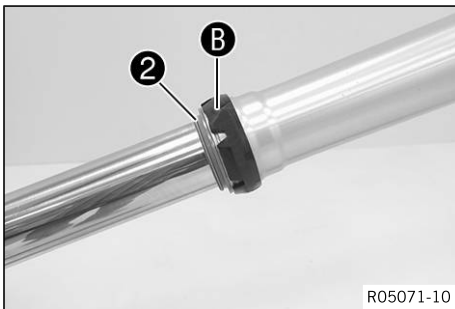
Mounting tool (T14040S) (📖 p. 480)

- Press the outside fork tube all the way in.



- Mount lock ring ③.

i **Info**
The lock ring must engage audibly.



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

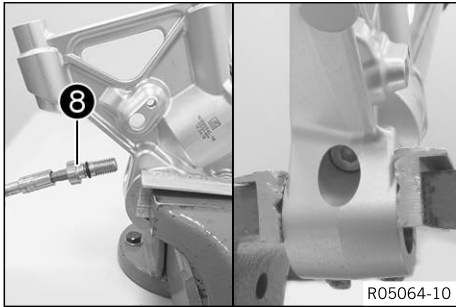


- Slide the cartridge all the way into the inside fork tube.
- ✓ The hexagonal part of the cartridge engages in the inside fork tube guide.

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



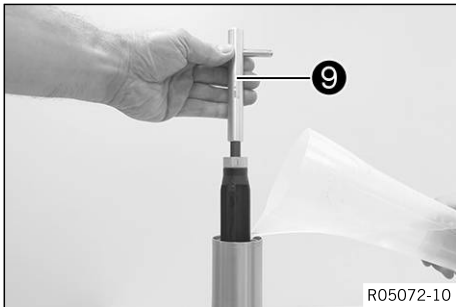
6 FORK, TRIPLE CLAMP



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

Guideline

Cartridge screw	M10x25	25 Nm (18.4 lbf ft)
-----------------	--------	---------------------



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

Support tool (T14026S1) (📖 p. 480)



Info

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

- Clamp the fork vertically.

Clamping stand (T1403S) (📖 p. 480)

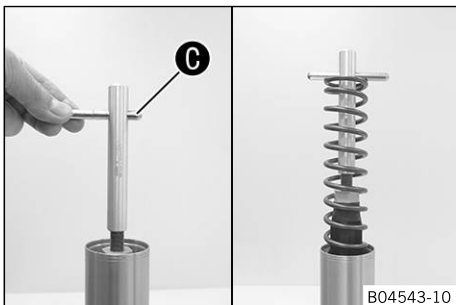
- Fill with fork oil.

Fork oil per fork leg	630 ± 5 ml (21.3 ± 0.17 fl. oz.)	Fork oil (SAE 4) (48601166S1) (📖 p. 459)
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Info

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



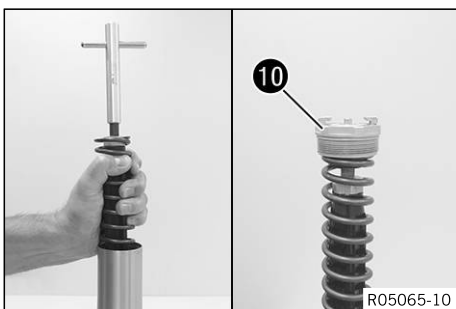
- Remove pin **C** of the special tool.

Support tool (T14026S1) (📖 p. 480)

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

Guideline

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



- Pull the spring downward.

- Remove the special tool.

Support tool (T14026S1) (📖 p. 480)

- Mount screw cap **10**.

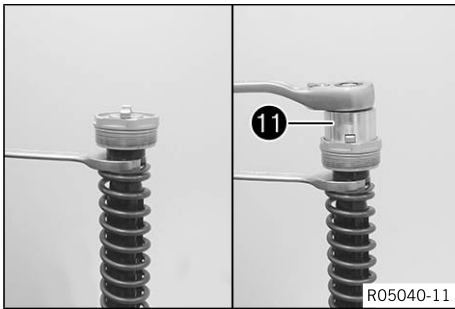


Info

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

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

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



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

Guideline

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

Special socket (T14087) (📖 p. 481)



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

Clamping stand (T1403S) (📖 p. 480)

- Grease the O-ring of the screw cap.

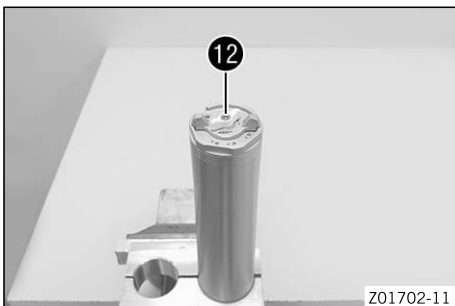
Lubricant (T158) (📖 p. 460)

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

Guideline

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

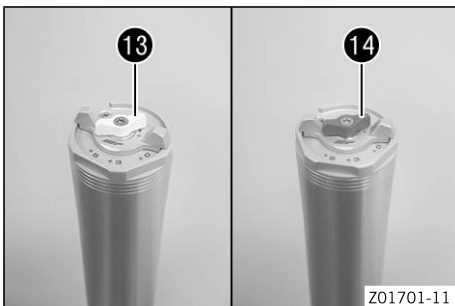
Ring wrench (T14017) (📖 p. 479)



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

Guideline

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



Alternative 1

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

Guideline

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

Alternative 2



Warning

Danger of 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.

- Set the adjusters to the positions determined upon removal.

6.17 Checking the steering head bearing play



Warning

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

- Correct incorrect steering head bearing play immediately.



Info

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

Preparatory work

- Remove main silencer. (📖 p. 106)
- Raise motorcycle with the work stand (center). (📖 p. 16)

Main work

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

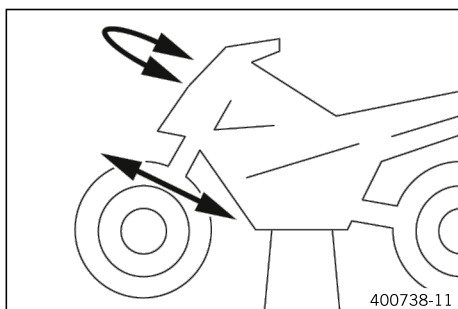
Play should not be detectable on the steering head bearing.

- » If there is detectable play:
 - Adjust the steering head bearing play. (📖 p. 49)

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

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

- » If detent positions are detected:
 - Adjust the steering head bearing play. (📖 p. 49)



- Check the steering head bearing and adjust if necessary.

Finishing work

- Remove the motorcycle from the work stand (center). (📖 p. 17)
- Install the main silencer. (📖 p. 106)



6.18 Adjusting the steering head bearing play

Preparatory work

- Remove main silencer. (📖 p. 106)
- Raise motorcycle with the work stand (center). (📖 p. 16)
- Place a load on the rear of the vehicle.
- ☑ The front wheel is not in contact with the ground.

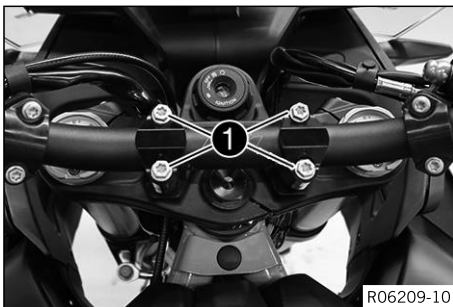
Main work

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

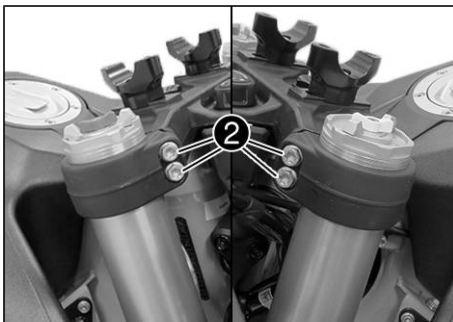


Info

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



R06209-10



R06208-10

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

Guideline

Screw, steering head	M20x1.5	18 Nm (13.3 lbf ft)
----------------------	---------	---------------------

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

Guideline

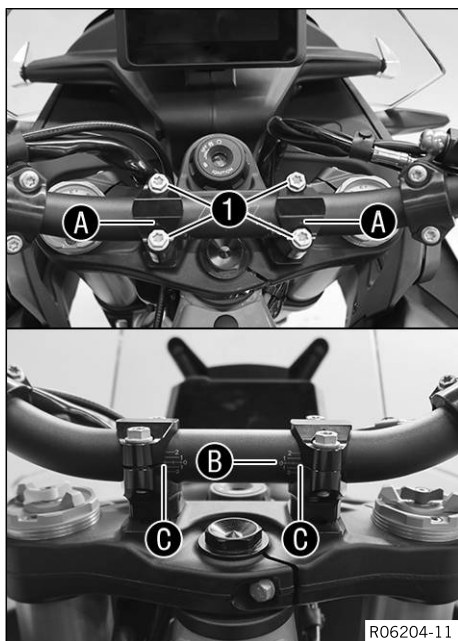
Screw, top triple clamp	M8	15 Nm (11.1 lbf ft)
-------------------------	----	---------------------

- Mount and tighten screw ❸.

Guideline

Screw, steering stem	M8	20 Nm (14.8 lbf ft) Loctite®243™
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6 FORK, TRIPLE CLAMP



- Position the handlebar.

Info
Make sure the cables and wiring are positioned correctly.

- Position the handlebar clamps. Mount the screws, but do not tighten them yet.
 - ✓ Markings **A** face backward.
 - ✓ The horizontal marking **B** on the handlebar scale is aligned with the center of the handlebar clamp.
 - ✓ The vertical markings **C** on the handlebar scale are aligned equally on both sides.
- Tighten screws **1** evenly.

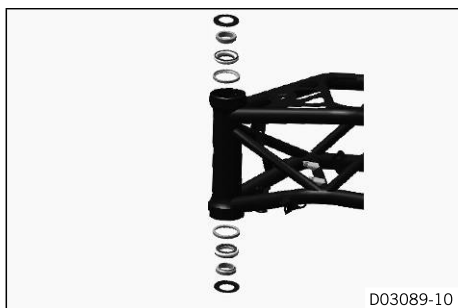
Guideline

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

Finishing work

- Check the steering head bearing play. (📖 p. 48)
- Remove the motorcycle from the work stand (center). (📖 p. 17)
- Install the main silencer. (📖 p. 106)

6.19 Lubricating the steering head bearing



- Remove the lower triple clamp. (📖 p. 50)
- Install the lower triple clamp. (📖 p. 52)

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

6.20 Removing the lower triple clamp

Preparatory work

- Remove main silencer. (📖 p. 106)
- Raise motorcycle with the work stand (center). (📖 p. 16)
- Remove fork protector. (📖 p. 24)
- Place a load on the rear of the vehicle.
 - ✓ The front wheel is not in contact with the ground.
- Remove the fork legs. (📖 p. 25)
- Remove the front fender. (📖 p. 144)

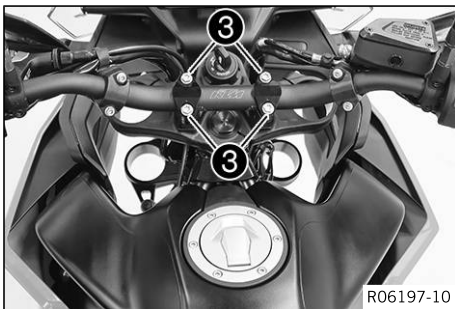


Main work

- Remove screw ①.
- Hang the brake line to the side.

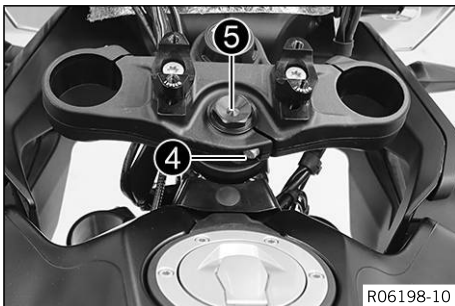


- Remove screw ②.



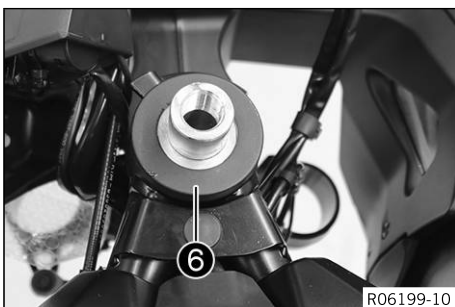
- Remove ③ screws.
- Take off the handlebar clamps.
- Take off the handlebar and place it at the front.

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



- Remove screw ④.
- Remove screw ⑤ with washer.
- Loosen the upper triple clamp and place it to one side.

i Info
Hold the lower triple clamp.



- Remove protective ring ⑥.

6 FORK, TRIPLE CLAMP



- Remove the lower triple clamp with steering stem.
- Remove seal ring retainer ⑦.
- Remove upper steering head bearing ⑧.

6.21 Installing the lower triple clamp

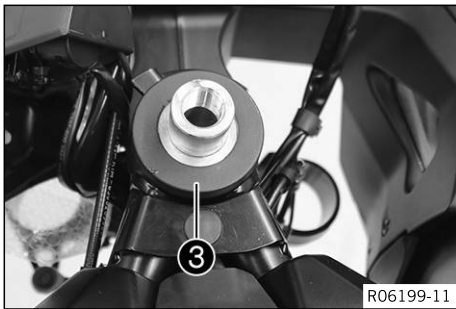


Main work

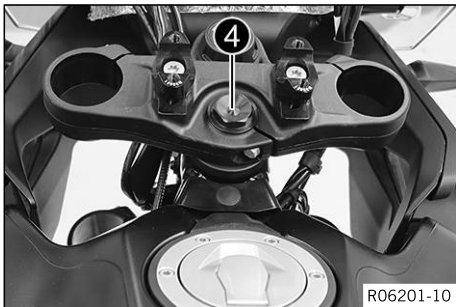
- Grease the bearing, clean the sealing elements, and check for damage.

High viscosity grease (📖 p. 460)

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



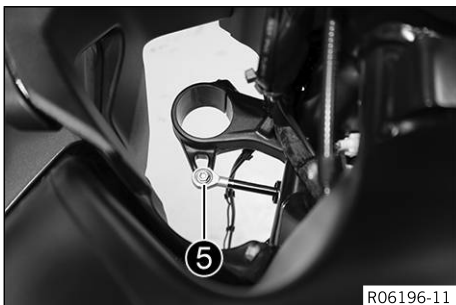
- Mount protective ring ③.



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

Guideline

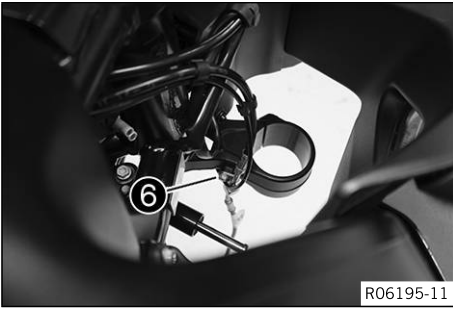
Screw, steering head	M20x1.5	18 Nm (13.3 lbf ft)
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- Position the steering damper.
- Mount and tighten screw ⑤.

Guideline

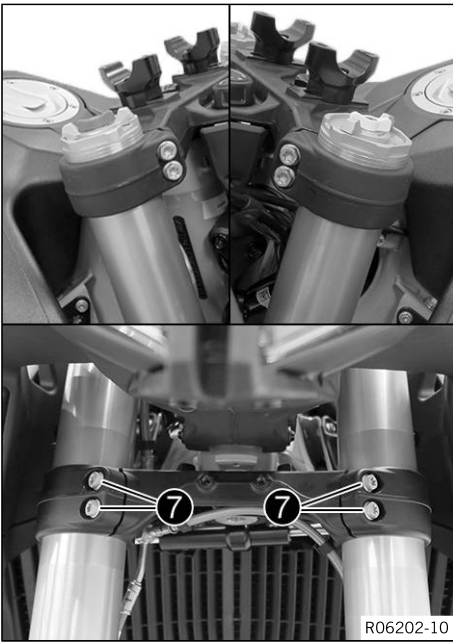
Screw, steering damper on triple clamp	M8	8 Nm (5.9 lbf ft) Loctite®243™
--	----	--



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

Guideline

Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
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- Push the fork legs into the triple clamp.
- Align the fork legs in the required position using the fork rings.
- Tighten screws 7 of the lower triple clamp.

Guideline

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



- Tighten screw 4.

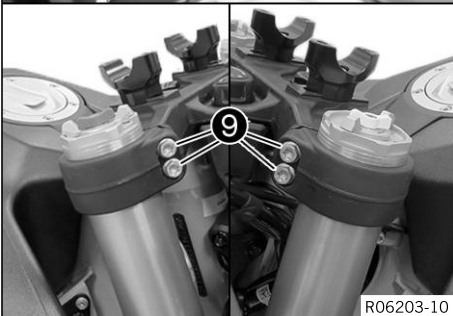
Guideline

Screw, steering head	M20x1.5	18 Nm (13.3 lbf ft)
----------------------	---------	---------------------

- Using a plastic hammer, tap lightly on the upper triple clamp to avoid stresses.
- Tighten screws 8 of the upper triple clamp.

Guideline

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

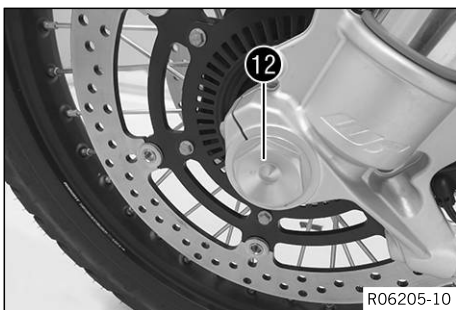
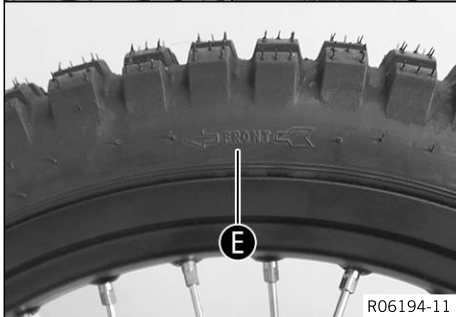
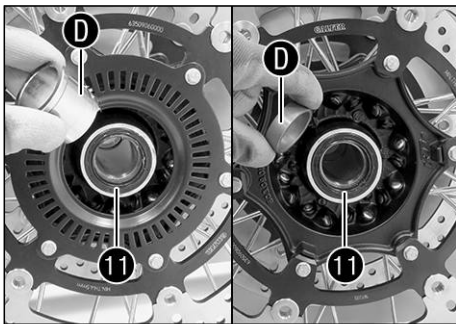
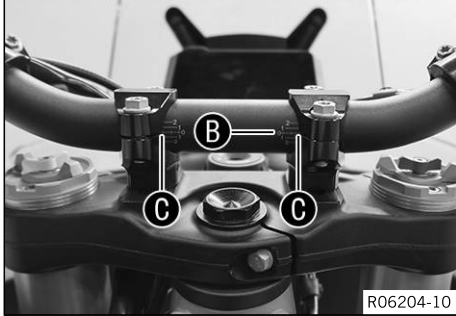
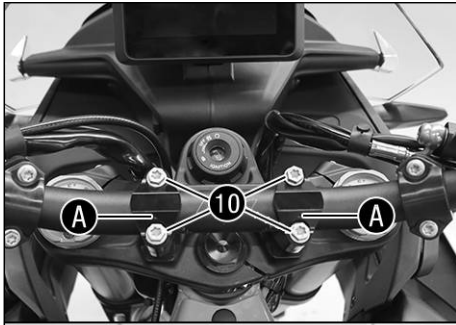


- Mount and tighten screw 9.

Guideline

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

6 FORK, TRIPLE CLAMP



- Position the handlebar.



Info

Make sure the cables and wiring are positioned correctly.

- Position the handlebar clamps. Mount the screws, but do not tighten them yet.
 - ✓ Markings **A** face the rear.
 - ✓ The horizontal marking **B** on the handlebar scale is aligned with the center of the handlebar clamp.
 - ✓ The vertical markings **C** on the handlebar scale are aligned equally on both sides.
- Tighten screws **10** evenly.

Guideline

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

- Check the wheel bearing for damage and wear.
 - » If the wheel bearing is damaged or worn:
 - Change front wheel bearing. (📖 p. 154)
- Remove the spacers.
- Clean and grease shaft seal rings **11** and contact surfaces **D** of the spacers.

Long-life grease (📖 p. 460)

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



Info

Arrow **E** indicates the direction of travel of the front wheel.

The wheel speed sensor wheel is on the left viewed in the direction of travel.



Warning

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

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

- Clean screw **12** and the wheel spindle.
- Grease wheel spindle lightly.

Long-life grease (📖 p. 460)

- Jack up the front wheel into the fork, position it, and insert the wheel spindle.

- Mount and tighten screw 12.

Guideline

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

- Position brake calipers.

✓ The brake linings are correctly positioned.

- Mount screws 13, but do not tighten yet.

Guideline

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

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

✓ The brake calipers straighten.

- Tighten screws 13.

Guideline

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

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

- Mount and tighten screw 14.

Guideline

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

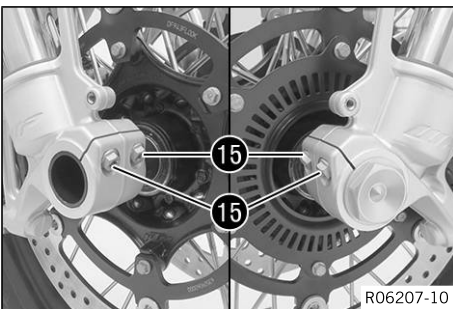
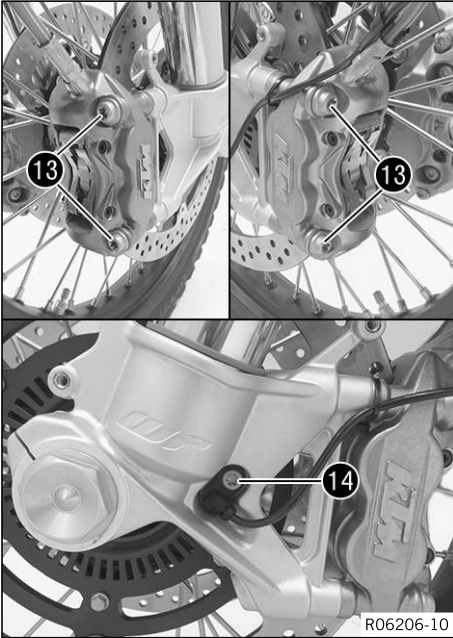
- Operate the front brake and compress the fork a few times firmly.

✓ The fork legs straighten.

- Tighten screws 15.

Guideline

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



Finishing work

- Check the steering head bearing play. (📖 p. 48)
- Remove the motorcycle from the work stand (center). (📖 p. 17)
- Install the main silencer. (📖 p. 106)
- Install the fork protector. (📖 p. 25)
- Install the front fender. (📖 p. 145)

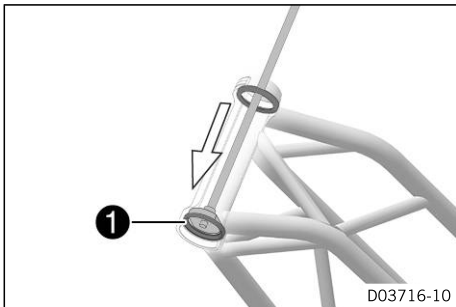
6.22 Changing the steering head bearing

Preparatory work

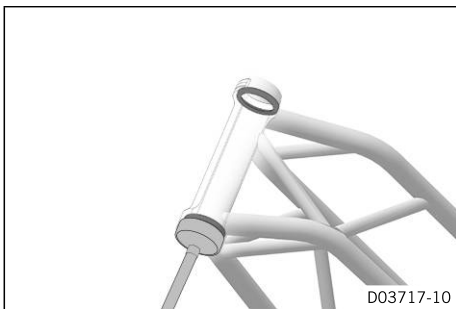
- Remove main silencer. (📖 p. 106)
- Raise motorcycle with the work stand (center). (📖 p. 16)
- Remove fork protector. (📖 p. 24)
- Place a load on the rear of the vehicle.
✔ The front wheel is not in contact with the ground.
- Remove the fork legs. (📖 p. 25)
- Remove the front fender. (📖 p. 144)
- Remove the lower triple clamp. (📖 p. 50)

Main work

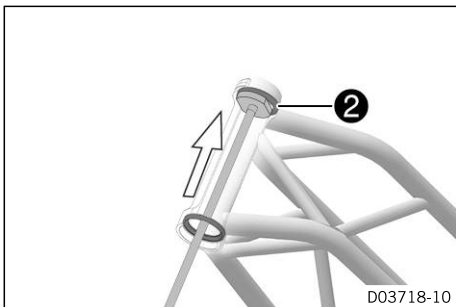
- Remove lower bearing ring **1** using a suitable tool.



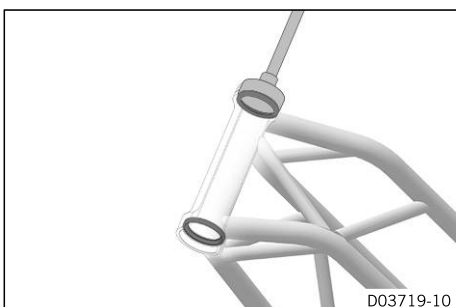
- Press in the new bearing ring all the way using a suitable tool.

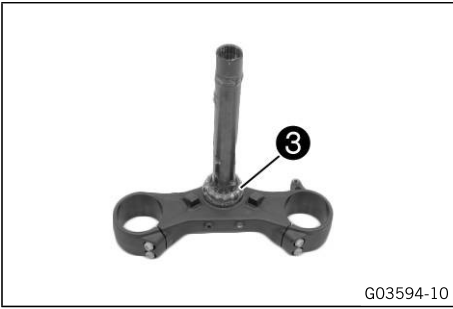


- Remove upper bearing ring **2** using a suitable tool.



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





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

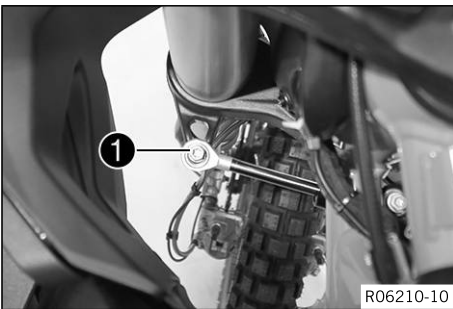
Finishing work

- Install the lower triple clamp. (📖 p. 52)
- Check the steering head bearing play. (📖 p. 48)
- Remove the motorcycle from the work stand (center). (📖 p. 17)
- Install the main silencer. (📖 p. 106)
- Install the fork protector. (📖 p. 25)
- Install the front fender. (📖 p. 145)

6.23 Changing the steering damper

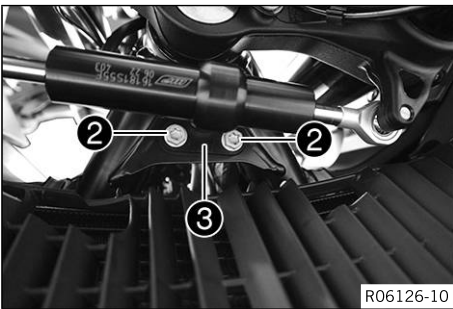
Preparatory work

- Remove the front fender. (📖 p. 144)



Main work

- Remove screw **1**.

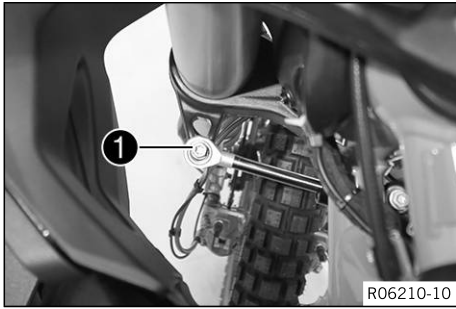


- Remove screws **2**.
- Take off bracket **3** with steering damper.
- Position bracket with new steering damper.
- Mount and tighten the screws.

Guideline

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

6 FORK, TRIPLE CLAMP



- Mount and tighten screw ❶.

Guideline

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

Finishing work

- Install the front fender. (📖 p. 145)

7.1 Adjusting the basic position of the clutch lever



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



Info

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

7.2 Checking the free travel of the clutch lever

Note

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

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



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

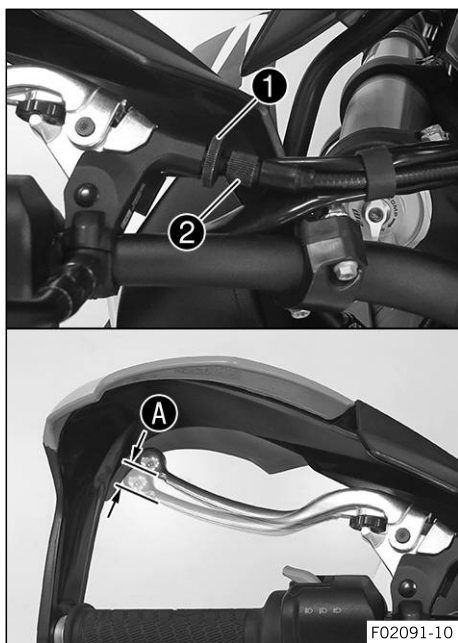
Free travel ① of clutch lever	5 mm (0.2 in)
-------------------------------	---------------

- » If the free travel of the clutch lever does not meet specifications:
 - Set the free travel of the clutch lever. (📖 p. 60)
- Move the handlebar to and fro over the entire steering range.

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

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

7.3 Setting the free travel of the clutch lever



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

Guideline

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

- Tighten lock nut ①.

7.4 Adjusting the handlebar position

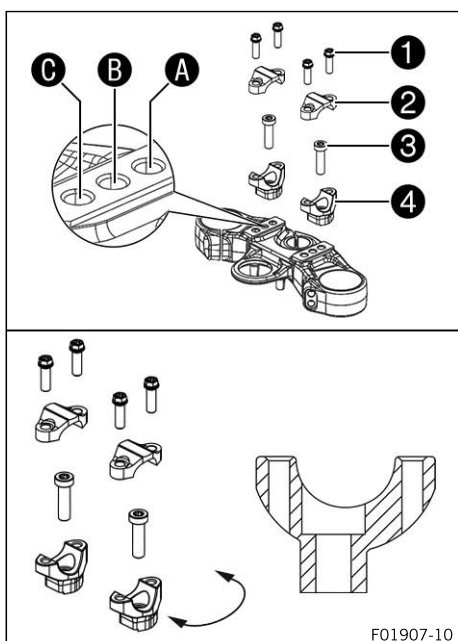


Warning

Danger of accidents A repaired handlebar poses a safety risk.

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

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



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



Info

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

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

Guideline

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

Screw, handlebar support	M10	45 Nm (33.2 lbf ft) Loctite®243™
--------------------------	-----	--

- Position the handlebar.



Info

Make sure the cables and wiring are positioned correctly.

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

Guideline

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



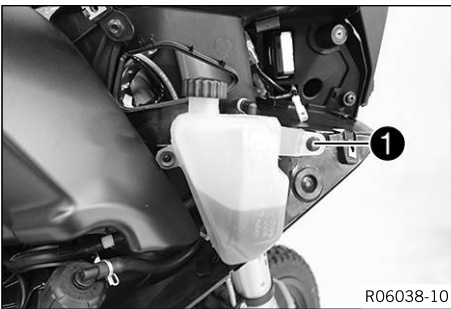
7.5 Changing the throttle grip

Preparatory work

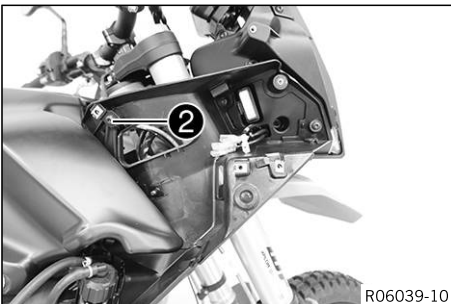
- Remove the seat. (📖 p. 120)
- Remove the left side cover. (📖 p. 137)
- Remove the battery cover. (📖 p. 138)
- Remove left fuel tank spoiler. (📖 p. 139)
- Remove the right side cover. (📖 p. 137)
- Remove right fuel tank spoiler. (📖 p. 141)
- Remove windshield. (📖 p. 145)
- Remove the headlight. (📖 p. 217)

Main work

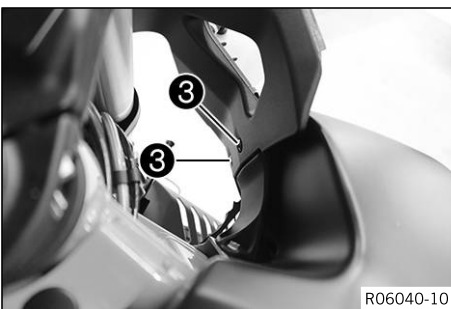
- Remove screw ❶.
- Hang the compensating tank to the side and secure it in a vertical position.



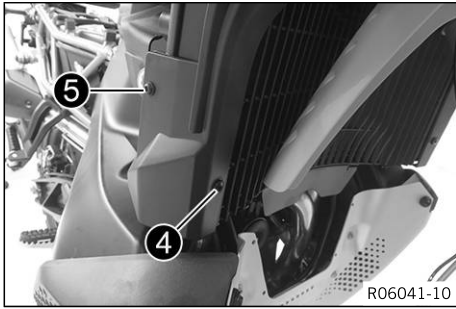
- Remove screw ❷.



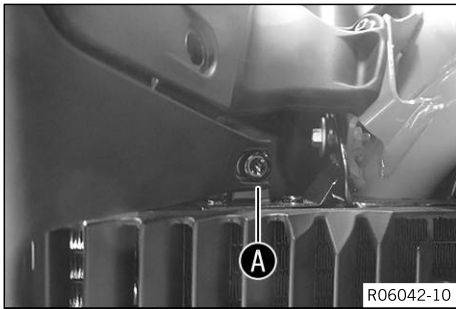
- Remove ❸ screws.



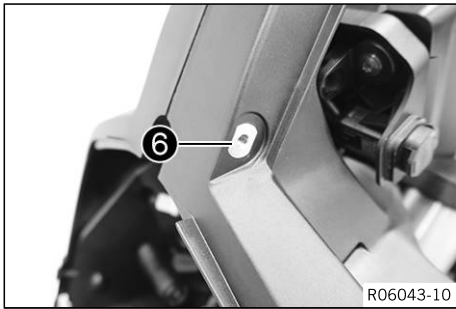
7 HANDLEBAR, CONTROLS



- Remove screw ④.
- Remove screw ⑤.



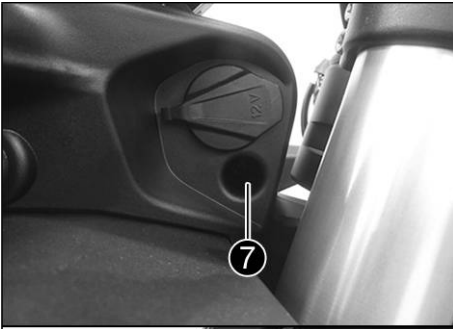
- Detach the inside cover from bracket A.



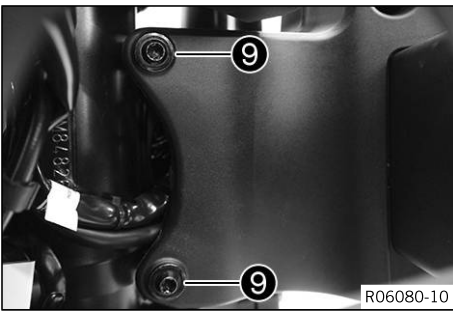
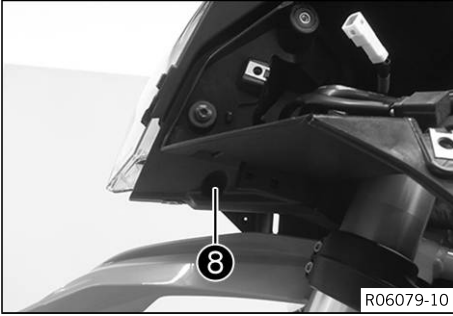
- Remove wheel spindle mask support ⑥.



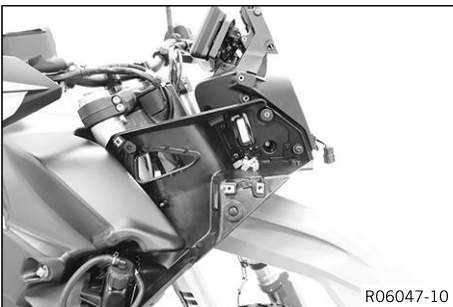
- Remove the cable tie.



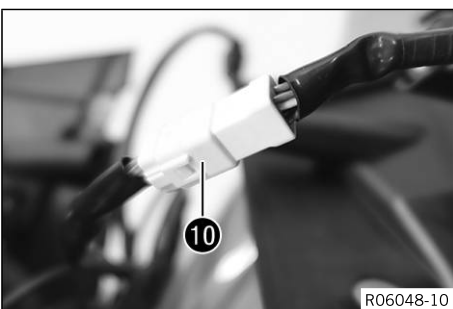
- Remove screw 7.
- Remove screw 8.



- Remove 9 screws.



- Remove the mask support with the inside cover facing forwards.

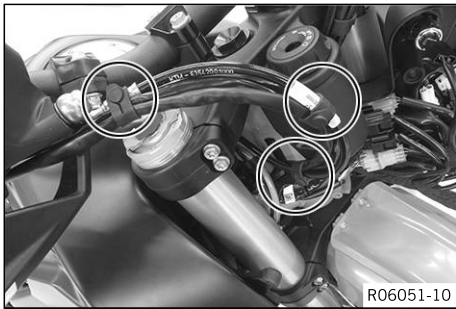


- Disconnect plug-in connector 10.

7 HANDLEBAR, CONTROLS



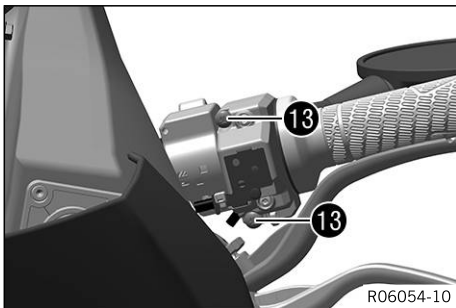
- Loosen plug-in connector **11** from the bracket and disconnect.



- Remove the cable holder.



- Loosen screw **12**.
- Push the hand guard slightly to the side.



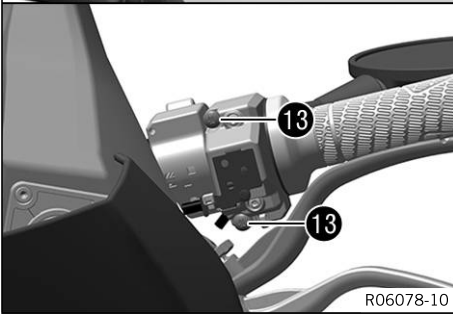
- Loosen screws **13**.
- Remove the throttle grip with the sensor unit.



- Position a new throttle grip with a sensor unit.
- Tighten screws **13**.

Guideline

Screw for throttle grip	M5	3.5 Nm (2.58 lbf ft)
-------------------------	----	-------------------------



R06078-10

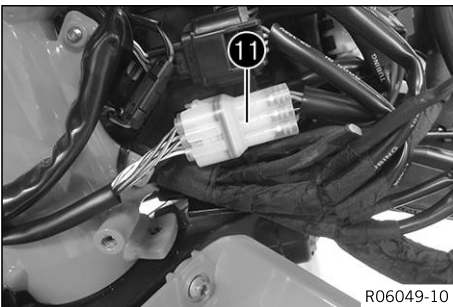


- Position the handguard.
- Tighten screw **12**.

Guideline

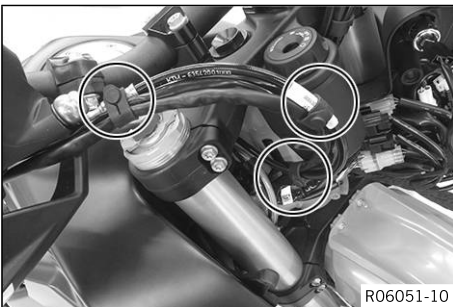
Hand guard screw	M8	25 Nm (18.4 lbf ft)
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R06052-10



R06049-10

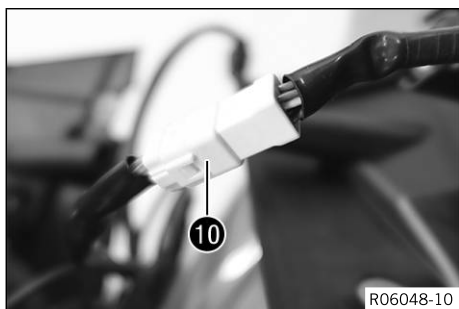
- Join plug-in connector **11** and position in the holder.



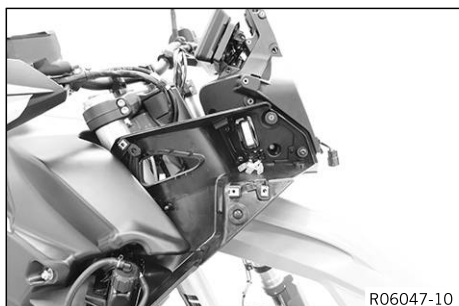
R06051-10

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

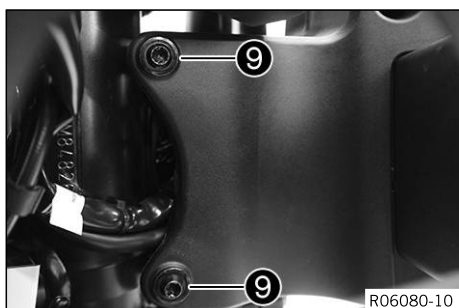
7 HANDLEBAR, CONTROLS



- Join plug-in connector **10**.



- Position the mask support with the inside cover.



- Mount and tighten screws **9**.

Guideline

Screw, mask support on steering head	M6	10 Nm (7.4 lbf ft) Loctite®243™
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- Mount and tighten screw **7**.

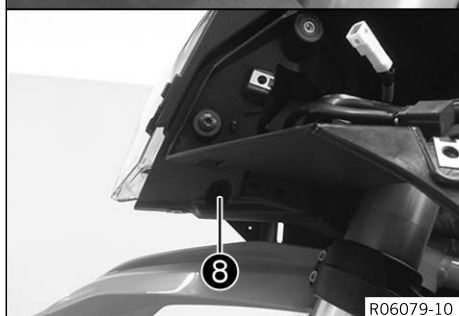
Guideline

Screw, mask support	M5	5 Nm (3.7 lbf ft)
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- Mount and tighten screw **8**.

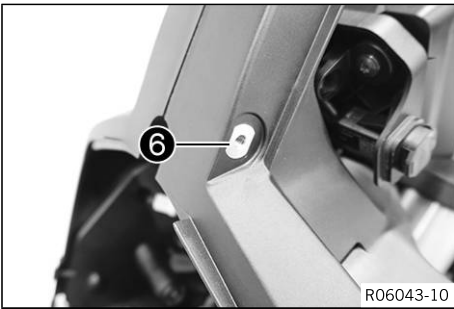
Guideline

Screw, mask support	M5	5 Nm (3.7 lbf ft)
---------------------	----	-------------------

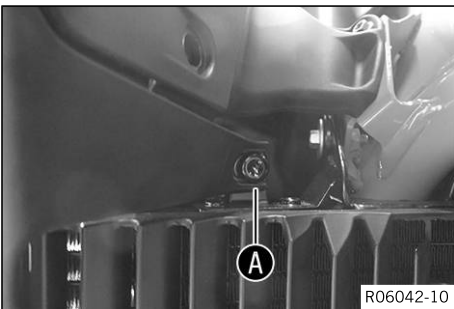




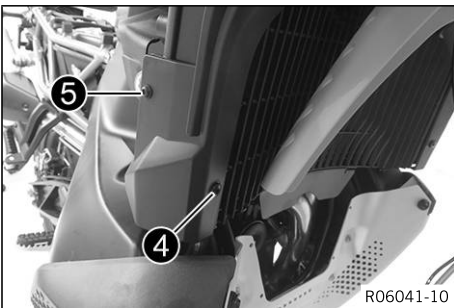
- Mount new cable ties.



- Mount wheel spindle mask support ⑥.



- Attach inside cover to bracket A.



- Mount and tighten screw ④.

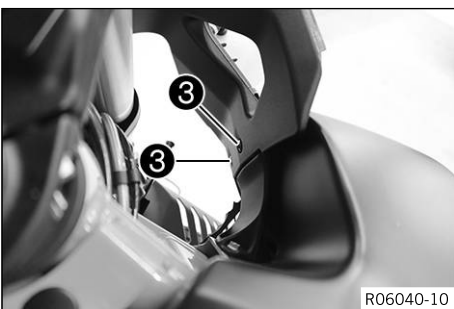
Guideline

Screw, trim	M5	3 Nm (2.2 lbf ft)
-------------	----	-------------------

- Mount and tighten screw ⑤.

Guideline

Remaining screws, chassis	EJOTPT® K50x12	1 Nm (0.7 lbf ft)
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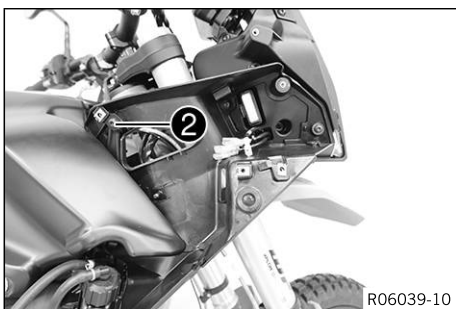


- Mount and tighten screws ③.

Guideline

Screw, trim	M5	3 Nm (2.2 lbf ft)
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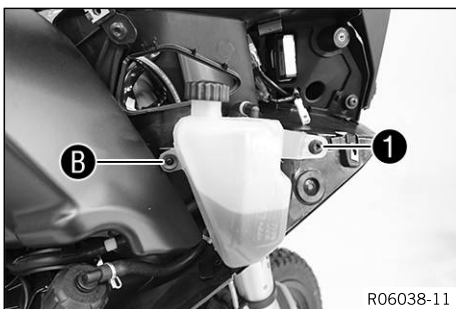
7 HANDLEBAR, CONTROLS



- Mount and tighten screw ②.

Guideline

Screw, trim	M5	3 Nm (2.2 lbf ft)
-------------	----	-------------------



- Hang the compensating tank in guide ③.

- Mount and tighten screw ①.

Guideline

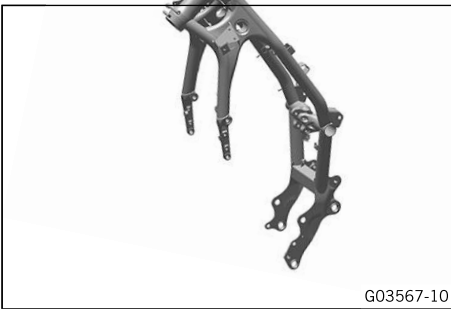
Remaining screws, chassis	M5	5 Nm (3.7 lbf ft)
---------------------------	----	-------------------

Finishing work

- Install the headlight. (📖 p. 220)
- Install windshield. (📖 p. 145)
- Install the left fuel tank spoiler. (📖 p. 140)
- Install the left side cover. (📖 p. 137)
- Install the right fuel tank spoiler. (📖 p. 142)
- Install the battery cover. (📖 p. 139)
- Install the right side cover. (📖 p. 138)
- Mount the seat. (📖 p. 120)

8.1

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.

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



Caution

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

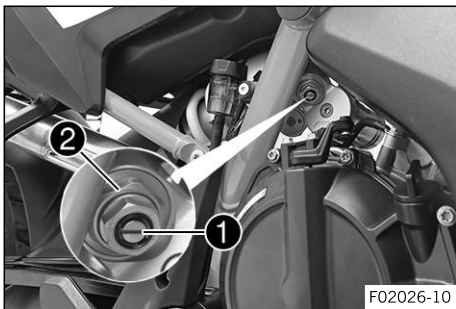
The shock absorber is filled with highly compressed nitrogen.

- Please follow the description provided.



Info

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



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



Info

Do not loosen fitting **2**!

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

Guideline

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



Info

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

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



Caution

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

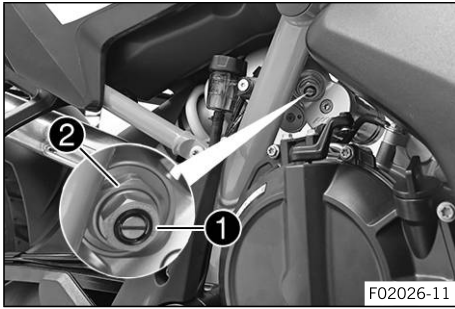
The shock absorber is filled with highly compressed nitrogen.

- Please follow the description provided.



Info

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



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

i Info
Do not loosen fitting **2**!

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

Guideline

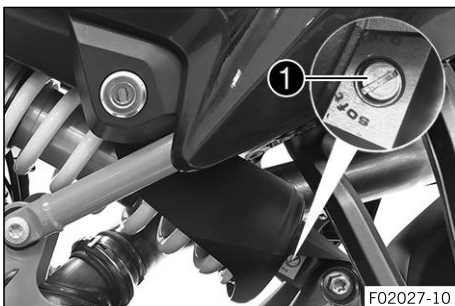
High-speed compression damping	
Comfort	2 turns
Standard	1.5 turns
Sport	1 turn
Full payload	0.5 turns

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

9.3 Adjusting the rebound damping of the shock absorber

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

- Please follow the description provided.



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

Guideline

Rebound damping	
Comfort	23 clicks
Standard	15 clicks
Sport	12 clicks
Full payload	5 clicks

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

9.4 Adjusting the spring preload of the shock absorber



Warning

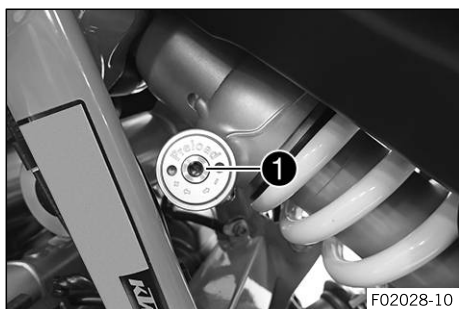
Danger of accidents Modifications to the suspension setting may seriously alter the handling characteristic.

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



Info

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



Condition

The link fork is relieved of weight.

- Turn adjusting screw **1** counterclockwise all the way.
- Turn it clockwise by the number of turns corresponding to the shock absorber type and use.

Guideline

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



Info

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

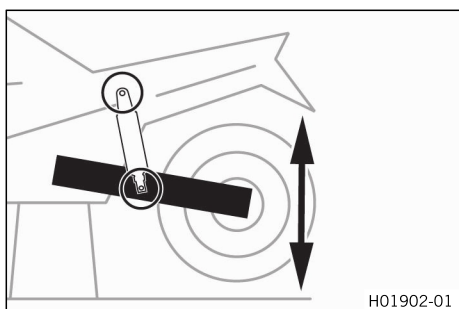
9.5 Checking the heim joint for play

Preparatory work

- Remove main silencer. (📖 p. 106)
- Raise motorcycle with the work stand (center). (📖 p. 16)
- Place a load on the front of the vehicle.
- ✓ The rear wheel is not in contact with the ground.

Main work

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



Finishing work

- Remove the motorcycle from the work stand (center). (📖 p. 17)
- Install the main silencer. (📖 p. 106)

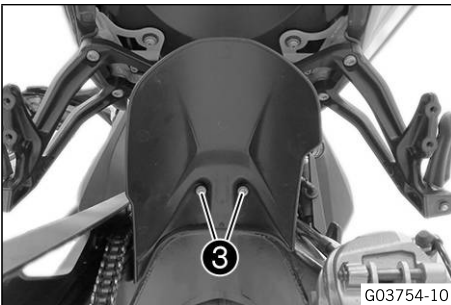
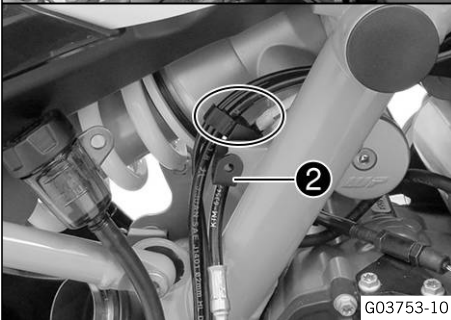
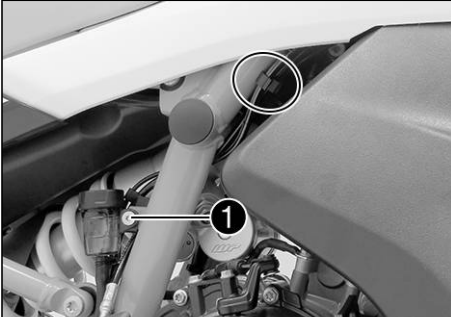
9.6 Removing the shock absorber

Preparatory work

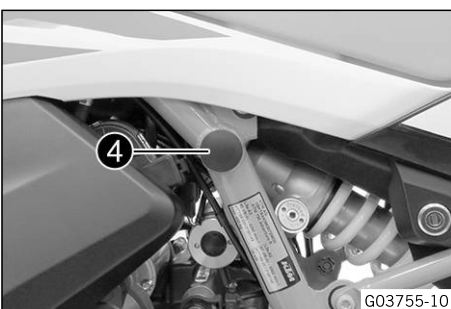
- Remove main silencer. (📖 p. 106)
- Raise motorcycle with the work stand (center). (📖 p. 16)
- Place a load on the front of the vehicle.
 - ✔ The rear wheel is not in contact with the ground.
- Remove the rear wheel (work stand, rear). (📖 p. 165)

Main work

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

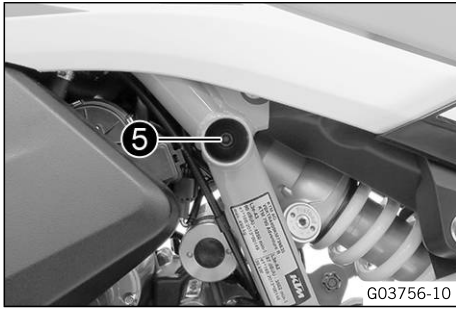


- Remove screws ❸.
- Remove the splash protector.



- Remove protection cap ❹.

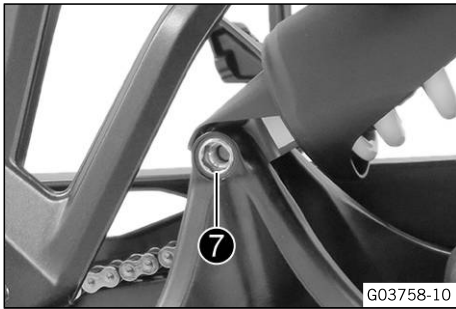
9 SHOCK ABSORBER, LINK FORK



- Loosen screw 5, but do not remove it yet.



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

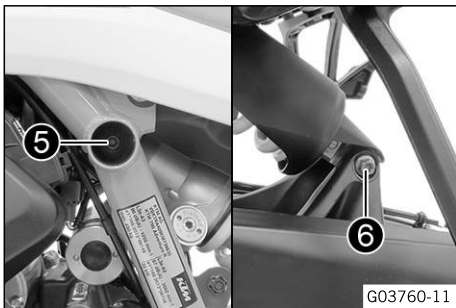


- Loosen bushing 7.

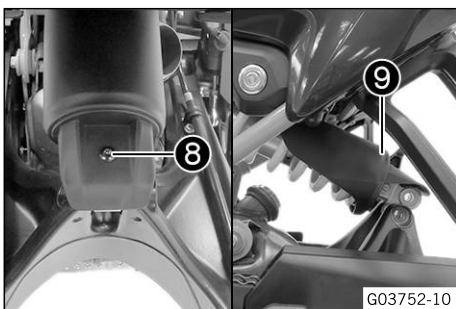


Info

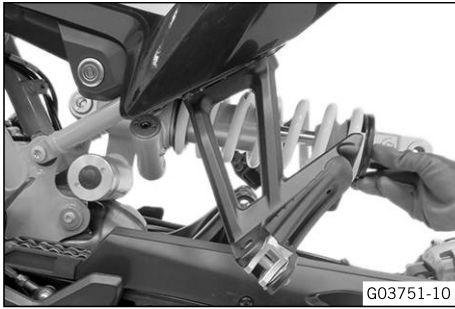
LH thread.



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



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



- Remove the shock absorber toward the rear.

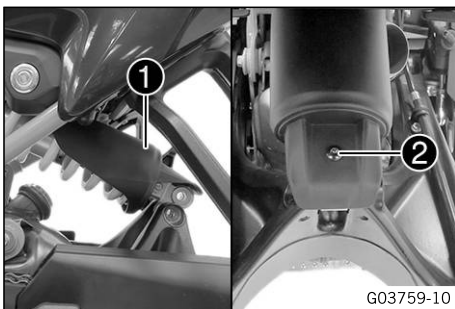


9.7 Installing the shock absorber



Main work

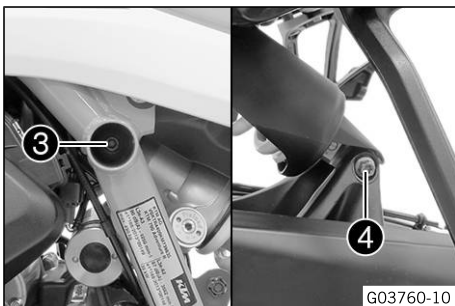
- Position the shock absorber.



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

Guideline

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

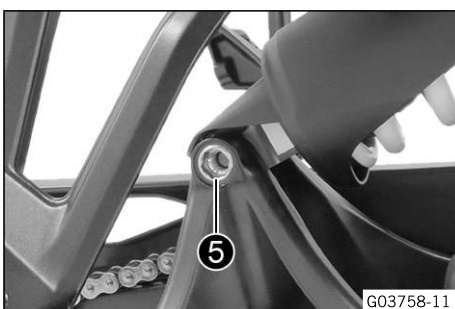
Guideline

Screw, top shock absorber	M12	80 Nm (59 lbf ft) Loctite®2701™
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- Raise the link fork and mount screw ④ but do not tighten it yet.

Guideline

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



- Tighten bushing ⑤.

Guideline

Bushing, shock absorber support	M20LHx1.5	10 Nm (7.4 lbf ft) Thread and fitting greased
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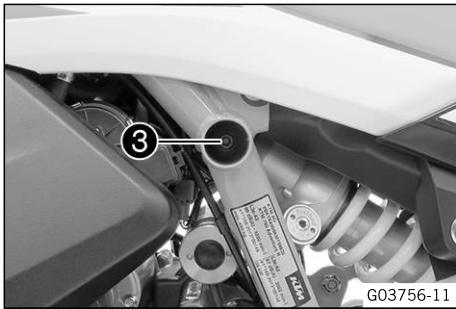
9 SHOCK ABSORBER, LINK FORK



- Tighten screw ④.

Guideline

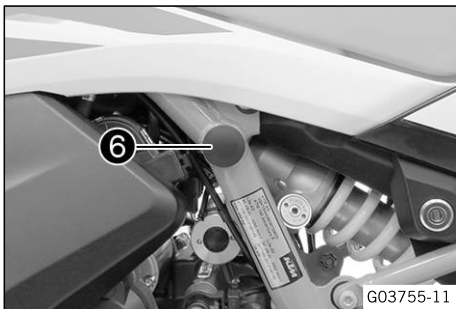
Screw, bottom shock absorber	M12	80 Nm (59 lbf ft) Loctite®2701™
------------------------------	-----	---



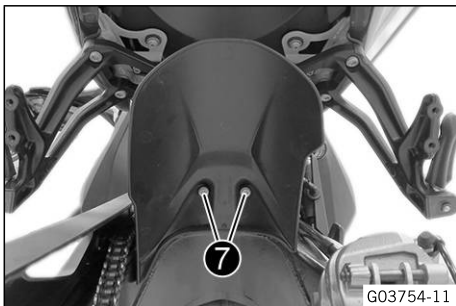
- Tighten screw ③.

Guideline

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



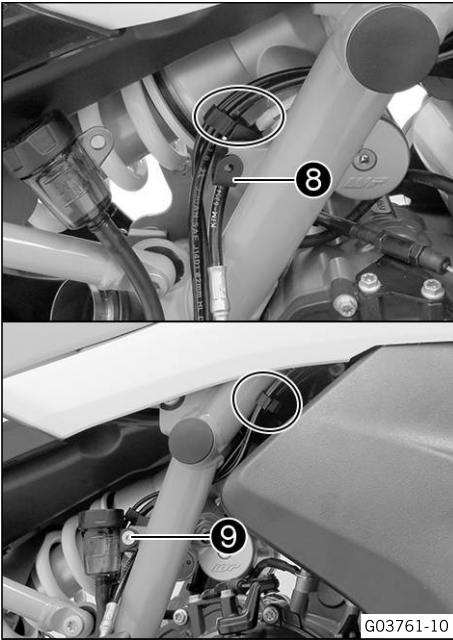
- Mount protection cap ⑥.



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

Guideline

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



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

Guideline

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

Finishing work

- Install the rear wheel (work stand, rear). (📖 p. 166)
- Check the chain tension. (📖 p. 175)
- Remove the motorcycle from the work stand (center). (📖 p. 17)
- Install the main silencer. (📖 p. 106)



9.8 Servicing the shock absorber



Caution

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

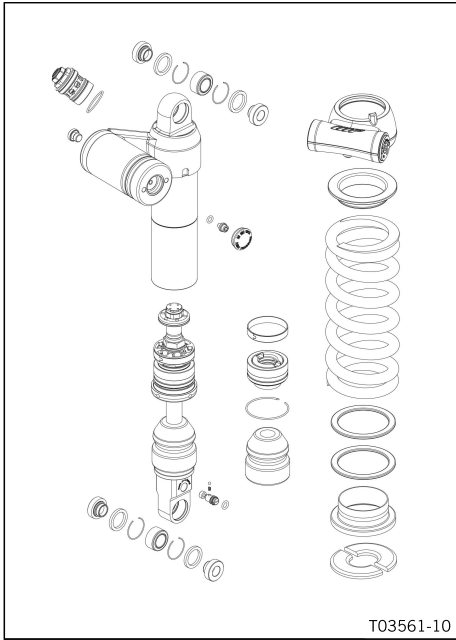
The shock absorber is filled with highly compressed nitrogen.

- Please follow the description provided.

Condition

The shock absorber has been removed.

9 SHOCK ABSORBER, LINK FORK

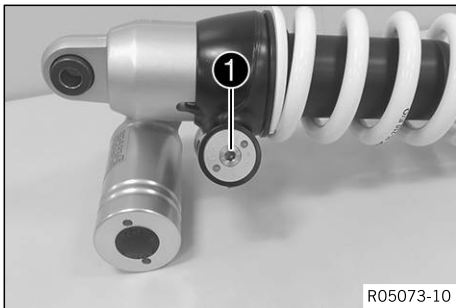


- Remove the spring. (📖 p. 78)
- Disassemble the damper. (📖 p. 79)
- Disassemble the piston rod. (📖 p. 81)
- Disassemble the rebound adjuster. (📖 p. 82)
- Check the damper. (📖 p. 83)
- Change the heim joint. (📖 p. 84)
- Assemble the rebound adjuster. (📖 p. 86)
- Assemble the piston rod. (📖 p. 87)
- Assemble the damper. (📖 p. 88)
- Install the spring. (📖 p. 95)

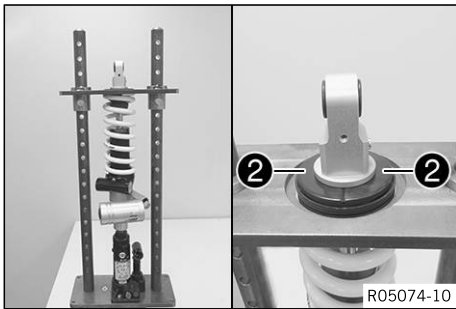
9.9 Removing the spring

Condition

The shock absorber has been removed.



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



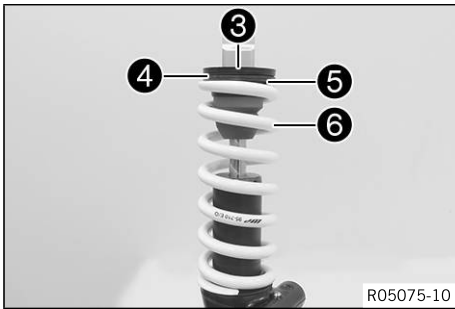
- Clamp the shock absorber into the special tool.

Spring tensioner (T14050S) (📖 p. 480)

Info

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

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

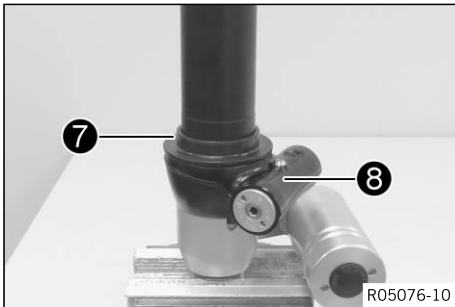


- Clamp the shock absorber into the vise.

Guideline

Use soft jaws.

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



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

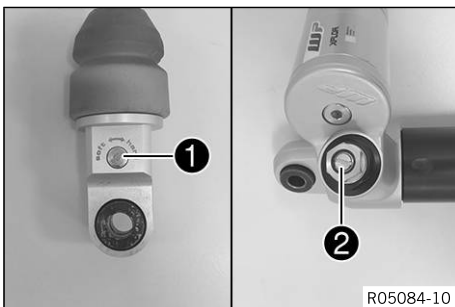
9.10 Disassembling the damper

Preparatory work

- Remove the spring. (📖 p. 78)

Main work

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

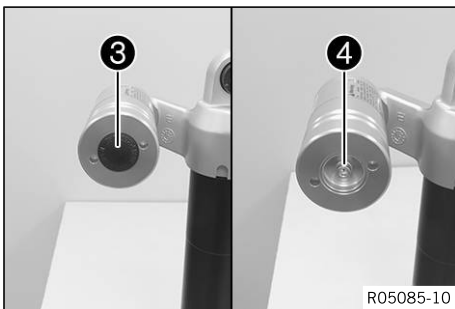


- Clamp the shock absorber into the vise.

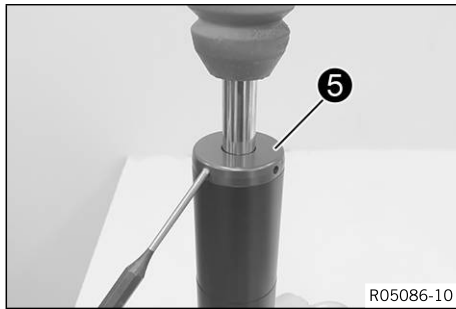
Guideline

Use soft jaws.

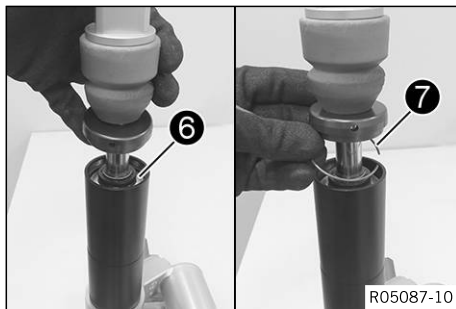
- Remove rubber cap ③ of the reservoir.
- Slowly open screw ④.
- ✓ The nitrogen pressure dissipates.
- Remove the screw with the O-ring.



9 SHOCK ABSORBER, LINK FORK



- Remove locking cap **5**.



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



Info

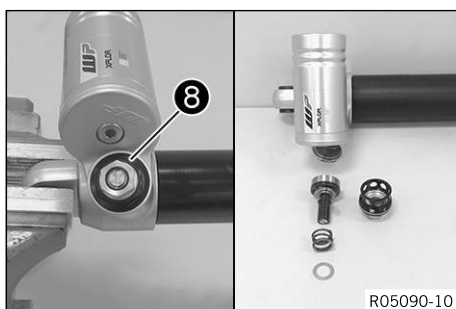
Check inner surface; do not scratch. If necessary, remove any burrs with sandpaper.



- Remove the piston rod.



- Unclamp the shock absorber.
- Drain the oil.



- Clamp the shock absorber into the vise.

Guideline

Use soft jaws.

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

9.11 Disassembling the piston rod

Preparatory work

- Remove the spring. (📖 p. 78)
- Disassemble the damper. (📖 p. 79)

Main work

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

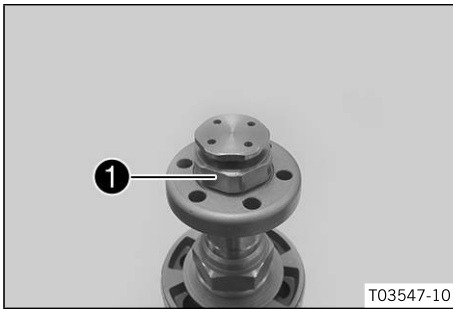
Guideline

Use soft jaws.

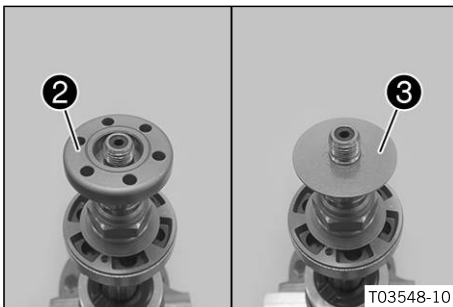
- Heat nut ❶ and remove.

Guideline

50 °C (122 °F)



T03547-10

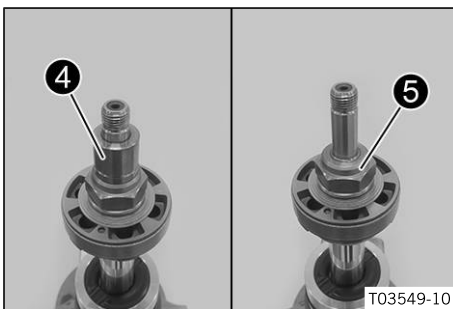


T03548-10

- Remove piston ❷.
- Remove shim stack ❸.

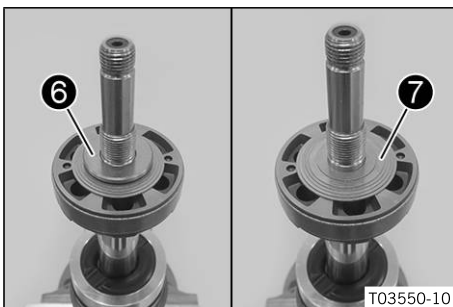
i Info

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



T03549-10

- Remove bushing ❹.
- Remove nut ❺.



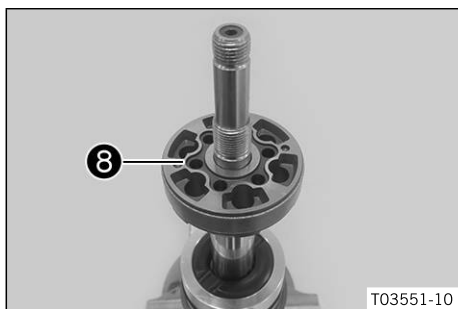
T03550-10

- Remove washer ❻.
- Remove rebound shim stack ❼.

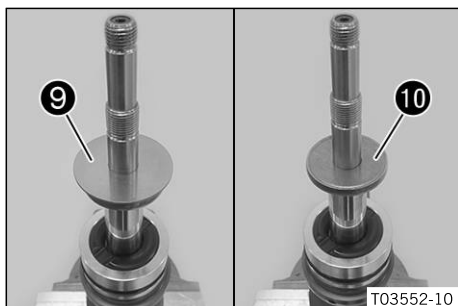
i Info

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

9 SHOCK ABSORBER, LINK FORK



- Remove piston 8.



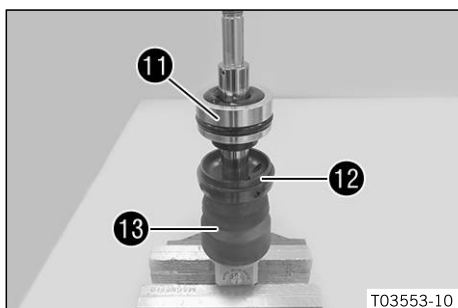
- Remove compression shim stack 9.



Info

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

- Remove rebound washer 10.



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

9.12 Disassembling the rebound adjuster

Preparatory work

- Remove the spring. (📖 p. 78)
- Disassemble the damper. (📖 p. 79)
- Disassemble the piston rod. (📖 p. 81)

Main work

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

Guideline

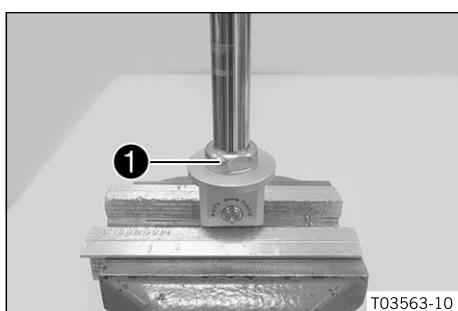
Use soft jaws.

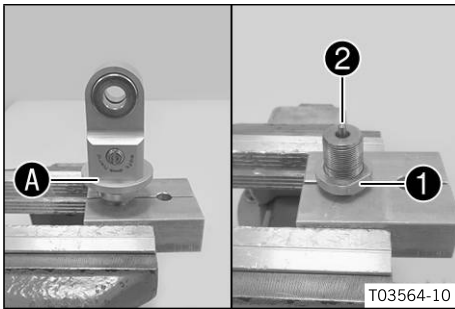
- Heat lock nut 1.

Guideline

50 °C (122 °F)

- Loosen lock nut.





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

Clamping stand (T1202S) (📖 p. 478)

- Heat the foot section in area **A**.

Guideline

50 °C (122 °F)

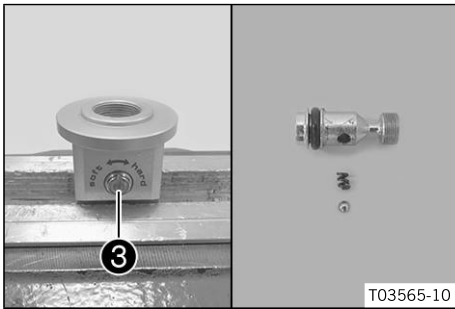
- Remove the foot section using a suitable tool.
- Remove rebound needle **2** with the O-ring.
- Remove lock nut **1**.
- Unclamp the piston rod.

- Clamp the foot section into the vise.

Guideline

Use soft jaws.

- Remove adjusting screw **3**.



i Info

Do not misplace the ball and the spring.

9.13 Checking the damper

Condition

The damper has been disassembled.



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

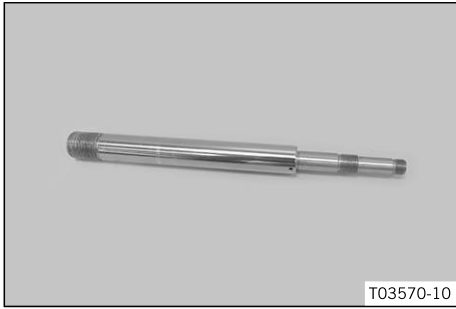
Damper cartridge

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

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



9 SHOCK ABSORBER, LINK FORK



- Measure the diameter of the piston rod.

Piston rod	
Diameter	≥ 17.95 mm (≥ 0.7067 in)

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

- Replace the piston rod.

- Measure the run-out of the piston rod.

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

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

- Replace the piston rod.

- Check the piston rod for damage and wear.

- » If there is damage or wear:

- Replace the piston rod.

- Check the piston rings for damage and wear.

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

- Replace the piston rings.



9.14 Changing the heim joint

i Info

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

Condition

The shock absorber has been removed.

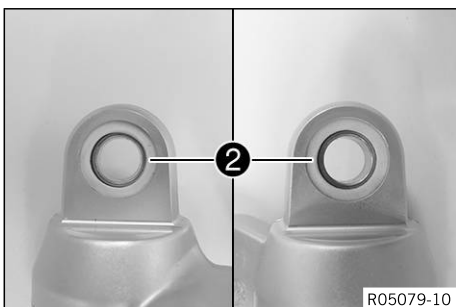
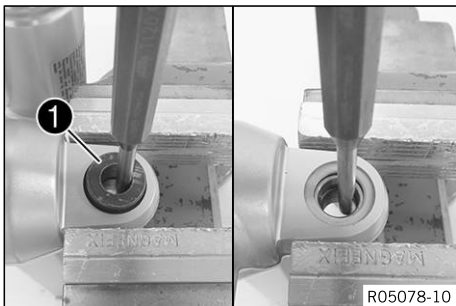
- Clamp the shock absorber into the vise.

Guideline

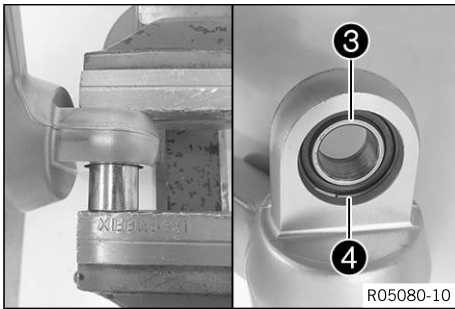
Use soft jaws.

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

Drift (T120) (📖 p. 478)



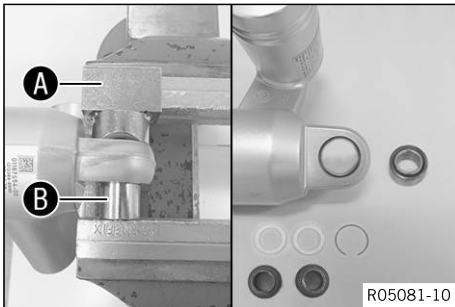
- Remove seal rings **2** on both sides.



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

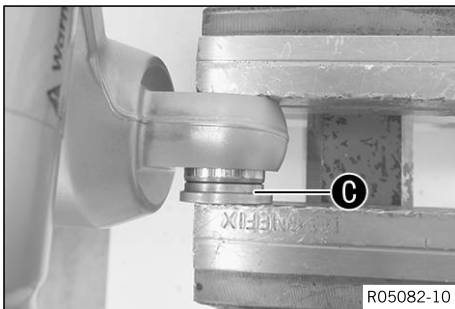
Pressing tool (T1207S) (📖 p. 478)

- ✓ The heim joint rests against a lock ring.
- Remove second circlip **4**.



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

Pressing tool (T1207S) (📖 p. 478)



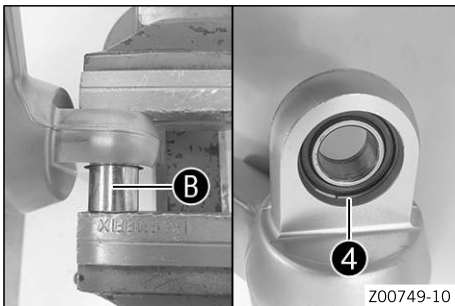
- Push in new heim joint **C** using the special tool.

Pressing tool (T1206) (📖 p. 478)



Info

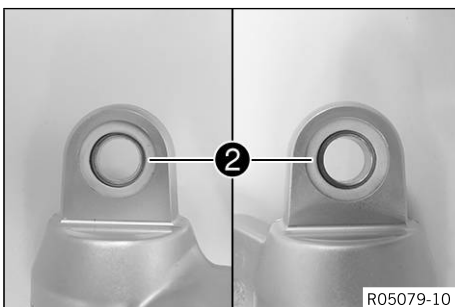
Only press the bearing in via the outer bearing race, otherwise the bearing will be damaged when it is pressed in.



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

Pressing tool (T1207S) (📖 p. 478)

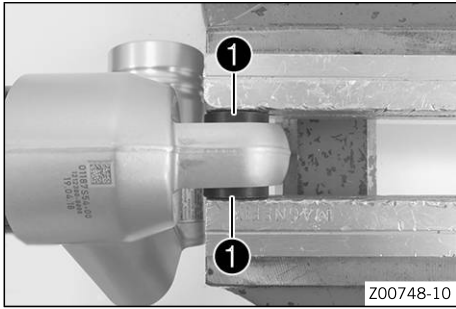
- Mount second circlip **4**.



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

Lubricant (T158) (📖 p. 460)

9 SHOCK ABSORBER, LINK FORK

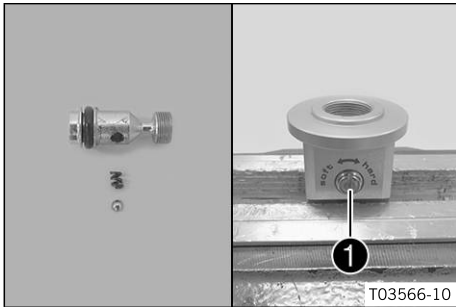


- Press in both collar bushings **1** of the heim joint.

Guideline

Use soft jaws.

9.15 Assembling the rebound adjuster



- Clamp the foot section into the vise.

Guideline

Use soft jaws.

- Grease the O-ring.

Lubricant (T158) (📖 p. 460)

- Lubricate the spring and the ball.

Lubricant (T159) (📖 p. 460)

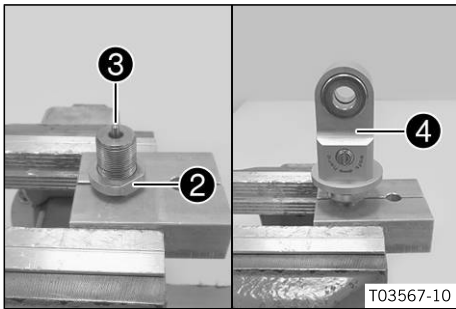
- Mount adjusting screw **1**.

✓ The collar is flush with the foot section.

- Unclamp the foot section.

- Clamp the piston rod using the special tool.

Clamping stand (T1202S) (📖 p. 478)



- Mount lock nut **2** all the way on.

- Grease the O-ring of the rebound needle.

Lubricant (T159) (📖 p. 460)

- Mount rebound needle **3** with the O-ring at the top.

- Mount and tighten foot section **4** using a suitable tool.

Guideline

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

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

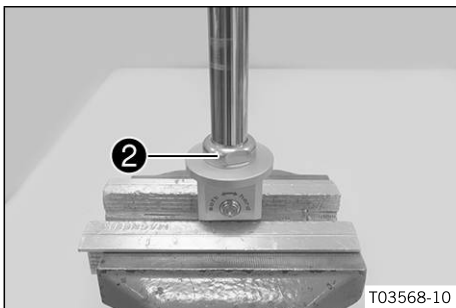
Guideline

Use soft jaws.

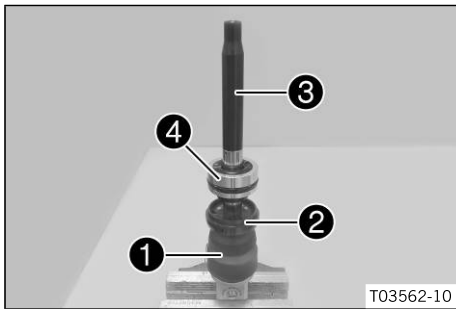
- Tighten lock nut **2**.

Guideline

Lock nut	M18x1	110 Nm (81.1 lbf ft) Loctite®2701™
----------	-------	--



9.16 Assembling the piston rod



Preparatory work

- Assemble the rebound adjuster. (📖 p. 86)

Main work

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

Guideline

Use soft jaws.

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

Mounting sleeve (T1554) (📖 p. 481)

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

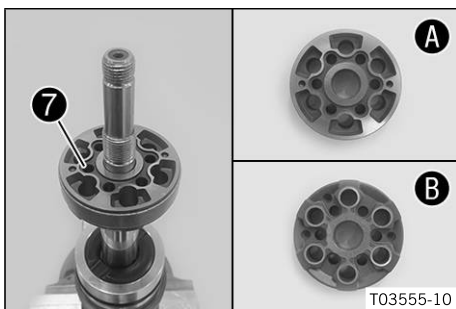
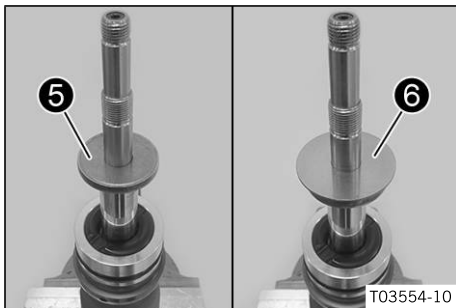
Lubricant (T625) (📖 p. 460)

- Remove the special tool.

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

i Info

Note the setting list.

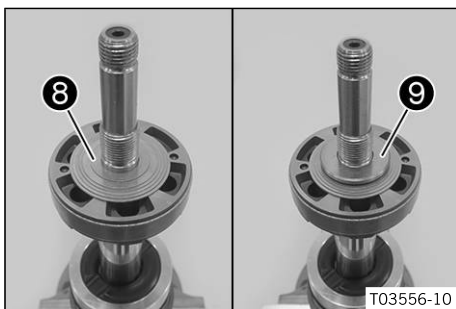


- Clean piston ⑦.
- Mount the piston.

Guideline

View **A** of piston from above

View **B** of piston from below



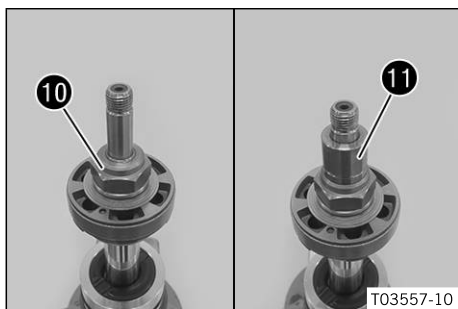
- Mount rebound shim stack ⑧ with the smaller washers facing upward.

i Info

Note the setting list.

- Mount washer ⑨.

9 SHOCK ABSORBER, LINK FORK

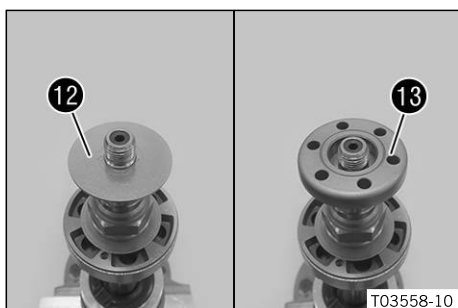


- Mount and tighten nut **10**.

Guideline

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

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



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



Info

Note the setting list.

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



- Mount and tighten nut **14**.

Guideline

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

9.17 Assembling the damper

Preparatory work

- Assemble the rebound adjuster. (📖 p. 86)
- Assemble the piston rod. (📖 p. 87)



Main work

- Grease the O-rings of the compression adjuster.

Lubricant (T158) (📖 p. 460)

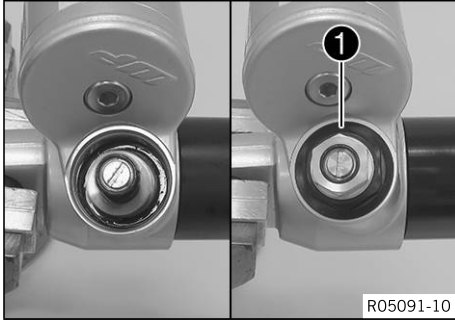
- Lubricate the thread.

Lubricant (T159) (📖 p. 460)

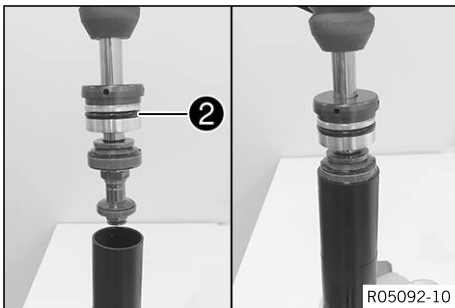
- Mount the piston with the spring and washer.
- Mount and tighten compression adjuster ❶.

Guideline

Compression adjuster	M31x1	35 Nm (25.8 lbf ft)
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R05091-10



R05092-10

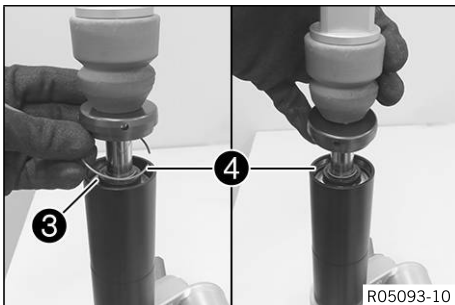
- Fill the damper cartridge about half full.

Shock absorber fluid (SAE 2.5) (50180751S1) (📖 p. 459)

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

Lubricant (T158) (📖 p. 460)

- Mount the piston rod carefully.



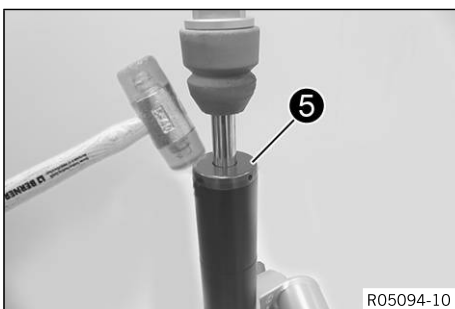
R05093-10

- Mount seal ring retainer ❸ and slide it under the ring groove.
- Mount lock ring ❹.

Info

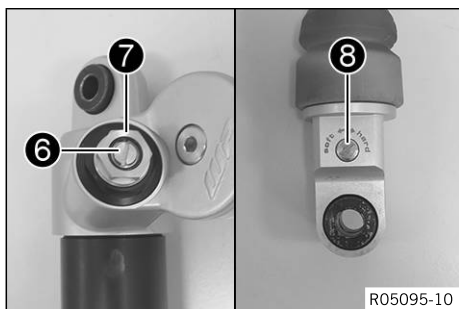
Do not scratch the inside surface.

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



R05094-10

- Mount locking cap ❺ of the damper cartridge.
- Bleed and fill the damper. (📖 p. 91)
- Fill the damper with nitrogen. (📖 p. 94)



Alternative 1

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

Guideline

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

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

Guideline

High-speed compression damping	
Comfort	2 turns
Standard	1.5 turns
Sport	1 turn
Full payload	0.5 turns

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

Guideline

Rebound damping	
Comfort	23 clicks
Standard	15 clicks
Sport	12 clicks
Full payload	5 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.

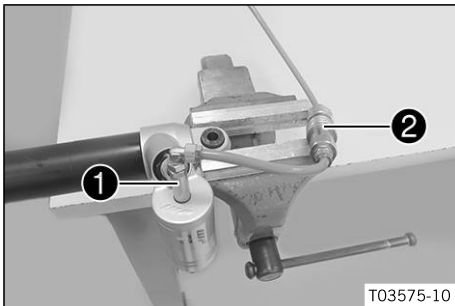
- Position adjusting screws **6**, **7**, and **8** in the location determined during disassembly.

9.18 Bleeding and filling the damper

i Info

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

Open the adjusters of the rebound and compression damping completely.



- Clamp the damper as shown.

Guideline

Use soft jaws.

i Info

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

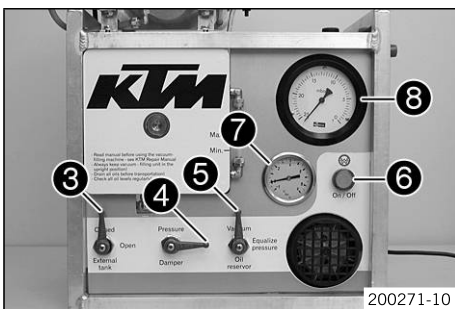
- Remove the screw from the filling port.
- Mount adapter **1** on the damper.

i Info

Hand-tighten only without using a tool.

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

Vacuum pump (T1240S) (📖 p. 479)



- 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

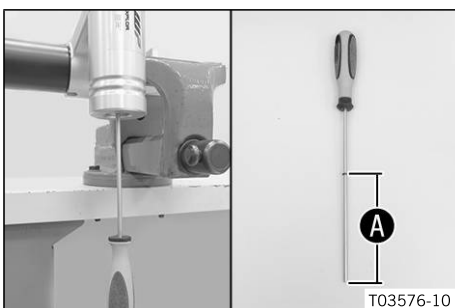
- ✓ Vacuum gauge **8** drops to the required value.

4 mbar

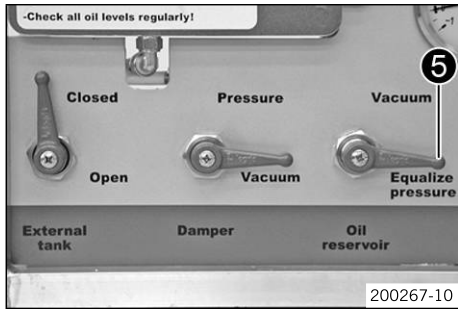
- Determine distance **A** between the floating piston and reservoir hole with the special tool.

Depth micrometer (T107S) (📖 p. 477)

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



9 SHOCK ABSORBER, LINK FORK



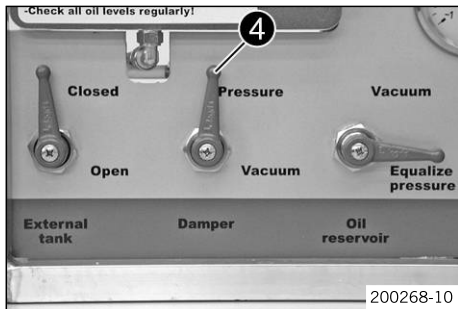
- When the vacuum gauge reaches the required value, turn control lever **Oil reservoir 5** to **Equalize pressure**.

Guideline

4 mbar

- ✓ The pressure gauge rises to the required value.

0 bar



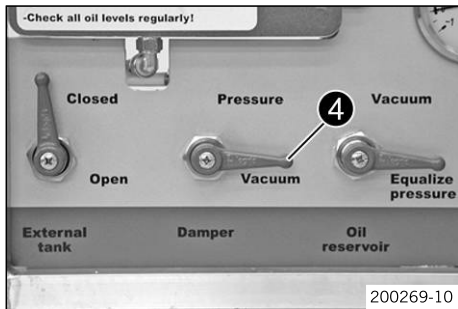
- When the pressure gauge reaches the specified value, turn control lever **Damper 4** to **Pressure**.

Guideline

0 bar

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

3 bar



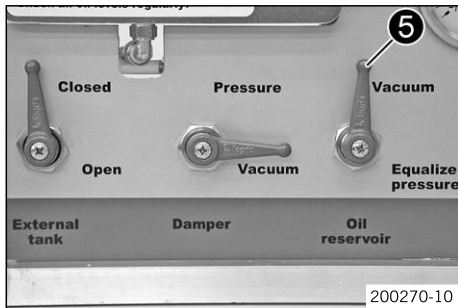
- When the pressure gauge reaches the specified value, turn control lever **Damper 4** to **Vacuum**.

Guideline

3 bar

- ✓ The pressure gauge drops to the required value.

0 bar



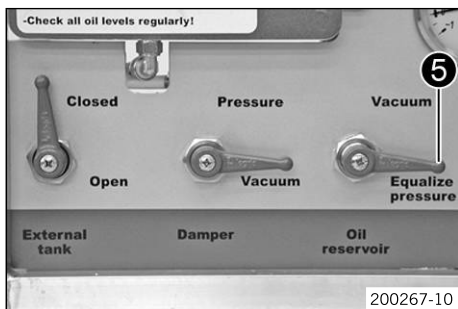
- When the pressure gauge reaches the specified value, turn control lever **Oil reservoir 5** to **Vacuum**.

Guideline

0 bar

- ✓ The vacuum gauge drops to the required value.

4 mbar



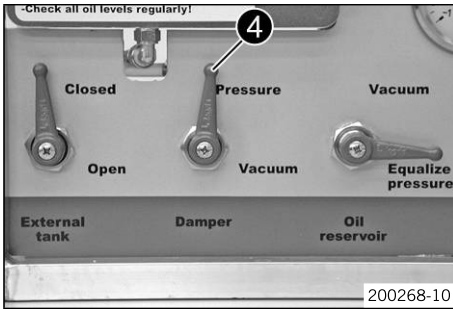
- When the vacuum gauge reaches the required value, turn control lever **Oil reservoir 5** to **Equalize Pressure**.

Guideline

4 mbar

- ✓ The pressure gauge drops to the required value.

0 bar



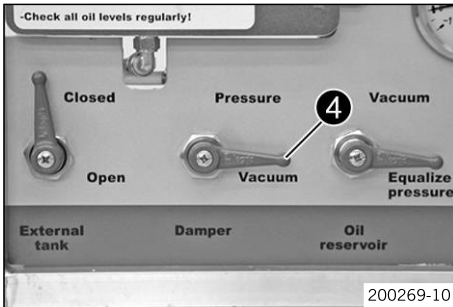
- When the pressure gauge reaches the specified value, turn control lever **Damper 4** to **Pressure**.

Guideline

0 bar

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

3 bar



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

Guideline

3 bar

- ✓ The pressure gauge drops to the required value.

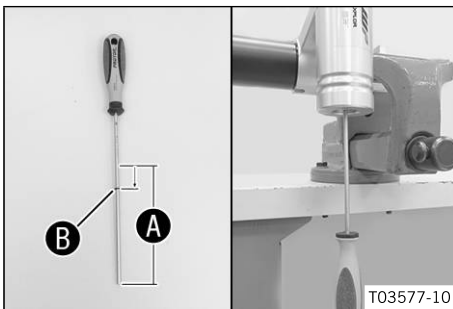
0 bar

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

Guideline

0 bar

- ✓ The vacuum pump is switched off.



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

Guideline

5 mm

Depth micrometer (T107S) (📖 p. 477)

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

i Info

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

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

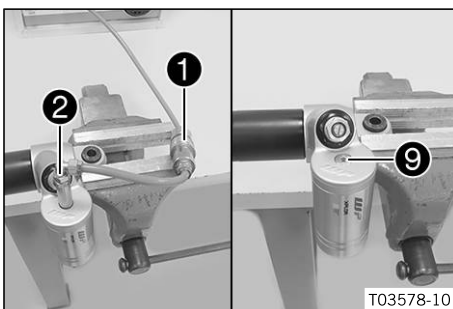
i Info

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

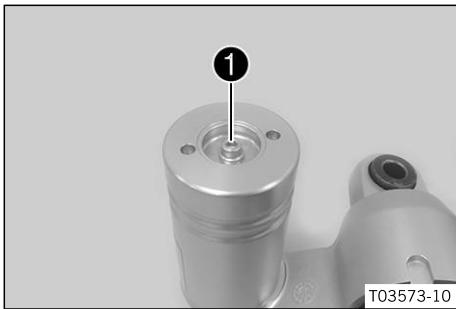
- Remove the adapter.
- Mount and tighten screw **9**.

Guideline

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



9.19 Filling damper with nitrogen

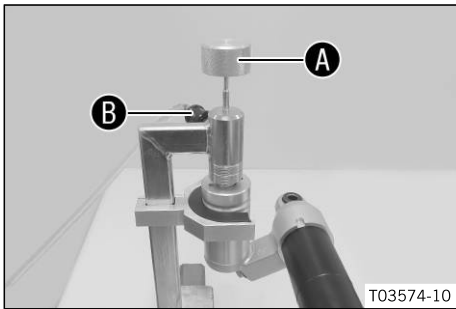


- Mount screw **1** with the O-ring and screw it in approx. 2 full turns, but do not tighten it fully yet.



Info

The piston rod is fully extended.



- Fix the special tool in the vise.

Filling tool (T170S1) (📖 p. 481)
Filling adapter (T1565) (📖 p. 481)

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

Filling gas - nitrogen

- Adjust the pressure regulator.

Guideline

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

- Position the damper in the special tool.

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

- Open filler tap **B**.

- Fill the damper for at least 15 seconds.

Guideline

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



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**.

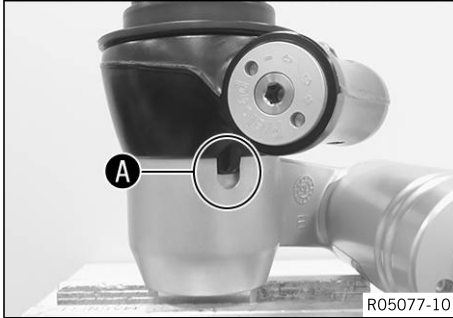
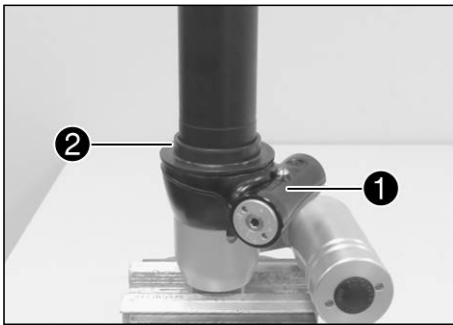
- Close spigot **B** and take the damper out of the special tool.

- Tighten the filling port screw.

Guideline

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

9.20 Installing the spring

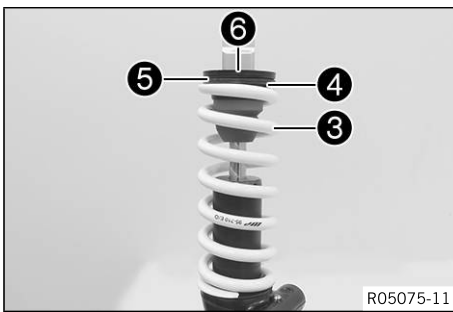


- Clamp the shock absorber into the vise.

Guideline

Use soft jaws.

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



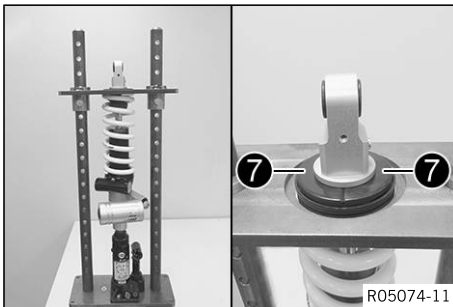
- Measure the total spring length while the spring is not under tension.
- Position spring ③.

Guideline

Spring rate

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

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



- Clamp the shock absorber into the special tool.

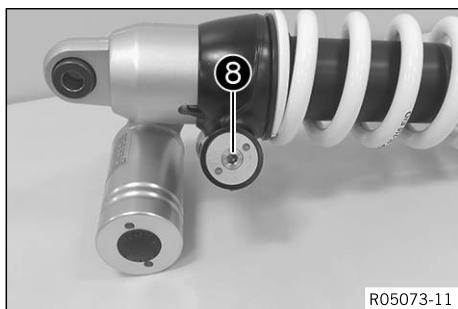
Spring tensioner (T14050S) (📖 p. 480)

i Info

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

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

9 SHOCK ABSORBER, LINK FORK



Warning

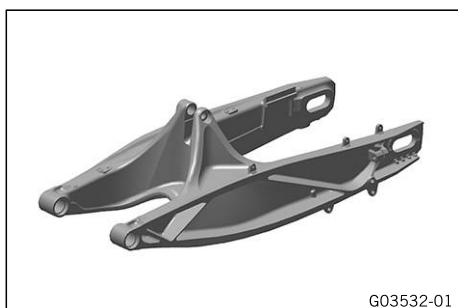
Danger of accidents Modifications to the suspension setting may seriously alter the handling characteristic.

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.

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

9.21 Checking the link fork



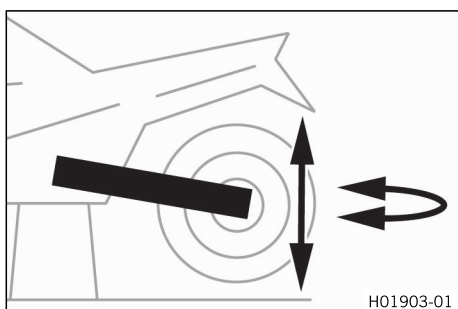
- Check the link fork for damage, cracking, and deformation.
 - » If the link fork exhibits damage, cracking, or deformation:
 - Change the link fork.



Info

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

9.22 Checking the fork bearing for play



Preparatory work

- Remove main silencer. (📖 p. 106)
- Raise motorcycle with the work stand (center). (📖 p. 16)
- 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. 99)
- Move the link fork from one side to the other.
 - » If there is detectable play:
 - Change the link fork bearing. (📖 p. 99)

Finishing work

- Remove the motorcycle from the work stand (center). (📖 p. 17)
- Install the main silencer. (📖 p. 106)

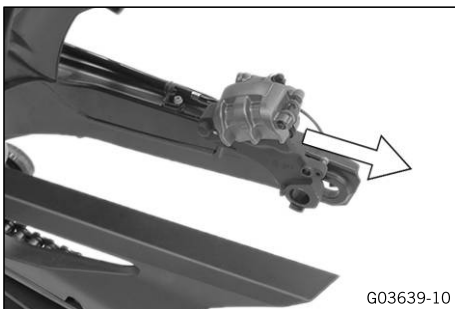
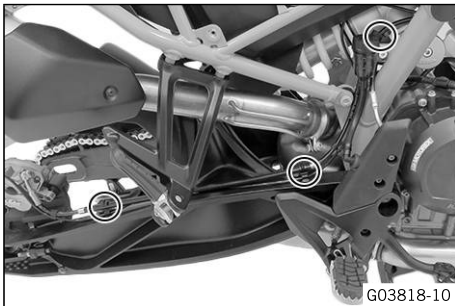
9.23 Removing the link fork

Preparatory work

- Remove the seat. (📖 p. 120)
- Remove the left side cover. (📖 p. 137)
- Remove the battery cover. (📖 p. 138)
- Remove left fuel tank spoiler. (📖 p. 139)
- Remove the right side cover. (📖 p. 137)
- Remove right fuel tank spoiler. (📖 p. 141)
- Remove the engine guard. (📖 p. 143)
- Remove the fuel tank. (📖 p. 120)
- Raise the motorcycle at the front using the work stand. (📖 p. 19)
- Place a load on the front of the vehicle.
 - ✓ The rear wheel is not in contact with the ground.
- Remove the rear wheel (work stand, front). (📖 p. 162)

Main work

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

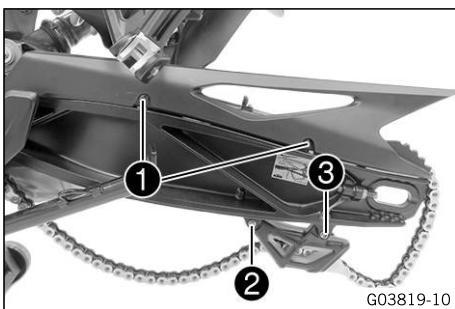


- Take the brake caliper out of the guide and hang it to the side.



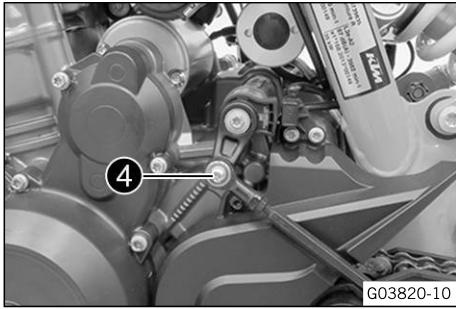
Info

Cover the components to protect them against damage.

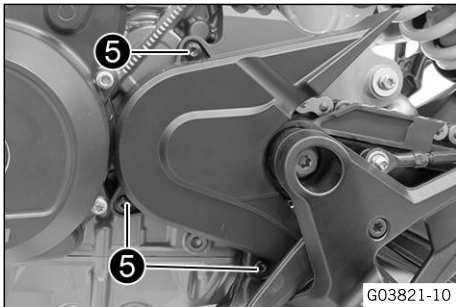


- Remove screws ①.
- Take off the chain guard.
- Remove fitting ②.
- Remove screw ③.
- Hang the chain guide with chain to the side.

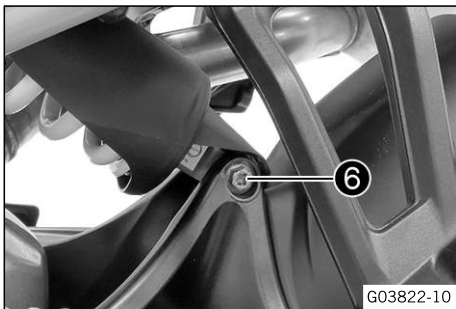
9 SHOCK ABSORBER, LINK FORK



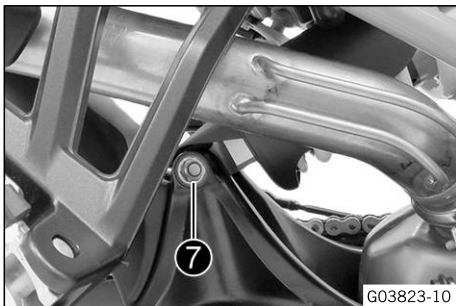
- Remove screw ④ with the washer.
- Place the shift rod to the side.



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

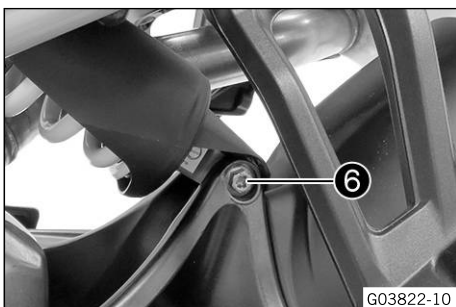


- Loosen screw ⑥, but do not remove it yet.

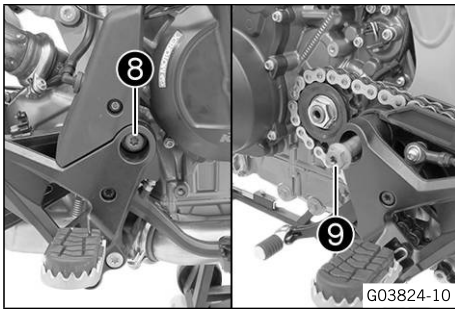


- Loosen adjusting screw ⑦.

i **Info**
LH thread



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



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

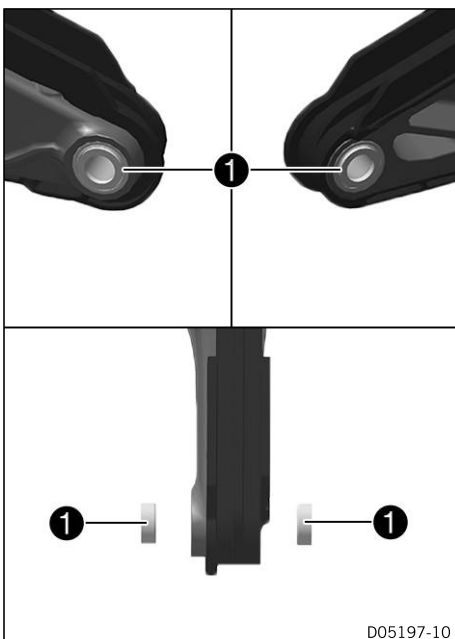
9.24 Changing the link fork bearing

Preparatory work

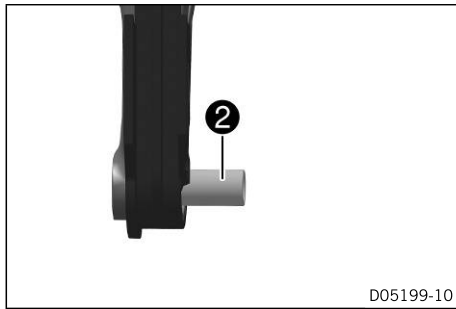
- Remove the seat. (📖 p. 120)
- Remove the left side cover. (📖 p. 137)
- Remove the battery cover. (📖 p. 138)
- Remove left fuel tank spoiler. (📖 p. 139)
- Remove the right side cover. (📖 p. 137)
- Remove right fuel tank spoiler. (📖 p. 141)
- Remove the engine guard. (📖 p. 143)
- Remove the fuel tank. (📖 p. 120)
- Raise the motorcycle at the front using the work stand. (📖 p. 19)
- Place a load on the front of the vehicle.
 - ☑ The rear wheel is not in contact with the ground.
- Remove the rear wheel (work stand, front). (📖 p. 162)
- Remove the link fork. (📖 p. 97)

Left fork bearing

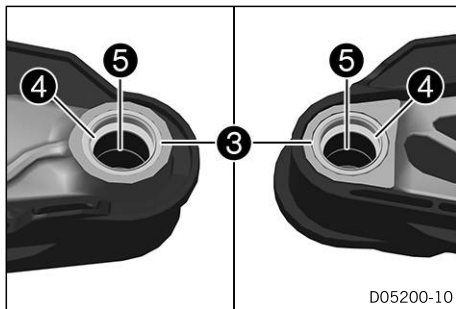
- Remove collar bushings 1.



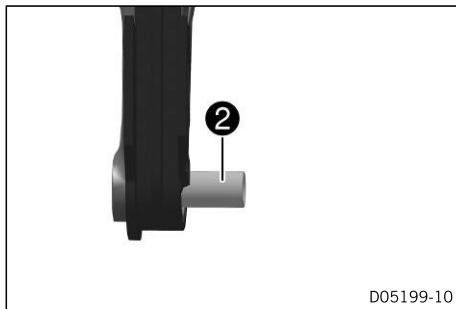
9 SHOCK ABSORBER, LINK FORK



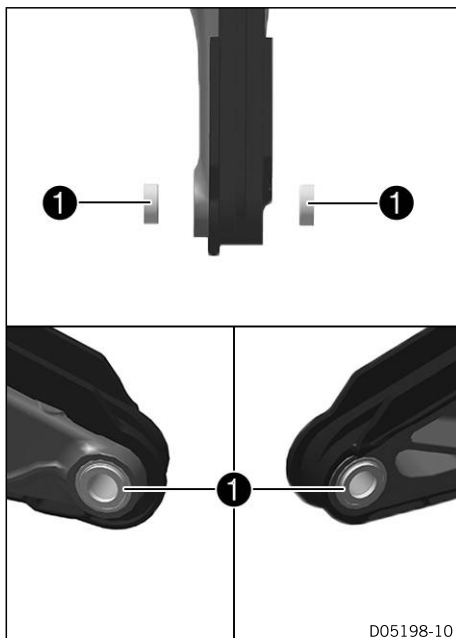
- Remove bushing 2.



- 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.



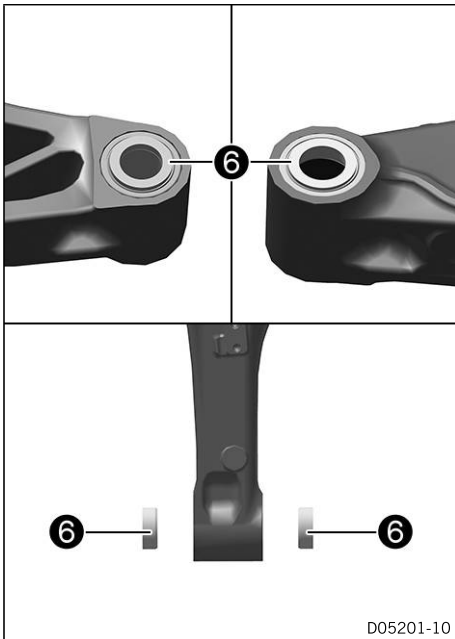
- Mount bushing 2.



- Grease the radial shaft seal rings.

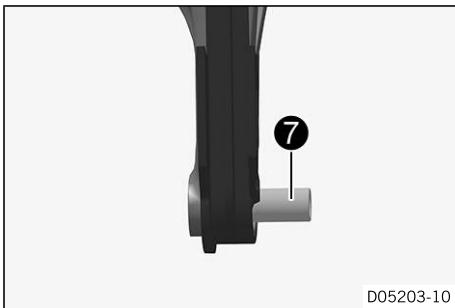
Long-life grease (📖 p. 460)

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

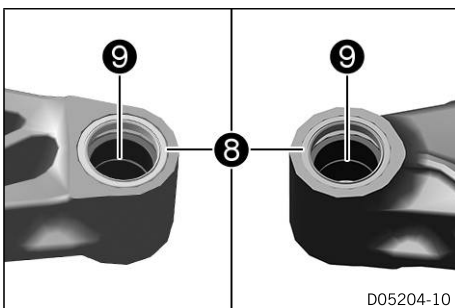


Right fork bearing

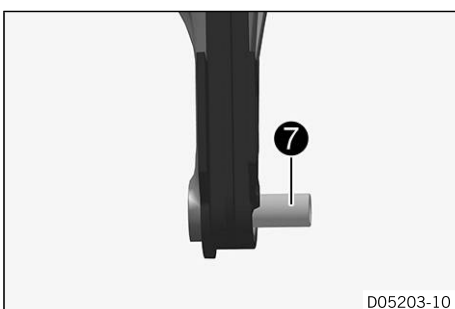
- Remove collar bushings ⑥.



- Remove bushing ⑦.

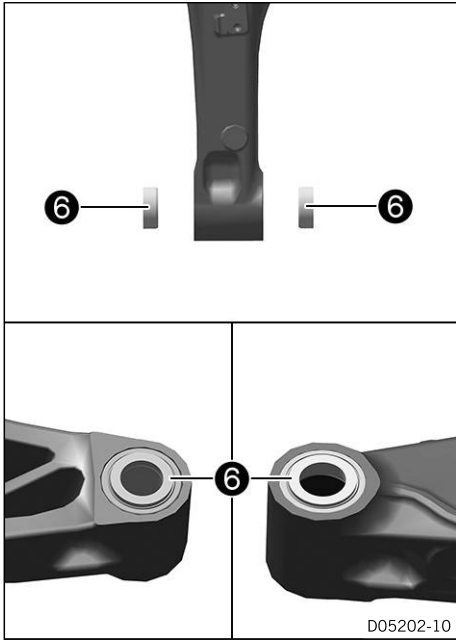


- Remove radial shaft seal rings ⑧ using a suitable tool.
- Press out bearing ⑨ using a suitable tool.
- Using a suitable tool, press in new bearing ⑨.
- Press in radial shaft seal rings ⑧.



- Mount bushing ⑦.

9 SHOCK ABSORBER, LINK FORK



- Grease the radial shaft seal rings.

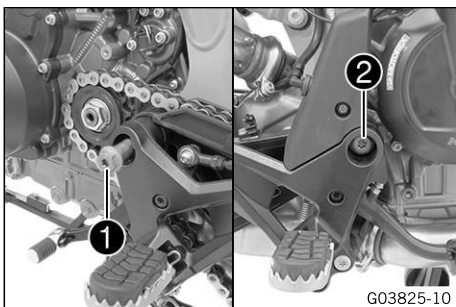
Long-life grease (📖 p. 460)

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

Finishing work

- Install the link fork. (📖 p. 102)
- Install the rear wheel (work stand, front). (📖 p. 163)
- Check the chain tension. (📖 p. 175)
- Remove the motorcycle from the work stand at the front. (📖 p. 19)
- Install the fuel tank. (📖 p. 123)
- Install the engine guard. (📖 p. 143)
- Install the right fuel tank spoiler. (📖 p. 142)
- Install the right side cover. (📖 p. 138)
- Install the left fuel tank spoiler. (📖 p. 140)
- Install the battery cover. (📖 p. 139)
- Install the left side cover. (📖 p. 137)
- Mount the seat. (📖 p. 120)

9.25 Installing the link fork

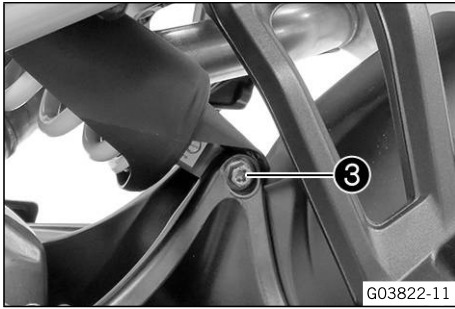


Main work

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

Guideline

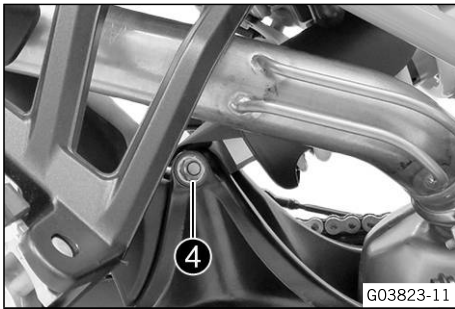
Screw, swingarm pivot	M12	100 Nm (73.8 lbf ft)
-----------------------	-----	-------------------------



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

Guideline

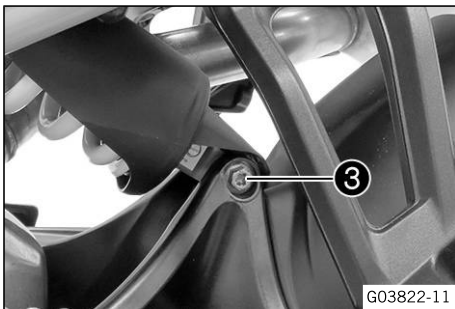
Screw, bottom shock absorber	M12	80 Nm (59 lbf ft) Loctite®2701™
------------------------------	-----	---



- Tighten adjusting screw ④.

Guideline

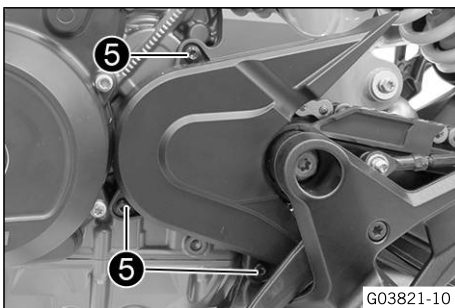
Bushing, shock absorber support	M20LHx1.5	10 Nm (7.4 lbf ft) Thread and fitting greased
---------------------------------	-----------	--



- Tighten screw ③.

Guideline

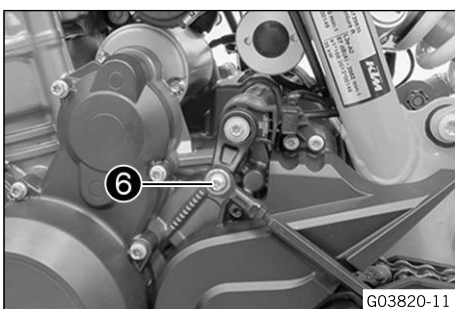
Screw, bottom shock absorber	M12	80 Nm (59 lbf ft) Loctite®2701™
------------------------------	-----	---



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

Guideline

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

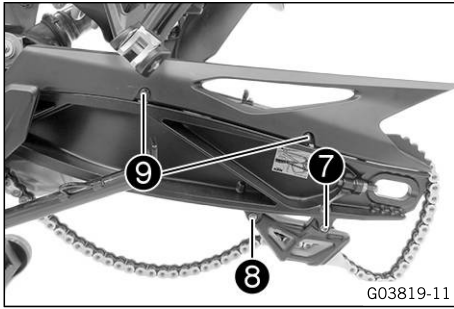


- Position the shift lever.
- Mount and tighten screw ⑥.

Guideline

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

9 SHOCK ABSORBER, LINK FORK



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

Guideline

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

- Mount and tighten fitting 8.

Guideline

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

- Tighten screw 7.

Guideline

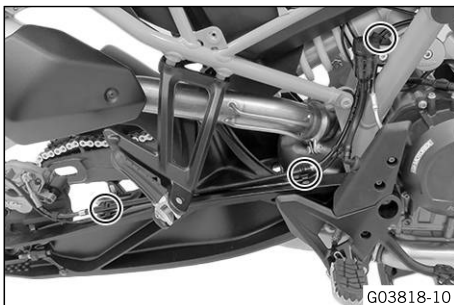
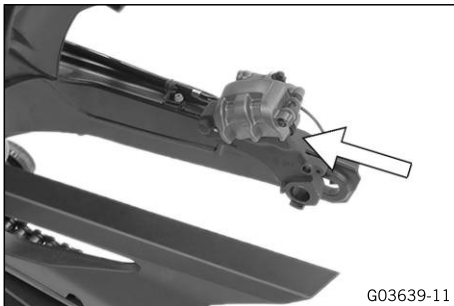
Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
---------------------------	----	--------------------

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

Guideline

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

- Position the brake caliper in the guide.



- Secure the brake line and cable in the holders.

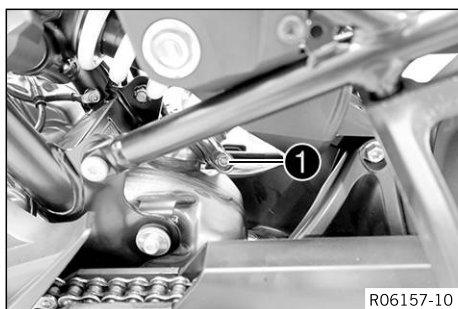
Finishing work

- Install the rear wheel (work stand, front). (📖 p. 163)
- Check the chain tension. (📖 p. 175)
- Remove the motorcycle from the work stand at the front. (📖 p. 19)
- Install the fuel tank. (📖 p. 123)
- Install the engine guard. (📖 p. 143)
- Install the right fuel tank spoiler. (📖 p. 142)
- Install the right side cover. (📖 p. 138)
- Install the left fuel tank spoiler. (📖 p. 140)
- Install the battery cover. (📖 p. 139)
- Install the left side cover. (📖 p. 137)

- Mount the seat. (📖 p. 120)



10.1 Removing the main silencer



- Remove screw ❶.
- Remove the clamp.



- Remove screw ❷ with the washer.
- Take off the main silencer.

10.2 Installing the main silencer



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

Guideline

Screw, main silencer holder	M8	25 Nm (18.4 lbf ft)
-----------------------------	----	---------------------



- Position the clamp.

Guideline

Distance A	1 mm (0.04 in)
------------	----------------



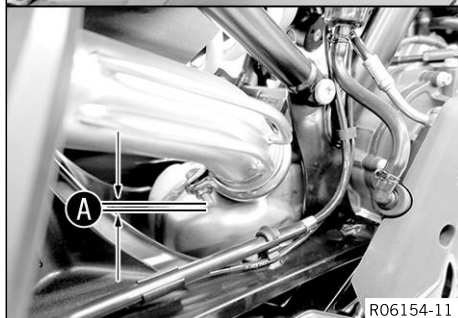
Info

The clamp must not touch the brake line when the rear wheel suspension compresses.

- Mount and tighten screw ❷.

Guideline

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

Guideline

Screw, main silencer holder	M8	25 Nm (18.4 lbf ft)
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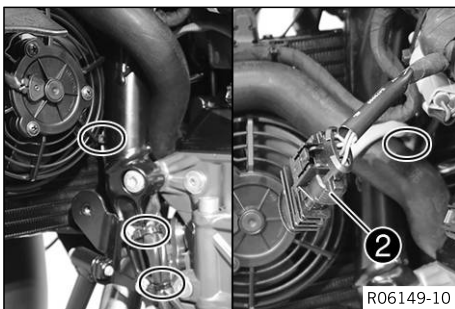
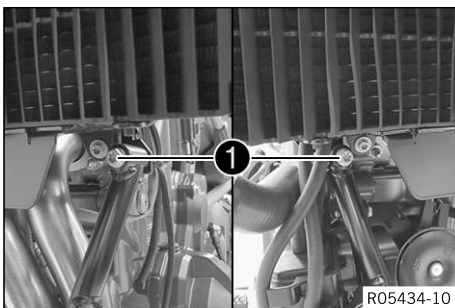
10.3 Removing the exhaust system

Preparatory work

- Remove main silencer. (📖 p. 106)
- Raise motorcycle with rear lifting gear. (📖 p. 15)
- Remove the seat. (📖 p. 120)
- Remove the left side cover. (📖 p. 137)
- Remove the battery cover. (📖 p. 138)
- Remove left fuel tank spoiler. (📖 p. 139)
- Remove the right side cover. (📖 p. 137)
- Remove right fuel tank spoiler. (📖 p. 141)
- Remove the engine guard. (📖 p. 143)
- Remove the fuel tank. (📖 p. 120)

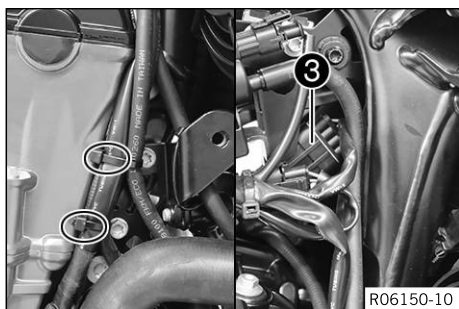
Main work

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

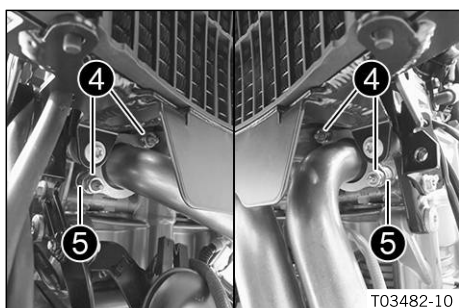


- Remove the cable ties.
- Disconnect plug-in connector ②.
- Expose the cable.

10 EXHAUST SYSTEM

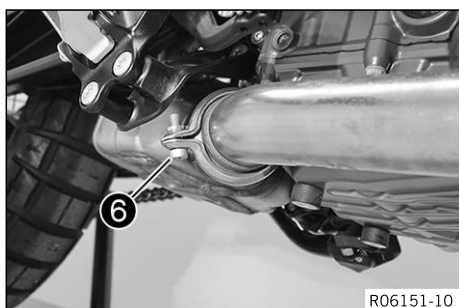


- Remove the cable ties.
- Pull off and disconnect plug-in connector 3 from the holder.
- Expose the cable.

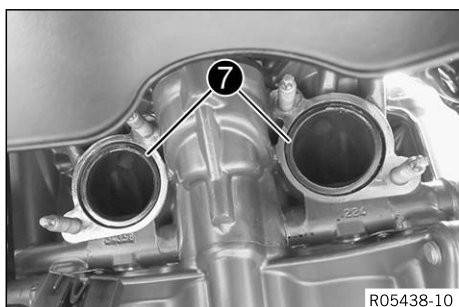


- Remove nuts 4.

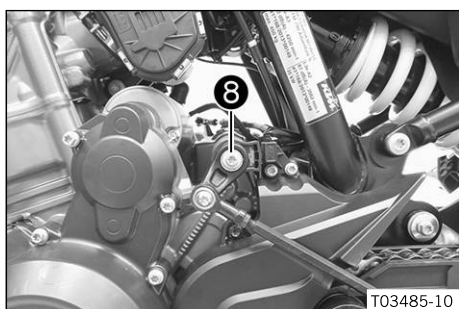
i Info
Do not misplace spacers 5.



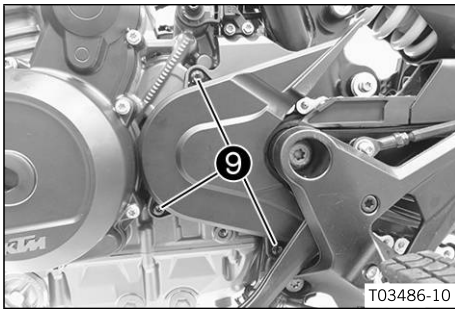
- Remove screw 6.
- Take off the exhaust clamp.
- Remove manifold with gasket.



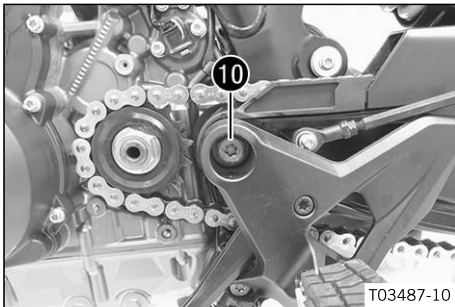
- Remove exhaust gaskets 7.



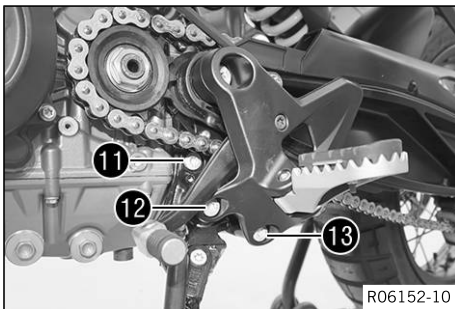
- Remove screw 8 with washers.
- Hang the bell crank with the shift linkage to the side.



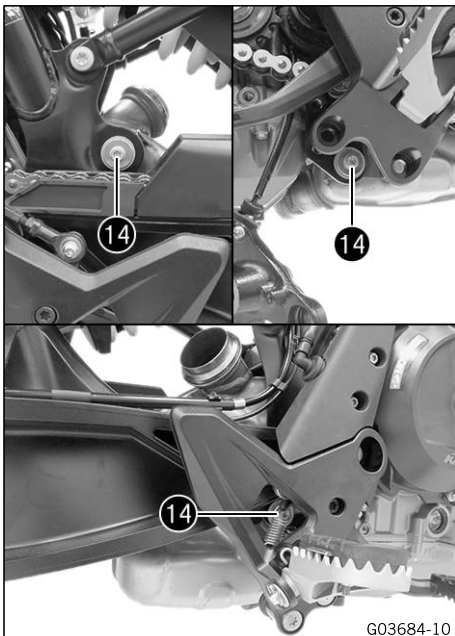
- Remove screws 9.
- Take off the engine sprocket cover.



- Loosen screw 10.

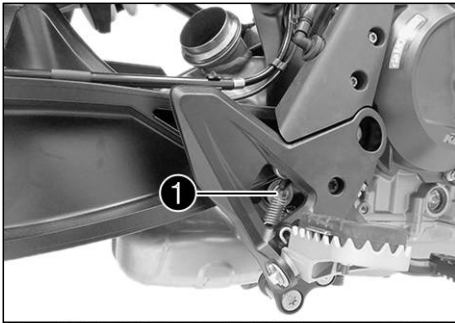


- Remove screw 11.
- Remove screw 12.
- Remove screw 13 with the bushing.
- Take off the side stand bracket and allow it to hang tension-free to the side.



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

10.4 Installing the exhaust system

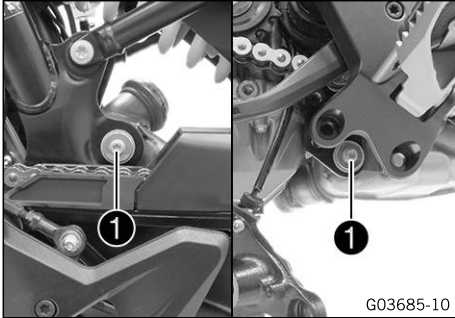


Main work

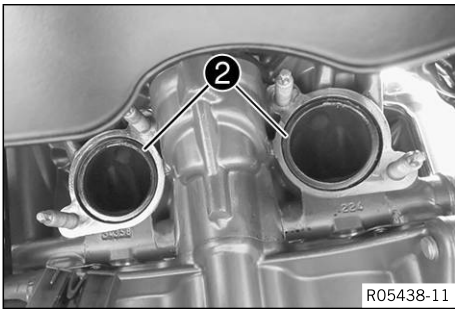
- Position the presilencer.
- Mount screws **1**, but do not tighten yet.

Guideline

Screw, presilencer on frame	M8	15 Nm (11.1 lbf ft) Loctite®243™
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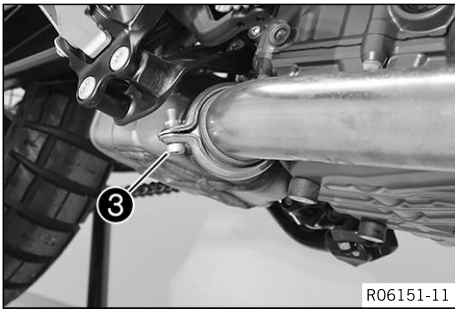


G03685-10



- Position exhaust gaskets **2**.

R05438-11

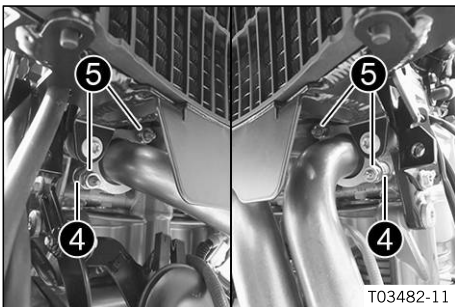


- Position the manifold with the gasket.
- Position the clamp. Mount screw **3**, but do not tighten it yet.

Guideline

Screw, manifold clamp	M6	8 Nm (5.9 lbf ft) Copper paste
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R06151-11

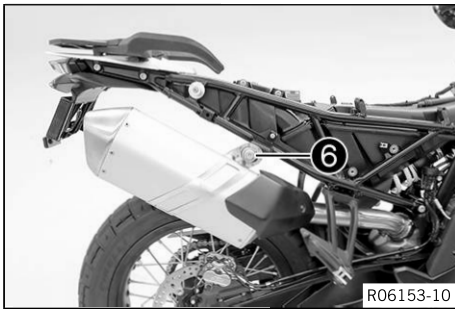


- Position spacers **4**.
- Mount nuts **5**, but do not tighten yet.

Guideline

Nut, exhaust flange	M8	15 Nm (11.1 lbf ft) Copper paste
---------------------	----	-------------------------------------

T03482-11



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

Guideline

Screw, main silencer fastening	M8	15 Nm (11.1 lbf ft)
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- Position the clamp.

Guideline

Distance A	1 mm (0.04 in)
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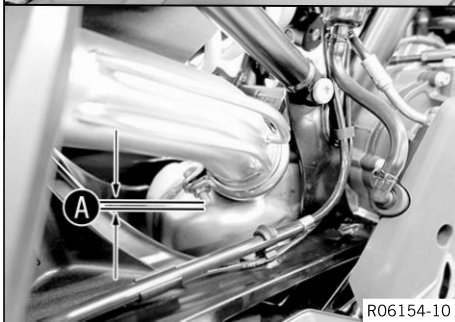
Info

The clamp must not touch the brake line when the rear wheel suspension compresses.

- Mount screw **7**, but do not tighten it yet.

Guideline

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



- Tighten nuts **5** evenly.

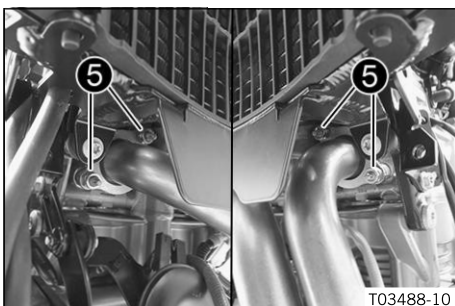
Guideline

Nut, exhaust flange	M8	15 Nm (11.1 lbf ft) Copper paste
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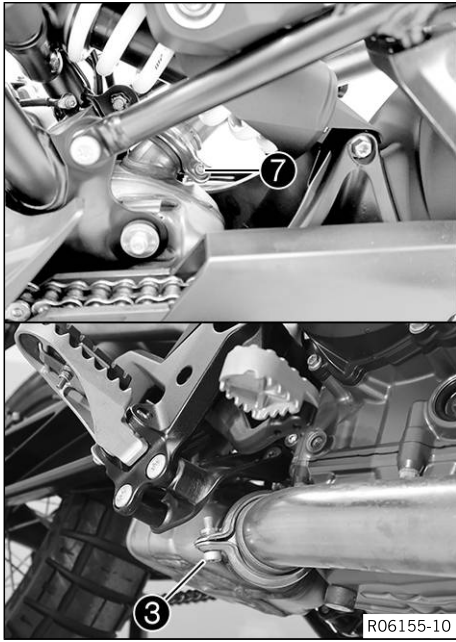


Info

First, tighten the nuts on the bushings.



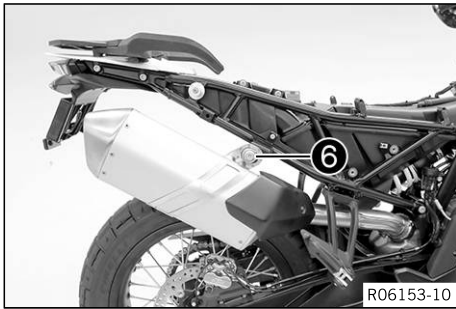
10 EXHAUST SYSTEM



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

Guideline

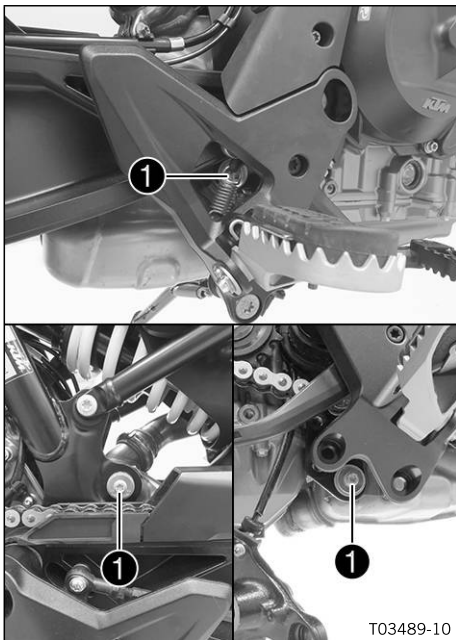
Screw, presilencer exhaust clamp	M6	8 Nm (5.9 lbf ft) Copper paste
Screw, manifold clamp	M6	8 Nm (5.9 lbf ft) Copper paste



- Tighten screw **6**.

Guideline

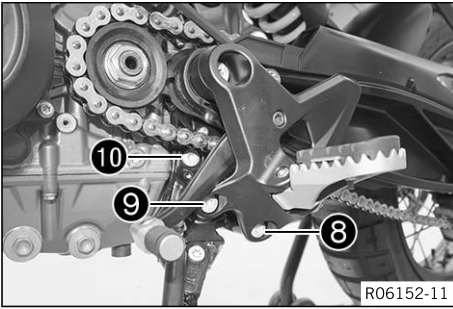
Screw, main silencer fastening	M8	15 Nm (11.1 lbf ft)
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- Tighten screws **1**.

Guideline

Screw, presilencer on frame	M8	15 Nm (11.1 lbf ft) Loctite®243™
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- Position the side stand bracket.
- Mount and tighten screw 8 and bushing.

Guideline

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

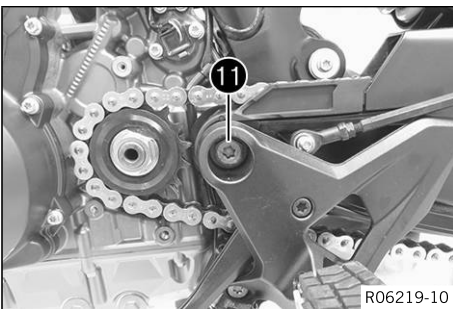
Guideline

Screw, front footrest bracket	M10x65	45 Nm (33.2 lbf ft) Loctite®243™
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- Mount and tighten screw 10.

Guideline

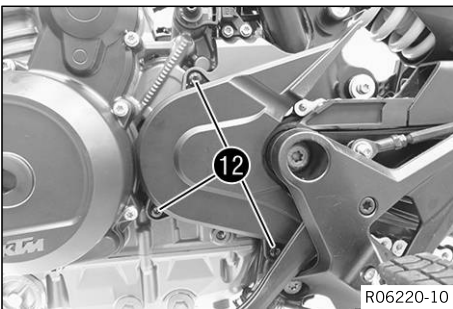
Screw, front footrest bracket	M10x30	45 Nm (33.2 lbf ft) Loctite®243™
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- Tighten screw 11.

Guideline

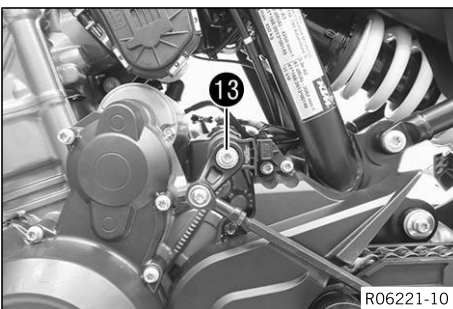
Screw, swingarm pivot	M12	100 Nm (73.8 lbf ft)
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- Position the engine sprocket cover.
- Mount and tighten screws 12.

Guideline

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

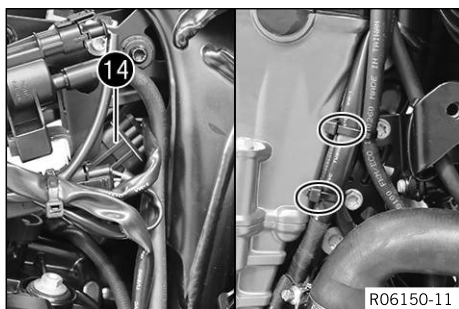
i Info

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

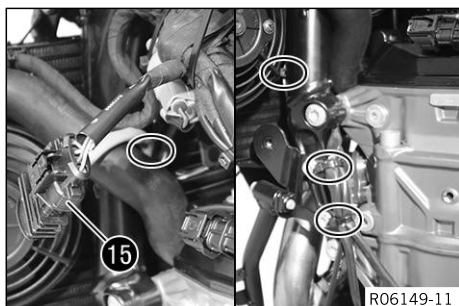
- Mount and tighten screw 13 with washers.

Guideline

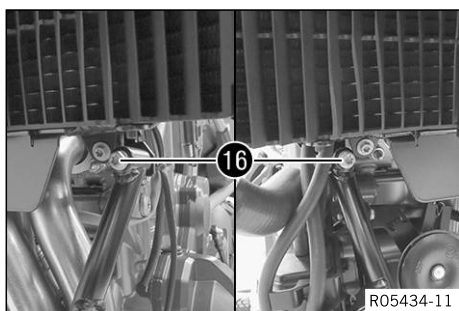
Screw, shift lever	M6	14 Nm (10.3 lbf ft) Loctite®243™
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- Route the cable without tension.
- Join plug-in connector **14** and position in the holder.
- Mount the cable ties.



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



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

Guideline

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

- Install the fuel tank. (📖 p. 123)
- Install the engine guard. (📖 p. 143)
- Install the right fuel tank spoiler. (📖 p. 142)
- Install the right side cover. (📖 p. 138)
- Install the left fuel tank spoiler. (📖 p. 140)
- Install the battery cover. (📖 p. 139)
- Install the left side cover. (📖 p. 137)
- Mount the seat. (📖 p. 120)
- Remove the rear of the motorcycle from the lifting gear. (📖 p. 16)

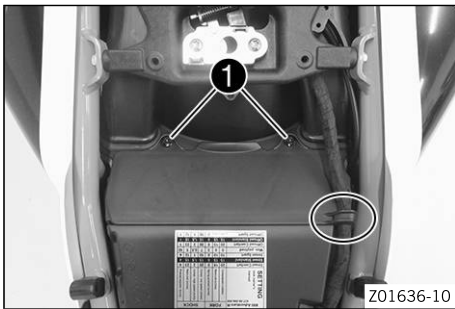
11.1 Removing the air filter

Preparatory work

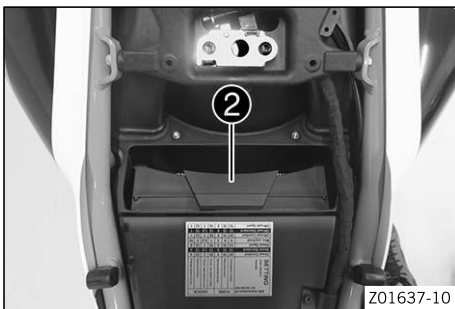
- Remove the seat. (📖 p. 120)

Main work

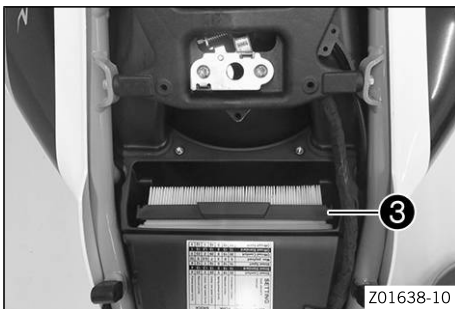
- Remove screws ❶.
- Remove the air filter box lid, loosening the wiring harness from the holder at the same time.



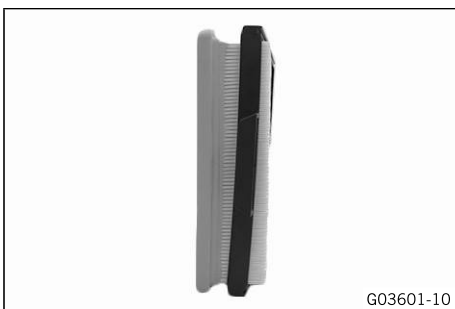
- Remove air filter clamping wedge ❷ upwards.



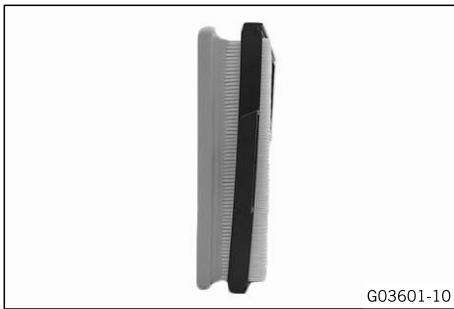
- Remove air filter frame ❸ with the air filter.



- Remove the air filter from the air filter frame.

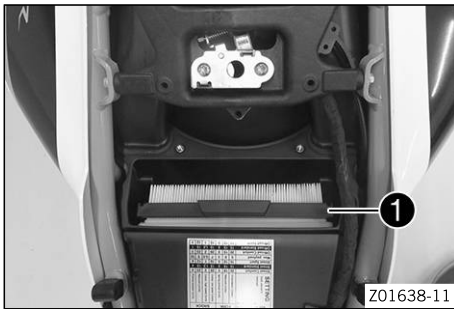


11.2 Installing the air filter

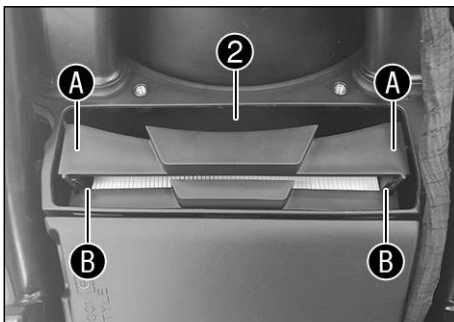


Main work

- Position air filter in the air filter frame.



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



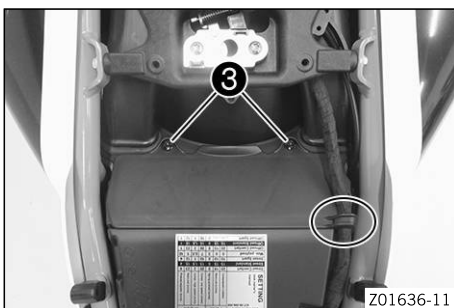
- Mount air filter clamping wedge **2**.
 - ✓ The open side of the air filter clamping wedge faces downward.
 - ✓ Guide rails **A** engage in recesses **B**.



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

Guideline

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

- Mount the seat. (📖 p. 120)

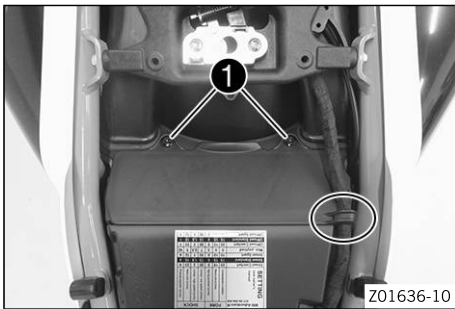
11.3 Changing the air filter, cleaning the air filter box

Preparatory work

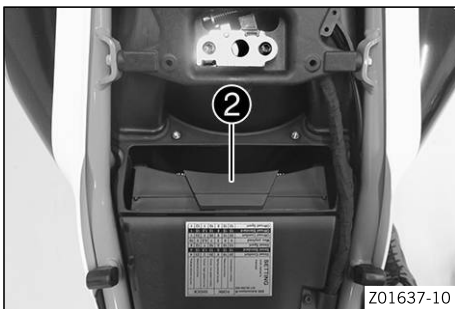
- Remove the seat. (📖 p. 120)

Main work

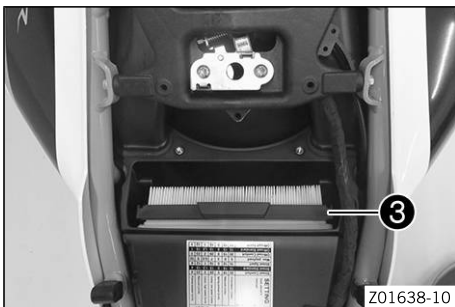
- Remove screws ①.
- Remove the air filter box lid, loosening the wiring harness from the holder at the same time.



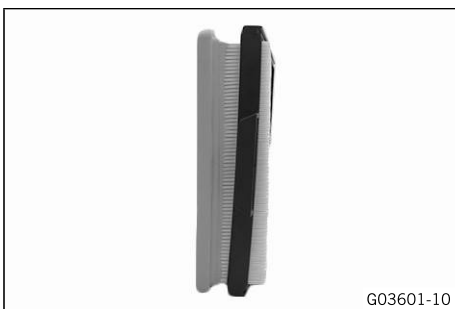
- Remove air filter clamping wedge ② upwards.



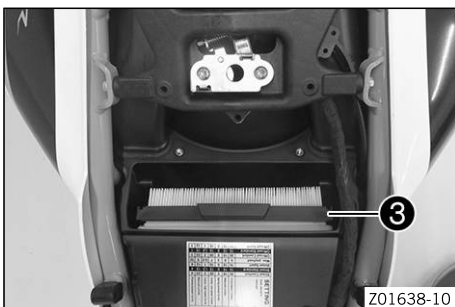
- Remove air filter frame ③ with the air filter.

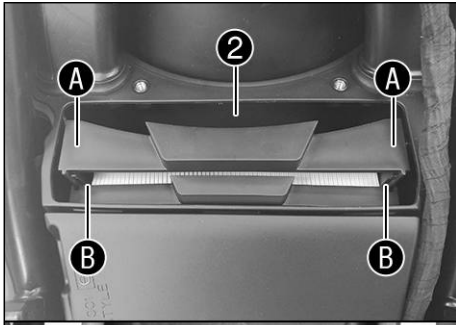


- Remove the air filter from the air filter frame.
- Position the new air filter in the air filter frame.



- Position air filter frame ③ with the air filter.





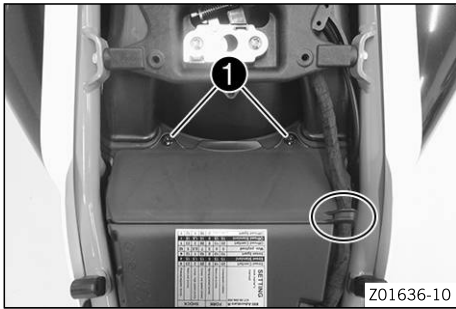
- Mount air filter clamping wedge **2**.
- ✓ The open side of the air filter clamping wedge faces downward.
- ✓ Guide rails **A** engage in recesses **B**.



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

Guideline

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

- Mount the seat. (📖 p. 120)

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.

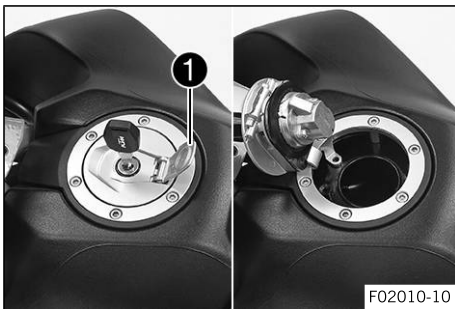
- Avoid skin, eye and clothing contact with fuel.
- Immediately consult a doctor if you swallow fuel.
- Do not inhale fuel vapors.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse the eyes thoroughly with water, and consult a doctor in case of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



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

Note

Danger of damage The ignition key may break if overloaded.

Damaged ignition keys must be replaced.

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



12.2 Closing the fuel tank filler cap



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



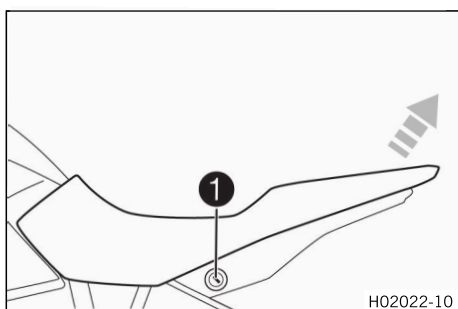
Warning

Fire hazard Fuel is highly flammable and a health hazard.

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

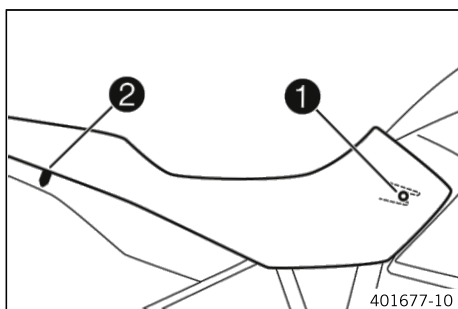
- Remove the ignition key and close the cover.

12.3 Removing the seat



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

12.4 Mounting the seat



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

12.5 Removing the fuel tank



Danger

Fire hazard Fuel is highly flammable.

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

- Do not 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

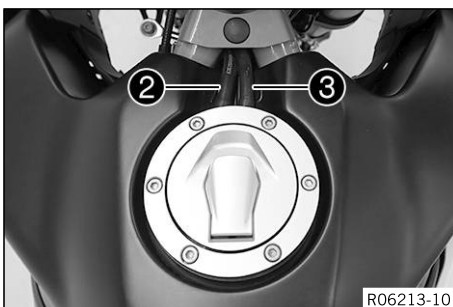
- Remove the seat. (📖 p. 120)
- Remove the left side cover. (📖 p. 137)
- Remove the battery cover. (📖 p. 138)
- Remove left fuel tank spoiler. (📖 p. 139)
- Remove the right side cover. (📖 p. 137)
- Remove right fuel tank spoiler. (📖 p. 141)
- Remove the engine guard. (📖 p. 143)

Main work

- Remove fuel tank cover ❶.



- Pull off vent hoses ❷ and ❸.



- Clean the quick release coupling thoroughly with compressed air.



Info

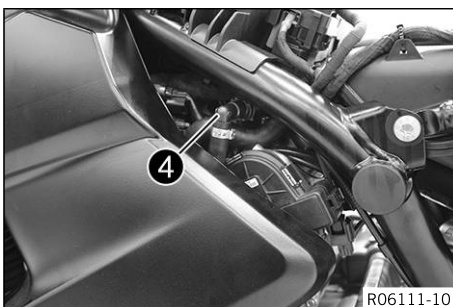
Under no circumstances should dirt enter into the fuel line. Dirt in the fuel line clogs the injection valve!

- Disconnect quick release coupling ❹.

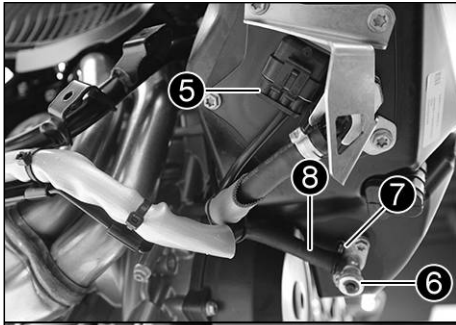


Info

Remaining fuel may flow out of the fuel hose.



12 FUEL TANK, SEAT, TRIM

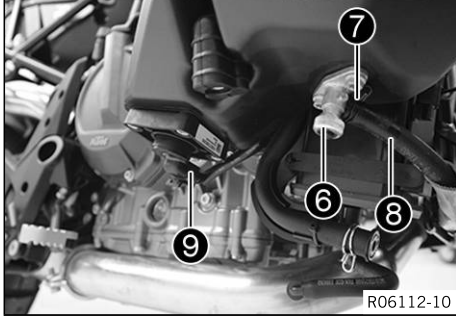


- Unplug connector ⑤.
- Close fuel cocks ⑥.
- Push back hose clips ⑦ and pull off fuel lines ⑧.

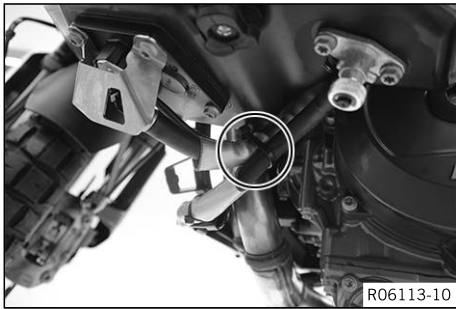


Info

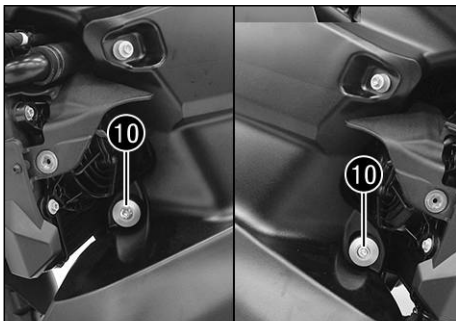
A residue of fuel may run out of the fuel lines.



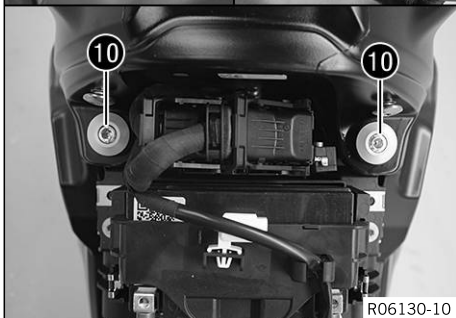
- Unplug connector ⑨.



- Remove the cable tie.



- Remove screws ⑩ along with bearing sleeves and rubber bushings.





- Take off the fuel tank.



12.6 Installing the fuel tank



Danger

Fire hazard Fuel is highly flammable.

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

- Do not 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.

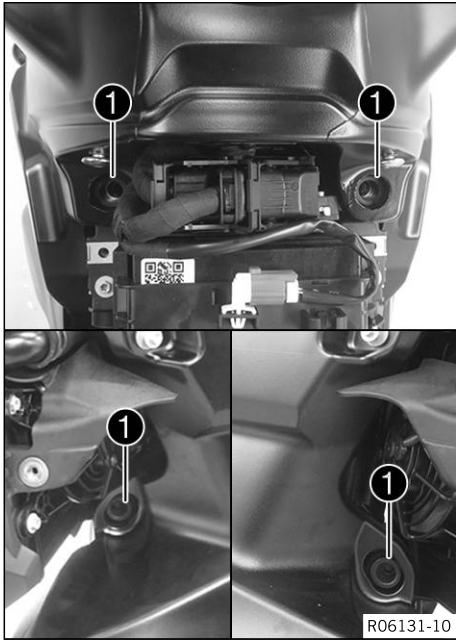
- Avoid skin, eye and clothing contact with fuel.
- Immediately consult a doctor if you swallow fuel.
- Do not inhale fuel vapors.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse the eyes thoroughly with water, and consult a doctor in case of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



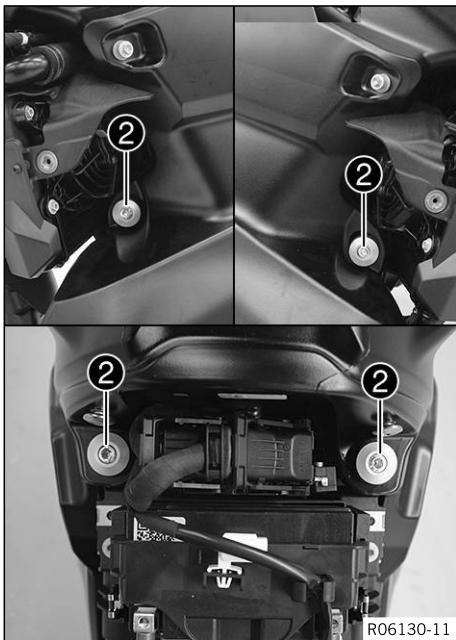
Main work

- Position the fuel tank.

12 FUEL TANK, SEAT, TRIM



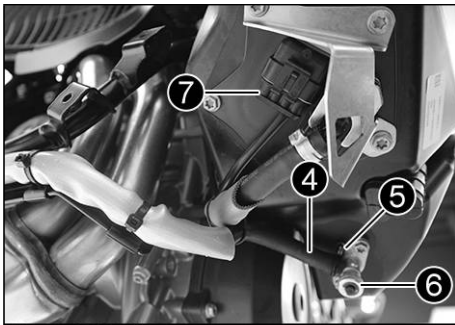
- Check that rubber bushings ① are seated correctly.



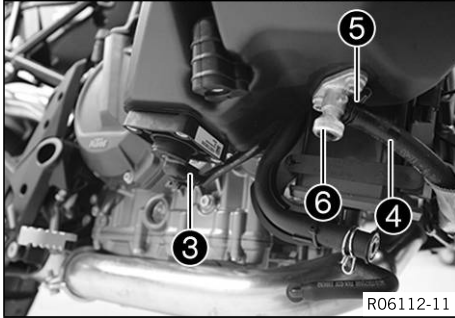
- Mount and tighten screws ② with the bearing sleeves and the rubber bushings.

Guideline

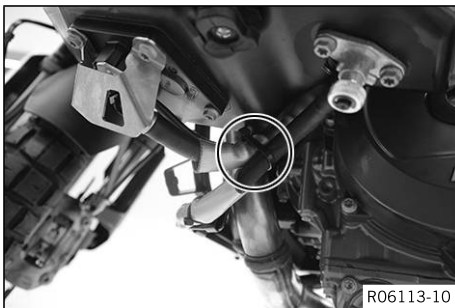
Remaining screws, chassis	M8	25 Nm (18.4 lbf ft)
------------------------------	----	---------------------



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

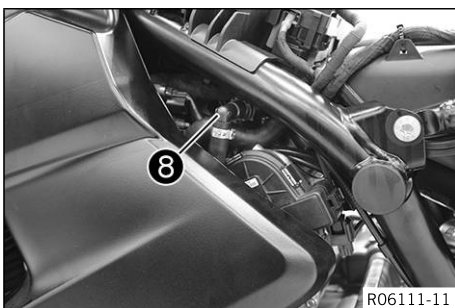


R06112-11



R06113-10

- Mount the cable ties.



R06111-11

- Clean the quick release coupling thoroughly with compressed air.



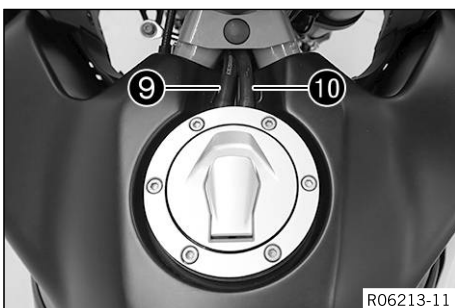
Info

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

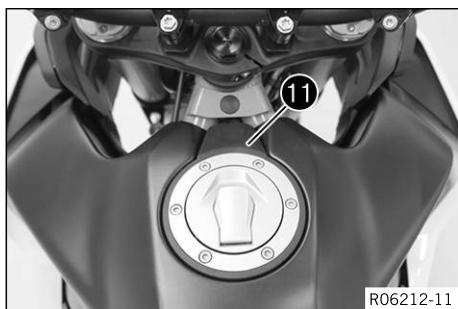
- Spray silicone spray onto a lint-free cleaning cloth and lightly lubricate the O-ring of the quick-release coupling.

Silicone spray (📖 p. 461)

- Join quick release coupling ⑧.
- Mount vent hoses ⑨ and ⑩.



R06213-11



- Mount fuel tank cover 11.

Finishing work

- Install the engine guard. (📖 p. 143)
- Install the right fuel tank spoiler. (📖 p. 142)
- Install the right side cover. (📖 p. 138)
- Install the left fuel tank spoiler. (📖 p. 140)
- Install the battery cover. (📖 p. 139)
- Install the left side cover. (📖 p. 137)
- Mount the seat. (📖 p. 120)

12.7 Checking the fuel pressure



Danger

Fire hazard Fuel is highly flammable.

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

- Do not 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.

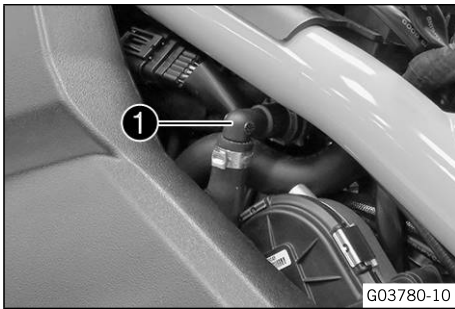
Ensure that the battery voltage does not drop below 12.5 V.

The ignition is off.

The diagnostics tool is connected.

Preparatory work

- Remove the seat. (📖 p. 120)
- Remove the left side cover. (📖 p. 137)
- Remove the battery cover. (📖 p. 138)
- Remove left fuel tank spoiler. (📖 p. 139)



G03780-10

Main work

- Clean the quick release coupling thoroughly with compressed air.



Info

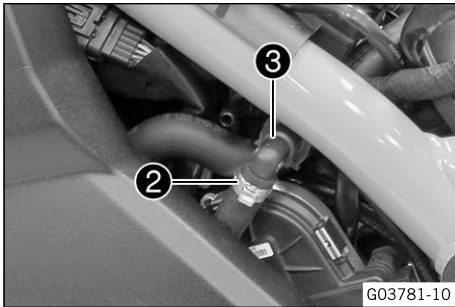
Under no circumstances should dirt enter into the fuel line. Dirt in the fuel line clogs the injection valve!

- Disconnect quick release coupling 1.



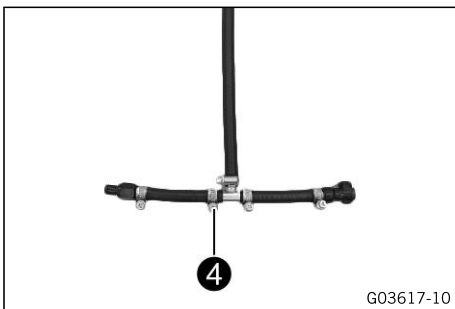
Info

Remaining fuel may flow out of the fuel hose.



G03781-10

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

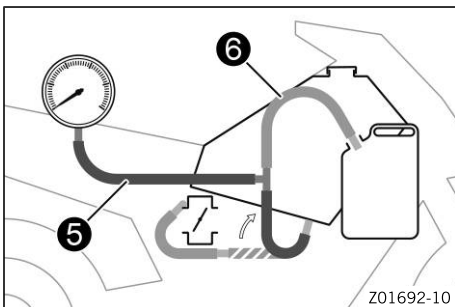


G03617-10

- Remove hose clip 4.

Pressure testing tool (61029094000) (📖 p. 467)
--

- Remove the hose.



Z01692-10

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

Pressure testing tool (61029094000) (📖 p. 467)
--

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

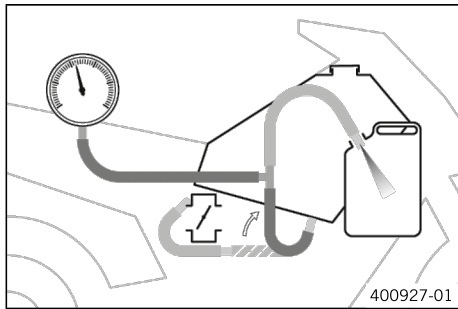
Testing hose (61029093000) (📖 p. 467)

- Position the hose end in a fuel can.

Guideline

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

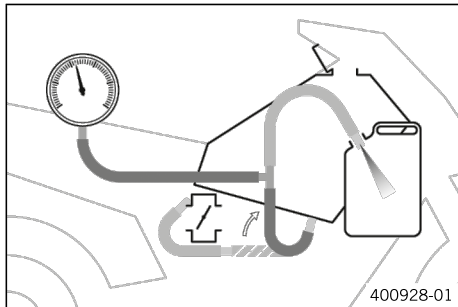
- Connect the diagnostics tool and start it.
- Execute **"Engine electronics" > "Actuator test" > "Function check of fuel pump controller"**.



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

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

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

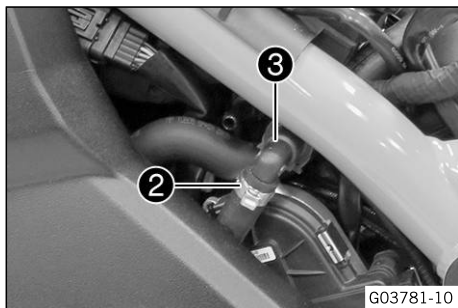


- Check the fuel pressure with the fuel tank filler cap open.

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

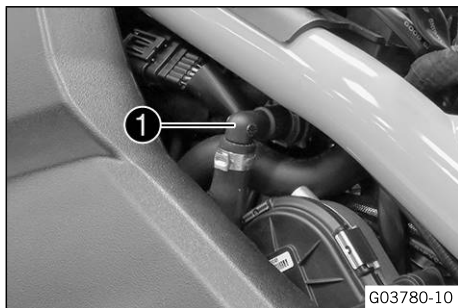
- » If the specification is not reached:
 - Check that the fuel line is clear.
 - Change the fuel filter. (📖 p. 131)
 - Change the fuel pump. (📖 p. 130)

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



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

Hose clamp pliers (60029057000) (📖 p. 466)
--



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

Silicone spray (📖 p. 461)

- Join quick release coupling **1**.

Finishing work

- Install the left fuel tank spoiler. (📖 p. 140)
- Install the battery cover. (📖 p. 139)
- Install the left side cover. (📖 p. 137)
- Mount the seat. (📖 p. 120)

12.8 Changing the fuel level sensor



Danger

Fire hazard Fuel is highly flammable.

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

- Do not 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

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

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

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



Note

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

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

Preparatory work

- Remove the engine guard. (📖 p. 143)
- Drain the fuel from the fuel tank into a suitable container.

Main work

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

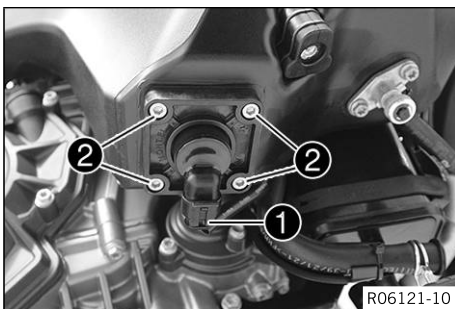
Guideline

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

- Plug in connector ❶.

Finishing work

- Install the engine guard. (📖 p. 143)



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

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

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

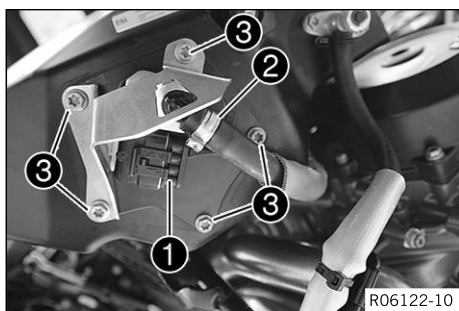
- Refuel only with clean fuel that meets the specified standards.



Note

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

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



Preparatory work

- Remove the engine guard. (📖 p. 143)
- Drain the fuel from the fuel tank into a suitable container.

Main work

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



Info

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

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

Guideline

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

- Mount fuel hose.

- Mount hose clamp ②.

Hose clamp pliers (60029057000) (📖 p. 466)

- Plug in connector ①.

Finishing work

- Install the engine guard. (📖 p. 143)



12.10 Changing the fuel filter



Danger

Fire hazard Fuel is highly flammable.

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

- Do not 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

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

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

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



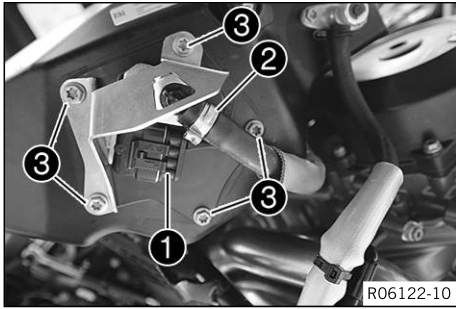
Note

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

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

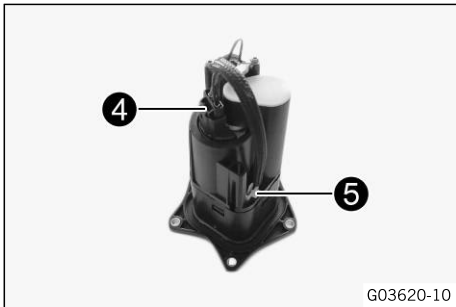
Preparatory work

- Remove the engine guard. (📖 p. 143)
- Drain the fuel from the fuel tank into a suitable container.

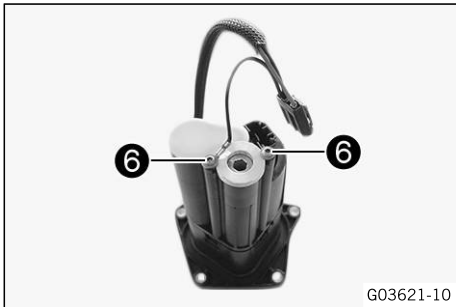


Main work

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



- Unplug connectors ④ and ⑤.



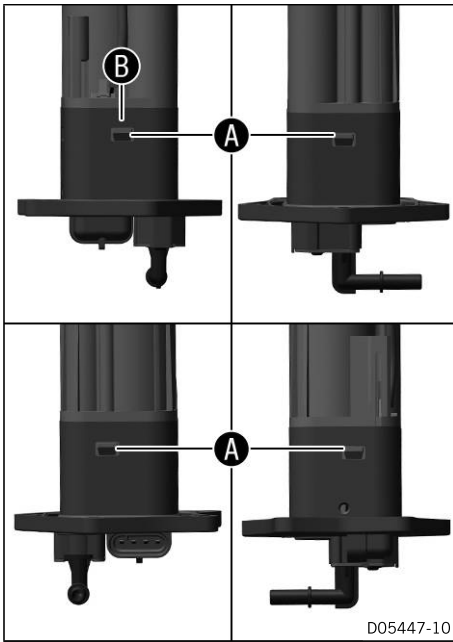
- Remove screws ⑥.
- Take off the cables.



- Remove retaining washer ⑦.



- Remove pressure control valve ⑧ with O-ring.



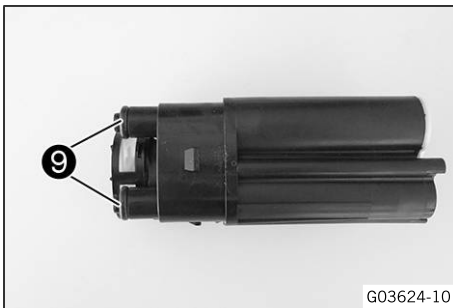
- Disengage locking mechanisms **A** on all sides in area **B**.



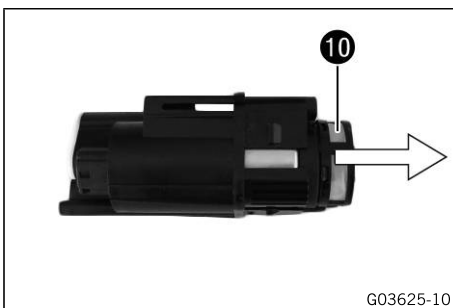
Info

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

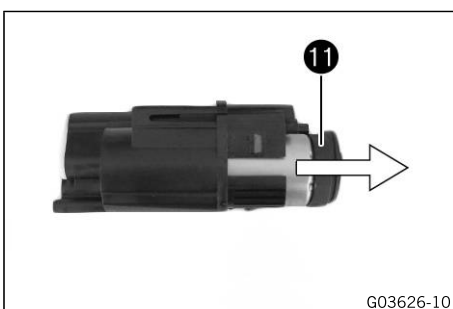
- Disengage housing halves.



- Remove O-rings **9**.



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

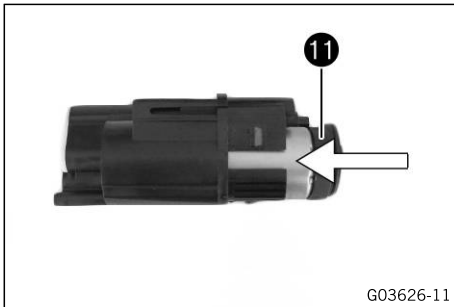


- Pull fuel pump **11** out of the fuel pump housing.

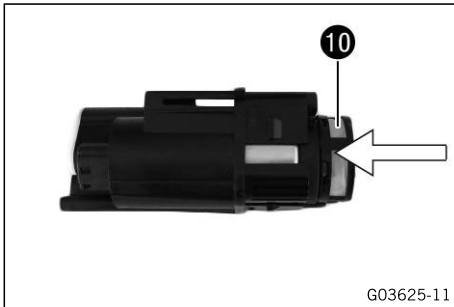
12 FUEL TANK, SEAT, TRIM



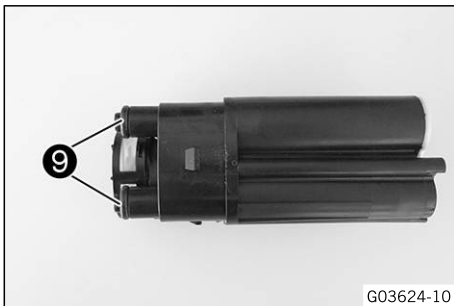
- Remove O-ring 12 and mount new O-ring.



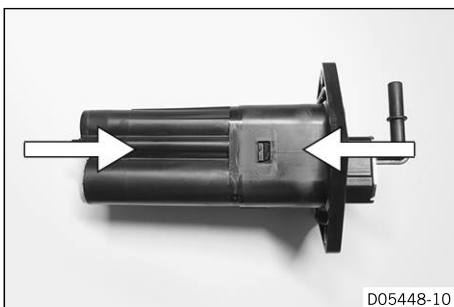
- Mount fuel pump 11 in new fuel pump housing.



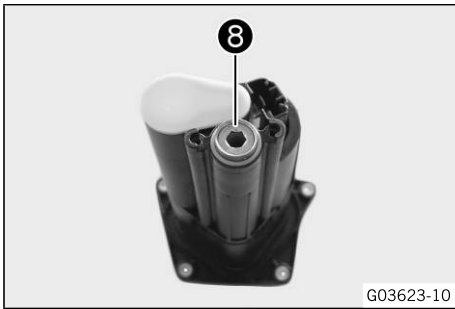
- Mount new fuel filter 10 on the fuel pump.



- Mount new O-rings 9.



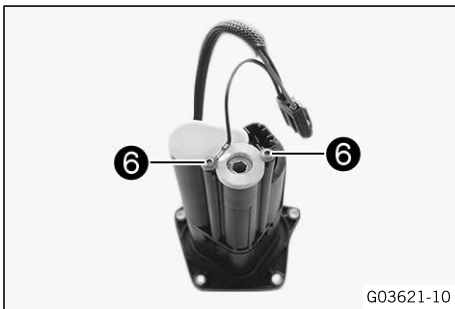
- Join housing halves and allow to click into place.



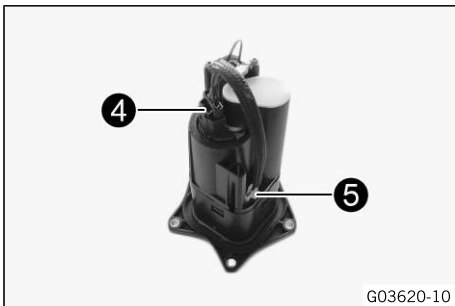
- Mount pressure control valve **8** with new O-ring.



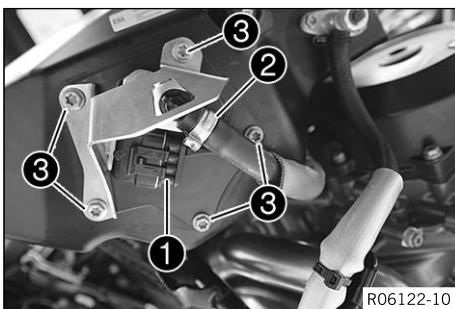
- Position retaining washer **7** with the collar facing downward.



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



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



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

Guideline

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

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

Hose clamp pliers (60029057000) (📖 p. 466)
--

- Plug in connector **1**.

Finishing work

- Install the engine guard. (📖 p. 143)



12.11 Refueling



Danger

Fire hazard Fuel is highly flammable.

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

- Do not 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

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

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

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



Note

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

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



- Switch off the engine.
- Open the fuel tank filler cap. (📖 p. 119)
- Fill the fuel tank with fuel up to the lower edge **A** of the filler neck.

Total fuel tank capacity, approx.	20 l (5.3 US gal)	Super unleaded (ROZ 95) (📖 p. 459)
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- Close the fuel tank filler cap. (📖 p. 119)



F03291-10

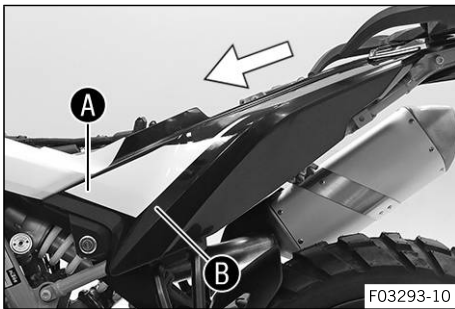
13.1 Removing the left side cover

Preparatory work

- Remove the seat. (📖 p. 120)

Main work

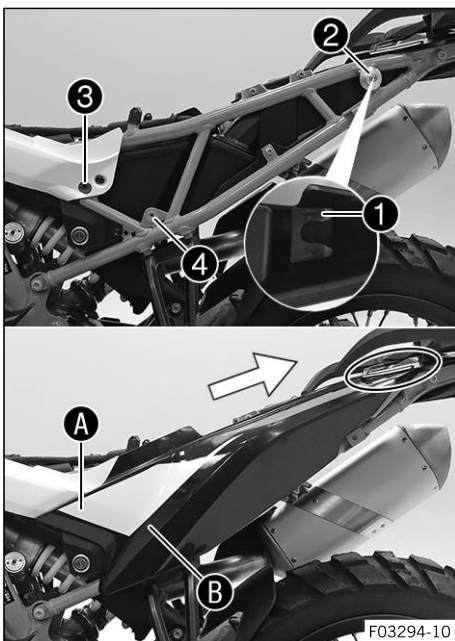
- Remove left side cover from the rubber bushings in the areas **A** and **B**.
- Pull off the left side cover sideways and remove it toward the front.



13.2 Installing the left side cover

Main work

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



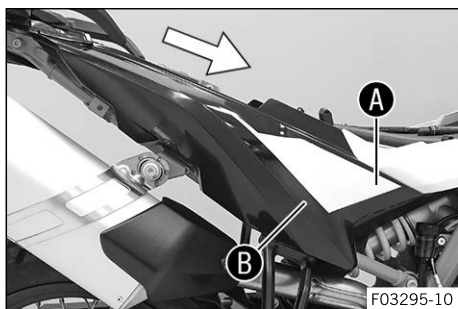
Finishing work

- Mount the seat. (📖 p. 120)

13.3 Removing the right side cover

Preparatory work

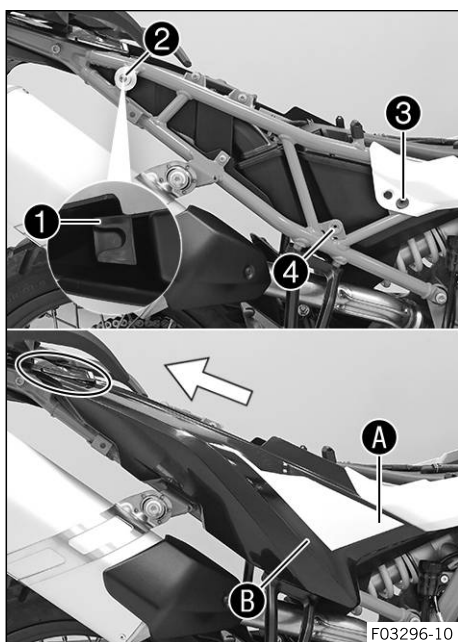
- Remove the seat. (📖 p. 120)



Main work

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

13.4 Installing the right side cover



Main work

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

Finishing work

- Mount the seat. (📖 p. 120)

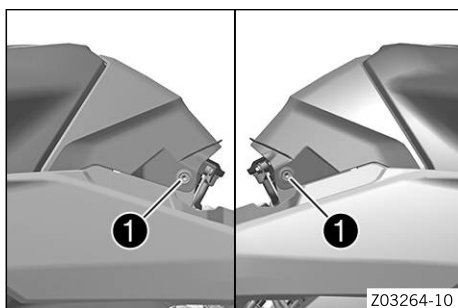
13.5 Removing the battery cover

Preparatory work

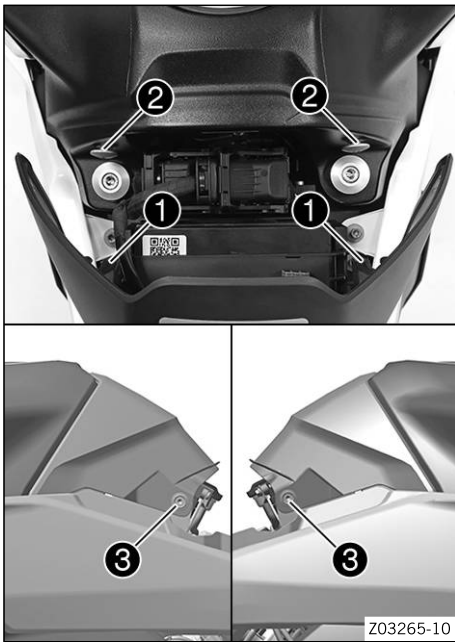
- Remove the seat. (📖 p. 120)

Main work

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



13.6 Installing the battery cover



Main work

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

Guideline

Screw, seat fixing	M6	6 Nm (4.4 lbf ft)
--------------------	----	-------------------

Finishing work

- Mount the seat. (📖 p. 120)



13.7 Removing left fuel tank spoiler

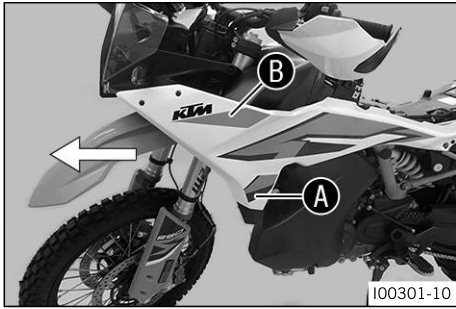
Preparatory work

- Remove the seat. (📖 p. 120)
- Remove the left side cover. (📖 p. 137)
- Remove the battery cover. (📖 p. 138)

Main work

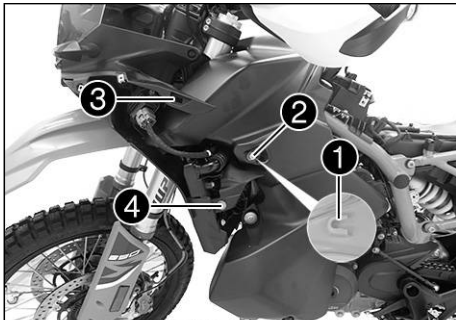
- Remove screw **1**.
- Remove screws **2**.





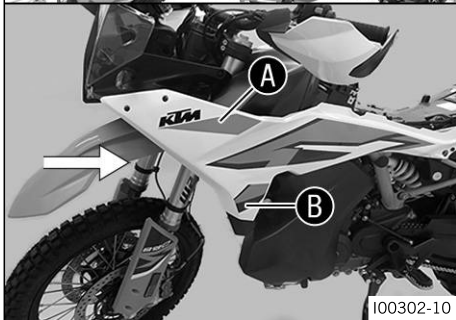
- Remove the left fuel tank spoiler from the rubber bushing in area **A**.
- Pull the left fuel tank spoiler in area **B** out of the bracket.
- Pull off the left fuel tank spoiler sideways and take off toward the front.

13.8 Installing the left fuel tank spoiler



Main work

- Position the left fuel tank spoiler with holding lug **1** on bushing **2** and push backward laterally.
- Press the left fuel tank spoiler into bracket **3** in area **A**.
- Press the left fuel tank spoiler into rubber bushing **4** in area **B**.



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

Guideline

Screw, trim	M5	3 Nm (2.2 lbf ft)
-------------	----	-------------------

- Mount screw **6**, but do not tighten it yet.

Guideline

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

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

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

Guideline

Screw, trim	M5	3 Nm (2.2 lbf ft)
Screw, fuel tank spoiler	M6	5 Nm (3.7 lbf ft)

Finishing work

- Install the battery cover. (📖 p. 139)
- Install the left side cover. (📖 p. 137)
- Mount the seat. (📖 p. 120)



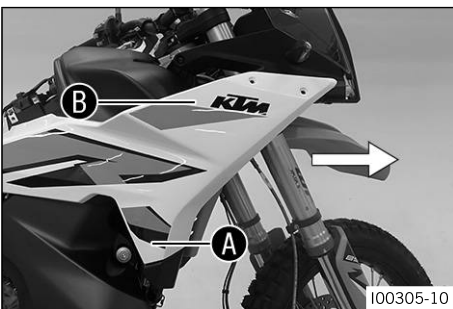
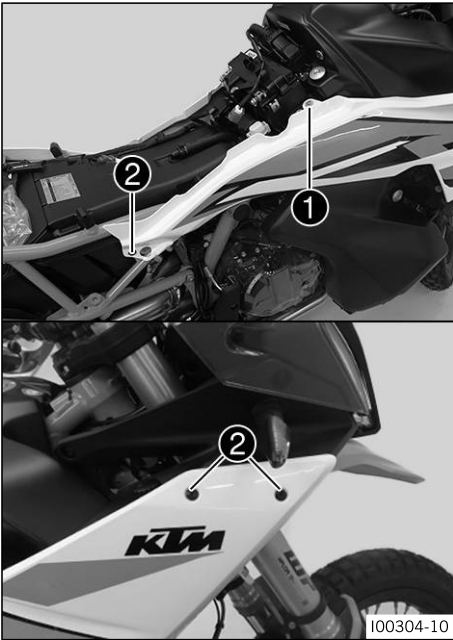
13.9 Removing the right fuel tank spoiler

Preparatory work

- Remove the seat. (📖 p. 120)
- Remove the right side cover. (📖 p. 137)
- Remove the battery cover. (📖 p. 138)

Main work

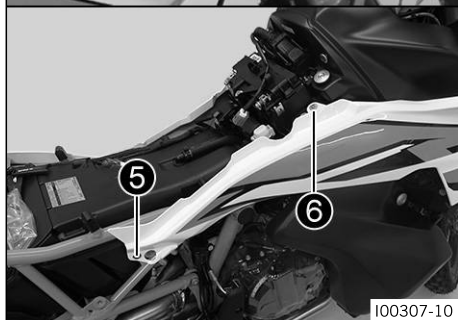
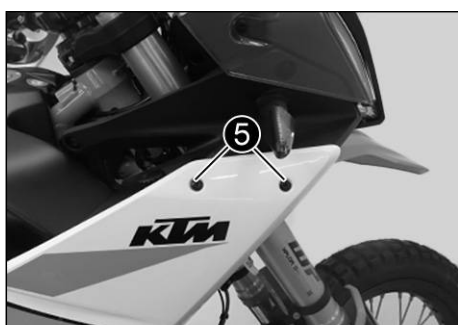
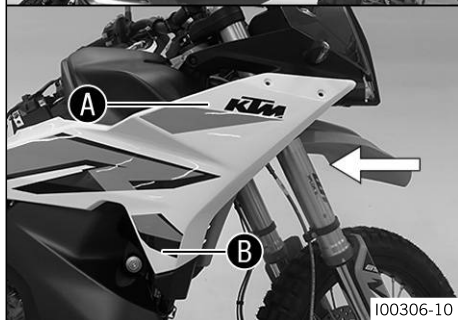
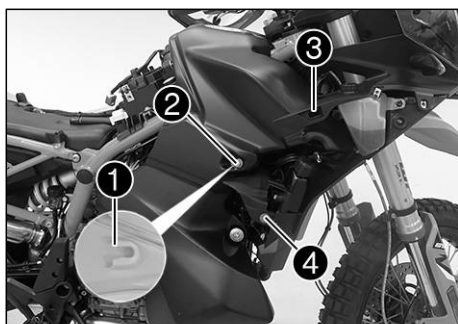
- Remove screw **1**.
- Remove **2** screws.



- Remove the fuel tank spoiler from the rubber bushing in area **A**.
- Pull the right fuel tank spoiler in area **B** out of the bracket.
- Pull off the right fuel tank spoiler sideways and take off toward the front.



13.10 Installing the right fuel tank spoiler



Main work

- Position the right fuel tank spoiler with holding lug **1** on bushing **2** and push backward laterally.
- Press the right fuel tank spoiler into bracket **3** in area **A**.
- Press the right fuel tank spoiler into rubber bushing **4** in area **B**.

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

Guideline

Screw, trim	M5	3 Nm (2.2 lbf ft)
-------------	----	-------------------

- Mount screw **6**, but do not tighten it yet.

Guideline

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

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

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

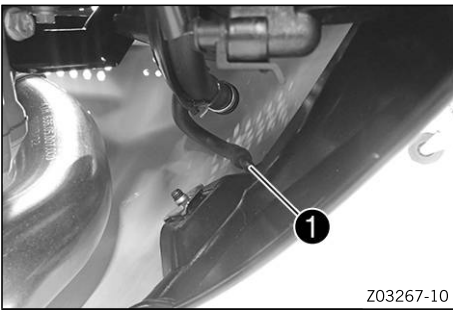
Guideline

Screw, trim	M5	3 Nm (2.2 lbf ft)
Screw, fuel tank spoiler	M6	5 Nm (3.7 lbf ft)

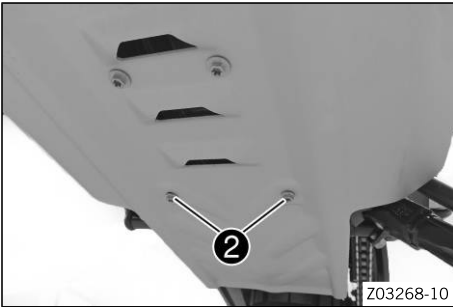
Finishing work

- Install the battery cover. (📖 p. 139)
- Install the right side cover. (📖 p. 138)
- Mount the seat. (📖 p. 120)

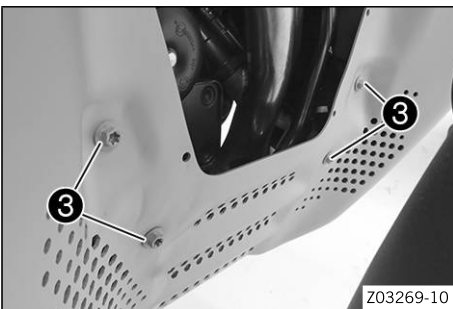
13.11 Removing the engine guard



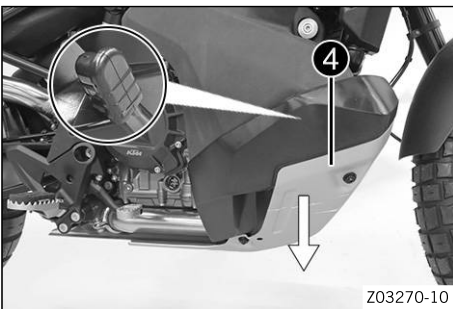
- Pull out hose ① from the angle piece.



- Remove screws ②.



- Remove screws ③.

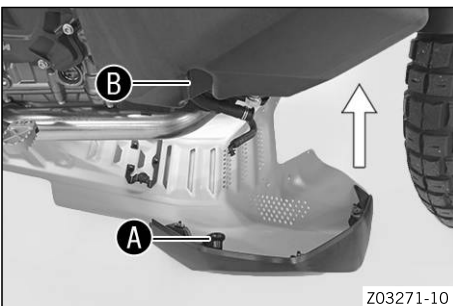


- Remove engine guard ④.

Guideline

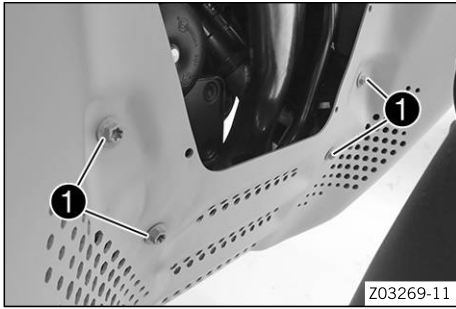
Pull the damping rubbers out of the cut-outs on both sides.

13.12 Installing the engine guard



- Position the engine guard.
 - ✓ Damping rubbers ① engage in cut-outs ② on both sides.

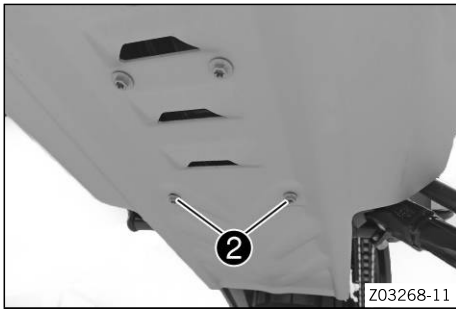
13 MASK, FENDER, DECAL



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

Guideline

Screw, engine guard	M6x10	10 Nm (7.4 lbf ft) Loctite®243™
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- Mount screws **2**, but do not tighten yet.

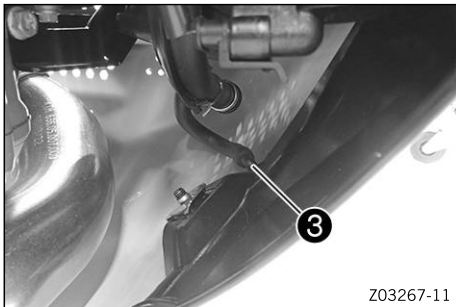
Guideline

Screw, engine guard	M6x8	8 Nm (5.9 lbf ft)
---------------------	------	-------------------

- Tighten all the screws of the engine guard.

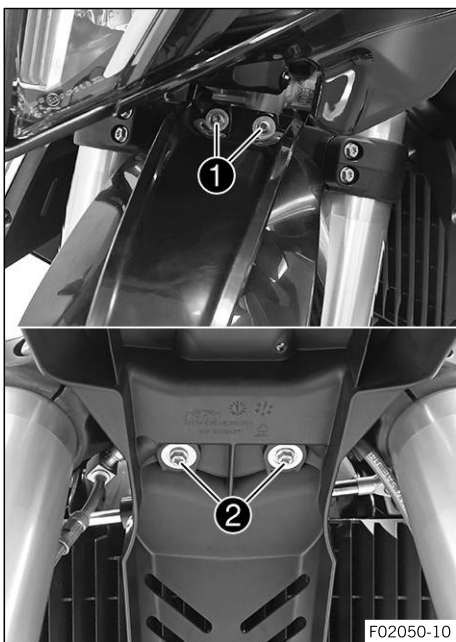
Guideline

Screw, engine guard	M6x8	8 Nm (5.9 lbf ft)
Screw, engine guard	M6x10	10 Nm (7.4 lbf ft) Loctite®243™



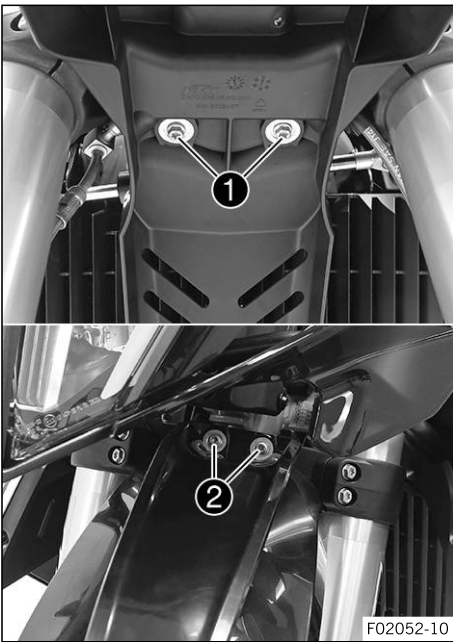
- Attach tube **3** to the angle piece.

13.13 Removing the front fender



- Remove screws **1**.
- Remove screws **2**.
- Take the fender off to the front.

13.14 Installing the front fender



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

Guideline

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

- Mount screws ②, but do not tighten yet.

Guideline

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

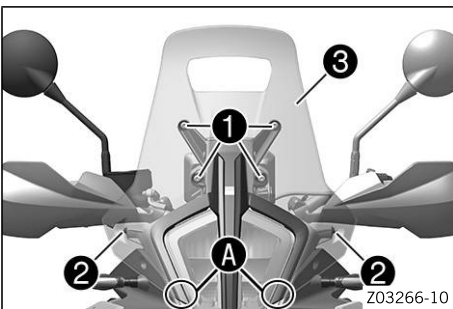
- ✓ The fender is evenly aligned to the front.

- Tighten all screws on the front fender.

Guideline

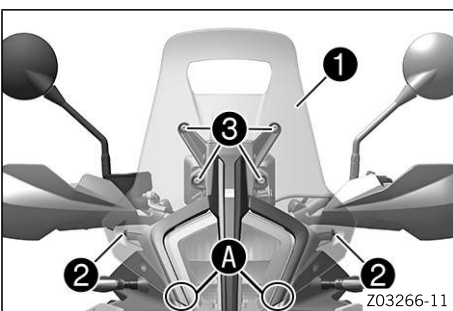
Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
---------------------------	----	--------------------

13.15 Removing the windshield



- Remove screws ①.
- Remove screws ② and detach windshield ③ in area A.

13.16 Installing the windshield



- Hook windshield ① into area A.
- Mount and tighten screws ②.

Guideline

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

- Mount and tighten screws ③.

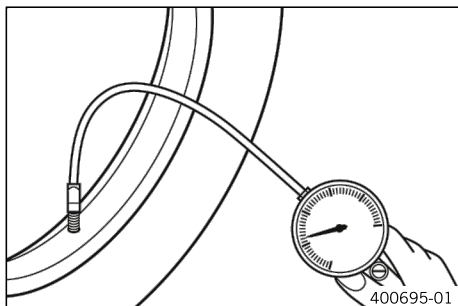
Guideline

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

14.1 Checking tire pressure

i Info

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



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

Tire pressure solo / with passenger	
front	2.4 bar (35 psi)
rear	2.4 bar (35 psi)

Offroad tire pressure	
front	1.8 bar (26 psi)
rear	1.8 bar (26 psi)

Tire pressure full payload	
front	2.6 bar (38 psi)
rear	2.9 bar (42 psi)

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

14.2 Checking the tire condition



Warning

Danger of accidents If a tire bursts while riding, the vehicle becomes uncontrollable.

- Ensure that damaged or worn tires are replaced immediately.



Warning

Danger of crashing Different tire tread patterns on the front and rear wheel impair the handling characteristic.

Different tire tread patterns can make the vehicle significantly more difficult to control.

- Make sure that only tires with a similar tire tread pattern are fitted to the front and rear wheel.



Warning

Danger of accidents Non-approved or non-recommended tires and wheels impact the handling characteristic.

- Only use tires/wheels approved by KTM with the corresponding speed index.



Warning

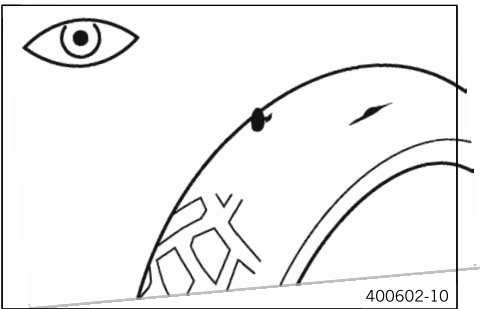
Danger of accidents New tires have reduced road grip.

The contact surface on new tires is not yet roughened.

- Run in new tires with moderate riding and only gradually increase the lean angle.

Run-in distance 200 km (124 mi)

i Info Tire type, tire condition, and tire pressure influence the braking and handling characteristics of the vehicle.
Worn tires have a negative effect on handling characteristics, especially on wet surfaces.

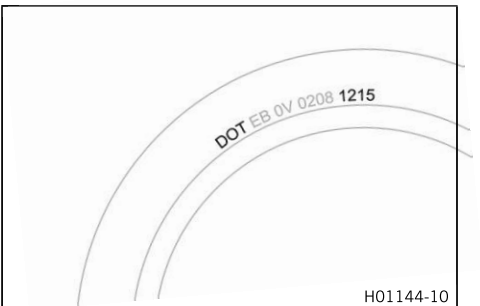


- Check the front and rear tires for cuts, embedded objects, and other damage.
 - » If the tires have cuts, run-in objects, or other damage:
 - Change the tires.
- Check the tread depth.

i Info Adhere to the legally required minimum tread depth.

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

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



- Check the tire age.

i Info The tire date of manufacture is usually contained in the tire label and is indicated by the last four digits of the **DOT** number. The first two digits indicate the week of manufacture and the last two digits the year of manufacture.
KTM recommends that the tires be changed after 5 years at the latest, regardless of the actual state of wear.

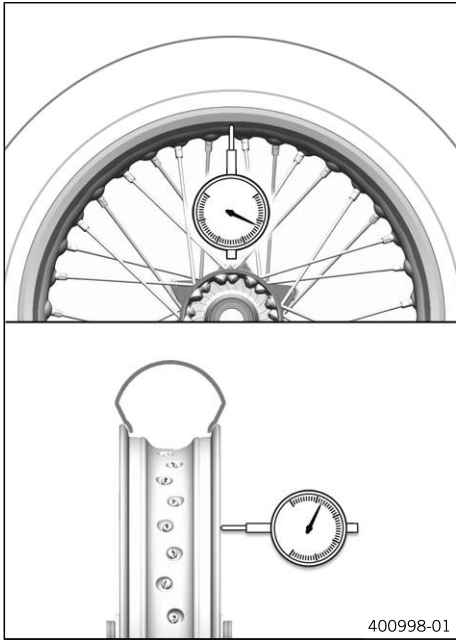
- » If the tires are more than 5 years old:
 - Change the tires.

14.3 Checking the rim run-out

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

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

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



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

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

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

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

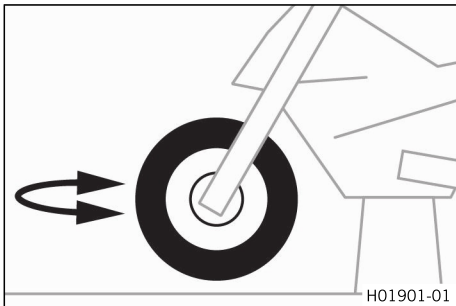
i Info
Center the rim by pulling the spoke nipple on the other side of the rim run-out. If there is significant deformation, change the rim.

- Correct the spoke tension.

14.4 Checking the wheel bearing for play

Preparatory work

- Remove main silencer. (📖 p. 106)
- Raise motorcycle with the work stand (center). (📖 p. 16)
- Place a load on the rear of the vehicle.
- ✓ The front wheel is not in contact with the ground.

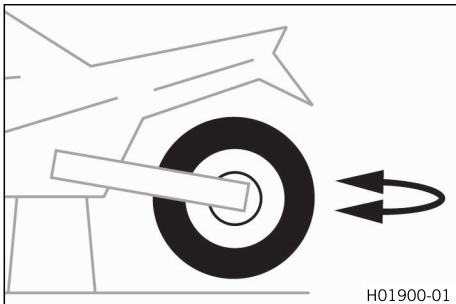


Main work

- Move the front wheel from side to side.

i Info
Hold fork leg to check it.

- » If there is detectable play:
 - Change front wheel bearing. (📖 p. 154)



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

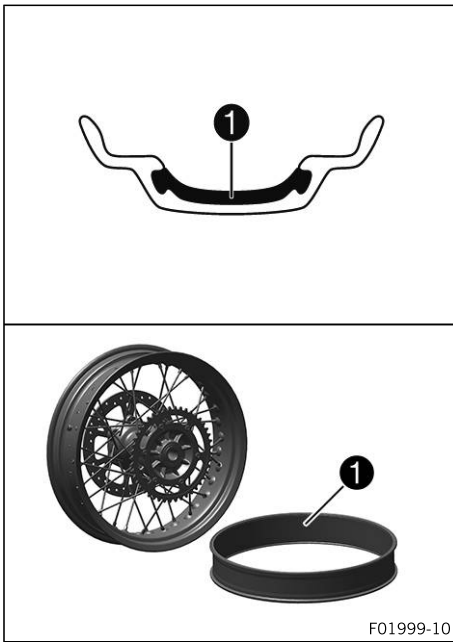
i Info
Hold link fork to check it.

- » If there is detectable play:
 - Change the rear wheel bearing. (📖 p. 167)

Finishing work

- Remove the motorcycle from the work stand (center). (📖 p. 17)
- Install the main silencer. (📖 p. 106)

14.5 Tubeless tire system



This vehicle uses a tubeless tire system in which a rim seal band ❶ is used instead of the conventional tube. The advantages of the tubeless system lie in the absence of danger from a faulty tube. This greatly reduces the risk of a sudden loss in pressure. The moments of inertia of these wheels are smaller than in conventional spoked wheels with a tube. This results in better handling and riding comfort. The rigid rim design results in a wire spoke wheel that is almost entirely maintenance-free. KTM recommends that the rim seal band be changed after 5 years at the latest, regardless of the actual state of wear.

14.6 Checking spoke tension

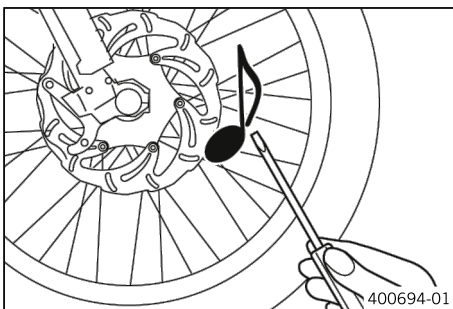


Warning

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

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

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



- Strike each spoke briefly using a screwdriver blade.



Info

The frequency of the sound depends on the spoke length and spoke diameter. If spokes of the same length and diameter vibrate with a different tone, this is an indication that the spoke tensions differ.

You should hear a high note.

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

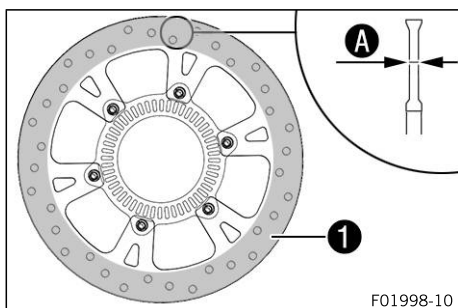
14.7 Checking brake discs



Warning

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

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



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

Info

Wear will reduce the thickness of the brake disc at contact surface **1** of the brake linings.

Brake discs - wear limit

front	4.5 mm (0.177 in)
rear	4.5 mm (0.177 in)

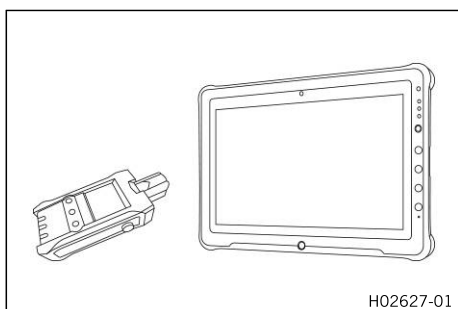
- » If the brake disc thickness is less than the specified value.
 - Change the front brake discs. (📖 p. 156)
 - Change the rear brake disc. (📖 p. 170)
- Check front and rear brake discs for damage, cracking, and deformation.
 - » If the brake disc exhibits damage, cracking, or deformation:
 - Change the front brake discs. (📖 p. 156)
 - Change the rear brake disc. (📖 p. 170)

14.8 Programming the tire pressure sensor



Info

To use the function in the combination instrument, the tire pressure display in the combination instrument must be enabled with the KTM diagnostics tool.



Condition

The diagnostics tool is connected and running.

Configuring the threshold value

- Execute **"Tire pressure monitoring system" > "Functions" > "Threshold value configuration"**.

Info

The instructions must be followed precisely.

Programming the transmitter ID – wheel set

- Execute **"Tire pressure monitoring system" > "Functions" > "Transmitter ID – wheel set"**.

Info

The instructions must be followed precisely.

The ID number is used to program the tire pressure sensor.

The tire pressure sensor ID consists of the last 8 digits of the serial number.

- Clear the fault memory using the KTM diagnostics tool.

- » Take a test ride.
 - Read out the trouble code memory using the KTM diagnostics tool.



14.9 Front wheel

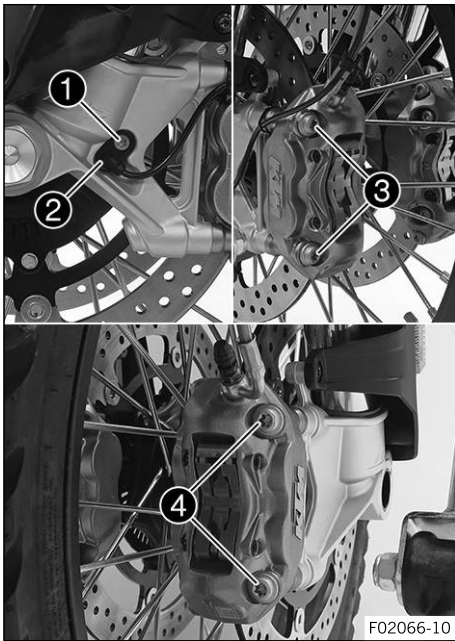
14.9.1 Removing the front wheel

Preparatory work

- Raise motorcycle with rear lifting gear. (📖 p. 15)
- Remove the front fender. (📖 p. 144)
- Lift the motorcycle with the front lifting gear. (📖 p. 15)

Main work

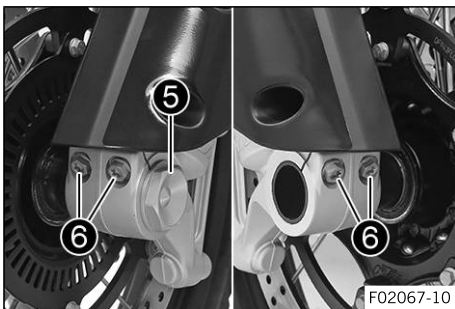
- Remove screw ❶ and pull wheel speed sensor ❷ out of the hole.
- Remove screws ❸ and ❹.
- Press back the brake linings by slightly tilting the left and right brake caliper laterally on the brake disc. Pull the left and right brake caliper carefully back from the brake disc and hang to the side.



F02066-10

i Info

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



F02067-10

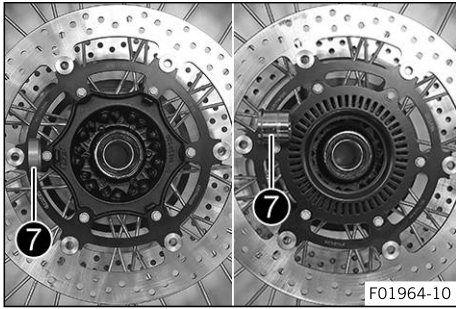
- Loosen screw ❺ by several rotations.
- Loosen screws ❻.
- Press on screw ❺ to push the wheel spindle out of the axle clamp.
- Remove screw ❺.

! Warning

Danger of accidents Damaged brake discs reduce the braking effect.

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

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



- Remove spacers **7**.

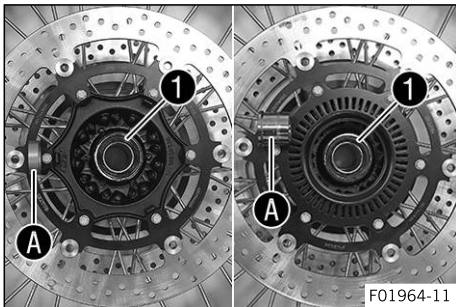
14.9.2 Installing the front wheel



Warning

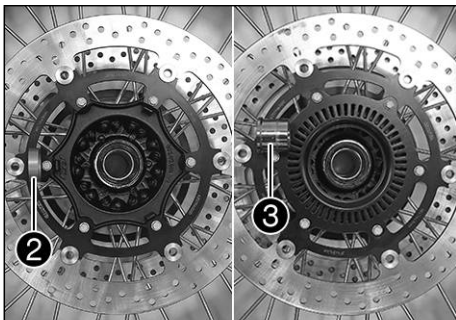
Danger of accidents Oil or grease on the brake discs reduces the braking effect.

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



- Check the wheel bearing for damage and wear.
 - » If the wheel bearing is damaged or worn:
 - Change front wheel bearing. (📖 p. 154)
- Clean and grease shaft seal rings **1** and contact surfaces **A** of the spacers.

Long-life grease (📖 p. 460)



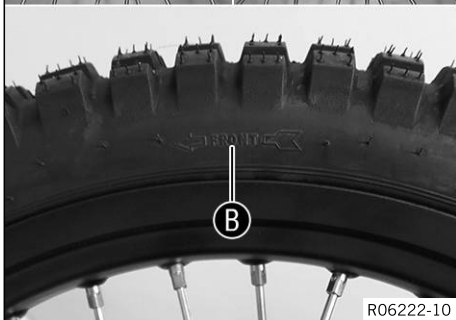
- Insert narrow spacer **2** on the right in the direction of travel.
- Insert wide spacer **3** on the left in the direction of travel.

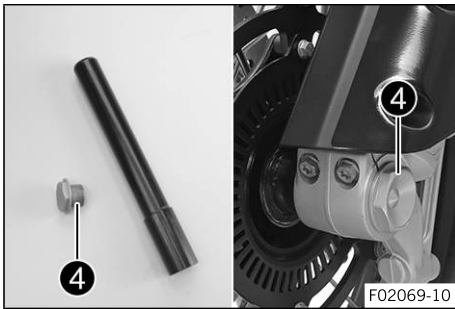


Info

Arrow **B** indicates the direction of travel of the front wheel.

The wheel speed sensor wheel is on the left viewed in the direction of travel.





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

Long-life grease (📖 p. 460)

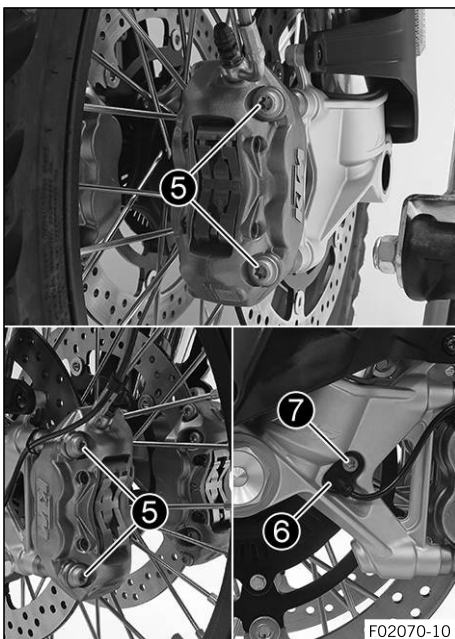
- Jack up the front wheel into the fork, position it, and insert the wheel spindle.
- Mount and tighten screw 4.

Guideline

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

i Tip

Temporarily tighten one of the axle clamp screws so that the axle does not rotate with it. Loosen the axle clamp screw again before compression to allow the fork legs to align.



- Position both brake calipers.
 - ✓ The brake linings are correctly positioned.
- Mount screws 5 on both sides but do not tighten yet.

Guideline

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

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

Guideline

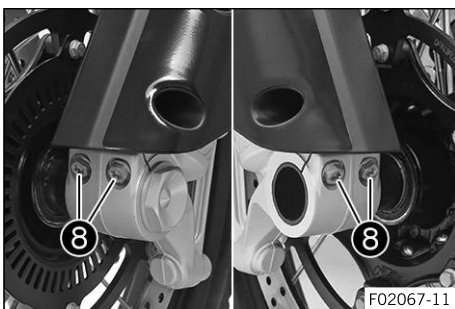
Screw, front brake caliper	M10x1.25	45 Nm (33.2 lbf ft) Loctite®243™
----------------------------	----------	--

- Position wheel speed sensor 6 in the hole.
- Mount and tighten screw 7.

Guideline

Screw, front wheel speed sensor	M6	6 Nm (4.4 lbf ft)
---------------------------------	----	-------------------

- Remove the locking piece of the hand brake lever.
- Take the motorcycle off the front lifting gear. (📖 p. 15)
- Remove the rear of the motorcycle from the lifting gear. (📖 p. 16)



- Operate the front brake and compress the fork a few times firmly.
 - ✓ The fork legs straighten.
- Tighten screws 8.

Guideline

Screw, fork stub	M8	15 Nm (11.1 lbf ft)
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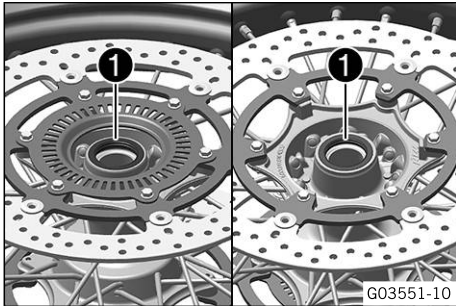
14.9.3 Changing the front wheel bearing

Preparatory work

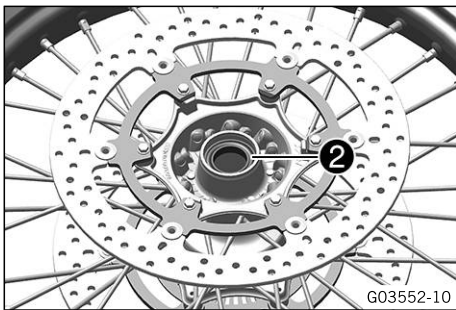
- Raise motorcycle with rear lifting gear. (📖 p. 15)
- Remove the front fender. (📖 p. 144)
- Lift the motorcycle with the front lifting gear. (📖 p. 15)
- Remove the front wheel. (📖 p. 151)

Main work

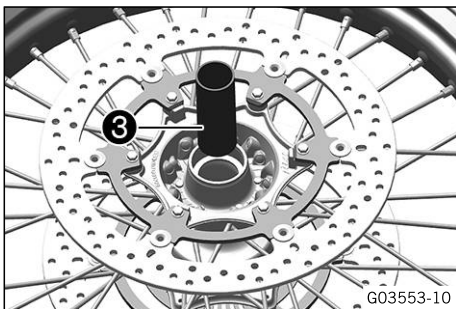
- Remove radial shaft seal rings **1**.



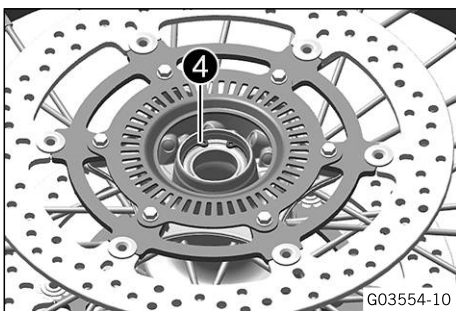
- Using a suitable tool, press bearing **2** out from the inside to the outside.

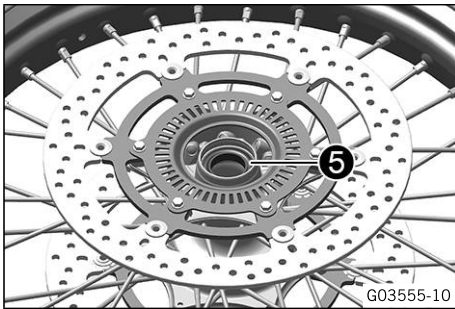


- Remove spacing tube **3**.



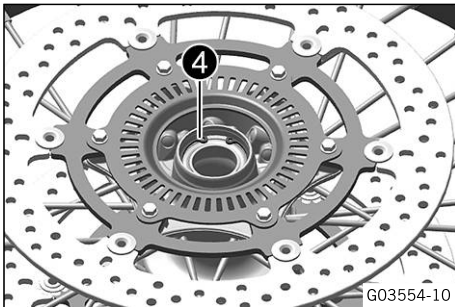
- Remove lock ring **4**.



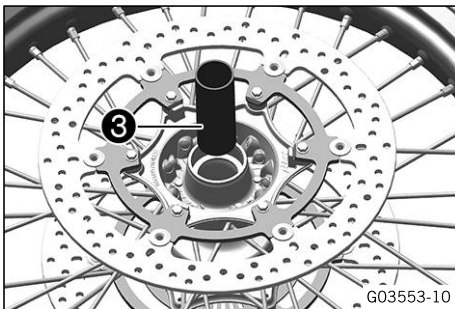


- Using a suitable tool, press bearing **5** out from the inside to the outside.
- Press the new bearing all the way in from the outside to the inside.

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

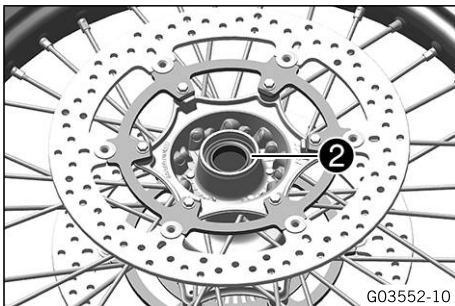


- Mount lock ring **4**.
- ✓ The lock ring engages audibly.



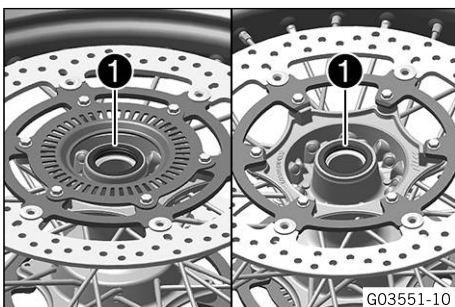
- Clean, grease, and mount spacing tube **3**.

Long-life grease (📖 p. 460)



- Press new bearing **2** all the way in from the outside to the inside.

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



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

Long-life grease (📖 p. 460)

Finishing work

- Install the front wheel. (📖 p. 152)



14.9.4 Changing the front brake discs

i Info

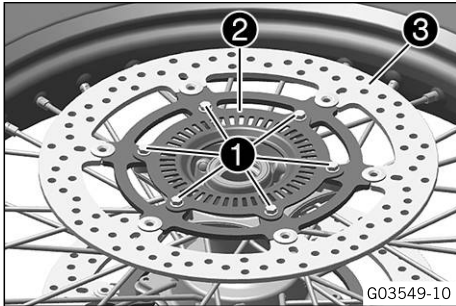
If the brake discs are changed, the brake linings must also be changed.

Preparatory work

- Raise motorcycle with rear lifting gear. (📖 p. 15)
- Remove the front fender. (📖 p. 144)
- Lift the motorcycle with the front lifting gear. (📖 p. 15)
- Remove the front wheel. (📖 p. 151)

Main work

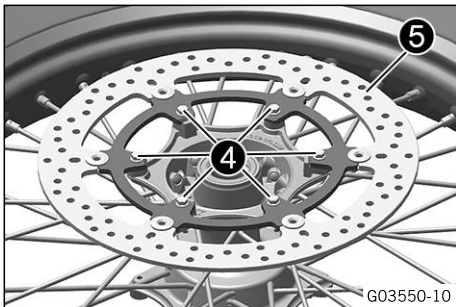
- Remove screws **1**.
- Take off wheel speed sensor wheel **2**.
- Take off left brake disc **3**.



- Remove screws **4**.
- Remove right brake disc **5**.
- Clean the contact surface of the brake disc.
- Position the brake disc with the label facing outward.
- Mount and tighten the screws.

Guideline

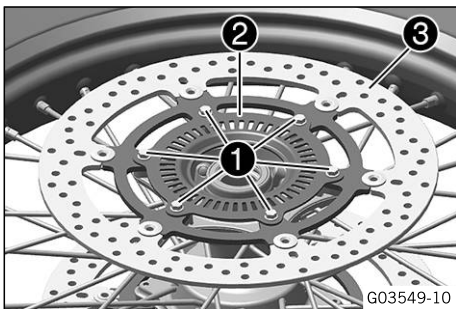
Screw, front brake disc	M6	14 Nm (10.3 lbf ft) Loctite®243™
-------------------------	----	--



- Clean the contact surface of the brake disc.
- Position new brake disc **3** with the label facing outward.
- Position wheel speed sensor wheel **2**.
- ✓ The wheel speed sensor wheel is on the left viewed in the direction of travel.
- Mount and tighten screws **1**.

Guideline

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



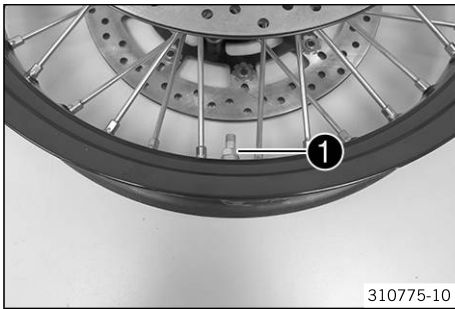
Finishing work

- Install the front wheel. (📖 p. 152)

14.9.5 Changing the rim seal band at the front

Preparatory work

- Raise motorcycle with rear lifting gear. (📖 p. 15)
- Remove the front fender. (📖 p. 144)
- Lift the motorcycle with the front lifting gear. (📖 p. 15)
- Remove the front wheel. (📖 p. 151)
- Remove the tire.



Main work

(Option: With TPMS)

- Remove nut ①.
- Take off the tire pressure sensor.

(Option: without TPMS)

- Remove nut ①.
- Take off the valve.

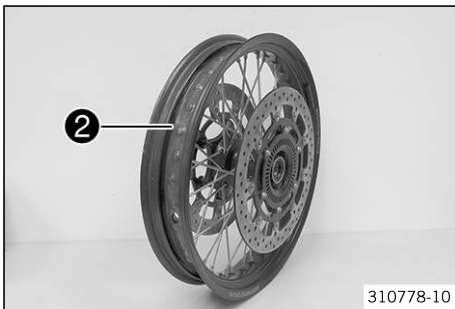


- Carefully cut through the rim seal band and pull it off.

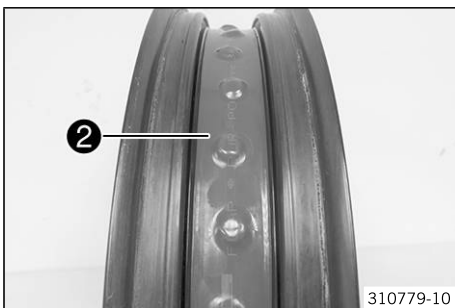


Tip

Raise the rim seal band slightly so that the rim tape is not damaged.



- Take off rim tape ②.
- Clean the seal groove.
- Check the rim for damage and wear.
 - » If there is damage or wear:
 - Change the rim.
- Check the rim run-out. (📖 p. 147)

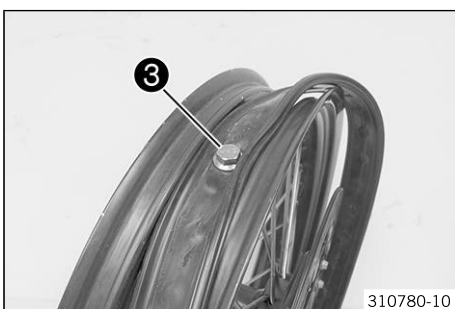


- Mount rim tape ②.



Info

Ensure that the rim tape is in exactly the right position.



- Lubricate the seal groove lightly.

Thinned tire mounting paste

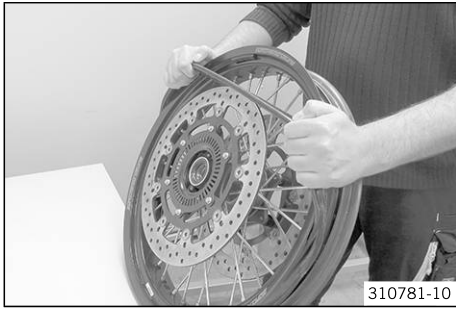
- Position the new rim seal band.



Tip

Using suitable screw ③, secure the holes of the rim seal band and the rim together.

Do not tighten the screw so that the seal ring is not damaged.



- Pull the rim seal band evenly over the rim.



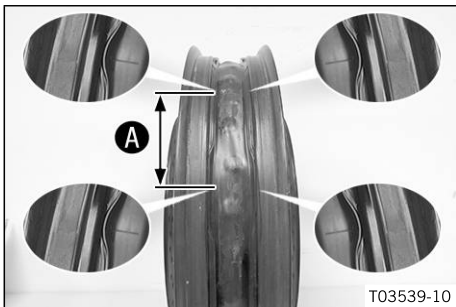
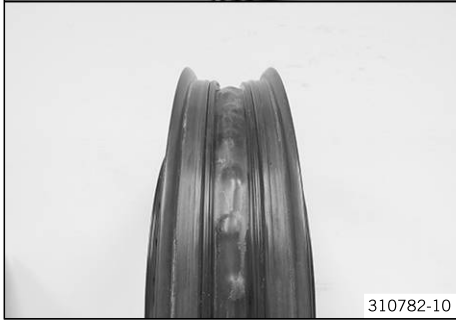
- Align the rim seal band.
 - ✓ Both sides of the rim seal band are positioned in the bottom of the seal groove.

i Info

Ensure that the rim seal band does not develop folds in the longitudinal direction.

- Grease the rim seal band at the edges.

Thinned tire mounting paste



- At distance **A**, press the rim seal band into the seal groove.
Guideline

Distance A	15 cm (5.9 in)
-------------------	----------------

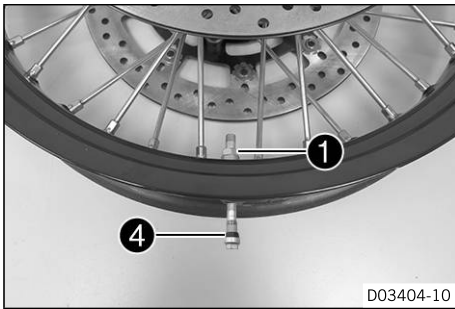
i Info

This step aids positioning, making it easier to mount the rim seal band.
Press perpendicular to the rim to avoid shifting the profile in a radial direction.

- Press the rim seal band into the seal groove along the entire circumference.
- Check that the rim seal band is seated correctly around the entire circumference.

- ✓ The valve is straight.





(Option: without TPMS)

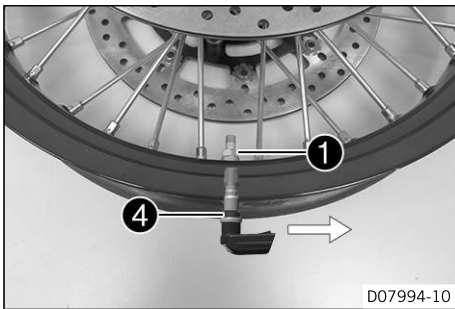
- Grease O-ring **4** slightly.

Thinned tire mounting paste

- Position the valve.
- Mount and tighten nut **1**.

Guideline

Nut, valve	ISO 10V2	12 Nm (8.9 lbf ft) Loctite®2701™
------------	----------	--



(Option: With TPMS)

- Grease O-ring **4** slightly.

Thinned tire mounting paste

- Position the tire pressure sensor.
- ✓ The tire pressure sensor points to the rear in the direction of travel.
- Mount and tighten nut **1**.

Guideline

Nut, tire pressure sensor	ISO 10V2	12 Nm (8.9 lbf ft) Loctite®2701™
---------------------------	----------	--

Finishing work

- Mount and balance the tires.
- Install the front wheel. (📖 p. 152)
- Program the tire pressure sensor. (📖 p. 150)

14.9.6 Changing the front tire pressure sensor (Option: With TPMS)

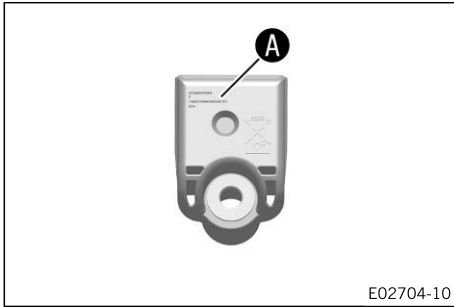
Preparatory work

- Raise motorcycle with rear lifting gear. (📖 p. 15)
- Remove the front fender. (📖 p. 144)
- Lift the motorcycle with the front lifting gear. (📖 p. 15)
- Remove the front wheel. (📖 p. 151)
- Remove the tire.

Main work

- Remove nut **1**.
- Take off the tire pressure sensor.





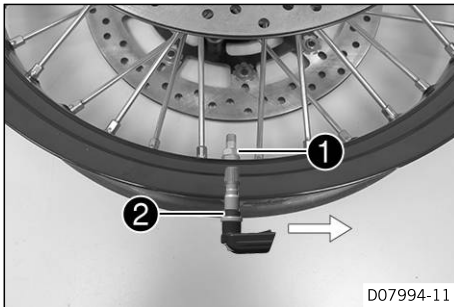
- Note ID number **A** of the new tire pressure sensor.



Info

The ID number is used to program the tire pressure sensor.

The tire pressure sensor ID consists of the last 8 digits of the serial number.



- Grease O-ring **2** lightly.

Thinned tire mounting paste

- Position the new tire pressure sensor.

- The tire pressure sensor points to the rear in the direction of travel.

- Mount and tighten nut **1**.

Guideline

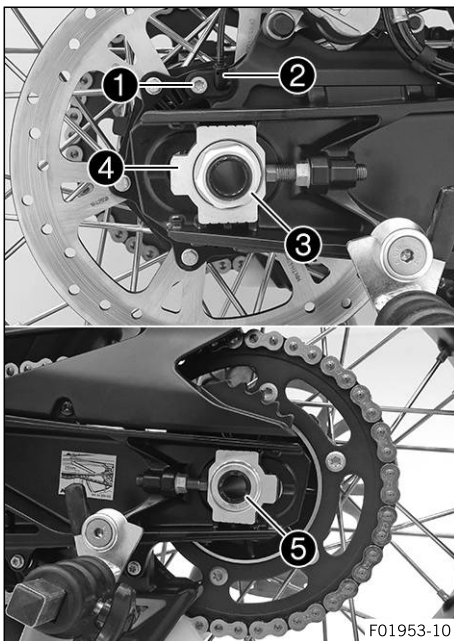
Nut, tire pressure sensor	ISO 10V2	12 Nm (8.9 lbf ft) Loctite®2701™
---------------------------	----------	--

Finishing work

- Mount and balance the tires.
- Install the front wheel. (📖 p. 152)
- Program the tire pressure sensor. (📖 p. 150)

14.10 Rear wheel

14.10.1 Removing the rear wheel

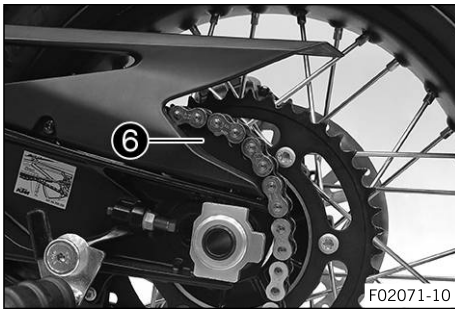


Preparatory work

- Raise motorcycle with rear lifting gear. (📖 p. 15)

Main work

- Manually press the brake caliper toward the brake disc to push back the brake piston.
- Remove screw **1** and pull wheel speed sensor **2** out of the hole.
- Remove nut **3**. Take off chain adjuster **4**.
- Pull out wheel spindle **5** far enough to allow the rear wheel to be pushed forward.



- Push the rear wheel forward as far as possible. Take the chain off the rear sprocket and place it on chain sprocket guard **6**.

i Info
Cover the components to protect them against damage.

- Hold the rear wheel and remove the wheel spindle.
- Pull the rear wheel back until the brake caliper bracket is suspended freely between the brake disc and rim.

! Warning
Danger of accidents Damaged brake discs reduce the braking effect.

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

- Take the rear wheel out of the link fork.

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



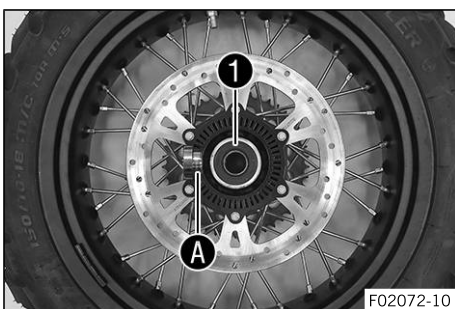
14.10.2 Installing the rear wheel

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

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

! Warning
Danger of accidents There is no braking effect to start with at the rear brake after installing the rear wheel.

- Actuate the foot brake several times before going on a ride until you can feel a firm pressure point.



Main work

- Check the rear hub damping rubber pieces. (📖 p. 181)
- Check the wheel bearing for damage and wear.
 - » If the wheel bearing is damaged or worn:
 - Change the rear wheel bearing. (📖 p. 167)
- Remove spacer.
- Clean and grease shaft seal ring **1** and contact surface **A** of the spacer.

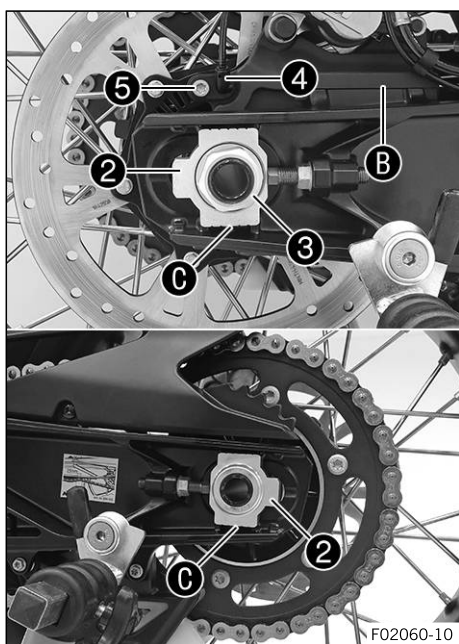
Long-life grease (📖 p. 460)

- Insert a spacer.
- Clean and grease the thread of the wheel spindle and nut.

Long-life grease (📖 p. 460)

- Clean and grease the wheel spindle.

Long-life grease (📖 p. 460)



- Clean the contact areas on the brake caliper bracket and link fork.
- Engage the thrust bearing of brake caliper bracket **B** and the link fork.
- Jack up the rear wheel into the link fork, position it, and insert the wheel spindle.
- ✓ The brake linings are correctly positioned.
- Place the chain on the sprocket.
- Position chain adjuster **2**. Mount nut **3**, but do not tighten it yet.

i Info
Mount the left and right chain adjusters in the same position.

- Make sure that chain adjusters **2** are fitted correctly on the adjusting screws. Tighten nut **3**.

Guideline

In order for the rear wheel to be correctly aligned, the markings on the left and right chain adjusters must be in the same position relative to reference markings **C**.

Nut, rear wheel spindle	M25x1.5	90 Nm (66.4 lbf ft) Thread and contact area of wheel spindle greased
-------------------------	---------	---

- Position wheel speed sensor **4** in the hole.
- Mount and tighten screw **5**.

Guideline

Screw, rear wheel speed sensor	M6	6 Nm (4.4 lbf ft)
--------------------------------	----	-------------------

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

Finishing work

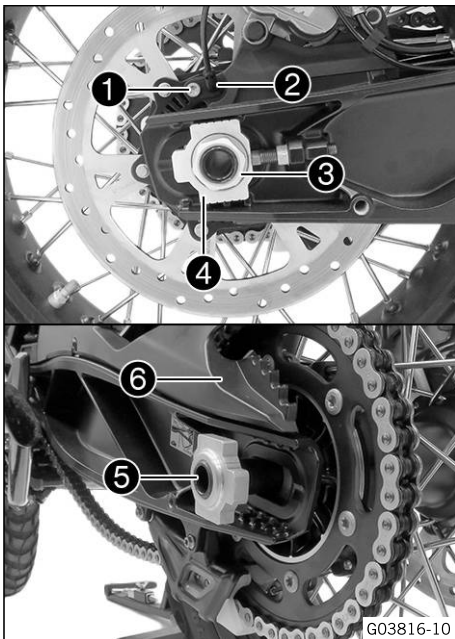
- Check the chain tension. (📖 p. 175)
- Remove the rear of the motorcycle from the lifting gear. (📖 p. 16)

14.10.3 Removing the rear wheel (work stand, front)

Preparatory work

- Remove the seat. (📖 p. 120)
- Remove the left side cover. (📖 p. 137)
- Remove the battery cover. (📖 p. 138)
- Remove left fuel tank spoiler. (📖 p. 139)
- Remove the right side cover. (📖 p. 137)
- Remove right fuel tank spoiler. (📖 p. 141)
- Remove the engine guard. (📖 p. 143)
- Remove the fuel tank. (📖 p. 120)
- Raise the motorcycle at the front using the work stand. (📖 p. 19)

- Place a load on the front of the vehicle.
- ✔ The rear wheel is not in contact with the ground.



Main work

- Manually press the brake caliper toward the brake disc to push back the brake piston.
- Remove screw **1** and pull wheel speed sensor **2** out of the hole.
- Remove nut **3**. Take off chain adjuster **4**.
- Pull out wheel spindle **5** far enough to allow the rear wheel to be pushed forward.
- Push the rear wheel forward as far as possible. Take the chain off the rear sprocket and place it on chain sprocket guard **6**.



Info

Cover the components to protect them against damage.

- Hold the rear wheel and remove the wheel spindle.
- Pull the rear wheel back until the brake caliper bracket is suspended freely between the brake disc and rim.



Warning

Danger of accidents Damaged brake discs reduce the braking effect.

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

- Take the rear wheel out of the link fork.



Info

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



14.10.4 Installing the rear wheel (work stand, front)



Warning

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

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



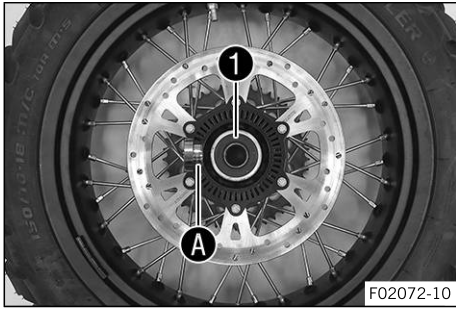
Warning

Danger of accidents There is no braking effect to start with at the rear brake after installing the rear wheel.

- Actuate the foot brake several times before going on a ride until you can feel a firm pressure point.

Main work

- Check the rear hub damping rubber pieces. (📖 p. 181)



- Check the wheel bearing for damage and wear.
 - » If the wheel bearing is damaged or worn:
 - Change the rear wheel bearing. (📖 p. 167)
- Remove spacer.
- Clean and grease shaft seal ring **1** and contact surface **A** of the spacer.

Long-life grease (📖 p. 460)

- Insert a spacer.
- Clean and grease the thread of the wheel spindle and nut.

Long-life grease (📖 p. 460)

- Clean and grease the wheel spindle.

Long-life grease (📖 p. 460)

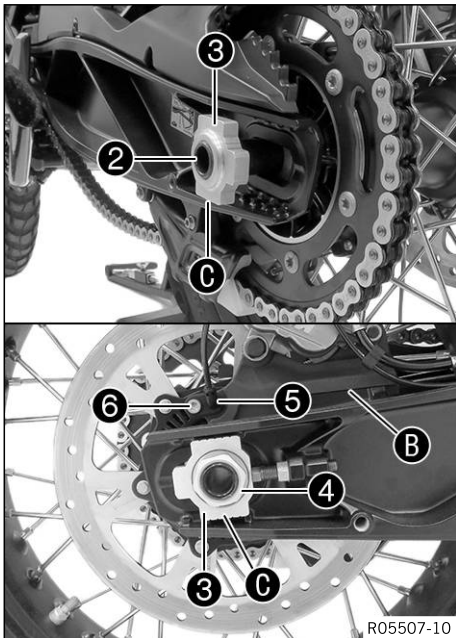
- Clean the contact areas on the brake caliper bracket and link fork.

- Engage the thrust bearing of brake caliper bracket **B** and the link fork.

- Lift the rear wheel into the link fork, position it, and insert wheel spindle **2**.

✓ The brake linings are correctly positioned.

- Place the chain on the sprocket.
- Position chain adjuster **3**. Mount nut **4**, but do not tighten it yet.



i Info

Mount the left and right chain adjusters in the same position.

- Make sure that chain adjusters **3** are fitted correctly on the adjusting screws. Tighten nut **4**.

Guideline

In order for the rear wheel to be correctly aligned, the markings on the left and right chain adjusters must be in the same position relative to reference markings **C**.

Nut, rear wheel spindle	M25x1.5	90 Nm (66.4 lbf ft) Thread and contact area of wheel spindle greased
-------------------------	---------	---

- Position wheel speed sensor **5** in the hole.
- Mount and tighten screw **6**.

Guideline

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

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

Finishing work

- Check the chain tension. (📖 p. 175)
- Remove the motorcycle from the work stand at the front. (📖 p. 19)
- Install the fuel tank. (📖 p. 123)

- Install the engine guard. (📖 p. 143)
- Install the right fuel tank spoiler. (📖 p. 142)
- Install the right side cover. (📖 p. 138)
- Install the left fuel tank spoiler. (📖 p. 140)
- Install the battery cover. (📖 p. 139)
- Install the left side cover. (📖 p. 137)
- Mount the seat. (📖 p. 120)



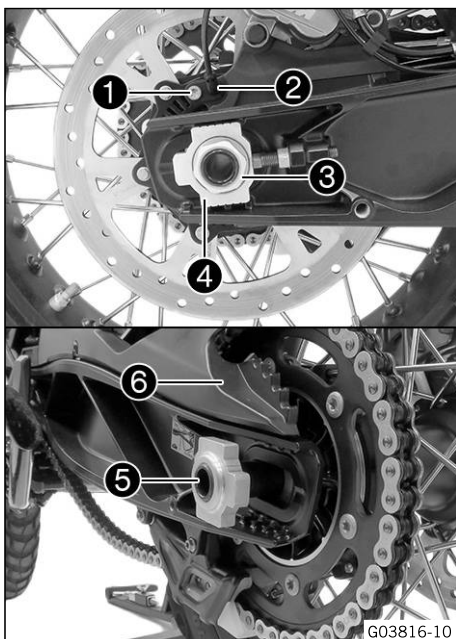
14.10.5 Removing the rear wheel (work stand, rear)

Preparatory work

- Remove main silencer. (📖 p. 106)
- Raise motorcycle with the work stand (center). (📖 p. 16)
- Place a load on the front of the vehicle.
- ✔ The rear wheel is not in contact with the ground.

Main work

- Manually press the brake caliper toward the brake disc to push back the brake piston.
- Remove screw **1** and pull wheel speed sensor **2** out of the hole.
- Remove nut **3**. Take off chain adjuster **4**.
- Pull out wheel spindle **5** far enough to allow the rear wheel to be pushed forward.
- Push the rear wheel forward as far as possible. Take the chain off the rear sprocket and place it on chain sprocket guard **6**.



Info

Cover the components to protect them against damage.

- Hold the rear wheel and remove the wheel spindle.
- Pull the rear wheel back until the brake caliper bracket is suspended freely between the brake disc and rim.



Warning

Danger of accidents Damaged brake discs reduce the braking effect.

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

- Take the rear wheel out of the link fork.



Info

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



14.10.6 Installing the rear wheel (work stand, rear)



Warning

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

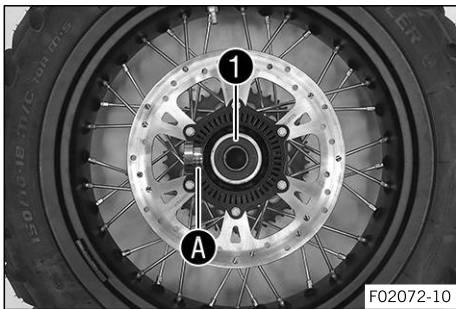
- Always keep the brake discs free of oil and grease.
- Clean the brake discs with brake cleaner when necessary.



Warning

Danger of accidents There is no braking effect to start with at the rear brake after installing the rear wheel.

- Actuate the foot brake several times before going on a ride until you can feel a firm pressure point.



Main work

- Check the rear hub damping rubber pieces. (📖 p. 181)
- Check the wheel bearing for damage and wear.
 - » If the wheel bearing is damaged or worn:
 - Change the rear wheel bearing. (📖 p. 167)
- Remove spacer.
- Clean and grease shaft seal ring **1** and contact surface **A** of the spacer.

Long-life grease (📖 p. 460)

- Insert a spacer.
- Clean and grease the thread of the wheel spindle and nut.

Long-life grease (📖 p. 460)

- Clean and grease the wheel spindle.

Long-life grease (📖 p. 460)

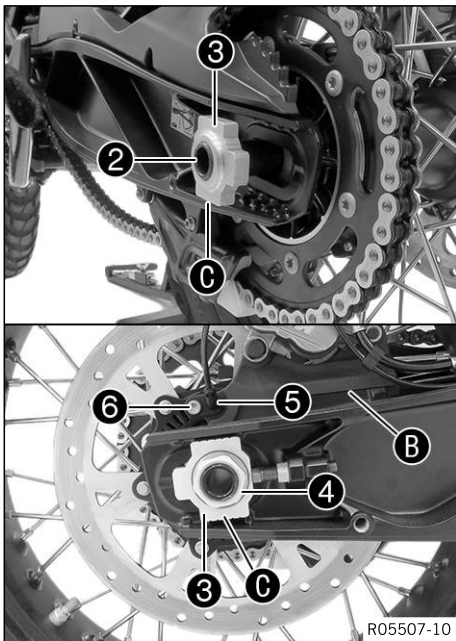
- Clean the contact areas on the brake caliper bracket and link fork.

- Engage the thrust bearing of brake caliper bracket **B** and the link fork.

- Lift the rear wheel into the link fork, position it, and insert wheel spindle **2**.

✓ The brake linings are correctly positioned.

- Place the chain on the sprocket.
- Position chain adjuster **3**. Mount nut **4**, but do not tighten it yet.



Info

Mount the left and right chain adjusters in the same position.

- Make sure that chain adjusters **3** are fitted correctly on the adjusting screws. Tighten nut **4**.

Guideline

In order for the rear wheel to be correctly aligned, the markings on the left and right chain adjusters must be in the same position relative to reference markings **C**.

Nut, rear wheel spindle	M25x1.5	90 Nm (66.4 lbf ft) Thread and contact area of wheel spindle greased
-------------------------	---------	---

- Position wheel speed sensor **5** in the hole.
- Mount and tighten screw **6**.

Guideline

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

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

Finishing work

- Check the chain tension. (📖 p. 175)
- Remove the motorcycle from the work stand (center). (📖 p. 17)
- Install the main silencer. (📖 p. 106)



14.10.7 Changing the rear wheel bearing

Preparatory work

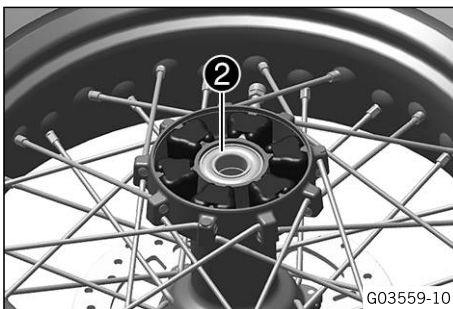
- Raise motorcycle with rear lifting gear. (📖 p. 15)
- Remove the rear wheel. (📖 p. 160)

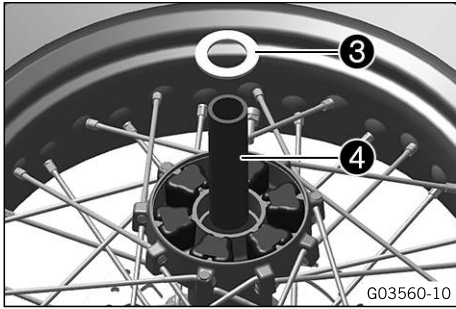
Main work

- Remove rear sprocket carrier **1**.

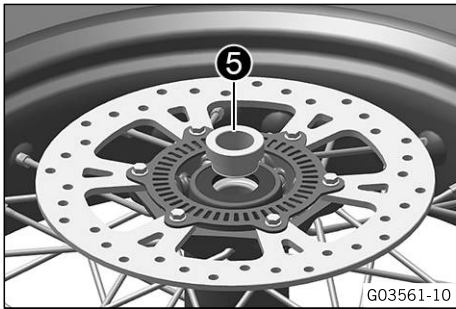


- Using a suitable tool, press bearing **2** out from the inside to the outside.

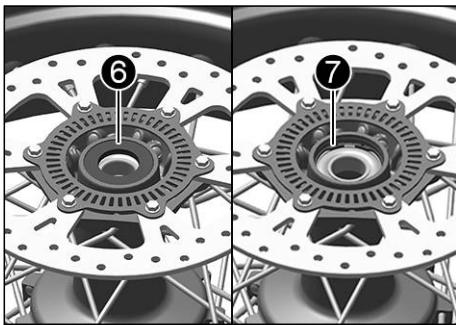




- Remove spacer washer **3**.
- Remove spacing tube **4**.



- Remove spacer **5**.

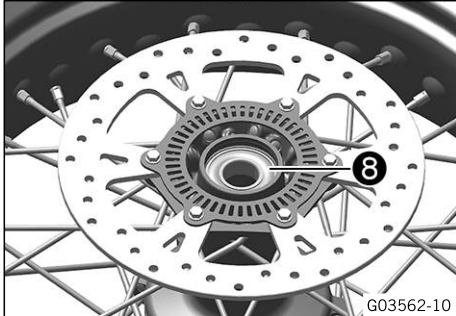


- Remove radial shaft seal ring **6**.
- Remove lock ring **7**.
- Using a suitable tool, press bearing **8** out from the inside to the outside.
- Press the new bearing all the way in from the outside to the inside.



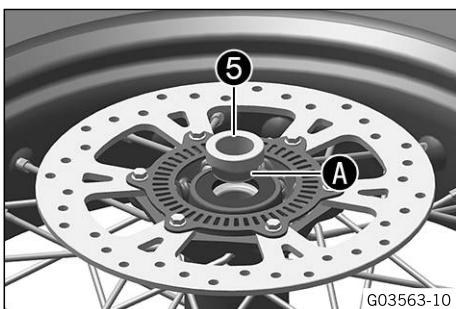
Info

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



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

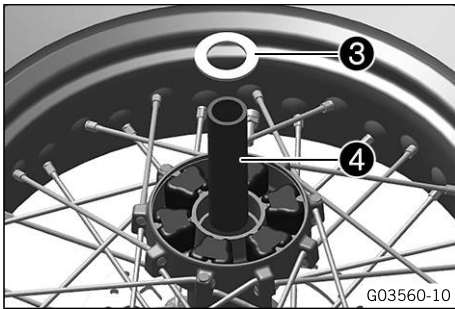
Long-life grease (📖 p. 460)



- Clean and grease the contact surfaces **A** of the spacer.

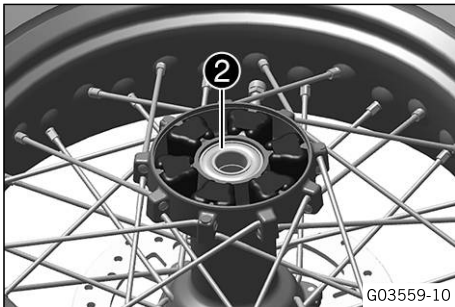
Long-life grease (📖 p. 460)

- Position spacer **5**.



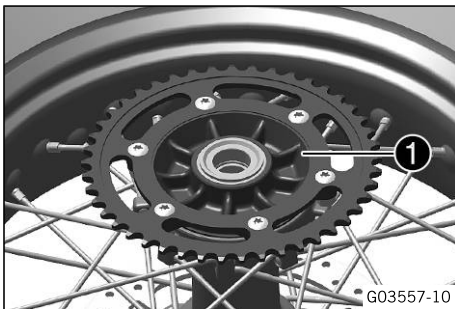
- Check spacer washer **3** for damage and wear.
 - » If the spacer washer is damaged or worn:
 - Replace the spacer washer.
- Mount the spacer washer.
- Clean, grease, and mount spacing tube **4**.

Long-life grease (📖 p. 460)



- Press new bearing **2** all the way in from the outside to the inside.

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



- Ensure that the damping rubber pieces are correctly seated.
- Mount rear sprocket carriers **1**.

Finishing work

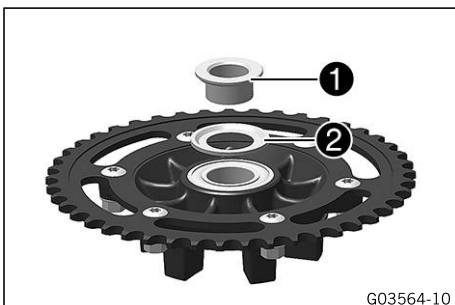
- Install the rear wheel. (📖 p. 161)
- Check the chain tension. (📖 p. 175)
- Remove the rear of the motorcycle from the lifting gear. (📖 p. 16)

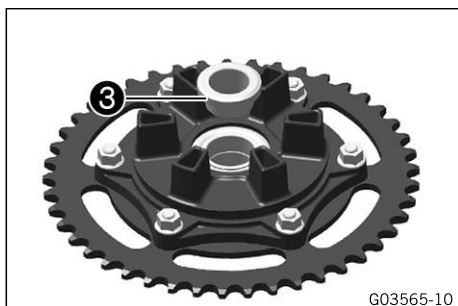
14.10.8 Changing the bearing of the rear sprocket carrier

Condition

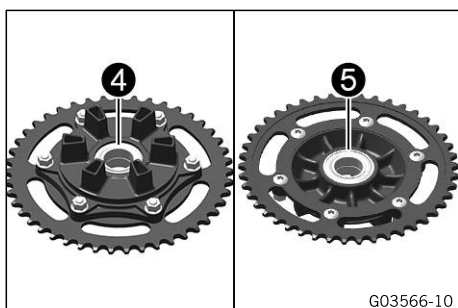
Rear sprocket carrier is removed.

- Remove spacer **1** with washer **2**.



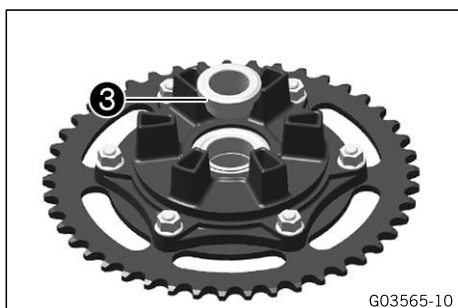


- Remove collar bushing ③.

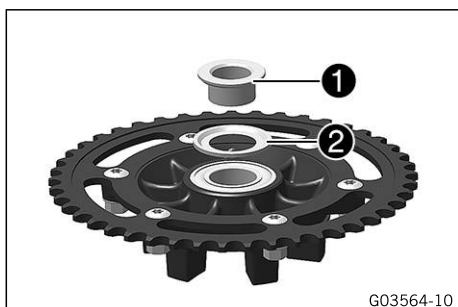


- Using a suitable tool, press bearings ④ and ⑤ out from the inside to the outside.
- Using a suitable tool, press in new bearings ⑤ and ④ from the outside to the inside until they are flush.

i Info
Only press the bearings in using the outer bearing ring; otherwise, the bearings will be damaged when they are pressed in.



- Mount collar bushing ③.



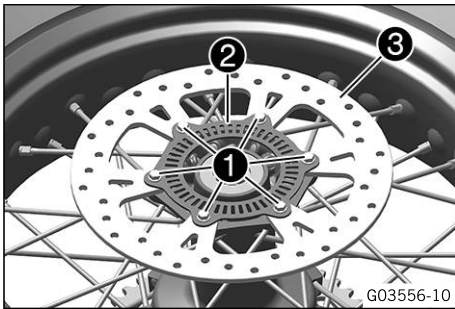
- Mount spacer ① with washer ②.

14.10.9 Changing the rear brake disc

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

Preparatory work

- Raise motorcycle with rear lifting gear. (📖 p. 15)
- Remove the rear wheel. (📖 p. 160)



Main work

- Remove screws ❶.
- Take off wheel speed sensor wheel ❷.
- Take off brake disc ❸.
- Clean the contact surface of the brake disc.
- Position the brake disc with the label facing outward.
- Position the wheel speed sensor wheel.
- Mount and tighten the screws.

Guideline

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

Finishing work

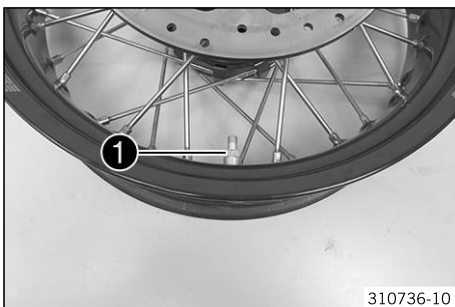
- Install the rear wheel. (📖 p. 161)
- Check the chain tension. (📖 p. 175)
- Remove the rear of the motorcycle from the lifting gear. (📖 p. 16)



14.10.10 Changing the rim seal band at the rear

Preparatory work

- Raise motorcycle with rear lifting gear. (📖 p. 15)
- Remove the rear wheel. (📖 p. 160)
- Take off the rear sprocket carrier and the damping rubbers.
- Remove the tire.



Main work

(Option: With TPMS)

- Remove nut ❶.
- Take off the tire pressure sensor.

(Option: without TPMS)

- Remove nut ❶.
- Take off the valve.

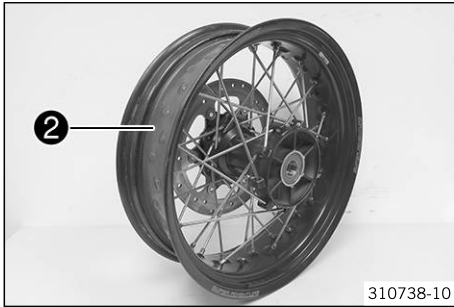
- Carefully cut through the rim seal band and pull it off.



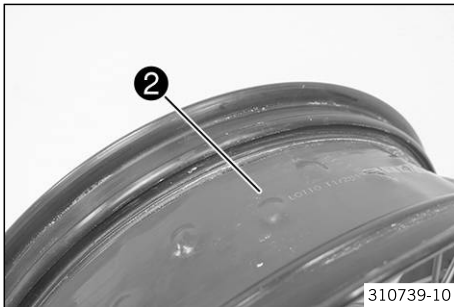
Tip

Raise the rim seal band slightly so that the rim tape is not damaged.



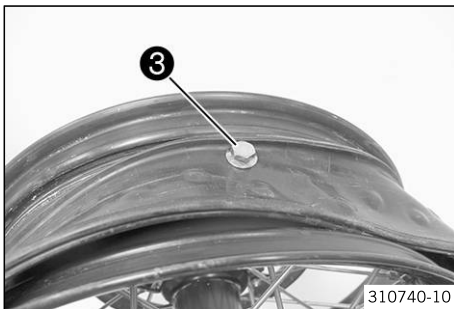


- Take off rim tape ②.
- Clean the seal groove.
- Check the rim for damage and wear.
 - » If there is damage or wear:
 - Change the rim.
- Check the rim run-out. (📖 p. 147)



- Mount rim tape ②.

i Info
Ensure that the rim tape is in exactly the right position.



- Lubricate the seal groove lightly.

Thinned tire mounting paste

- Position the new rim seal band.

i Tip
Using suitable screw ③, secure the holes of the rim seal band and the rim together.
Do not tighten the screw so that the seal ring is not damaged.

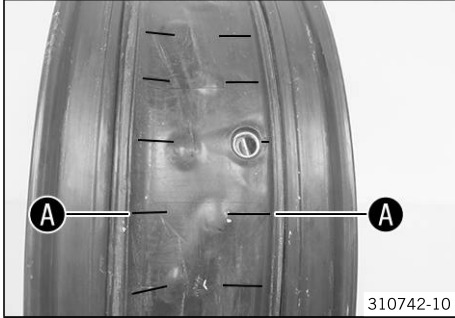


- Pull the rim seal band evenly over the rim.



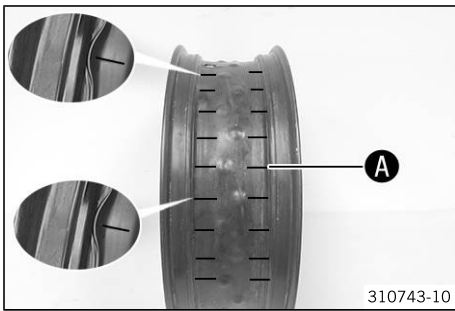
- Align the rim seal band.
- ✓ Both sides of the rim seal band are positioned in the bottom of the seal groove.
- ✓ Markings **A** are aligned along the total circumference of the rim.

i Info
Ensure that the rim seal band does not develop folds in the longitudinal direction.



- Grease the rim seal band at the edges.

Thinned tire mounting paste

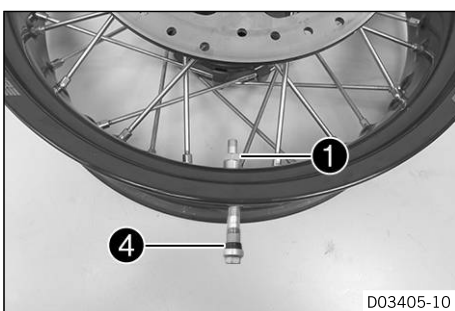


- Press the rim seal band into the seal groove at intervals that are 5 markings **A** apart.

i Info
This step aids positioning, making it easier to mount the rim seal band.
Press perpendicular to the rim to avoid shifting the profile in a radial direction.



- Press the rim seal band into the seal groove along the entire circumference.
- Check that the rim seal band is seated correctly around the entire circumference.
- ✓ The valve is straight.



(Option: without TPMS)

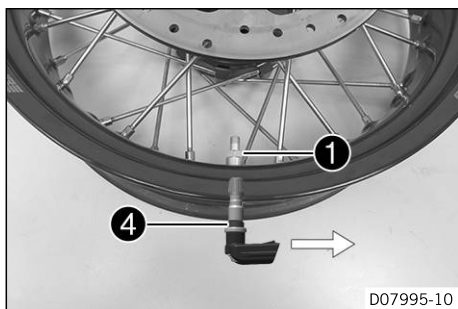
- Grease O-ring **4** slightly.

Thinned tire mounting paste

- Position the valve.
- Mount and tighten nut **1**.

Guideline

Nut, valve	ISO 10V2	12 Nm (8.9 lbf ft) Loctite®2701™
------------	----------	--



(Option: With TPMS)

- Grease O-ring 4 slightly.

Thinned tire mounting paste

- Position the tire pressure sensor.
 - ✓ The tire pressure sensor points to the rear in the direction of travel.
- Mount and tighten nut 1.

Guideline

Nut, tire pressure sensor	ISO 10V2	12 Nm (8.9 lbf ft) Loctite®2701™
---------------------------	----------	--

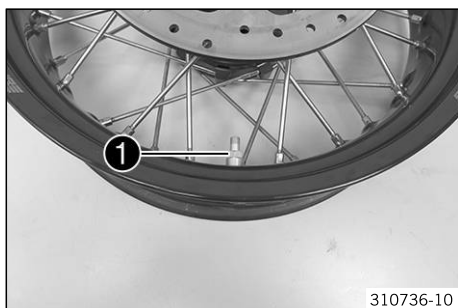
Finishing work

- Mount and balance the tires.
- Mount the damping rubbers and rear sprocket carrier.
- Install the rear wheel. (📖 p. 161)
- Check the chain tension. (📖 p. 175)
- Remove the rear of the motorcycle from the lifting gear. (📖 p. 16)
- Program the tire pressure sensor. (📖 p. 150)

14.10.11 Changing the rear tire pressure sensor (Option: With TPMS)

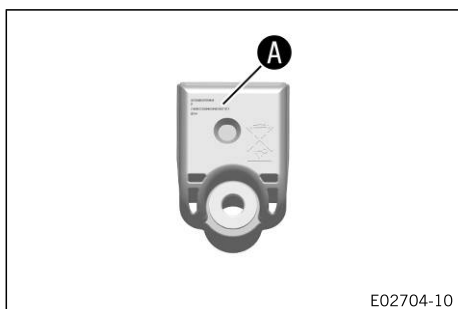
Preparatory work

- Raise motorcycle with rear lifting gear. (📖 p. 15)
- Remove the rear wheel. (📖 p. 160)
- Take off the rear sprocket carrier and the damping rubbers.
- Remove the tire.



Main work

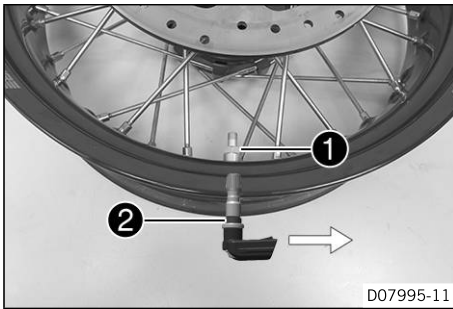
- Remove nut 1.
- Take off the tire pressure sensor.



- Note ID number A of the new tire pressure sensor.

i Info

The ID number is used to program the tire pressure sensor.
The tire pressure sensor ID consists of the last 8 digits of the serial number.



- Grease O-ring **2** lightly.

Thinned tire mounting paste

- Position the new tire pressure sensor.
 - ✓ The tire pressure sensor points to the rear in the direction of travel.
- Mount and tighten nut **1**.

Guideline

Nut, tire pressure sensor	ISO 10V2	12 Nm (8.9 lbf ft) Loctite®2701™
---------------------------	----------	--

Finishing work

- Mount and balance the tires.
- Mount the damping rubbers and rear sprocket carrier.
- Install the rear wheel. (📖 p. 161)
- Check the chain tension. (📖 p. 175)
- Remove the rear of the motorcycle from the lifting gear. (📖 p. 16)
- Program the tire pressure sensor. (📖 p. 150)



14.10.12 Checking the chain tension



Warning

Danger of accidents Incorrect chain tension damages components and results in accidents.

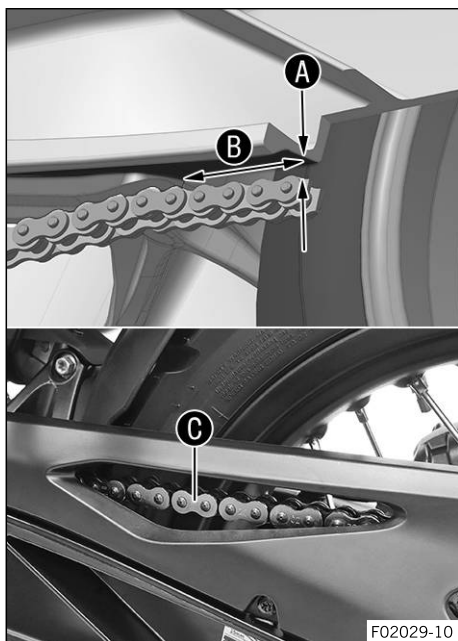
If the chain is tensioned too much, the chain, engine sprocket, rear sprocket, transmission and rear wheel bearings wear more quickly. Some components may break if overloaded.

If the chain is too loose, the chain may fall off the engine sprocket or the rear sprocket. As a result, the rear wheel locks or the engine will be damaged.


- Check the chain tension regularly.
- Set the chain tension in accordance with the specification.

Preparatory work

- Raise motorcycle with rear lifting gear. (📖 p. 15)



Main work

- Shift the transmission into neutral .
- Push the chain behind the chain sliding piece up and determine the chain tension **A** between the link fork and the upper edge of the chain.



Guideline

Distance B from the chain sliding piece	2.5 cm (0.98 in)
Measure the distance from the flat part of the link fork directly above the chain, not from the edge of the link fork.	

Info

Top chain section **C** must be taut.
Chain wear is not always even. Repeat this measurement at different chain positions.

Chain tension	2 ... 5 mm (0.08 ... 0.2 in)
---------------	------------------------------

- » If the chain tension does not meet the specification:
 - Adjust the chain tension. ( p. 176)
- Remove the rear of the motorcycle from the lifting gear. ( p. 16)

14.10.13 Adjusting the chain tension



Warning



Danger of accidents Incorrect chain tension damages components and results in accidents.

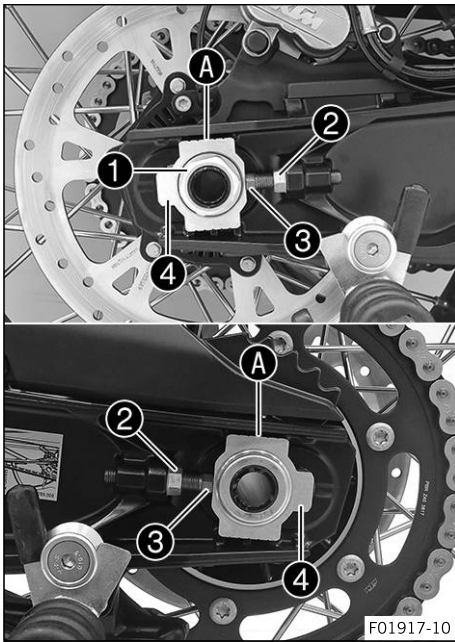
If the chain is tensioned too much, the chain, engine sprocket, rear sprocket, transmission and rear wheel bearings wear more quickly. Some components may break if overloaded.

If the chain is too loose, the chain may fall off the engine sprocket or the rear sprocket. As a result, the rear wheel locks or the engine will be damaged.

- Check the chain tension regularly.
- Set the chain tension in accordance with the specification.

Preparatory work

- Raise motorcycle with rear lifting gear. ( p. 15)
- Check the chain tension. ( p. 175)



Main work

- Loosen nut ①.
- Loosen nuts ②.
- Adjust the chain tension by turning adjusting screws ③ left and right.

Guideline

Chain tension	2 ... 5 mm (0.08 ... 0.2 in)
Turn the adjusting screws ③ on the left and right so that the markings on the left and right chain adjusters ④ are in the same position relative to the reference marks A. The rear wheel is then correctly aligned.	

i Info

The top chain section must be taut.
Chain wear is not always even. Repeat this measurement at different chain positions.

- Tighten nuts ②.
- Make sure that chain adjusters ④ are fitted correctly on adjusting screws ③.
- Tighten nut ①.

Guideline

Nut, rear wheel spindle	M25x1.5	90 Nm (66.4 lbf ft) Thread and contact area of wheel spindle greased
-------------------------	---------	---

Finishing work

- Check the chain tension. (📖 p. 175)



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

Preparatory work

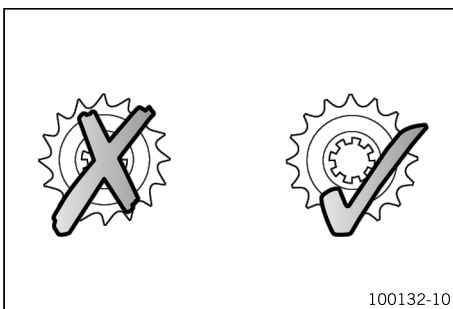
- Raise motorcycle with rear lifting gear. (📖 p. 15)

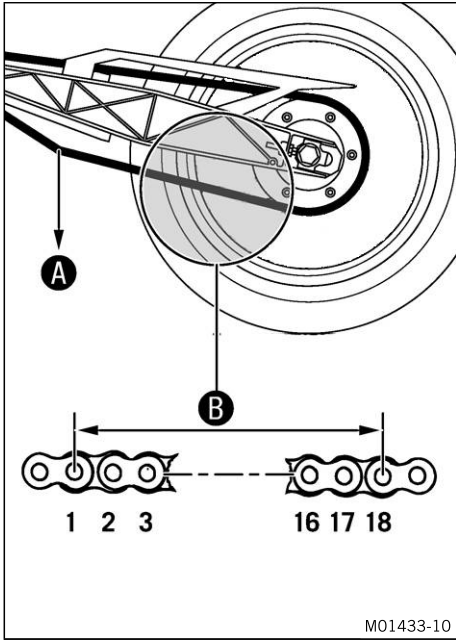
Main work

- Check the chain, rear sprocket, and engine sprocket for wear.
 - » If the chain, rear sprocket or engine sprocket is worn:
 - Change the drivetrain kit. (📖 p. 183)

i Info

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





- Shift the transmission into neutral **N**.
- Pull on the lower chain section with the specified weight **A**.

Guideline

Weight, chain wear measurement	15 kg (33 lb.)
--------------------------------	----------------

- Measure distance **B** of 18 chain rollers in the lower chain section.

i Info

Chain wear is not always even. Repeat this measurement at different chain positions.

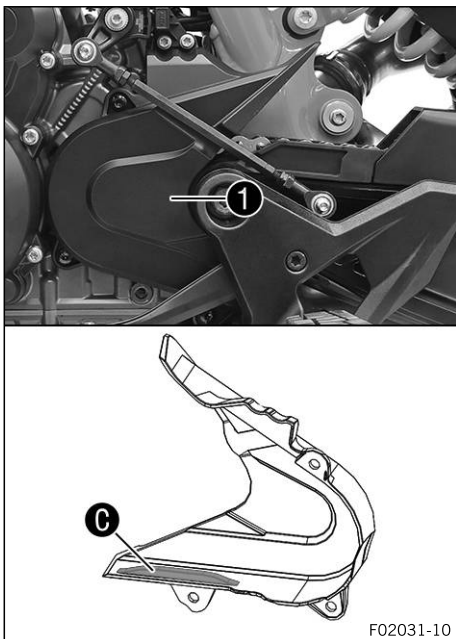
Maximum distance B from 18 chain rollers at the longest chain section	272 mm (10.71 in)
--	-------------------

- » If distance **B** is greater than the specified measurement:
 - Change the drivetrain kit. (📖 p. 183)

i Info

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

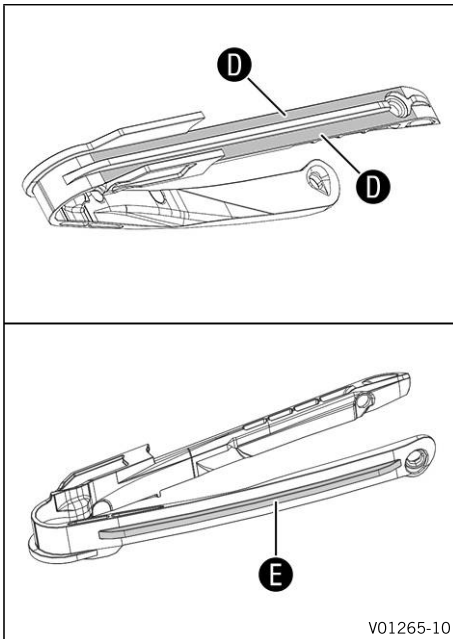
For safety reasons, the chain has no chain joint.



- Check the engine sprocket cover **1** for wear.
 - » If the engine sprocket cover is highly worn in the marked area **C**:
 - Change the engine sprocket cover.
- Check the engine sprocket cover **1** for tightness.
 - » If the engine sprocket cover is loose:
 - Tighten the screws on the engine sprocket cover.

Guideline

Screw, engine sprocket cover	M5	5 Nm (3.7 lbf ft) Loctite®243™
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- Check the chain sliding guard for wear.
 - » If continuous signs of wear to the chain are visible on the chain sliding guard in the area **D** marked:
 - Change the chain sliding guard.
 - » If the chain sliding guard is highly worn on the underside in the marked area **E**:
 - Change the chain sliding guard.
- Check that the chain sliding guard is firmly seated.
 - » If the chain sliding guard is loose:
 - Tighten screws on the chain sliding guard.

Guideline

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

Finishing work

- Remove the rear of the motorcycle from the lifting gear. (📖 p. 16)



14.10.15 Cleaning the chain



Warning

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

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



Warning

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

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



Note

Environmental hazard Hazardous substances cause environmental damage.

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

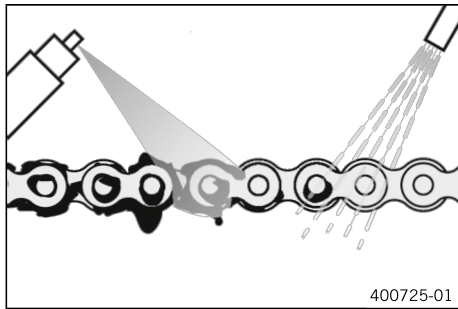


Info

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

Preparatory work

- Raise motorcycle with rear lifting gear. (📖 p. 15)



Main work

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

Chain cleaner (📖 p. 460)

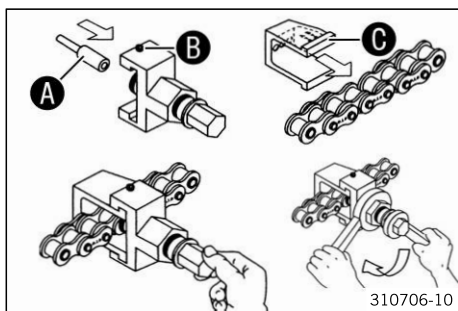
- After drying, apply chain spray.

Street chain spray (📖 p. 461)

Finishing work

- Remove the rear of the motorcycle from the lifting gear. (📖 p. 16)

14.10.16 Opening the chain

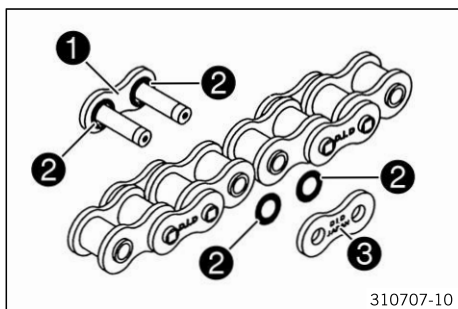


- Mount mandrel **A** with the larger diameter in the spindle of the special tool. Turn the spindle counterclockwise.

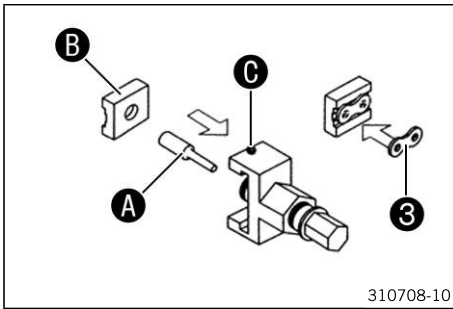
Chain rivet tool (60029020000) (📖 p. 466)

- Make the connecting link of the chain accessible. Fret the riveting point.
- Position the special tool with the mandrel on one of the 2 pins of the connecting link of the chain.
 - ✓ Locking screw **B** points upwards.
- Position retaining clamp **C** of the special tool on the chain from the rear.
 - ✓ Markings **A** and **B** point upwards.
- Slide retaining clamp **C** of the special tool into the pressing tool.
 - ✓ The arrow of marking **A** points to locking screw **B**.
- Screw the locking screw hand-tight as far as it will go.
 - ✓ The retaining clamp is fixed.
- Hold the special tool and screw in the spindle.
 - ✓ The chain pin is pressed out through the retaining clamp drill hole.
- Unscrew the locking screw and remove the special tool.
- Repeat the process on the second pin of the chain link.

14.10.17 Riveting the chain



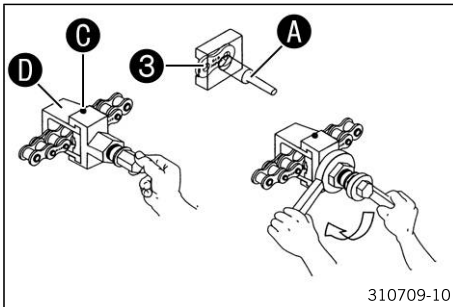
- Grease new connecting link **1** and position an X-ring **2** on each pin.
- Connect the chain ends with a connecting link.
- Position another X-ring **2** on each pin.



- Mount mandrel **A** with the smaller diameter in the spindle of the special tool. Turn the spindle counterclockwise.

Chain rivet tool (60029020000) (📖 p. 466)

- Position press plate **B** of the special tool on the mandrel.
- Position chain joint plate **3** in the press plate.



- Position the special tool on the chain.
 - ✓ Locking screw **C** points upwards.
- Position retaining clamp **D** of the special tool on the chain from the rear.
 - ✓ Markings **A** and **B** point upwards.
- Slide retaining clamp **D** of the special tool into the pressing tool.
 - ✓ The arrow of marking **A** points to locking screw **C**.
- Screw the locking screw hand-tight as far as it will go.
 - ✓ The retaining clamp is fixed.
- Hold the special tool and screw in the spindle.
 - ✓ Mandrel **A** of the special tool presses against the center of chain joint plate **3**.
 - ✓ The chain joint plate is pressed on.
- Unscrew the locking screw and remove the special tool.
- Rivet the two pins of the connecting link with special tool.

Chain rivet tool (60029020000) (📖 p. 466)

14.10.18 Checking the rear hub damping rubber pieces

i Info

The engine power is transmitted from the rear sprocket to the rear wheel via the 6 damping rubber pieces. They eventually wear out during operation. If the damping rubber pieces are not changed in time, the rear sprocket carrier and the rear hub will be damaged.

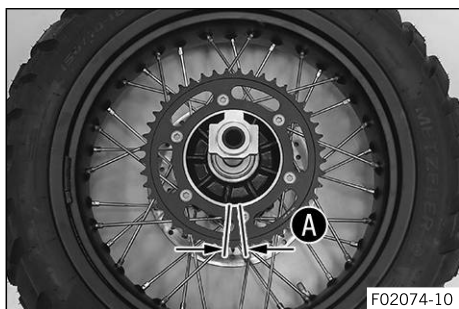
Preparatory work

- Raise motorcycle with rear lifting gear. (📖 p. 15)
- Remove the rear wheel. (📖 p. 160)

Main work

- Check bearing **1**.
 - » If the bearing is damaged or worn:
 - Change the bearing of the rear sprocket carrier. (📖 p. 169)
- Check damping rubber pieces **2** of the rear hub for damage and wear.
 - » If the damping rubber pieces of the rear hub are damaged or worn:
 - Change all the damping rubber pieces of the rear hub.





- Lay the rear wheel on a workbench with the rear sprocket facing upwards and insert the wheel spindle in the hub.
- To check play **A**, hold the rear wheel tight and try to turn the rear sprocket with your hand.

i Info
Measure the play on the outside of the rear sprocket.

Play of damping rubber pieces on rear wheel	≤ 5 mm (≤ 0.2 in)
---	-------------------

- » If clearance **A** is larger than the specified value:
 - Change all the damping rubber pieces of the rear hub. (📖 p. 182)

Finishing work

- Install the rear wheel. (📖 p. 161)
- Check the chain tension. (📖 p. 175)
- Remove the rear of the motorcycle from the lifting gear. (📖 p. 16)

14.10.19 Changing all the damping rubber pieces of the rear hub

Preparatory work

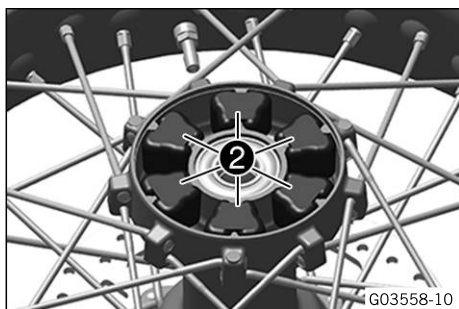
- Raise motorcycle with rear lifting gear. (📖 p. 15)
- Remove the rear wheel. (📖 p. 160)

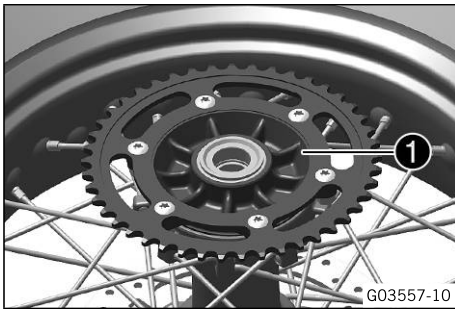
Main work

- Remove rear sprocket carrier **1**.



- Remove all damping rubber pieces **2**.
- Position new damping rubber pieces.





- Mount rear sprocket carriers **1**.

Finishing work

- Install the rear wheel. (📖 p. 161)
- Check the chain tension. (📖 p. 175)
- Remove the rear of the motorcycle from the lifting gear. (📖 p. 16)



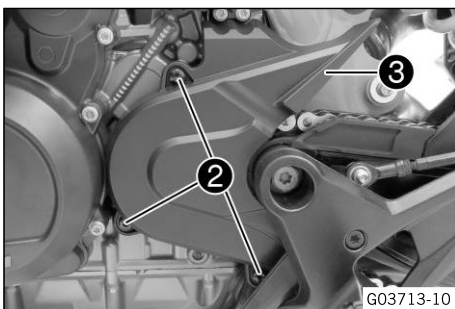
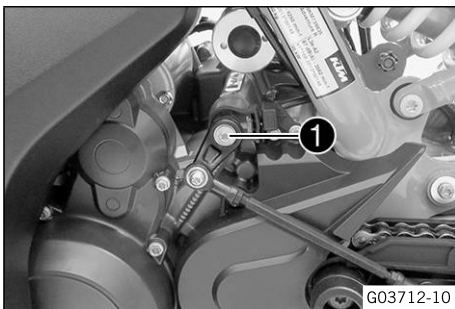
14.10.20 Changing the drivetrain kit

Preparatory work

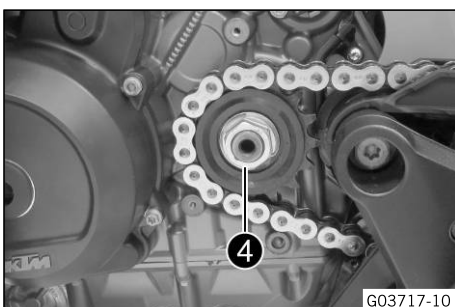
- Raise motorcycle with rear lifting gear. (📖 p. 15)

Main work

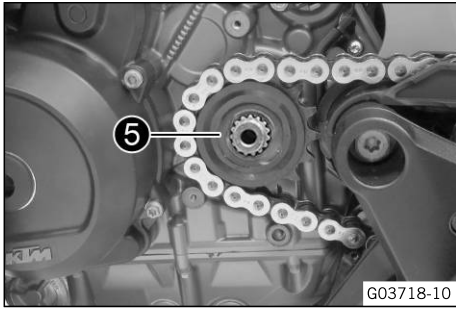
- Remove screw **1** with washers.
- Hang the bell crank with the shift linkage to the side.



- Remove screws **2**.
- Take off engine sprocket cover **3**.



- Bend up the lock washer.
- Have an assistant operate the rear brake.
- Remove nut **4** with the lock washer.
- Remove the rear wheel. (📖 p. 160)



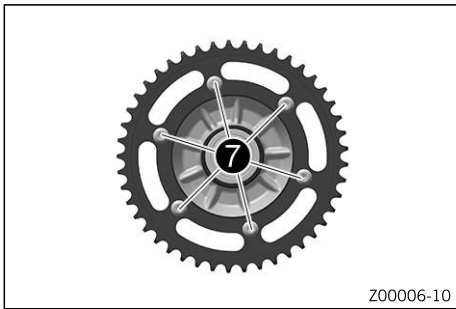
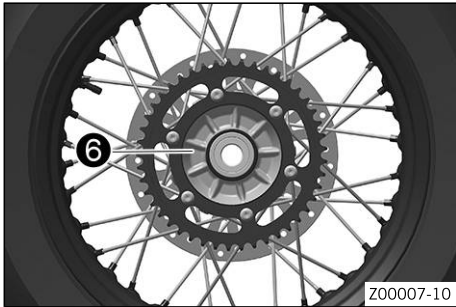
- Remove engine sprocket **5**.
- Open the chain. (📖 p. 180)
- Take off the chain.



Info

Protect the components against damage by covering them.

- Mount the new chain.
- Rivet the chain. (📖 p. 180)
- Position new engine sprocket **5** in the chain and mount on the countershaft.
- Remove rear sprocket carrier **6**.



- Fix the rear sprocket carrier in the vise.



Info

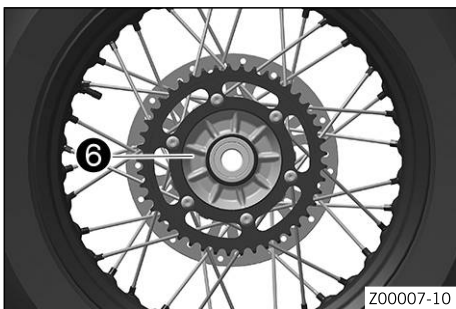
Use soft jaws.

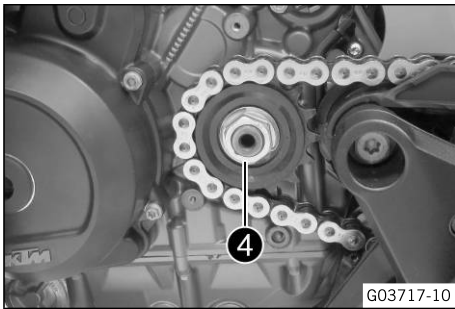
- Remove fittings **7** and take off the rear sprocket.
- Clean the contact area of the rear sprocket.
- Position the new rear sprocket.
- Mount and tighten fittings **7**.

Guideline

Nut, rear sprocket screw	M8	35 Nm (25.8 lbf ft) Loctite®2701™
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- Mount rear sprocket carriers **6**.



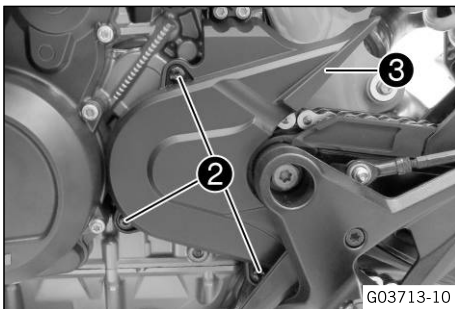


- Install the rear wheel. (📖 p. 161)
- Have an assistant operate the rear brake.
- Mount nut **4** with lock washer and tighten.

Guideline

Nut, engine sprocket	M20x1.5	100 Nm (73.8 lbf ft) Loctite®243™
----------------------	---------	---

- Secure the nut with a lock washer.



- Position engine sprocket cover **3**.
- Mount and tighten screws **2**.

Guideline

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

- Position the bell crank.

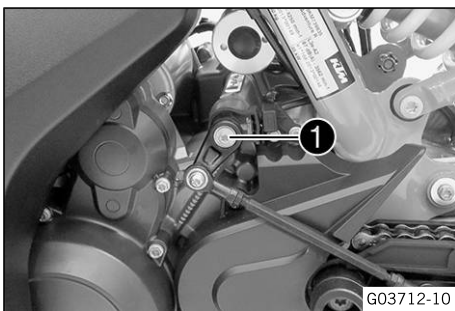
i Info

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

- Mount and tighten screw **1** with washers.

Guideline

Screw, shift lever	M6	14 Nm (10.3 lbf ft) Loctite®243™
--------------------	----	--



Finishing work

- Check the chain tension. (📖 p. 175)



15.1 Removing the 12-V battery



Warning

Risk of injury Battery acid and battery gases cause serious chemical burns.

- Keep 12 V batteries out of the reach of children.
- Wear suitable protective clothing and safety glasses.
- Avoid contact with battery acid and battery gases.
- Keep sparks or open flames away from the 12 V battery.
- Only charge 12 V batteries in well-ventilated rooms.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes with water for at least 15 minutes and consult a doctor immediately if battery acid and battery gases get into the eyes.



Caution

Danger of accidents Electronic components and safety devices will be damaged if the 12-V battery is discharged or missing.

If the 12-V battery is discharged or defective, malfunctions in the vehicle electronics can occur, especially when starting.

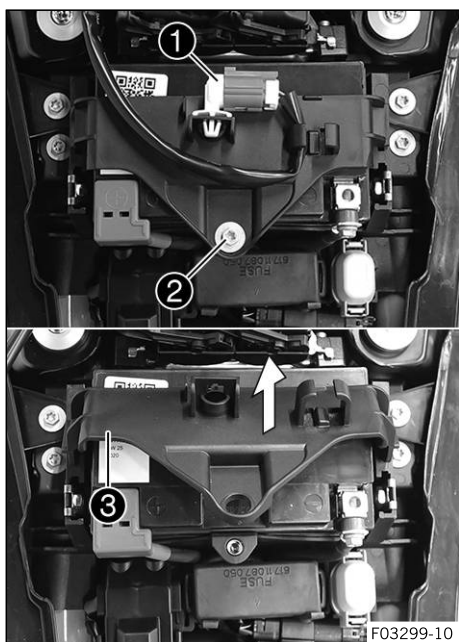
- Never operate the vehicle with a discharged 12-V battery or without a 12-V battery.

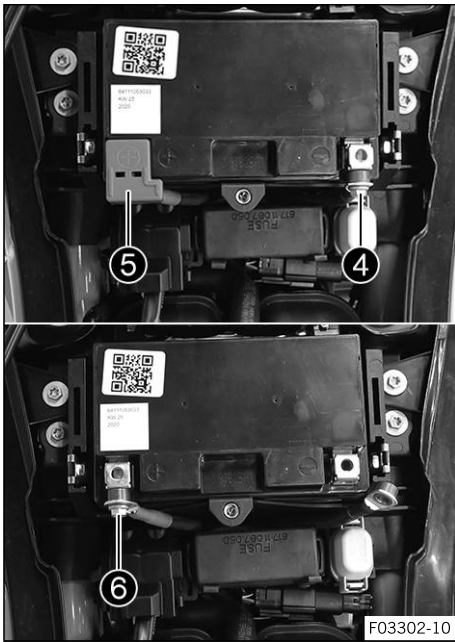
Preparatory work

- Remove the seat. (📖 p. 120)
- Remove the battery cover. (📖 p. 138)

Main work

- Pull the diagnostics connector **1** out of the bracket and hang to the side.
- Remove screw **2**.
- Raise the battery mounting element **3** at the rear and remove in upward direction.





- Disconnect negative cable ④ from the 12-V battery.
- Remove positive terminal cover ⑤.
- Disconnect positive cable ⑥ from the 12-V battery.
- Pull the 12-V battery upwards and out of the battery compartment.

15.2 Installing the 12-V battery



Warning

Risk of injury Battery acid and battery gases cause serious chemical burns.

- Keep 12 V batteries out of the reach of children.
- Wear suitable protective clothing and safety glasses.
- Avoid contact with battery acid and battery gases.
- Keep sparks or open flames away from the 12 V battery.
- Only charge 12 V batteries in well-ventilated rooms.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes with water for at least 15 minutes and consult a doctor immediately if battery acid and battery gases get into the eyes.

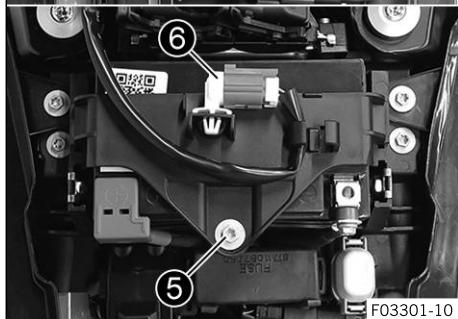
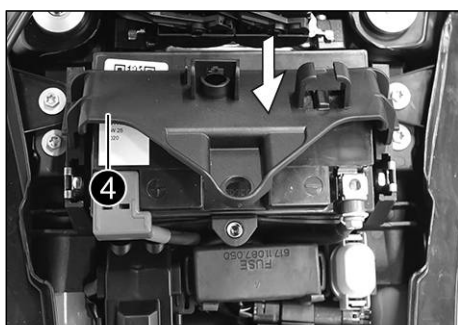
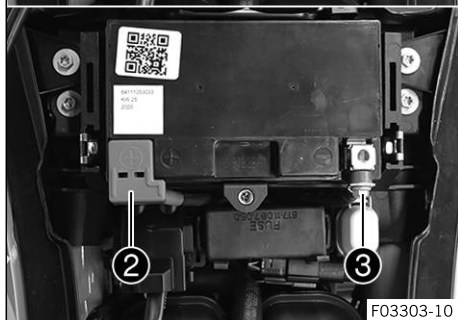


Caution

Danger of accidents Electronic components and safety devices will be damaged if the 12-V battery is discharged or missing.

If the 12-V battery is discharged or defective, malfunctions in the vehicle electronics can occur, especially when starting.

- Never operate the vehicle with a discharged 12-V battery or without a 12-V battery.



Main work

- Position the 12-V battery in the battery compartment.

12-V battery (HTZ12A-BS) (📖 p. 422)

- ✓ The battery terminals face opposite the direction of travel.

- Connect positive cable ① to the 12-V battery.

Guideline

Screw, battery terminal	M6	4.5 Nm (3.32 lbf ft)
-------------------------	----	-------------------------

- Mount positive terminal cover ②.

- Connect negative cable ③ to the 12 V battery.

Guideline

Screw, battery terminal	M6	4.5 Nm (3.32 lbf ft)
-------------------------	----	-------------------------

- Hang battery mounting bracket ④ to the left and right in the holding lugs and push downward at the back.

- Mount and tighten screw ⑤.

Guideline

Screw, battery holding bracket	M6	4.5 Nm (3.32 lbf ft)
--------------------------------	----	-------------------------

- Position the diagnostics connector ⑥ in the holder.

Finishing work

- Install the battery cover. (📖 p. 139)

- Mount the seat. (📖 p. 120)

- Set time and date.

15.3 Disconnecting the negative cable of the 12-V battery



Warning

Risk of injury Battery acid and battery gases cause serious chemical burns.

- Keep 12 V batteries out of the reach of children.
- Wear suitable protective clothing and safety glasses.
- Avoid contact with battery acid and battery gases.
- Keep sparks or open flames away from the 12 V battery.
- Only charge 12 V batteries in well-ventilated rooms.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes with water for at least 15 minutes and consult a doctor immediately if battery acid and battery gases get into the eyes.



Caution

Danger of accidents Electronic components and safety devices will be damaged if the 12-V battery is discharged or missing.

If the 12-V battery is discharged or defective, malfunctions in the vehicle electronics can occur, especially when starting.

- Never operate the vehicle with a discharged 12-V battery or without a 12-V battery.

Preparatory work

- Remove the seat. (📖 p. 120)

Main work

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



15.4 Connecting the negative cable of the 12-V battery



Warning

Risk of injury Battery acid and battery gases cause serious chemical burns.

- Keep 12 V batteries out of the reach of children.
- Wear suitable protective clothing and safety glasses.
- Avoid contact with battery acid and battery gases.
- Keep sparks or open flames away from the 12 V battery.
- Only charge 12 V batteries in well-ventilated rooms.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes with water for at least 15 minutes and consult a doctor immediately if battery acid and battery gases get into the eyes.



Caution

Danger of accidents Electronic components and safety devices will be damaged if the 12-V battery is discharged or missing.

If the 12-V battery is discharged or defective, malfunctions in the vehicle electronics can occur, especially when starting.

- Never operate the vehicle with a discharged 12-V battery or without a 12-V battery.



Main work

- Connect negative cable ① to the 12-V battery.

Guideline

Screw, battery terminal	M6	4.5 Nm (3.32 lbf ft)
-------------------------	----	-------------------------

Finishing work

- Mount the seat. (📖 p. 120)
- Set the time and date.

15.5 Charging the 12-V battery



Warning

Risk of injury Battery acid and battery gases cause serious chemical burns.

- Keep 12 V batteries out of the reach of children.
- Wear suitable protective clothing and safety glasses.
- Avoid contact with battery acid and battery gases.
- Keep sparks or open flames away from the 12 V battery.
- Only charge 12 V batteries in well-ventilated rooms.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes with water for at least 15 minutes and consult a doctor immediately if battery acid and battery gases get into the eyes.

Note

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

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



Note

Environmental hazard 12 V batteries contain environmentally hazardous materials.

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



Note

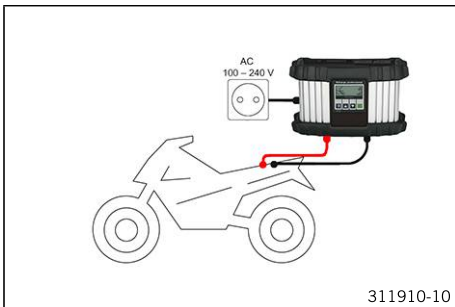
Environmental hazard Hazardous substances cause environmental damage.

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



Info

Even when there is no load on the 12-V battery, it discharges steadily each day. The charging level and the method of charging are very important for the service life of the 12-V battery. Rapid recharging with a high charging current shortens the service life of the battery. If the charging current, charging voltage, and charging time are exceeded, the 12-V battery will be destroyed. If the 12-V battery is depleted from starting the vehicle repeatedly, the battery must be charged immediately. If the 12-V battery is left in a discharged state for an extended period, it will become deeply discharged and sulfating occurs, thus destroying the battery. The 12-V battery is maintenance-free, i.e. the acid level does not have to be checked.



Preparatory work

- Remove the seat. (📖 p. 120)
- Disconnect the negative cable of the 12-V battery. (📖 p. 189)

Main work

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

EU battery charger **XCharge-professional** (00029095050)
(📖 p. 463)

Alternative 1

US battery charger **XCharge-professional**
(00029095051) (📖 p. 463)

Alternative 2

UK battery charger **XCharge-professional**
(00029095052) (📖 p. 464)



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	6 months
---	----------

Finishing work

- Connect the negative cable of the 12-V battery. (📖 p. 189)
- Mount the seat. (📖 p. 120)
- Set the time and date.



15.6 Changing the main fuse



Warning

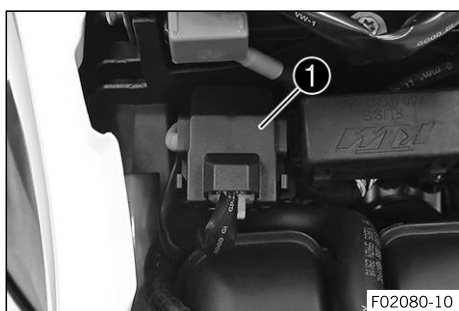
Fire hazard Incorrect fuses overload the electrical system.

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



Info

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

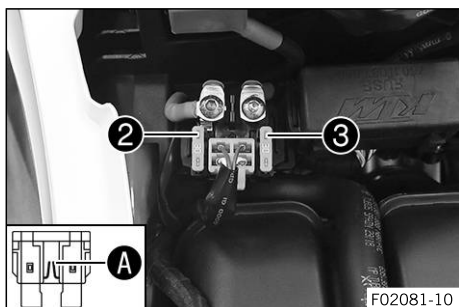


Preparatory work

- Remove the seat. (📖 p. 120)

Main work

- Remove protection cap **1**.



- Remove faulty main fuse **2**.



Info

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

A spare fuse **3** is located in the starter relay.

- Insert a new main fuse.

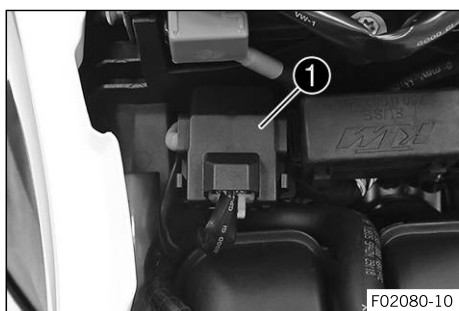
Fuse (58011109130) (📖 p. 422)



Tip

Insert a new spare fuse into the starter relay to have it available when needed.

- Mount protection cap **1**.



Finishing work

- Mount the seat. (📖 p. 120)
- Set time and date.

15.7 Changing the ABS fuses



Warning

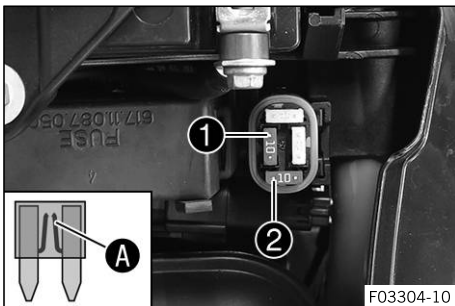
Fire hazard Incorrect fuses overload the electrical system.

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



Info

Two fuses for the ABS are located under the seat. These fuses protect the return pump and the hydraulic unit of the ABS. The third fuse, which protects the ABS control unit, is located in the fuse box.



Preparatory work

- Remove the seat. (📖 p. 120)

To change the fuse of the ABS hydraulic unit:

- Remove the protection cap and fuse ①.



Info

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

- Insert the spare fuse with the correct rating.

Fuse (75011088010) (📖 p. 422)



Tip

Insert spare fuse ② in the fuse box so that it is available if needed.

- Mount the protection cap.

To change the fuse of the ABS return pump:

- Remove the protection cap and fuse ③.



Info

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

- Insert the spare fuse with the correct rating.

Fuse (75011088025) (📖 p. 422)



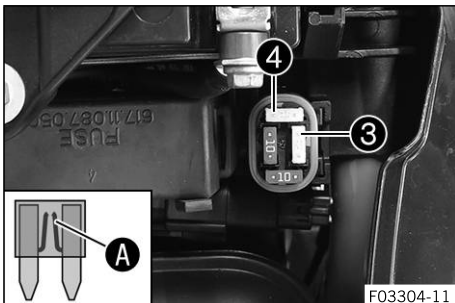
Tip

Insert spare fuse ④ in the fuse box so that it is available if needed.

- Mount the protection cap.

Finishing work

- Mount the seat. (📖 p. 120)



15.8 Changing the fuses of individual electrical power consumers



Warning

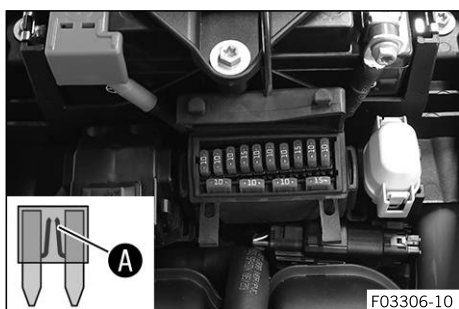
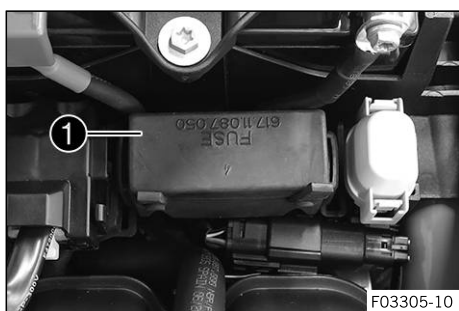
Fire hazard Incorrect fuses overload the electrical system.

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



Info

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



Preparatory work

- Remove the seat. (📖 p. 120)

Main work

- Open fuse box cover ❶.

- Remove the faulty fuse.

Guideline

Fuse 1 - 10 A - ignition, alarm system (optional)
Fuse 2 - 10 A - ignition, engine control unit, electronic fuel injection, fuel vapor retention system, lambda sensor, immobilizer
Fuse 3 - 10 A - fuel pump
Fuse 4 - 15 A - radiator fan
Fuse 5 - 10 A - horn, combination instrument, brake light
Fuse 6 - 10 A - high beam, low beam, position light, tail light, license plate lamp
Fuse 7 - 10 A - ACC1
Fuse 8 - 15 A - ACC2, HCU (optional)
Fuse 9 - 10 A - ABS control unit, diagnostics connector, 5D sensor, TPMS (function optional)
Fuse 10 - 10 A - light control unit
Fuse SPARE - 10 A - spare fuses
Fuse SPARE - 15 A - spare fuses



Info

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

- Insert the spare fuse with the correct rating.

Fuse (75011088010) (📖 p. 422)

Fuse (75011088015) (📖 p. 422)

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

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

Finishing work

- Mount the seat. (📖 p. 120)



15.9 Checking the charging voltage

Condition

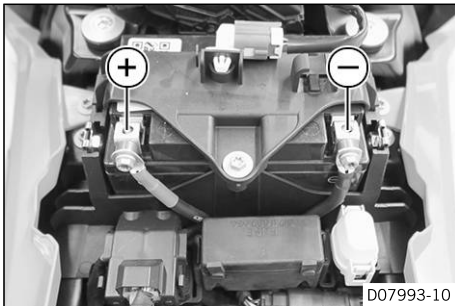
The 12-V battery must be fully functional and completely charged.

Preparatory work

- Remove the seat. (📖 p. 120)
- Remove the battery cover. (📖 p. 138)

Main work

- Take off positive terminal cover.
- Start the motorcycle to check the function. (📖 p. 21)
- **V** Measure the voltage between the specified points.
Measuring point **plus (+)** – Measuring point **Ground (-)**



D07993-10

Charging voltage	
5,000 rpm	13.5 ... 15.0 V

- » If the displayed value is greater than the specified value:
 - Change voltage regulator.
- Mount the positive terminal cover.

Finishing work

- Install the battery cover. (📖 p. 139)
- Mount the seat. (📖 p. 120)



15.10 Checking the open-circuit current

Preparatory work

- Remove the seat. (📖 p. 120)
- Disconnect the negative cable of the 12-V battery. (📖 p. 189)

Main work

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



G03648-10

i Info
The value of the open-circuit current only applies to vehicles in their original state without additional electrical power consumers.
After switching off the ignition, wait one minute until the measurement.

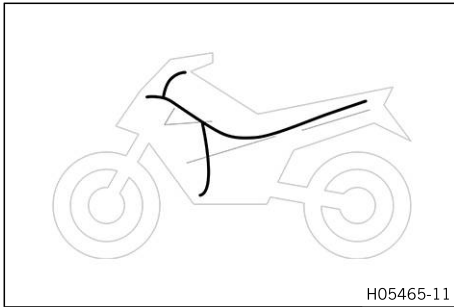
Maximum open-circuit current	< 1.0 mA
------------------------------	----------

- » If the measured value is greater than the specified value:
 - Disconnect the voltage regulator from the wiring harness and perform the measurement again.

Finishing work

- Connect the negative cable of the 12-V battery. (📖 p. 189)
- Mount the seat. (📖 p. 120)
- Set the time and date.

15.11 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.

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.

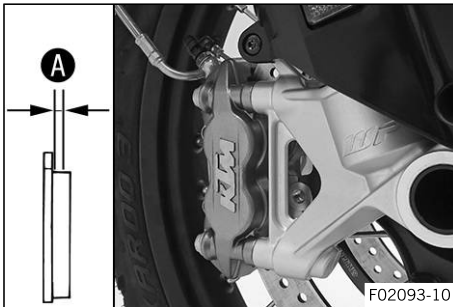


Warning

Danger of accidents Damaged brake discs reduce the braking effect.

If the brake linings are not changed in time, the brake lining carriers grind against the brake disc. As a consequence, the braking effect is greatly reduced and the brake discs are destroyed.

- Check the brake linings regularly.



- Check all brake linings on both brake calipers to ensure they have the minimum thickness **A**.

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

- » If the minimum thickness is less than specified:
 - Change the brake linings of the front brake. (📖 p. 197)
- Check all the brake linings on both the brake calipers for damage and cracking.
 - » If there is damage or cracking:
 - Change the brake linings of the front brake. (📖 p. 197)
- 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 causes skin irritation.

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



Warning

Danger of accidents Old brake fluid reduces the braking effect.

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



Warning

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

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



Warning

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

Not all brake linings are tested and approved for KTM motorcycles. The structure and friction coefficient of the brake linings, and thus their brake power, may vary greatly from that of original brake linings.

If brake linings are used that differ from the original equipment, compliance with the original homologation is not guaranteed. In this case, the vehicle no longer corresponds to its condition at delivery and the manufacturer warranty shall be void.

- Only use brake linings approved and recommended by KTM.



Note

Environmental hazard Hazardous substances cause environmental damage.

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

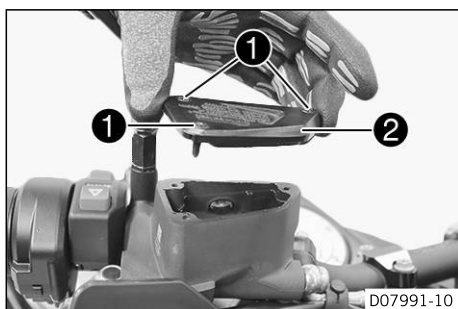


Info

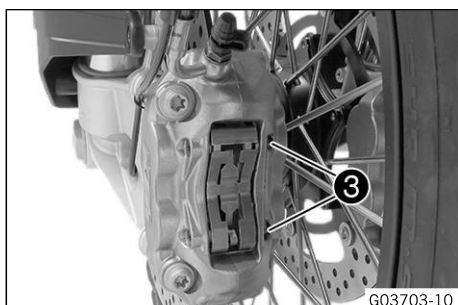
Never use DOT 5 brake fluid. It is silicone-based and purple in color. Oil seals and brake lines are not designed for DOT 5 brake fluid.

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

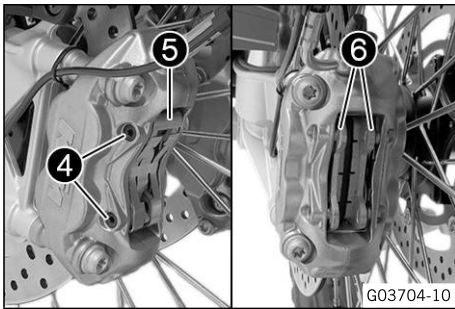
Only use clean brake fluid from a sealed container.



- Move the brake fluid reservoir mounted on the handlebar to a horizontal position.
- Remove screws ❶.
- Take off cover ❷ with membrane.

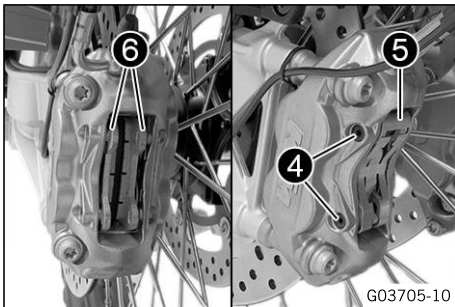


- Remove lock rings ❸.



- Remove pins 4.
- Take off plate 5.
- Push the brake piston back into the basic position.

i Info
Ensure that brake fluid does not flow out of the brake fluid reservoir; extract some if necessary.



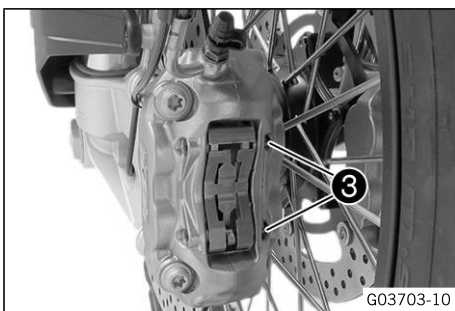
- Remove brake linings 6.
- Clean the brake caliper.
- Position new brake linings 6.

i Info
Always change the brake linings in sets and on both sides.

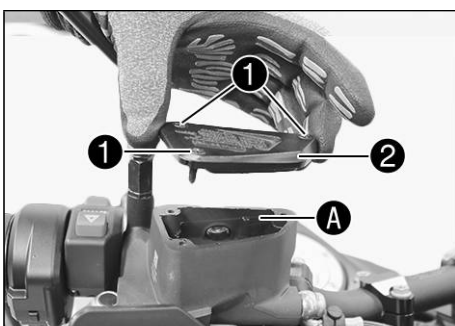
- Position plate 5.
- ✓ The arrow faces upward.
- Mount pins 4.

Guideline

Securing bolt for brake linings	M8	10 Nm (7.4 lbf ft)
---------------------------------	----	--------------------



- Mount lock rings 3.
- Repeat these steps on the opposite side.
- Operate the hand brake lever repeatedly until the brake linings are in contact with the brake disc and there is a pressure point.



- Correct the brake fluid to the **MAX** marking A.

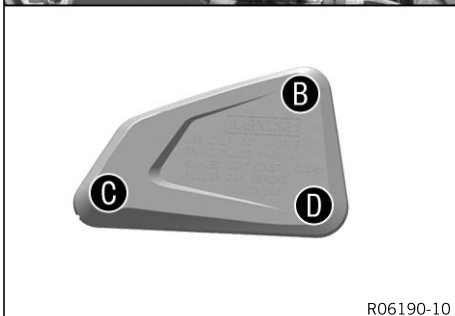
Brake fluid DOT 4 / DOT 5.1 (📖 p. 458)
--

- Position cover 2 with the membrane.
- Mount screws 1 and tighten in the order B C D.

Guideline

Brake fluid reservoir cover, front	-	2 Nm (1.5 lbf ft)
------------------------------------	---	-------------------

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



R06190-10

16.3 Checking the front brake fluid level



Warning

Danger of accidents An insufficient brake fluid level will cause the brake system to fail.

If the brake fluid level drops below the specified marking or the specified value, the brake system is leaking or the brake linings are worn down.

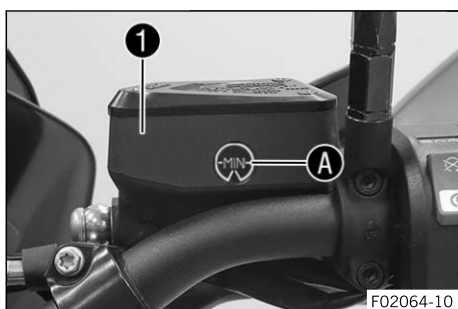
- Check the brake system and do not continue riding until the problem is eliminated.



Warning

Danger of accidents Old brake fluid reduces the braking effect.

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



- Move the brake fluid reservoir mounted on the handlebar to a horizontal position.
- Check the brake fluid level in brake fluid reservoir ①.
 - » If the brake fluid level has dropped below **MIN** marking **A**:
 - Add front brake fluid. (📖 p. 200)

16.4 Adding front brake fluid



Warning

Danger of accidents An insufficient brake fluid level will cause the brake system to fail.

If the brake fluid level drops below the specified marking or the specified value, the brake system is leaking or the brake linings are worn down.

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



Warning

Skin irritation Brake fluid causes skin irritation.

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



Warning

Danger of accidents Old brake fluid reduces the braking effect.

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



Note

Environmental hazard Hazardous substances cause environmental damage.

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



Info

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

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

Only use clean brake fluid from a sealed container.

Preparatory work

- Check that the brake linings of the front brake are secured. (📖 p. 197)

Main work

- Move the brake fluid reservoir mounted on the handlebar to a horizontal position.
- Remove screws ①.
- Take off cover ② with membrane ③.
- Add brake fluid up to the marking ④.

Brake fluid DOT 4 / DOT 5.1 (📖 p. 458)

- Position cover ② with membrane ③.
- Mount screws ① and tighten in the order A B C.

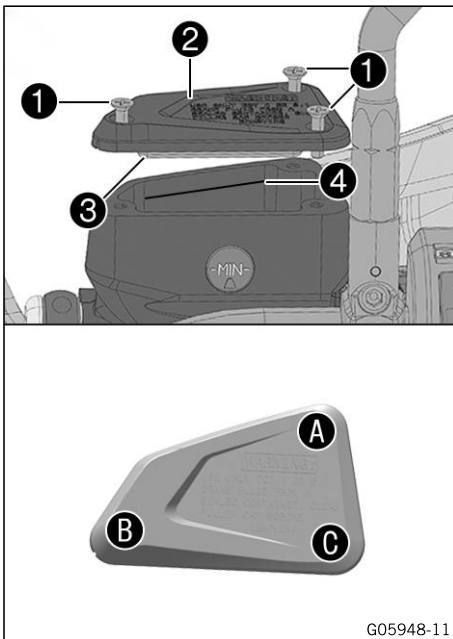
Guideline

Brake fluid reservoir cover, front	-	2 Nm (1.5 lbf ft)
------------------------------------	---	-------------------



Info

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



16.5 Changing the front brake fluid



Warning

Skin irritation Brake fluid causes skin irritation.

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



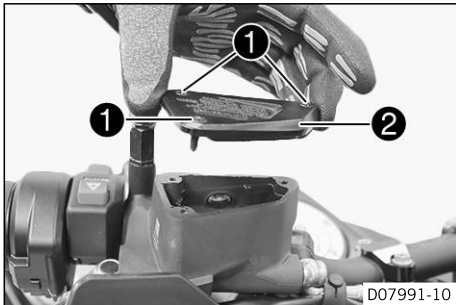
Note

Environmental hazard Hazardous substances cause environmental damage.

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

i Info

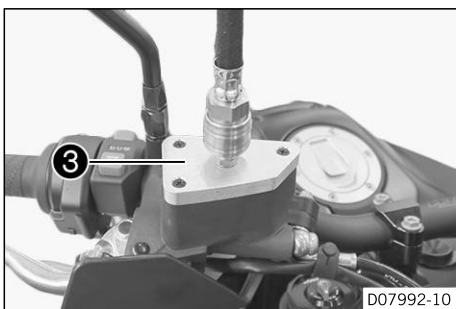
Never use DOT 5 brake fluid. It is silicone-based and purple in color. Oil seals and brake lines are not designed for DOT 5 brake fluid.
 Avoid contact between brake fluid and painted parts. Brake fluid corrodes paint.
 Only use clean brake fluid from a sealed container.



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

Syringe (50329050000) (📖 p. 464)

Brake fluid DOT 4 / DOT 5.1 (📖 p. 458)

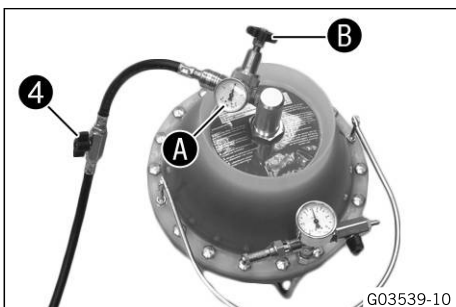


- Mount corresponding bleeder cover **3** from the special tool.

Bleeder cover (00029013021) (📖 p. 462)

- Connect the bleeding device.

Bleeding device (00029013100) (📖 p. 462)



- Open shut-off valve **4**.

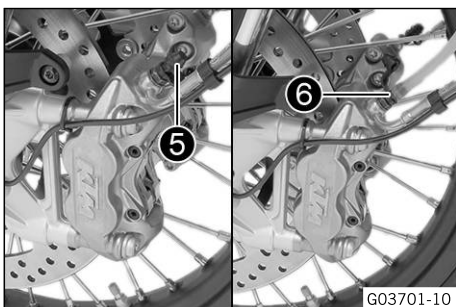
i Info

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

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

Guideline

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



- Pull protection cap **5** off the bleeder screw of the left brake caliper.
- Connect the bleeder bottle hose.

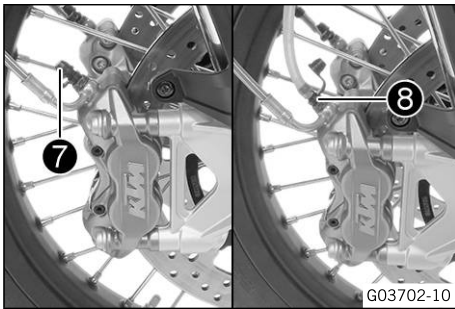
Bleeding device (00029013100) (📖 p. 462)

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

i Info

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

- Tighten the bleeder screw. Remove the bleeder bottle hose.
- Mount the protection cap.



- Pull protection cap **7** off the bleeder screw of the right brake caliper.
- Connect the bleeder bottle hose.

Bleeding device (00029013100) (📖 p. 462)

- Open bleeder screw **8** by approx. one half turn.



Info

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

- Tighten the bleeder screw.
- Close shut-off valve **4**.
- Open the bleeder screw again until brake fluid stops emerging.
- ✔ Overfilling the brake fluid reservoir is prevented.
- Tighten the bleeder screw. Remove the bleeder bottle hose.
- Mount the protection cap.
- Disconnect the bleeding device. Remove the bleeder cover.

- Correct the brake fluid to **MAX** marking **C**.

Brake fluid DOT 4 / DOT 5.1 (📖 p. 458)

- Position cover **2** with the membrane.
- Mount screws **1** and tighten in the order **D E F**.

Guideline

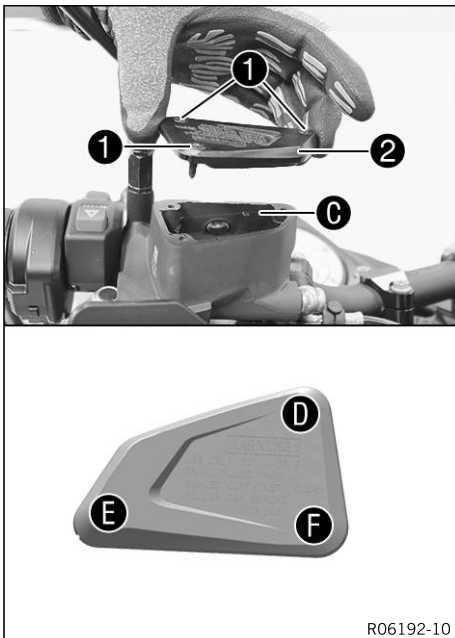
Brake fluid reservoir cover, front	-	2 Nm (1.5 lbf ft)
------------------------------------	---	-------------------



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.



16.6 Adjusting the basic position of the hand brake lever



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

i Info

Turn the adjusting screw clockwise to decrease the distance between the hand brake lever and the handlebar.

Turn the adjusting screw counterclockwise to increase the distance between the hand brake lever and the handlebar.

The range of adjustment is limited.

Only turn the adjusting screw by hand, and do not use force.

Do not make any adjustments while riding.

16.7 Checking 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.

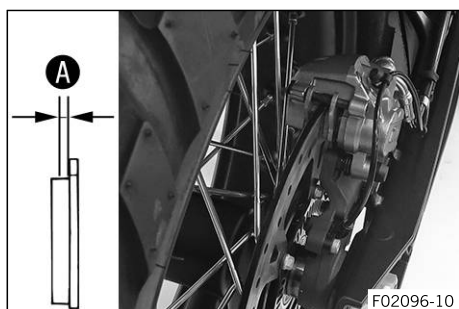


Warning

Danger of accidents Damaged brake discs reduce the braking effect.

If the brake linings are not changed in time, the brake lining carriers grind against the brake disc. As a consequence, the braking effect is greatly reduced and the brake discs are destroyed.

- Check the brake linings regularly.



- Check the brake linings for minimum thickness **A**.

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

- » If the minimum thickness is less than specified:
 - Change the rear brake linings. (📖 p. 204)

- Check the brake linings for damage and cracking.

- » If there is damage or cracking:
 - Change the rear brake linings. (📖 p. 204)

- Check that the brake linings are secured.

- » If the brake linings are not secured correctly:
 - Secure brake linings, replace with new parts if necessary.

16.8 Changing the rear brake linings



Warning

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

- Ensure that service work and repairs are performed professionally.

**Warning****Skin irritation** Brake fluid causes skin irritation.

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

**Warning****Danger of accidents** Old brake fluid reduces the braking effect.

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

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

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

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

Not all brake linings are tested and approved for KTM motorcycles. The structure and friction coefficient of the brake linings, and thus their brake power, may vary greatly from that of original brake linings.

If brake linings are used that differ from the original equipment, compliance with the original homologation is not guaranteed. In this case, the vehicle no longer corresponds to its condition at delivery and the manufacturer warranty shall be void.

- Only use brake linings approved and recommended by KTM.

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

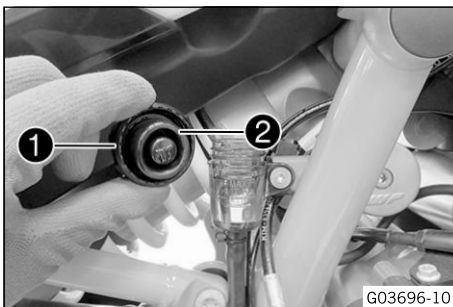
- Dispose of oils, grease, filters, fuel, cleaning agents, brake fluid, etc., correctly and in compliance with the applicable regulations.

**Info**

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

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

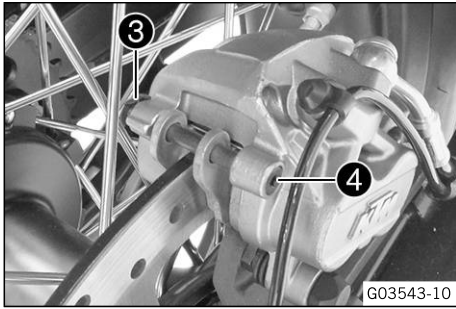
Only use clean brake fluid from a sealed container.



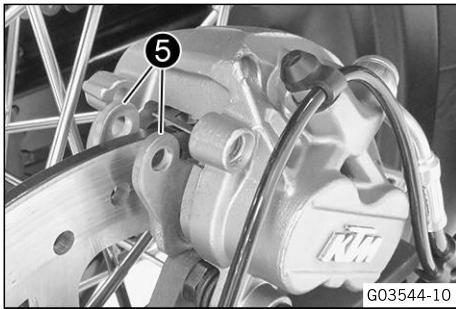
- Position the vehicle vertically.
- Remove screw cover ① with insert and membrane ②.
- Manually press the brake caliper toward the brake disc to push back the brake pistons.

**Info**

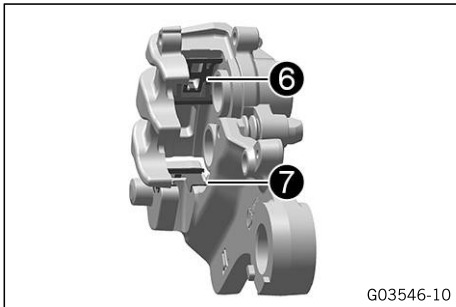
Ensure that brake fluid does not flow out of the brake fluid reservoir; extract some if necessary.



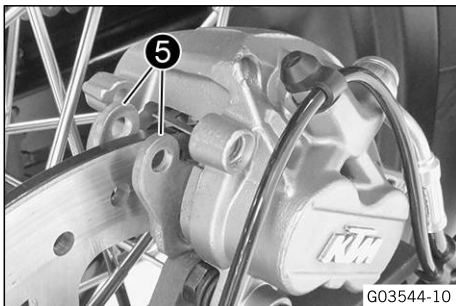
- Remove lock ring ③.
- Remove pin ④.



- Remove brake linings ⑤.



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

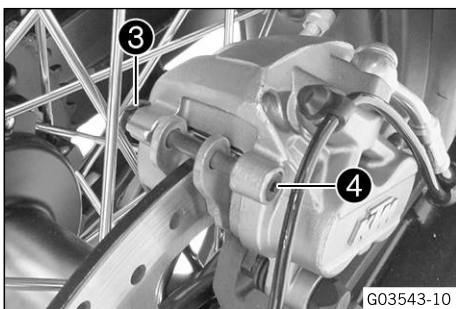


- Position new brake linings ⑤.



Info

Always change the brake linings in pairs.

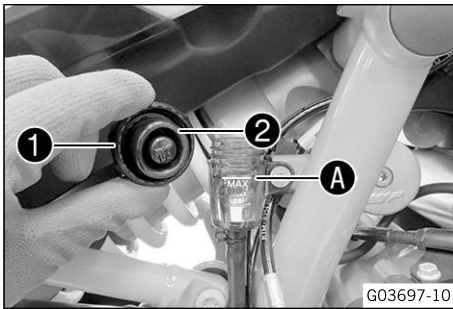


- Mount and tighten pin ④.

Guideline

Pin, rear brake caliper	M8	22 Nm (16.2 lbf ft) Loctite®243™
-------------------------	----	--

- Mount lock ring ③.



- Operate the foot brake lever repeatedly until the brake linings are in contact with the brake disc and there is a pressure point.
- Correct the brake fluid level to the **MAX** marking **A**.

Brake fluid DOT 4 / DOT 5.1 (📖 p. 458)
--

- Mount and tighten screw cover **1** with the insert and membrane **2**.



Info

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



16.9 Checking the free travel of the foot brake lever

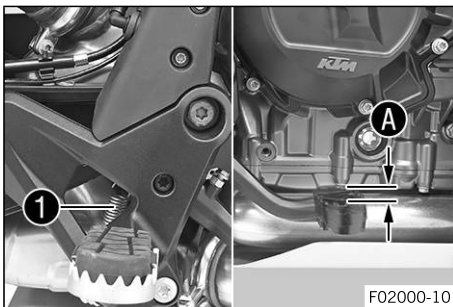


Warning

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

If there is no free travel on the foot brake lever, pressure builds up in the brake system on the rear brake.

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



- Detach spring **1**.
- Move the foot brake lever back and forth between the end stop and the contact to the foot brake cylinder piston and check free travel **A**.

Guideline

Free travel at foot brake lever	3 ... 5 mm (0.12 ... 0.2 in)
---------------------------------	------------------------------

- » If the free travel does not match the specification:
 - Adjust the basic position of the foot brake lever. (📖 p. 207)
- Attach spring **1**.



16.10 Adjusting the basic position of the foot brake lever

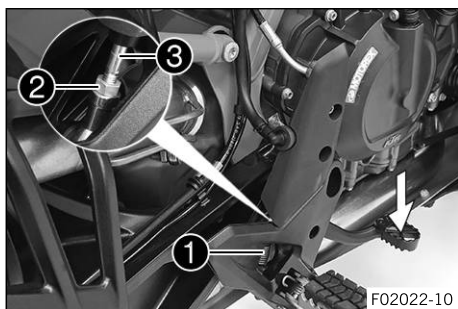


Warning

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

If there is no free travel on the foot brake lever, pressure builds up in the brake system on the rear brake.

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



- Detach spring ①.
- Loosen nut ②.

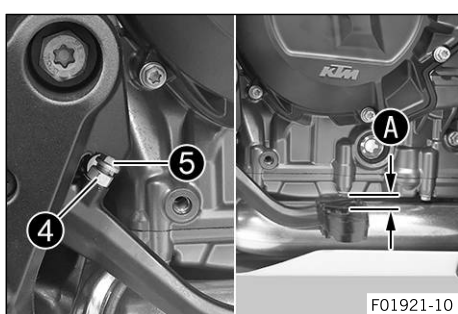
i Tip

Press the foot brake lever downwards to make this easier.

- Turn the push rod ③ to set the basic position of the foot brake lever.

i Info

The range of adjustment is limited. The screw must be screwed in by at least five full turns. Screwing the push rod into the ball joint adjusts the foot brake lever downwards. Screwing the push rod out of the ball joint adjusts the brake lever upwards.



- Loosen nut ④ and turn screw ⑤ correspondingly until the free travel A is present. If necessary, adjust the basic position of the foot brake lever.

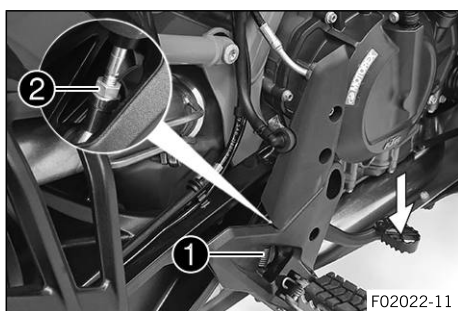
Guideline

Free travel at foot brake lever	3 ... 5 mm (0.12 ... 0.2 in)
---------------------------------	------------------------------

- Hold screw ⑤ and tighten nut ④.

Guideline

Nut, foot brake lever adjustment	M6	6 Nm (4.4 lbf ft)
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- Tighten nut ②.

Guideline

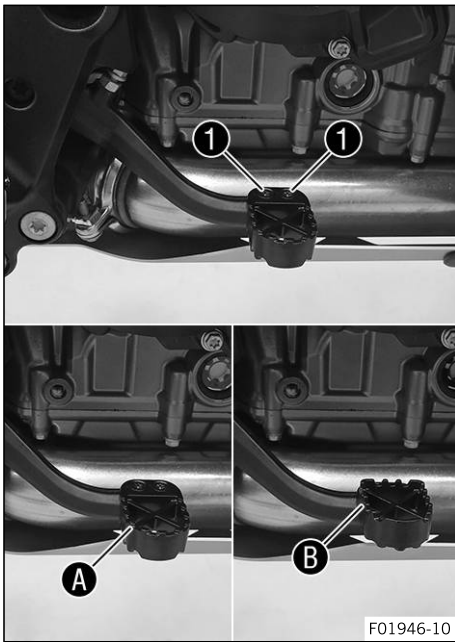
Nut, push rod, foot brake lever	M6	6 Nm (4.4 lbf ft)
---------------------------------	----	-------------------

i Tip

Press the foot brake lever downwards to make this easier.

- Attach spring ①.

16.11 Adjusting foot brake lever stub



- Remove screws **1** with the foot brake lever stub.
- Move the foot brake lever stub into desired position **A** or **B**. Mount and tighten screws **1**.

Guideline

Screw, foot brake lever stub	M5	10 Nm (7.4 lbf ft) Loctite®243™
------------------------------	----	---

16.12 Checking the rear brake fluid level



Warning

Danger of accidents An insufficient brake fluid level will cause the brake system to fail.

If the brake fluid level drops below the **MIN** marking, the brake system is leaking or the brake linings are worn down.

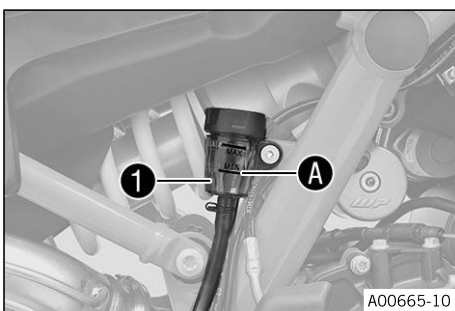
- Check the brake system and do not continue riding until the problem is eliminated.



Warning

Danger of accidents Old brake fluid reduces the braking effect.

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



- Position the vehicle upright.
- Check the brake fluid level in brake fluid reservoir **1**.
 - » If the fluid level reaches the **MIN** marking **A**:
 - Add rear brake fluid. (📖 p. 210)

16.13 Adding rear brake fluid



Warning

Danger of accidents An insufficient brake fluid level will cause the brake system to fail.

If the brake fluid level drops below the **MIN** marking, the brake system is leaking or the brake linings are worn down.

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



Warning

Skin irritation Brake fluid causes skin irritation.

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



Warning

Danger of accidents Old brake fluid reduces the braking effect.

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



Note

Environmental hazard Hazardous substances cause environmental damage.

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

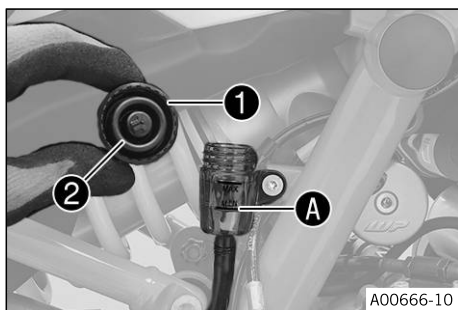


Info

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

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

Only use clean brake fluid from a sealed container.



Preparatory work

- Check that the brake linings of the rear brake are secured. (📖 p. 204)

Main work

- Position the vehicle vertically.
- Remove screw cover **1** with insert and membrane **2**.
- Add brake fluid up to the **MAX** marking **A**.

Brake fluid DOT 4 / DOT 5.1 (📖 p. 458)

- Mount and tighten screw cover **1** with the insert and membrane **2**.

Guideline

Brake fluid reservoir cover, rear	-	1.5 Nm (1.11 lbf ft)
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Info

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

16.14 Changing the rear brake fluid



Warning

Skin irritation Brake fluid causes skin irritation.

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



Note

Environmental hazard Hazardous substances cause environmental damage.

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

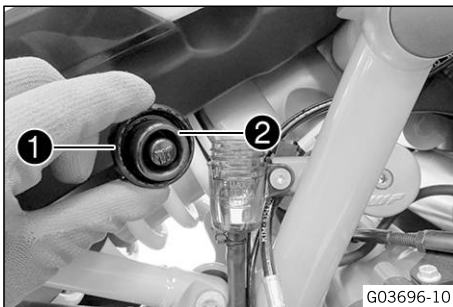


Info

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

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

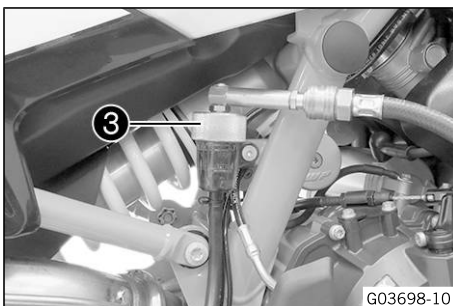
Only use clean brake fluid from a sealed container.



- Cover the painted parts.
- Remove screw cover ❶ with insert and membrane ❷.
- Extract the old brake fluid from the brake fluid reservoir using a syringe and fill with fresh brake fluid.

Syringe (50329050000) (📖 p. 464)

Brake fluid DOT 4 / DOT 5.1 (📖 p. 458)
--

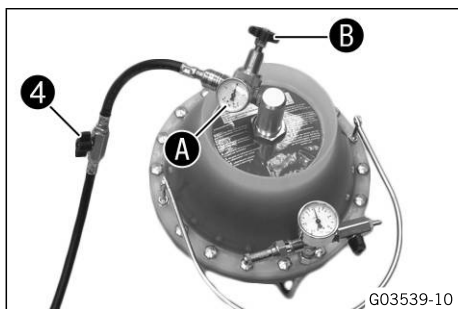


- Mount bleeder cover ❸.

Bleeder cover (00029013022) (📖 p. 462)
--

- Connect the bleeding device.

Bleeding device (00029013100) (📖 p. 462)
--



- Open shut-off valve **4**.

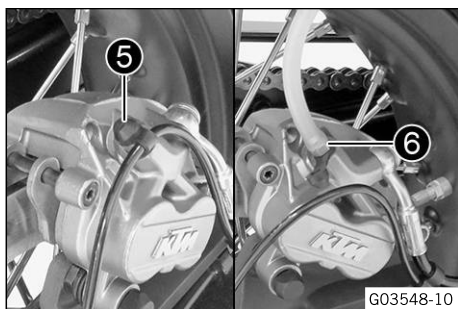
i Info

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

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

Guideline

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



- Pull off protection cap **5** of the bleeder screw. Hang the cable to the side.

- Connect the bleeder bottle hose.

Bleeding device (00029013100) (📖 p. 462)
--

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

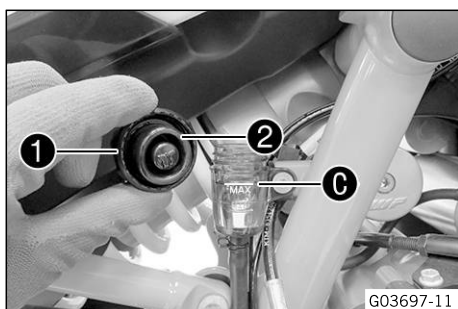
i Info

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

- Tighten the bleeder screw.
- Close shut-off valve **4**.
- Open the bleeder screw again until brake fluid stops emerging.
 - ✓ Overfilling the brake fluid reservoir is prevented.
- Tighten the bleeder screw. Remove the bleeder bottle hose.
- Position the cable on the protection cap. Mount the protection cap.
- Disconnect the bleeding device. Remove the bleeder cover.
- Correct the brake fluid to **MAX** marking **C**.

Brake fluid DOT 4 / DOT 5.1 (📖 p. 458)
--

- Mount and tighten screw cover **1** with the insert and membrane **2**.



i Info

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

16.15 Changing the ABS module



Warning

Skin irritation Brake fluid causes skin irritation.

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



Note

Environmental hazard Hazardous substances cause environmental damage.

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



Info

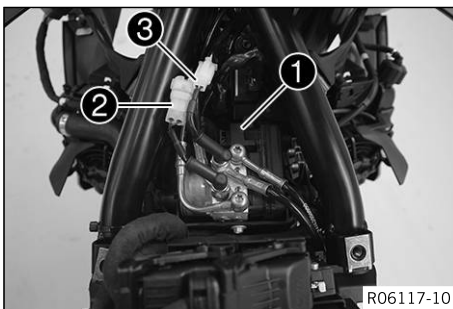
Avoid contact between brake fluid and painted parts. Brake fluid corrodes paint.

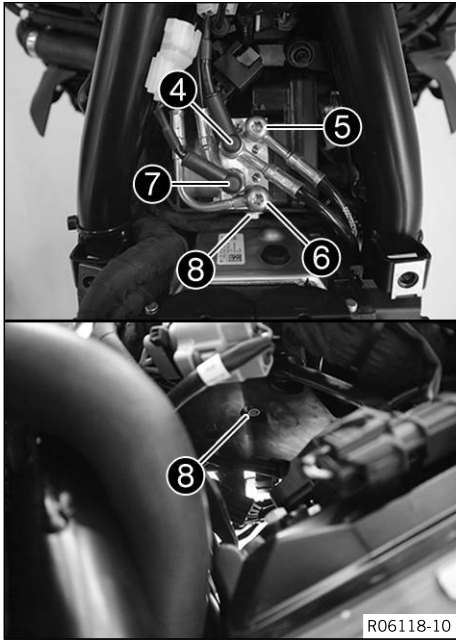
Preparatory work

- Remove the seat. (📖 p. 120)
- Remove the left side cover. (📖 p. 137)
- Remove the battery cover. (📖 p. 138)
- Remove left fuel tank spoiler. (📖 p. 139)
- Remove the right side cover. (📖 p. 137)
- Remove right fuel tank spoiler. (📖 p. 141)
- Remove the engine guard. (📖 p. 143)
- Remove the fuel tank. (📖 p. 120)

Main work

- Unplug ABS module connector ❶.
- Unplug plug-in connector ❷ for the brake pressure switch.
- Unplug plug-in connector ❸ for the brake pressure switch.





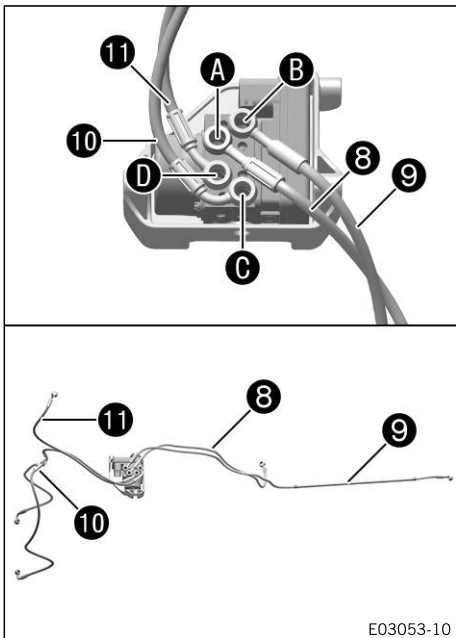
- Remove screws **4**, **5**, **6** and **7** and sealing washers, take off the brake lines, close them with a suitable object and hang them facing upward.

Guideline

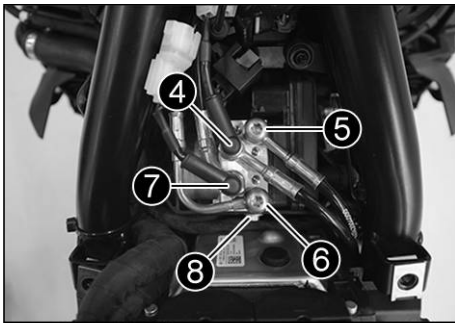
Immediately wash off any leaked brake fluid with water.

Do not kink the brake lines.

- Remove screws **8**.
- Carefully remove the ABS module from the vehicle.



- Position the new ABS module on the holder.
- Position brake line **8** of the rear brake actuation in area **A** of the ABS module.
- Position brake line **9** of the rear brake caliper in area **B** of the ABS module.
- Position the brake line **10** of the front brake caliper in the area **C** of the ABS module.
- Position brake line **11** of the front brake actuation in area **D** of the ABS module.



- Mount and tighten screws ⑧.

Guideline

Screw, ABS module	M6	8 Nm (5.9 lbf ft)
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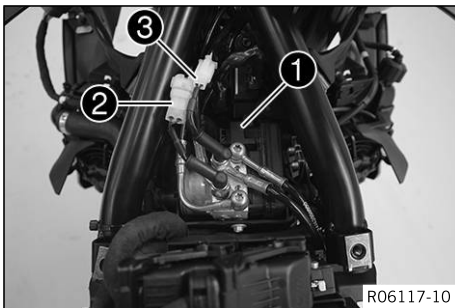
- Mount and tighten screws ④, ⑤, ⑥ and ⑦ and new sealing washers.

Guideline

Banjo bolt, brake line	M10x1	25 Nm (18.4 lbf ft)
------------------------	-------	---------------------



R06118-10



R06117-10

- Plug-in connector ③ for the brake pressure switch.
- Plug-in connector ② for the brake pressure switch.
- Plug in ABS module connector ①.

Finishing work

- Bleed the brake system. (📖 p. 216)
- Install the fuel tank. (📖 p. 123)
- Install the engine guard. (📖 p. 143)
- Install the right fuel tank spoiler. (📖 p. 142)
- Install the right side cover. (📖 p. 138)
- Install the left fuel tank spoiler. (📖 p. 140)
- Install the battery cover. (📖 p. 139)
- Install the left side cover. (📖 p. 137)
- Mount the seat. (📖 p. 120)



16.16 Bleeding the brake system



Warning

Skin irritation Brake fluid causes skin irritation.

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



Note

Environmental hazard Hazardous substances cause environmental damage.

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



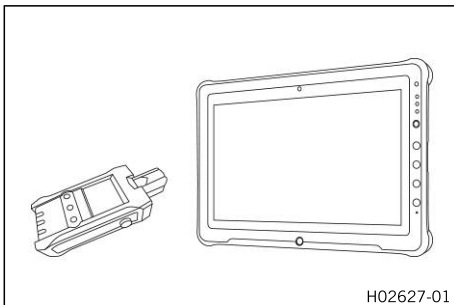
Info

Avoid contact between brake fluid and painted parts. Brake fluid attacks paint!
Use only clean brake fluid from a sealed container.

Condition

The diagnostics tool is connected and running.

- Execute "**Brake electronics**" > "**Functions**" > "**Bleed brake system**".
- Follow the instructions in the diagnostics tool.



17.1 Programming the ignition key

i Info

If an ignition key is lost or replaced, all ignition keys must be reactivated. This will also prevent the vehicle from being operated without authorization with the lost ignition key.
You can activate up to four ignition keys. All ignition keys not programmed during the activation procedure are invalid, but can be reprogrammed in a further activation procedure.

Condition

The diagnostics tool is connected and running.

- Switch on the ignition by turning the ignition key to the position \odot .
- **"Immobilizer" > "Functions" > "Program key" > "Select"**.

i Info

The instructions in the diagnostics tool must be followed precisely.

- Select **"Start programming procedure"**.

i Info

The instructions in the diagnostics tool must be followed precisely.

- Clear the fault memory using the KTM diagnostics tool.
- Switch off the ignition for 20 seconds.
- Read out the trouble code memory using the KTM diagnostics tool.
 - » If a malfunction is still present:
 - Repeat the procedure.



17.2 Removing the headlight

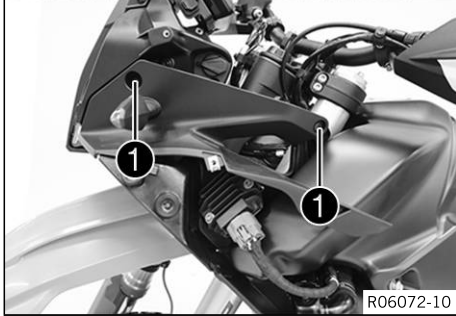
Preparatory work

- Remove the seat. (📖 p. 120)
- Remove the left side cover. (📖 p. 137)
- Remove the battery cover. (📖 p. 138)
- Remove left fuel tank spoiler. (📖 p. 139)
- Remove the right side cover. (📖 p. 137)
- Remove right fuel tank spoiler. (📖 p. 141)
- Remove windshield. (📖 p. 145)

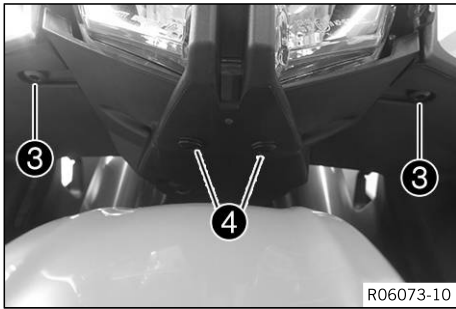


Main work

- Remove screws ①.
- Remove compensating tank cover ②.

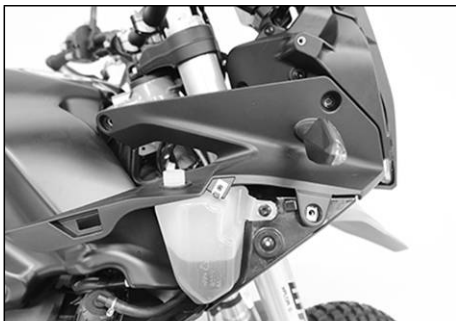


R06072-10



R06073-10

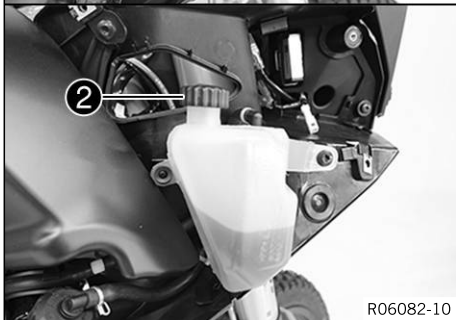
- Remove screws ③.
- Remove screws ④.



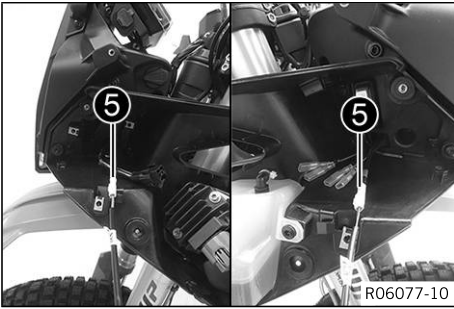
- Pull the right mask spoiler off of the compensating tank and hang to the side.
- Mount cover ② of the compensating tank.

Guideline

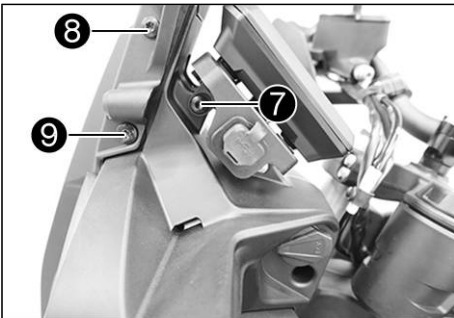
Compensating tank cover	-	1.1 Nm (0.81 lbf ft)
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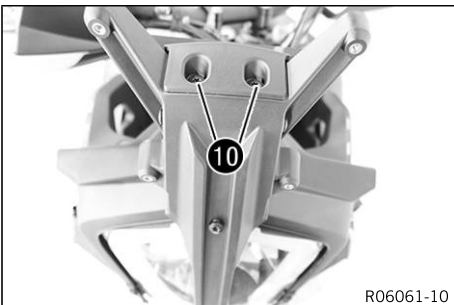
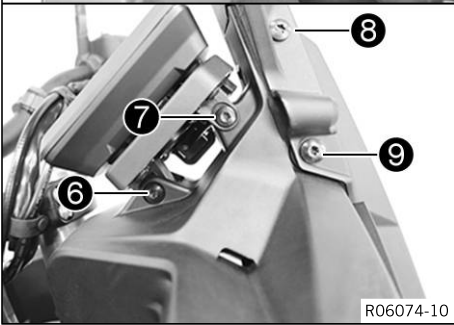
R06082-10



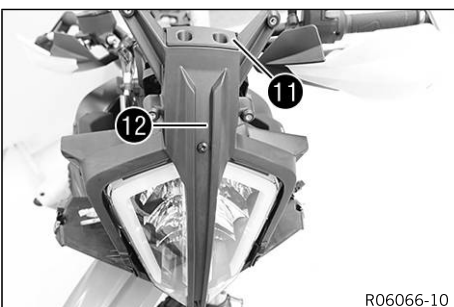
- Disconnect plug-in connectors **5** of the turn signals.
- Remove the mask spoilers.



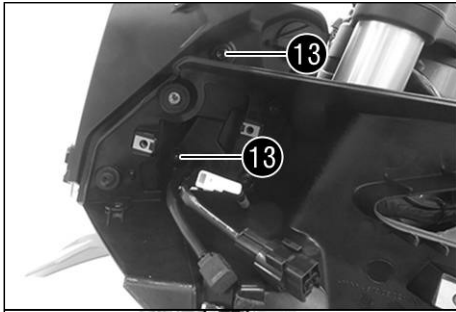
- Remove screw **6**.
- Remove **7** screws.
- Remove screws **8**.
- Remove screws **9**.



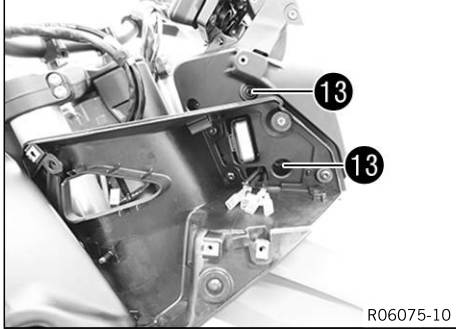
- Remove screws **10**.



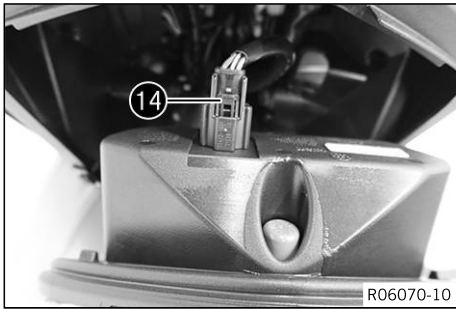
- Remove cover of mask support **11** toward the rear.
- Remove the headlight mask center part **12** toward the front.



- Remove screws 13.
- Pull the headlight forward.



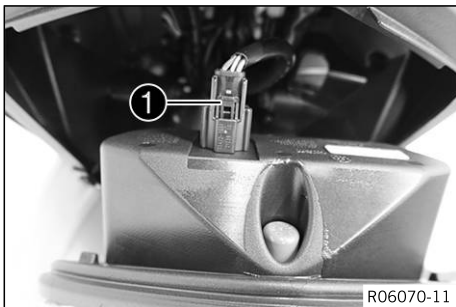
R06075-10



- Unplug connector 14.
- Put down the headlight on a soft cloth.

R06070-10

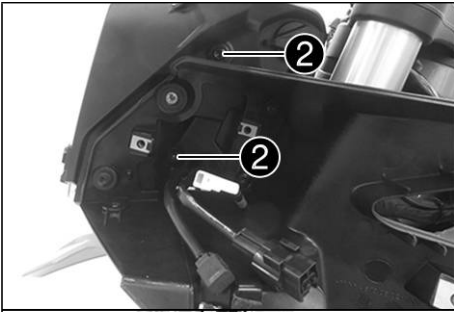
17.3 Installing the headlight



R06070-11

Main work

- Plug in connector 1 for the headlight.
- Check that the lighting is functioning properly.
- Position the headlight.

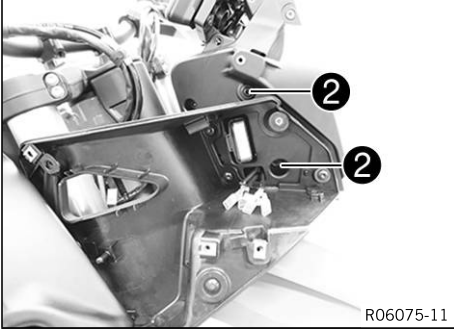


- Mount and tighten screws ②.

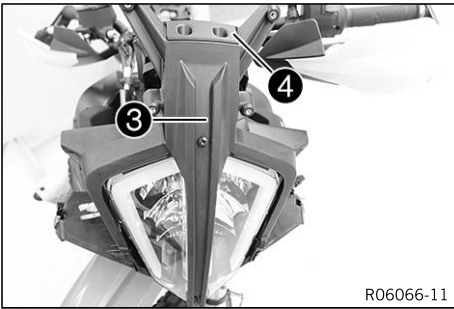
Guideline

Screw, headlight	M6	5 Nm (3.7 lbf ft)
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- Check the headlight setting. (📖 p. 223)

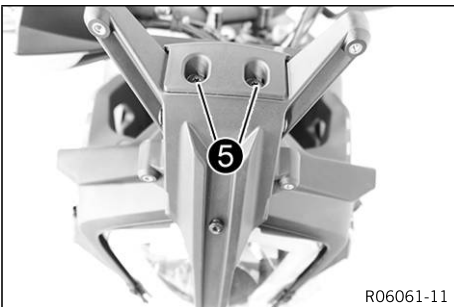


R06075-11



R06066-11

- Position headlight mask center part ③.
- Mount cover of mask support ④.

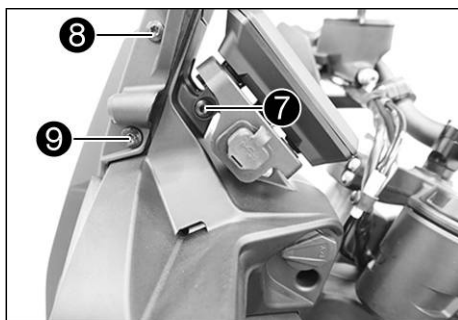


R06061-11

- Mount and tighten screws ⑤.

Guideline

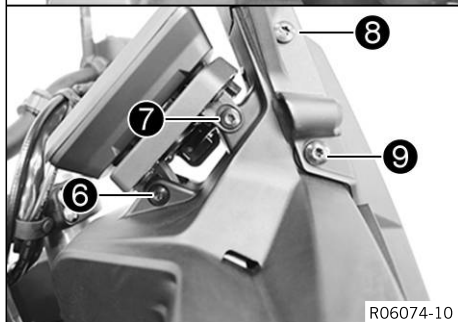
Screw, mask support cover	M5	3.5 Nm (2.58 lbf ft)
---------------------------	----	----------------------



- Mount and tighten screw **6**.

Guideline

Screw, instrument support on mask support, rear	M5	5 Nm (3.7 lbf ft)
---	----	-------------------



- Mount and tighten screws **7**.

Guideline

Screw, instrument support on mask support, front	M5	5 Nm (3.7 lbf ft)
--	----	-------------------

- Mount and tighten screws **8**.

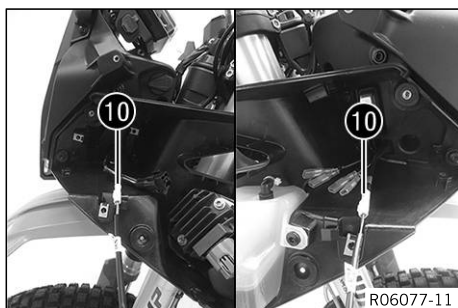
Guideline

Screw, mask support center part	M5	3.5 Nm (2.58 lbf ft)
---------------------------------	----	----------------------

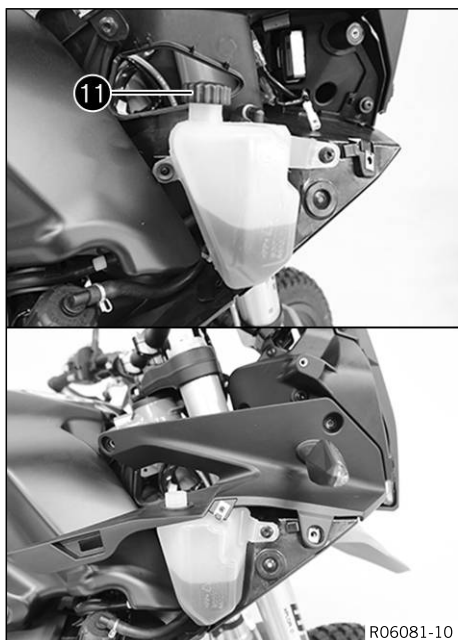
- Mount and tighten screws **9**.

Guideline

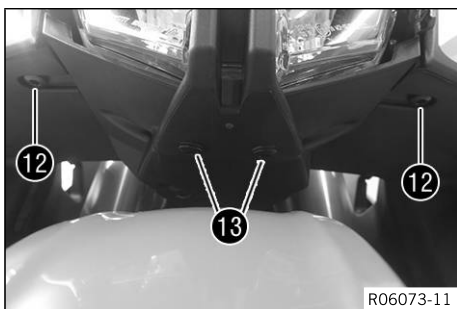
Screw, brace for mask support center part	M6	3 Nm (2.2 lbf ft) Loctite®243™
---	----	--



- Connect plug-in connectors **10** of the turn signals.
- Position the left mask spoiler.



- Remove compensating tank cover **11**.
- Position the right mask spoiler on the compensating tank.



- Mount and tighten screws 12.

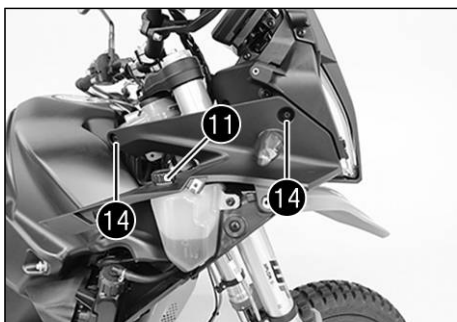
Guideline

Screw, trim	M5	3 Nm (2.2 lbf ft)
-------------	----	-------------------

- Mount and tighten screws 13.

Guideline

Screw, mask support center part	M5	3.5 Nm (2.58 lbf ft)
---------------------------------	----	----------------------



- Mount cover 11 of the compensating tank.

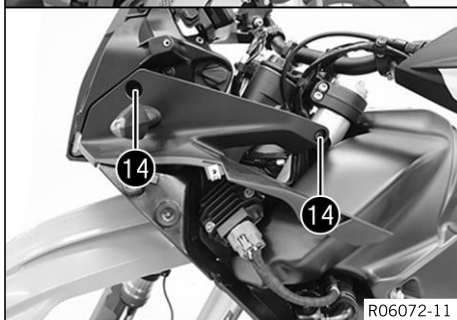
Guideline

Compensating tank cover	-	1.1 Nm (0.81 lbf ft)
-------------------------	---	----------------------

- Mount and tighten screws 14.

Guideline

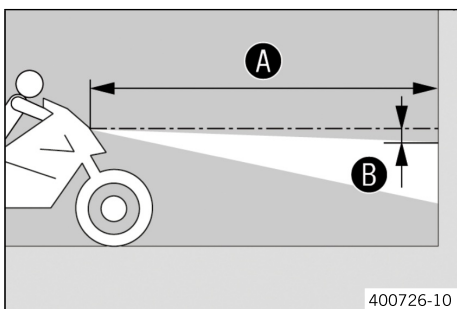
Screw, trim	M5	3 Nm (2.2 lbf ft)
-------------	----	-------------------



Finishing work

- Install windshield. (📖 p. 145)
- Install the left fuel tank spoiler. (📖 p. 140)
- Install the left side cover. (📖 p. 137)
- Install the right fuel tank spoiler. (📖 p. 142)
- Install the battery cover. (📖 p. 139)
- Install the right side cover. (📖 p. 138)
- Mount the seat. (📖 p. 120)

17.4 Checking the headlight setting



- Park the vehicle on a horizontal surface in front of a light-colored wall and make a mark at the height of the center of the low beam headlight.

- Make another mark at a distance B under the first marking.

Guideline

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

- Position the vehicle upright at distance A from the wall and switch on the low beam.

Guideline

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

- The rider now mounts the motorcycle with luggage and passenger if applicable.
- Check the headlight setting.

The light-dark boundary must be exactly on the lower marking when the motorcycle is ready to be operated with the rider mounted along with any luggage and a passenger if applicable.

- » If the boundary between light and dark does not meet specifications:
 - Adjust headlight range. (📖 p. 224)

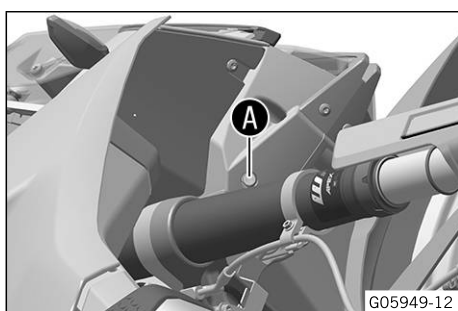
17.5 Adjusting the headlight range

Preparatory work

- Check the headlight setting. (📖 p. 223)

Main work

- Turn adjusting screw **A** to adjust the headlight range.



G05949-12

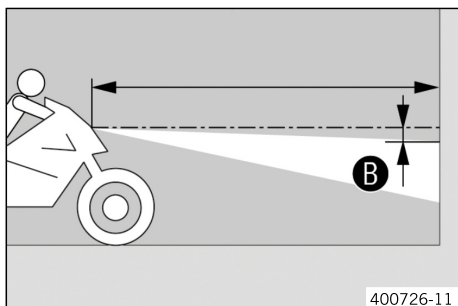
Info

Turn clockwise to reduce the headlight range; turn counterclockwise to increase the headlight range. If you have a payload, you may have to correct the headlight range.

- Set the headlight to marking **B**.

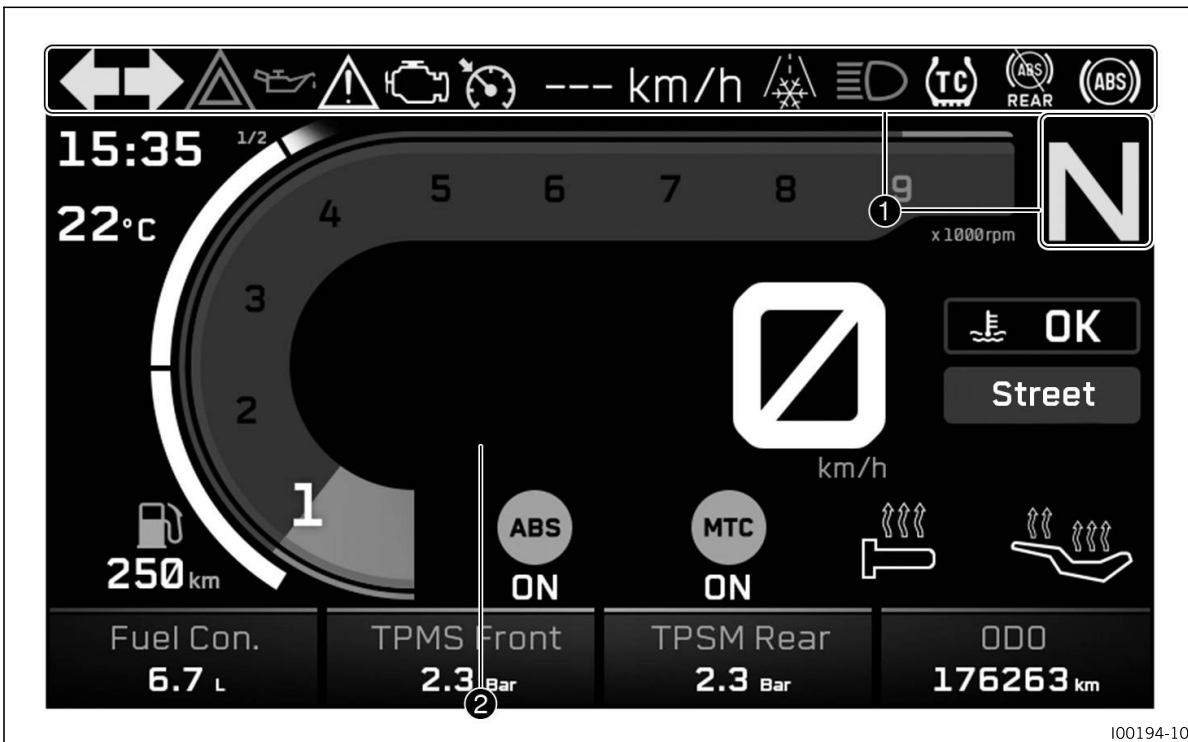
Guideline

The light-dark boundary must lie exactly on lower marking **B** when the motorcycle is ready to operate with the rider mounted along with any luggage and a passenger, if applicable.



400726-11

18.1 Combination instrument



The combination instrument is attached in front of the handlebar.
 The combination instrument is divided into two function areas.

① indicator lamps (📖 p. 228)

Display ②



Caution

Danger of burns Parts of the combination instrument become very hot in certain situations.

In particular, the display gets hot in ambient temperatures above 55 °C (131 °F), during extended stationary periods, for example, at a traffic light, or in direct sunlight.

- Do not touch the combination instrument with bare hands in the situations referred to.
- Where appropriate protective clothing.
- If you have been burned, hold the area affected under lukewarm water immediately.

18.2 Activation and test



Activation

The combination instrument is activated when the ignition is switched on.





Info



The brightness of the displays is controlled by an ambient light sensor in the combination instrument.



Test

The welcome text appears on the display and all indicator lamps are briefly activated for a function check.

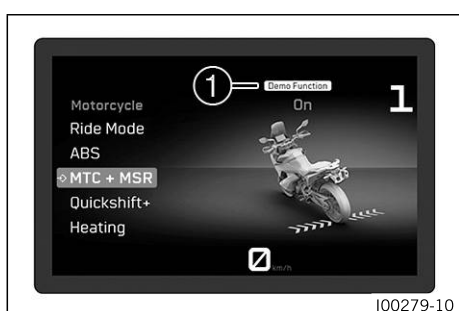
i Info

The malfunction indicator lamp  always lights up as long as the engine is not running. If the engine is running and the malfunction indicator lamp  lights up, stop (taking care not to endanger yourself or other road users in the process) and contact an authorized KTM workshop.

The oil pressure warning lamp  always lights up as long as the engine is not running. If the engine is running and the oil pressure warning lamp  lights up, stop immediately (taking care not to endanger yourself or other road users in the process) and switch off the engine.

The ABS warning lamp  and TC indicator lamp  light up until a speed of approx. 6 km/h (approx. 4 mph) or more has been reached.

18.3 Demo mode



Activation

Demo mode is activated in the factory and allows you to test optional software functions.

Once a distance has been covered, demo mode is automatically deactivated as soon as the ignition is turned off.

Distance until demo mode is deactivated	1,500 km (930 mi)
---	-------------------

The demo functions are shown in area **1** of the display.

i Info

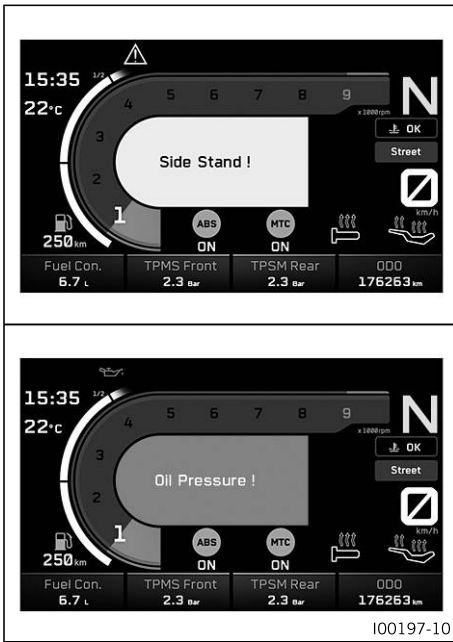
You will regularly be shown messages indicating when demo mode will be ending.

All optional software functions will be deactivated and no longer displayed when demo mode ends. The optional software functions are available from an authorized KTM dealer.

Functions included in demo mode

- **RALLY PACK** including riding mode **Rally**, MTC+MSR, deactivatable **ABS** on the rear wheel, adjustable characteristics of the throttle response, adjustable motorcycle traction control
- Quickshifter+
- MSR
- Cruise control system

18.4 Warnings



Warnings appear in the middle of the display; these are marked yellow or red depending on their relevance. Yellow warnings indicate a malfunction or information which requires prompt intervention or an adjustment to the riding style. Red warnings indicate a malfunction or information which requires immediate intervention.

i Info
Warnings can be hidden by pressing any button. All the existing warnings are displayed in the **Warning** sub-menu until they are no longer active.

18.5 Ice warning



The ice warning ❄️ goes on when there is an increased risk of ice on the roads. The ice warning ❄️ appears on the display when the ambient temperature drops below the specified value.

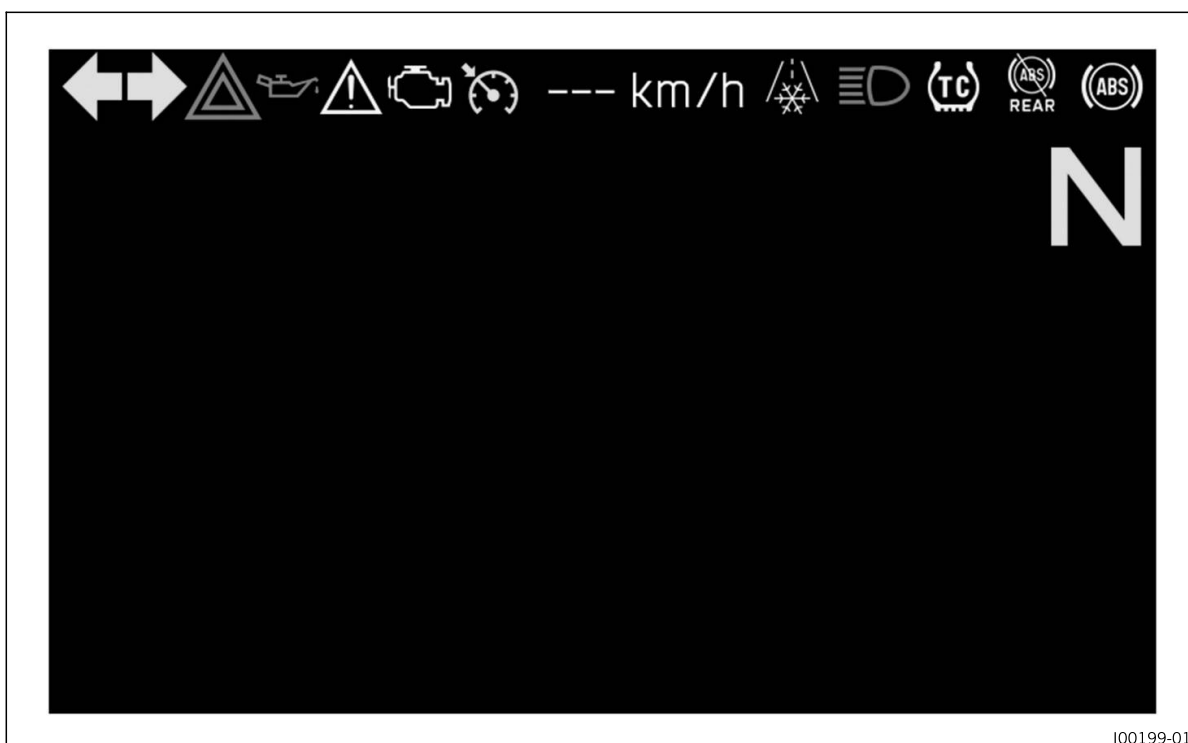
Temperature	≤ 4 °C (≤ 39 °F)
-------------	------------------

The ice warning ❄️ goes out on the display when the ambient temperature rises above the specified value again.


Temperature	≥ 6 °C (≥ 43 °F)
-------------	------------------

i Info
When the ice warning ❄️ lights up, a text warning also appears.



18.6 Indicator lamps





I00199-01

The indicator lamps offer additional information about the operating state of the motorcycle. When the ignition is switched on, all indicator lamps light up briefly, except for the TC indicator lamp .







Info








The malfunction indicator lamp  always lights up as long as the engine is not running. If the engine is running and the malfunction indicator lamp  lights up, stop (taking care not to endanger yourself or other road users in the process) and contact an authorized KTM workshop.

The oil pressure warning lamp  always lights up as long as the engine is not running. If the engine is running and the oil pressure warning lamp  lights up, stop immediately (taking care not to endanger yourself or other road users in the process) and switch off the engine.

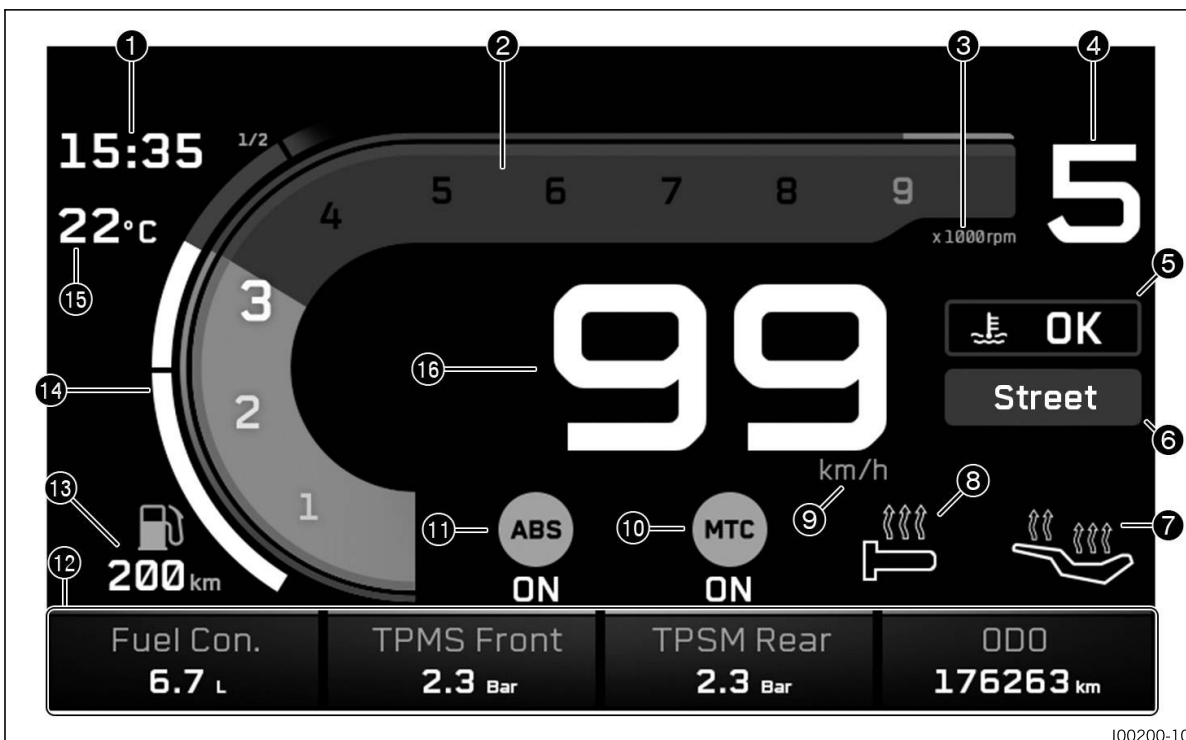
The ABS warning lamp  and TC indicator lamp  light up until a speed of approx. 6 km/h (approx. 4 mph) or more has been reached.

Possible states

	The turn signal indicator lamp flashes green simultaneously with the turn signal – The turn signal is switched on.
	The malfunction indicator lamp lights up yellow – The <u>OBD</u> has detected a malfunction in the vehicle electronics. Come safely to a halt, and contact an authorized KTM workshop.
	ABS warning lamp lights up yellow – Status or error messages relating to <u>ABS</u> .
	The ABS rear warning lamp lights up yellow – <u>ABS</u> is deactivated on the rear wheel.
	The idle indicator lamp lights up green – The transmission is in neutral.
	TC indicator lamp lights up/flashes yellow – <u>MTC</u> is not enabled or is currently intervening. The TC indicator lamp also lights up if a malfunction is detected. Contact an authorized KTM workshop. The TC indicator lamp flashes, if <u>MTC</u> or <u>MSR</u> (optional) actively engage.

	The oil pressure warning lamp lights up red – The oil pressure is too low. Stop immediately, taking care not to endanger yourself or other road users in the process, and switch off the engine.
	The alarm system indicator lamp lights up or flashes red – Status or error message of the alarm system.
	The cruise control system indicator lamp (optional) lights up yellow – The cruise control system function is switched on, but cruise control is not activated.
	The cruise control system indicator lamp (optional) lights up green – The cruise control system function is switched on and cruise control is activated.
	The high beam indicator lamp lights up blue – The high beam is switched on.
	The general warning lamp lights up yellow – A note/warning note on operating safety has been detected. This is also shown in the display.
	Hazard warning flasher indicator lamps – The hazard warning flasher is switched on.

18.7 Display

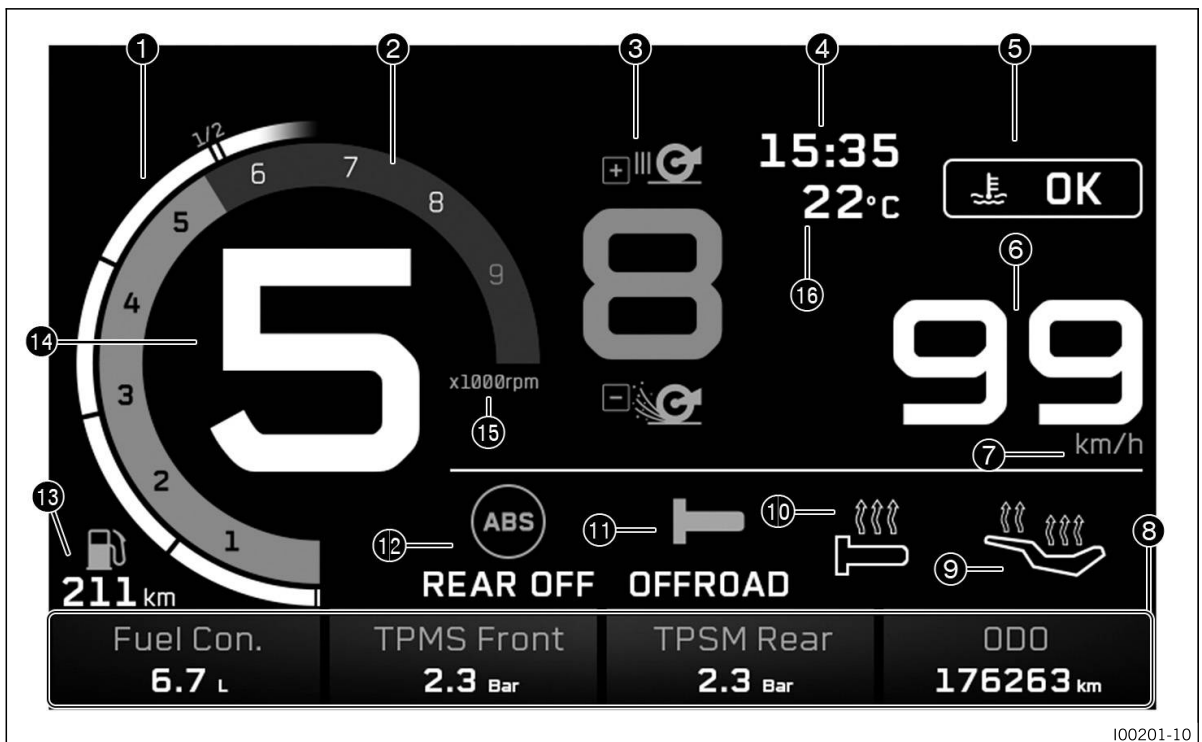


100200-10

- ① Time (📖 p. 232)
- ② Speed (📖 p. 231)
- ③ Shift warning light (📖 p. 231)
The shift warning light is integrated in the tachometer display.
- ④ Unit for the engine speed display
- ⑤ Gear display
- ⑥ Coolant temperature indicator (📖 p. 233)
- ⑦ **Ride-Mode** display (📖 p. 233)
- ⑧ Front rider's seat heating (optional) (📖 p. 235)

- ⑧ Heated grip (optional) (📖 p. 234)
- ⑨ Unit for the speedometer
- ⑩ MTC display (📖 p. 233)
- ⑪ ABS display (📖 p. 233)
- ⑫ Favorites display (📖 p. 235)
- ⑬ Fuel range display
- ⑭ Fuel level display (📖 p. 234)
- ⑮ Ambient air temperature indicator (📖 p. 232)
- ⑯ Speedometer (📖 p. 232)

18.8 Rally display (optional)



I00201-10

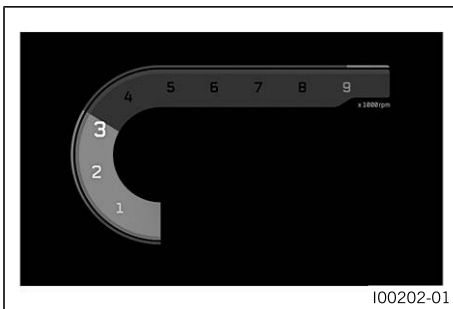
i Info

The figure shows the start screen of the combination instrument in active riding mode **Rally** (optional). If the menu is open, the speed and the selected gear are still displayed.

- ① Fuel level display (📖 p. 234)
- ② Speed (📖 p. 231)
- ② Shift warning light (📖 p. 231)
The shift warning light is integrated in the tachometer display.
- ③ Slip adjustment (optional)
- ④ Time (📖 p. 232)
- ⑤ Coolant temperature indicator (📖 p. 233)
- ⑥ Speedometer (📖 p. 232)
- ⑦ Unit for the speedometer

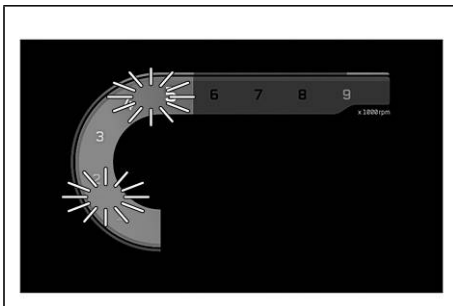
- 8 **Favorites** display (📖 p. 235)
- 9 Front rider's seat heating (optional) (📖 p. 235)
- 10 Heated grip (optional) (📖 p. 234)
- 11 **Throttle Response** (optional)
- 12 **ABS** display (📖 p. 233)
- 13 Fuel range display
- 14 Gear display
- 15 Unit for the engine speed display
- 16 Ambient air temperature indicator (📖 p. 232)

18.9 Speed



The speed is measured in revolutions per minute.

18.10 Shift warning light

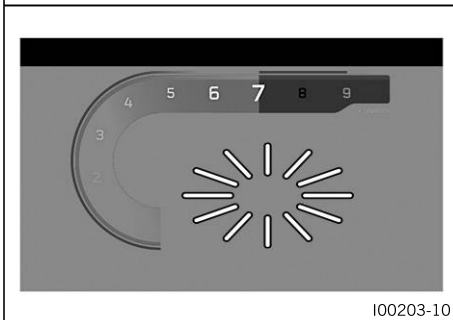


The shift light is integrated in the rpm gauge display.

In the **Shift Light** submenu, the engine speed for the shift warning light can be set. The shift warning light is always active during the running-in phase (up to 1,000 km / 621 mi). The shift warning light can only be deactivated, and the values for **RPM1** and **RPM2** can only be adjusted after this. At **RPM1**, the engine speed display flashes red and at **RPM2**, the entire display flashes red.

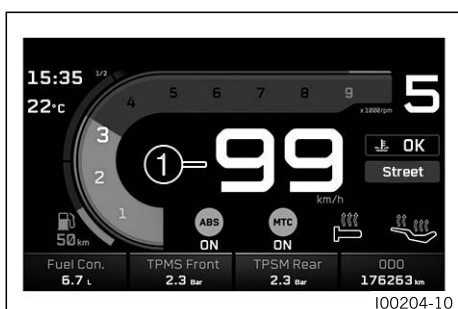
i **Info**

After the first service, the shift warning light is deactivated when the engine is warm and in sixth-gear.



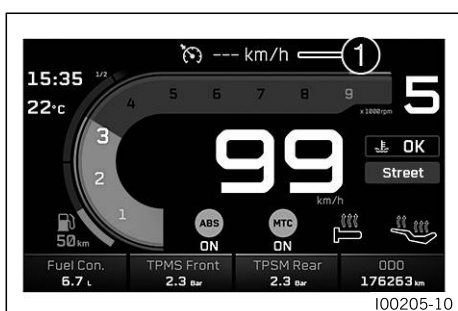
Coolant temperature	≤ 35 °C (≤ 95 °F)
ODO	< 1,000 km (< 620 mi)
The shift warning light always flashes at	6,500 rpm
Coolant temperature	> 35 °C (> 95 °F)
ODO	> 1,000 km (> 620 mi)
RPM1 shift warning light	flashes
RPM2 shift warning light	flashes and changes color

18.11 Speedometer



The speed is shown in area **1** of the display.
Speed is shown in kilometers per hour **km/h** or in miles per hour **mph**.
The unit of speed can be configured in the **Distance** submenu.

18.12 Cruise control indicator (optional)

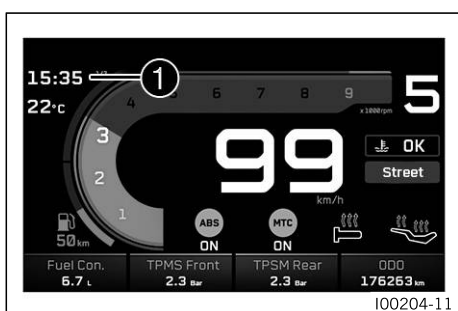


The operating state of the active cruise control is shown in the **1** area of the display.
Cruise control is operated using the cruise control tip switch.

i Info

If the cruise control system function is switched on but cruise control is not activated, the cruise control system indicator lamp lights up yellow.
If the cruise control system function is switched on and cruise control is activated, the cruise control system indicator lamp lights up green.

18.13 Time

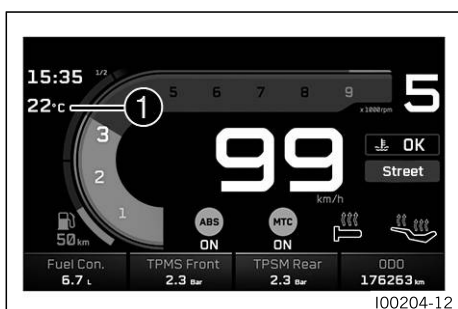


The time is shown in area **1** of the display.
The time can be displayed in 24-hour format or 12-hour format in all languages.
The format of the time can be configured in the **Clock Format** menu.

i Info

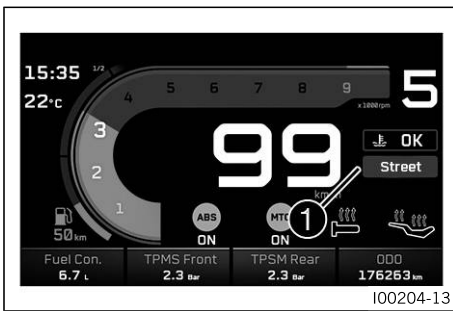
The time must be reset if the 12-V battery was disconnected from the vehicle or the fuse was removed.

18.14 Ambient air temperature indicator



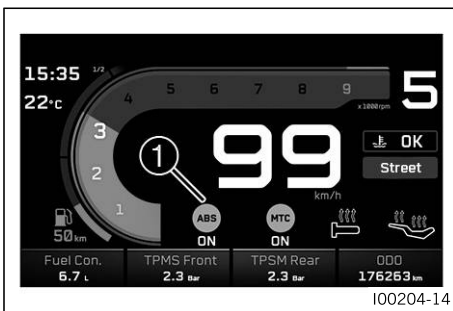
The ambient temperature is shown in area **1** of the display.
The ambient air temperature is displayed in **°C** or **°F**.
The unit of the ambient air temperature can be configured in the **Temperature** submenu.

18.15 Ride-Mode display



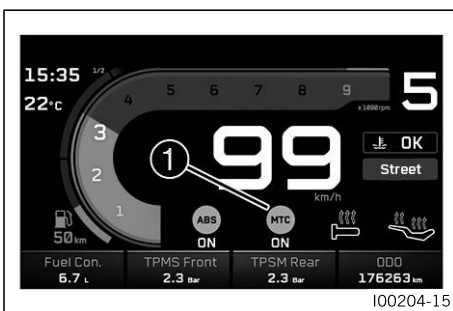
The **Ride Mode** setting is shown in area **1** of the display. The drive mode can be configured in the **Ride Mode** submenu.

18.16 ABS display



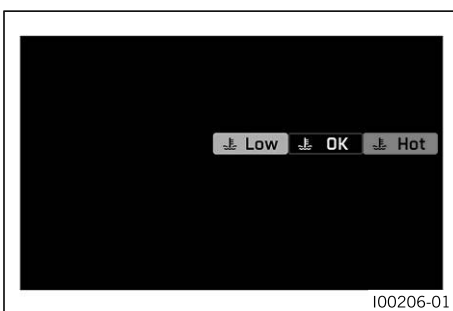
The ABS mode setting is shown in the **1** area of the display. When the **Ride Mode Rally** is activated, the ABS can be configured in the **ABS** submenu.

18.17 MTC display



The **1** area of the display indicates whether **MTC** is switched on or off. The motorcycle traction control can be switched on or off in the **MTC** submenu.

18.18 Coolant temperature indicator



The coolant temperature is displayed by a symbol. The symbol changes between **LOW**, **OK** and **HOT** depending on the temperature.

Note

Engine failure Overheating damages the engine.

- If the coolant temperature warning is displayed, stop immediately and take care not to endanger yourself or other traffic participants in the process.
- Allow the engine and cooling system to cool down.
- Check and, if necessary, correct the coolant level on the cooling system while it is in a cooled state.

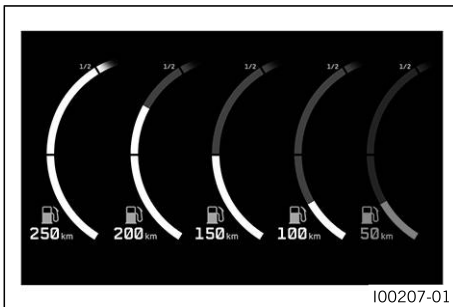
i Info

If the coolant temperature indicator shows **HOT**, the indicator also starts to flash.
If the cooling system overheats, the maximum engine speed is limited.

Possible states

- The engine is cold – The coolant temperature indicator shows **LOW**.
- Engine warm – The coolant temperature indicator shows **OK**.
- Engine hot – The coolant temperature indicator shows **HOT**.

18.19 Fuel level display

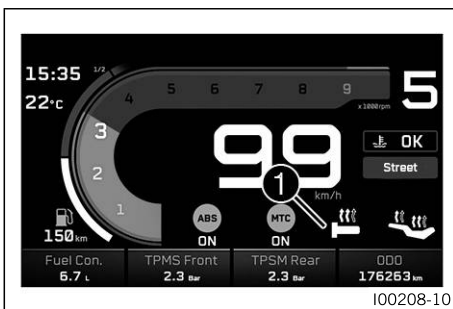


The fuel level display consists of the fuel range display and a bar. The higher the bar is filled, the more fuel is in the fuel tank

i Info

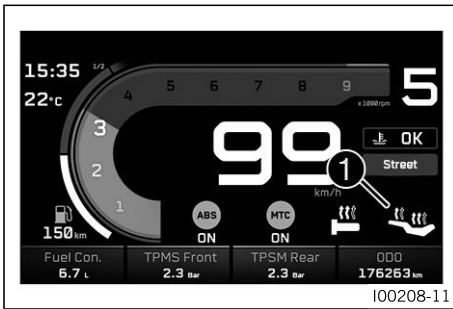
Measurement of the fuel supply only becomes active after reaching half of the fuel tank content. Up to half of the fuel tank content, the fuel level display will be shown as full. If the fuel level is getting low, the last segment flashes red and the following warning **LOW FUEL** also appears. The fuel level is displayed with a slight delay to prevent the indicator from constantly moving while riding. The fuel level display is not updated while the side stand is folded out or the emergency off switch is switched off. Once the side stand is folded up and the emergency OFF switch is switched on, the fuel level display is next updated after 2 minutes. The fuel level display flashes if the combination instrument does not receive a signal from the fuel level sensor.

18.20 Heated grip (optional)



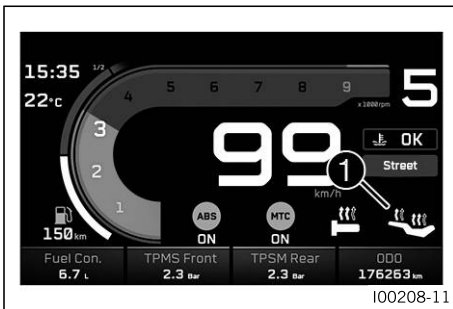
The status of the grip heater is shown in area **1** of the display. The grip heater can be configured in the **Heated Grip** menu.

18.21 Front rider's seat heating (optional)



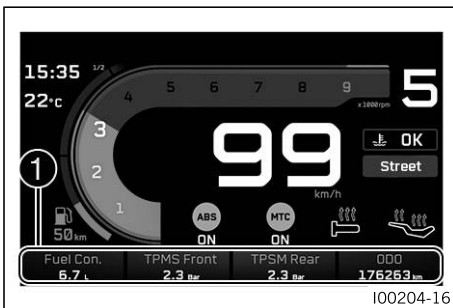
The status of the front rider's seat heating is shown in area ❶ of the display.
The front rider's seat heating can be configured in the **Seat Heating Rider** submenu.

18.22 passenger seat heating (optional)



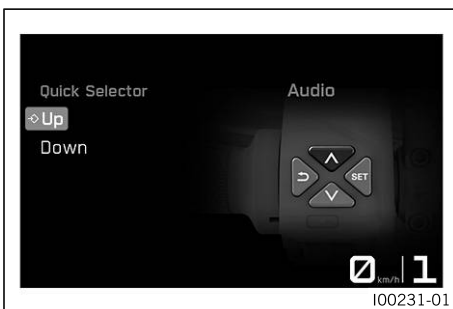
The status of the passenger seat heating is shown in area ❶ of the display.
The seat heating can be configured in the **Seat Heating Pillion** submenu.

18.23 Favorites display



Up to four items of information are shown on the **Favorites** indicator.
The **Favorites** indicator can be freely configured in the **Favorites** submenu.

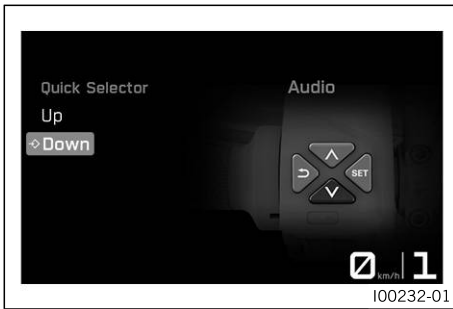
18.24 Quick Selector 1 display



When the menu is closed, the **Quick Selector 1** display is opened by pressing the **UP** button.
Press the **BACK** button to close the **Quick Selector 1** display.

i Info
The **Quick Selector 1** display can be configured in the **Settings** menu under **Quick Selector 1**. Any information can be selected.

18.25 Quick Selector 2 display

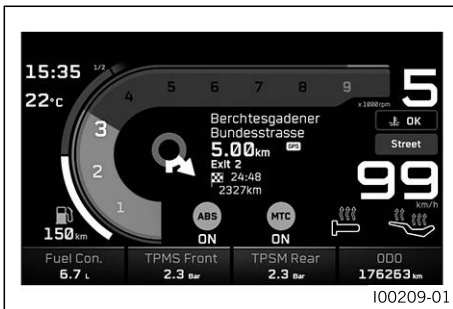


When the menu is closed, the **Quick Selector 2** display is opened by pressing the **DOWN** button.

Press the **BACK** button to close the **Quick Selector 2** display.

i Info
The **Quick Selector 2** display can be configured in the **Settings** menu under **Quick Selector 2**. Any information can be selected.

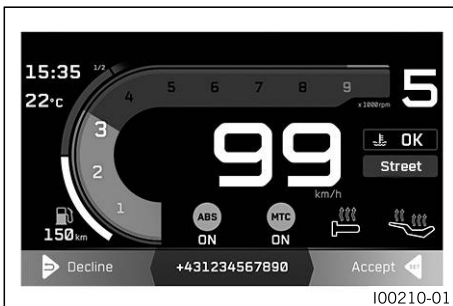
18.26 Navigation display



The **Navigation** indicator appears when the navigation function is activated.

In the **Navigation** display, the direction arrow, the distance from the destination, the estimated arrival time of the cellphone, the distance to the next waypoint, and the street name are displayed. The **Navigation** display can be switched on or off in the **Navigation** submenu.

18.27 Call display



! Warning
Danger of accidents Headphone volume which is too high distracts attention from traffic activity.
– Always select headphone volume which is low enough for you to still clearly hear acoustic signals.

The **Call** indicator appears for incoming or active calls.

Press the **SET** button to accept an incoming call.

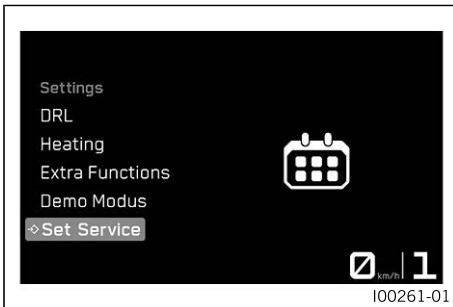
Press the **BACK** button to reject an incoming call.

Press the **UP** button to increase the audio volume.

Press the **DOWN** button to reduce the audio volume.

i Info
It is not possible to change the audio volume using the combination switch with every cellphone.
The call duration and contact are displayed. Depending on the cellphone settings, the contact is shown by name.
You cannot navigate in the menu during an active phone conversation.

18.28 Setting the service interval display



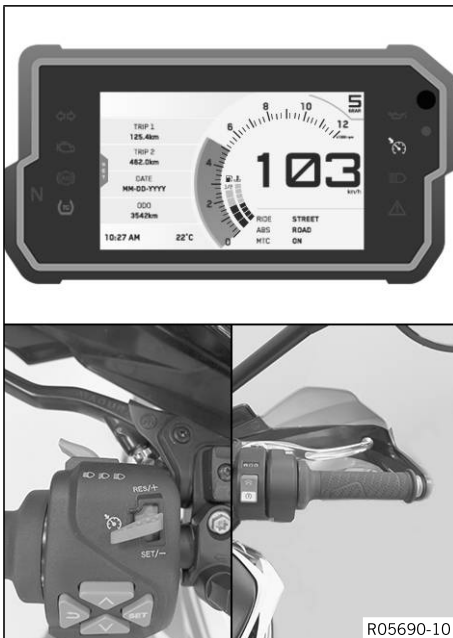
Condition






The motorcycle is stationary.

- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is marked.
- Press and hold the **UP** and **DOWN** buttons simultaneously for 3 seconds until the menu **Service** opens.
- Press the **UP** or **DOWN** button until the riding distance display is marked. Press the **SET** button to increase the kilometers in intervals of 500.
- Press the **UP** or **DOWN** button until the date display is marked. Press the **SET** button to advance the date in intervals of one month.
- Press the **BACK** button to close the current menu and save the settings.

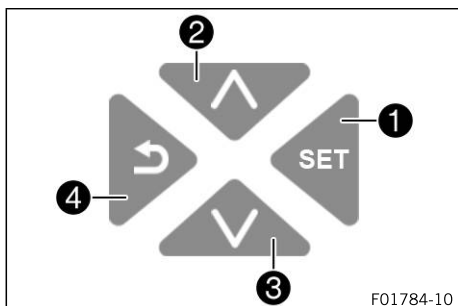


18.29 Programming the cruise control system (optional)



- Switch on the ignition.
 - The cruise control system indicator lamp  flashes.
- Press the cruise control tip switch  to the left for 3 seconds.
- Press the cruise control tip switch  to position **RES/+** for 3 seconds.
- Press the cruise control tip switch  to position **SET/-** for 3 seconds.
- Turn the throttle grip forward, past the basic position.
 - The cruise control system indicator lamp  goes out.
- Switch off the ignition.





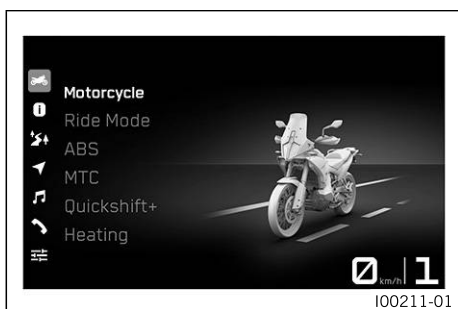
Info

Press the **SET** button **1** in the start screen to open the menu.

Navigate through the menu using the **UP** button **2** or the **DOWN** button **3**.

By pressing the **BACK** button **4**, the menu structure jumps one step back, or the menu is closed.

19.1 Motorcycle

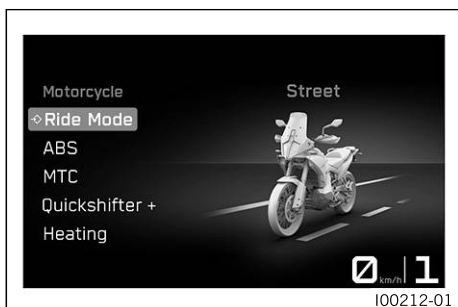


- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Motorcycle** is highlighted. Press the **SET** button to open the menu.

In **Motorcycle**, you can set the riding mode, ABS mode, traction control, motor slip regulation, quickshifter+, seat heating, and the heated grip.

When riding mode **Rally** (optional) is activated, the characteristics of the throttle response, the slip on the rear wheel and the **ABS** can also be configured.

19.2 Ride Mode



- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Motorcycle** is highlighted. Press the **SET** button to open the menu.



Warning

Danger of accidents An incorrectly selected riding mode makes control of the vehicle considerably more difficult.

The riding modes are each only suitable for certain conditions.

- Always select a riding mode that suits the surface on which you are riding, the weather and the riding situation.

- Press the **UP** or **DOWN** button until **Ride Mode** is highlighted. Press the **SET** button to open the menu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to select the riding mode, which changes coordinated settings for the engine and motorcycle traction control.

Guideline

Only use riding modes **Street** and **Rain** on asphalt.

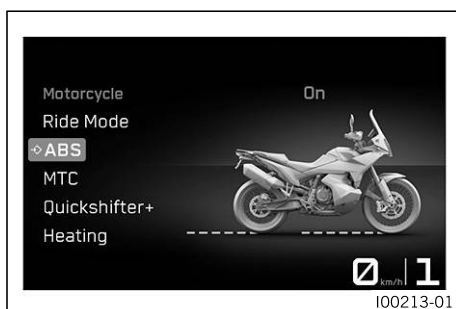
Only use riding modes **Offroad** and **Rally** (optional) on unpaved roads.

- ✓ **Street** - Homologated performance with balanced response; the motorcycle traction control allows normal slip on the rear wheel. ABS regulates both wheels.

- ✓ **Rain** - Reduced homologated performance with soft response for improved rideability on surfaces with low road grip; the motorcycle traction control allows very little slip on the rear wheel. ABS regulates both wheels.
- ✓ **Offroad** - Reduced homologated performance for better rideability on unpaved roads; the motorcycle traction control allows high slip on the rear wheel. ABS only controls the front wheel.
- ✓ **Rally** (optional) - Setting with homologated performance and extremely direct response. The motorcycle traction control and the characteristics of the throttle response can be set individually. ABS can be configured separately.

The riding mode of the vehicle can be configured in the **Ride Mode** menu.

19.3 ABS



Condition

- Model with **RALLY PACK**.
- Riding mode **Rally** (optional) is activated.
 - Press the **SET** button when the menu is closed.
 - Press the **UP** or **DOWN** button until **Motorcycle** is highlighted. Press the **SET** button to open the menu.
 - Press **UP** or **DOWN** button until **ABS** is highlighted. Press the **SET** button to open the submenu.
 - Activate the menu item using the **UP** or **DOWN** button.



Warning

Danger of accidents An incorrectly selected ABS mode makes control of the vehicle considerably more difficult.

The ABS modes are each only suitable for certain conditions.

- Always select an ABS mode that is compatible with the surface of the ground.

- Press the **SET** button to select the desired ABS mode.



Info

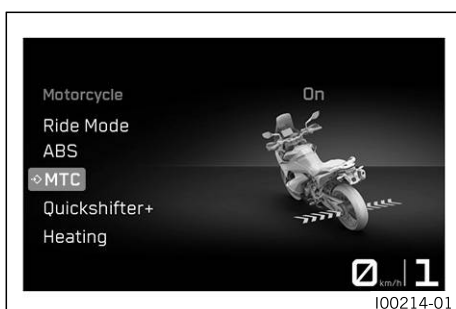
The ABS mode can be switched during the journey.

Do not open the throttle during the selection.

When the ABS mode **Road** is active, ABS controls both wheels.

When the **Offroad** ABS mode is active, ABS only controls the front wheel. The rear wheel is no longer controlled by ABS and may lock during braking maneuvers. The indicator lamp **ABS REAR** lights up.

19.4 MTC

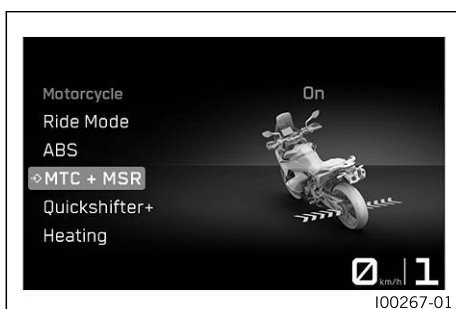
**Condition**

- Cruise control system function (optional) deactivated.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Motorcycle** is highlighted. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **MTC** is highlighted. Press the **SET** button to open the submenu.
- Activate the menu item using the **UP** or **DOWN** button.
- Switch **MTC** on or off by pressing the **SET** button.

i Info

Do not open the throttle when switching on or off. Press the **SET** button briefly when activating the motorcycle traction control. Hold down the **SET** button when switching off the motorcycle traction control. After the ignition is switched on, motorcycle traction control is enabled again.

19.5 MTC+MSR (optional)

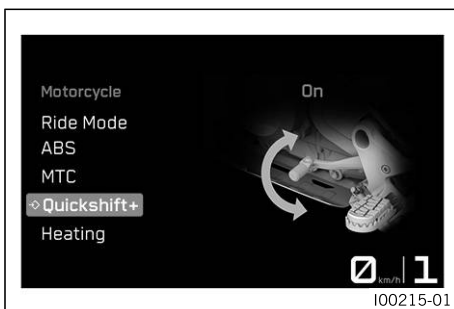
**Condition**

- Model with **MTC+MSR**.
- Cruise control system function (optional) deactivated.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Motorcycle** is highlighted. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **MTC+MSR** is highlighted. Press the **SET** button to open the menu.
- Activate the menu item using the **UP** or **DOWN** button.
- Switch **MTC+MSR** on or off by pressing the **SET** button.

i Info

Do not open the throttle when switching on or off. Press the **SET** button briefly when activating the motorcycle traction control and the engine traction torque control. Hold down the **SET** button when switching off the motorcycle traction control and engine traction torque control. When ABS mode **Offroad** is active, the **MSR** is not active. After the ignition is switched on, the motorcycle traction control and engine traction torque control are enabled again.

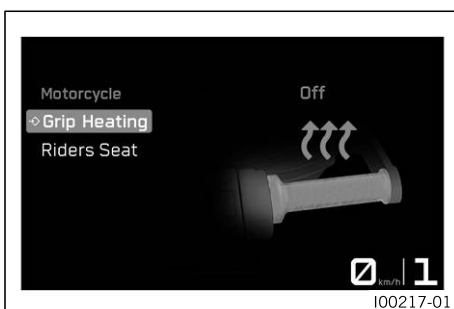
19.6 Quickshift+ (optional)



Condition

- Model with Quickshifter+.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Motorcycle** is highlighted. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Quickshift+** is highlighted. Press the **SET** button to open the submenu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to switch quickshifter + button on or off.

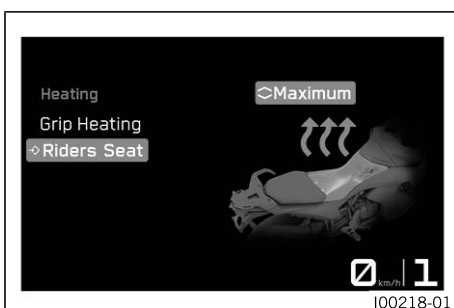
19.7 Grip Heating (function optional)



Condition

- Model with heated grip.
- **Heated Grip** menu (optional function) activated.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Motorcycle** is highlighted. Press the **SET** button to open the menu.
- Press **UP** or **DOWN** button until **Heating** is highlighted. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Grip Heating** is highlighted. Press the **SET** button to open the menu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to select the heating level or to switch the heated grip on or off.

19.8 Riders Seat (function optional)



Condition

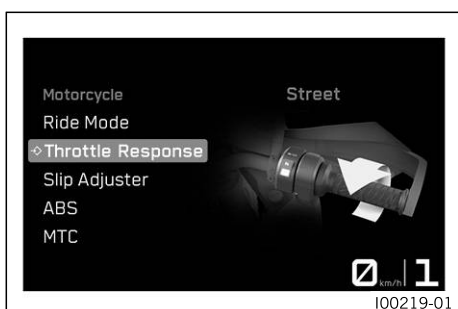
- Model with seat heater.
- **Seat Heating Rider** menu (optional function) activated.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Motorcycle** is highlighted. Press the **SET** button to open the menu.
- Press **UP** or **DOWN** button until **Heating** is highlighted. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Riders Seat** is highlighted. Press the **SET** button to open the menu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to select the heating level or to switch the front rider's seat heating on or off.



Info

The heating level for the passenger seat heating is selected using the switch next to the right grab handle.

19.9 Throttle Response (optional)

**Condition**

- Model with **RALLY PACK**.
- Riding mode **Rally** (optional) is activated.
- Press the **SET** button when the menu is closed.

**Warning**

Danger of accidents An incorrectly selected riding mode makes control of the vehicle considerably more difficult.

The riding modes are each only suitable for certain conditions.

- Always select a riding mode that suits the surface on which you are riding, the weather and the riding situation.

- Press the **UP** or **DOWN** button until **Motorcycle** is marked on the display. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Throttle Response** is marked on the display. Press the **SET** button to open the submenu.
- Activate the menu item using the **UP** or **DOWN** button.
- The characteristic map of the throttle response can be adjusted by pressing the **SET** button.
 - ✓ Street – balanced response.
 - ✓ Rally – extremely direct response.
 - ✓ Offroad – very direct response.

**Info**

Do not open the throttle when setting it.

19.10 Slip Adjuster (optional)

**Condition**

- The ride mode **Rally** (optional) is activated.
- **MTC + MSR** is activated.
- Press the **SET** button when the menu is closed.

**Warning**

Danger of accidents An incorrectly selected riding mode makes control of the vehicle considerably more difficult.

The riding modes are each only suitable for certain conditions.

- Always select a riding mode that suits the surface on which you are riding, the weather and the riding situation.

- Press the **UP** or **DOWN** button until **Motorcycle** is marked on the display. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Slip Adjuster** is highlighted. Press the **SET** button to open the menu.
- Activate the menu item using the **UP** or **DOWN** button.

- Press the **SET** button to set the maximum permitted slip for the motorcycle traction control.

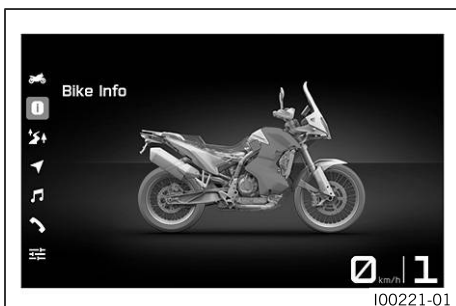
i Info
Do not open the throttle during the selection.

The spin adjuster is a motorcycle traction control function. The slip adjustment allows the motorcycle traction control to be tuned through nine levels to the desired characteristic map. Level 0 allows the maximum slip on the rear wheel, and level 9 the minimum. If the cruise control function is deactivated, the **UP** and **DOWN** buttons in the main display or in the **Slip Adjuster** menu can be used to adjust the **Slip Adjuster**.

i Info
The slip adjustment is only available in **Rally** riding mode (optional).
The slip adjustment is only available when motorcycle traction control is activated.

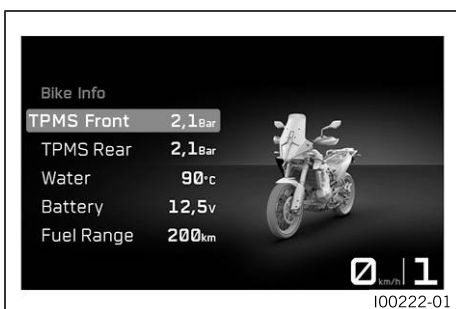
Press and hold the DOWN button for approx. 2 seconds.	Slip adjustment level 0 is activated.
--	---------------------------------------

19.11 Bike Info



- Press the **SET** button when the menu is closed.
 - Press the **UP** or **DOWN** button until **Bike Info** is highlighted. Press the **SET** button to open the menu.
- General information and warnings that may be present can be called up in **Bike Info**.

19.12 Bike Info



- Press the **SET** button when the menu is closed.
 - Press the **UP** or **DOWN** button until **Bike Info** is highlighted. Press the **SET** button to open the menu.
- Tire Pressure** (optional function) shows the current tire pressure of the front and rear tires.
Water displays the coolant temperature.
Fuel Range displays the possible distance you can cover with the fuel reserve.
Battery displays the battery voltage.
Odometer displays the total distance covered.
Service displays when the next service is due.
Warnings displays warnings that have occurred until they are no longer active.

19.13 Warning



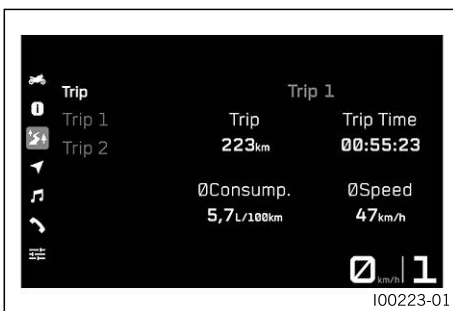
Condition

- Message or warning is present.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Bike Info** is highlighted. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Warning** is highlighted. Press the **SET** button to open the submenu.
- Use the **UP** or **DOWN** button to navigate through the warnings.

Info

The warnings that have occurred are saved in the display until they are no longer active.

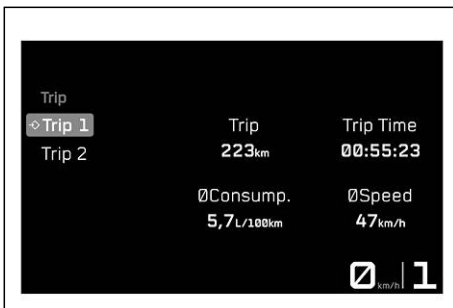
19.14 Trip Info



- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Trip** is highlighted. Press the **SET** button to open the menu.

General information on the odometer, riding time, average fuel consumption, and average speed can be accessed in the menu **Trip**.

19.15 Trip 1



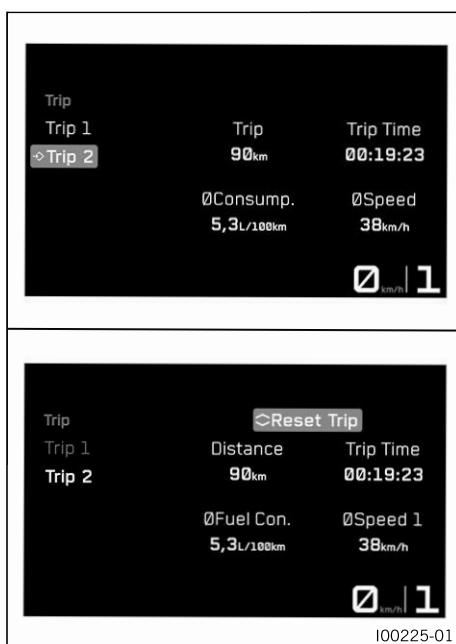
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Trip** is highlighted. Press the **SET** button to open the menu.
- Press **UP** or **DOWN** button until **Trip 1** is highlighted. Press the **SET** button to open the submenu.

Information on **Trip 1** can be viewed in the **Trip 1** submenu.

Info

Trip displays the distance since the last reset, e.g. between two refueling stops. **Trip** is running and counts up to **9999**. **Trip Time** shows the riding time on the basis of **Trip** and runs as soon as a speed signal is received. **ØConsump.** indicates the average fuel consumption based on **Trip**. **ØSpeed** indicates the average speed based on **Trip** and **Trip Time**. Press **Reset Trip** to reset all entries in the **Trip 1** menu.

19.16 Trip 2



- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Trip** is highlighted. Press the **SET** button to open the menu.
- Press **UP** or **DOWN** button until **Trip 2** is highlighted. Press the **SET** button to open the submenu.

Information on **Trip 2** can be viewed in the **Trip 2** submenu.

i Info

Trip displays the distance since the last reset, e.g. between two refueling stops. **Trip** is running and counts up to **9999**. **Trip Time** shows the riding time on the basis of **Trip** and runs as soon as a speed signal is received.

ØConsump. indicates the average fuel consumption based on **Trip**.

ØSpeed indicates the average speed based on **Trip** and **Trip Time**.

Press **Reset Trip** to reset all entries in the **Trip 2** menu.

19.17 Navigation (optional)



Condition

- **Bluetooth®** function is activated.
 - The **KTMconnect** app (optional) is installed and opened on a suitable cellphone (Android devices Version 7.0 and higher, iOS devices Version 13 and higher).
 - The combination instrument is connected to a suitable phone.
 - The GPS function is activated on the connected phone.
 - For voice navigation: The combination instrument is connected to a suitable headset and an appropriate language package has been downloaded in the **KTMconnect Navigation** app (optional).
- Press **SET** button when the menu is closed.
 - Press **UP** or **DOWN** button until **Navigation** is highlighted. Press the **SET** button to open the submenu.
 - Activate the menu item using the **UP** or **DOWN** button.

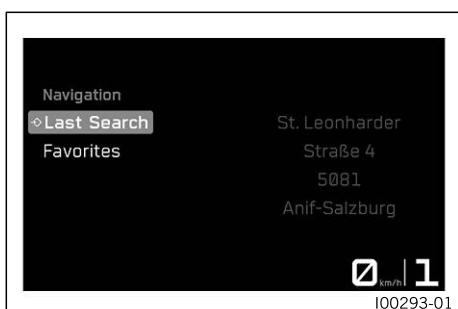
Press the **SET** button to switch the visual navigation on or off.

i Info

Voice navigation remains switched on if it has been activated.

The volume of the activated voice navigation is identical to the volume of the audio player on the cellphone. If the volume on the cellphone is changed, the volume of the activated voice navigation also changes.

19.18 Last search (optional)

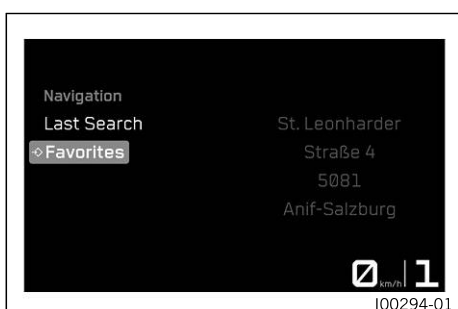
**Condition**

- **Bluetooth®** function is activated.
- The **KTMconnect** app (optional) is installed and opened on a suitable cellphone (Android devices Version 7.0 and higher, iOS devices Version 13 and higher).
- The combination instrument is connected to a suitable phone.
- The GPS function is activated on the connected phone.
- The addresses sought can be found in the **KTMconnect** app (optional).
 - Press **SET** button when the menu is closed.
 - Press **UP** or **DOWN** button until **Navigation** is highlighted. Press the **SET** button to open the submenu.
 - Activate the menu item using the **UP** or **DOWN** button.
 - Press **UP** or **DOWN** button until **Last search** is highlighted. Press the **SET** button to open the submenu.
 - Press **UP** or **DOWN** button to select an address.
 - Press the **SET** button to confirm the selection and start navigation.

Info

The last 10 addresses searched for in the **KTMconnect** app (optional) are saved in **Last search**.

19.19 Favorites (optional)

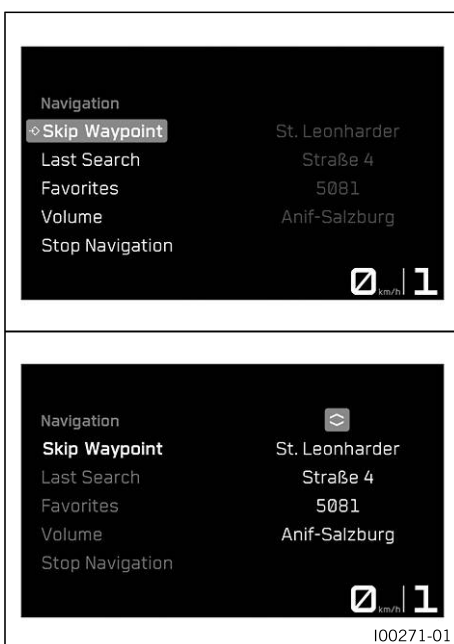
**Condition**

- **Bluetooth®** function is activated.
- The **KTMconnect** app (optional) is installed and opened on a suitable cellphone (Android devices Version 7.0 and higher, iOS devices Version 13 and higher).
- The combination instrument is connected to a suitable phone.
- The GPS function is activated on the connected phone.
- Favorites are saved in the **KTMconnect** app (optional).
 - Press **SET** button when the menu is closed.
 - Press **UP** or **DOWN** button until **Navigation** is highlighted. Press the **SET** button to open the submenu.
 - Activate the menu item using the **UP** or **DOWN** button.
 - Press **UP** or **DOWN** button until **Favorites** is highlighted. Press the **SET** button to open the submenu.
 - Press **UP** or **DOWN** button to select an address.
 - Press the **SET** button to confirm the selection and start navigation.

Info

10 addresses in the **KTMconnect** app (optional) can be stored in **Favorites**.

19.20 Skip Waypoint (optional)



Condition

- **Bluetooth®** function is activated.
- The **KTMconnect** app (optional) is installed and opened on a suitable cellphone.
- The combination instrument is connected to a suitable phone.
- The GPS function is activated on the connected phone.
- Navigation with at least one interim destination has been started in the **KTMconnect** app (optional).
 - Press **SET** button when the menu is closed.
 - Press **UP** or **DOWN** button until **Navigation** is highlighted. Press the **SET** button to open the submenu.
 - Activate the menu item using the **UP** or **DOWN** button.
 - Press **UP** or **DOWN** button until **Skip Waypoint** is highlighted. Press **SET** to select the waypoint.
 - Press the **SET** button again to confirm the selection and the waypoint is removed.

19.21 Volume (optional)



Condition

- The **KTMconnect** app (optional) is installed and opened on a suitable cellphone (Android devices Version 7.0 and higher, iOS devices Version 13 and higher).
- The combination instrument is connected to a suitable phone.
- For voice navigation: The combination instrument is connected to a suitable headset and an appropriate language package has been downloaded in the **KTMconnect** app (optional).
 - Press **SET** button when the menu is closed.
 - Press **UP** or **DOWN** button until **Navigation** is highlighted. Press the **SET** button to open the submenu.
 - Activate the menu item using the **UP** or **DOWN** button.



Warning

Danger of accidents Headphone volume which is too high distracts attention from traffic activity.

- Always select headphone volume which is low enough for you to still clearly hear acoustic signals.

- Press **UP** or **DOWN** button until **Volume** is highlighted. Press the **SET** button to open the submenu.
- Press the **UP** button to increase the volume of the activated voice navigation.
- Press the **DOWN** button to reduce the volume of the activated voice navigation.

19.22 Stop Navigation (optional)



Condition

- **Bluetooth®** function is activated.
- The **KTMconnect** app (optional) is installed and opened on a suitable cellphone (Android devices Version 7.0 and higher, iOS devices Version 13 and higher).
- The combination instrument is connected to a suitable phone.
 - Press **SET** button when the menu is closed.
 - Press **UP** or **DOWN** button until **Navigation** is highlighted. Press the **SET** button to open the submenu.
 - Activate the menu item using the **UP** or **DOWN** button.
 - Press **UP** or **DOWN** button until **Stop Navigation** is highlighted. Press **SET** button to confirm the selection.
 - Press **SET** button again to confirm the selection and end navigation.

19.23 Audio



Condition

- **Bluetooth®** function is activated.
- The combination instrument is connected to a suitable phone.
- The combination instrument is connected to a suitable headset or the **Headset Type Corded** is selected.
 - Press the **SET** button when the menu is closed.
 - Press **UP** or **DOWN** button until **KTMconnect** (optional) is marked. Press the **SET** button to open the menu.

**Warning**

Danger of accidents Headphone volume which is too high distracts attention from traffic activity.

- Always select headphone volume which is low enough for you to still clearly hear acoustic signals.

- Press **UP** or **DOWN** button until **Audio** is highlighted. Press the **SET** button to open the submenu.
- Press and hold the **UP** button to increase the audio volume.
- Press and hold **DOWN** button to reduce the audio volume.
- Press the **UP** button briefly to change to the next audio track.
- Briefly pressing the **DOWN** button twice changes to the previous audio title or plays the current audio title from the start, depending on the cellphone model.
- Press the **SET** button to play or pause the audio track.

**Info**

With some cellphones, the audio player needs to be started before playback is possible.

The audio function can be added to **Quick Selector 1** or **Quick Selector 2** for easier operation.

19.24 call

**Condition**

- **Bluetooth**® function is activated.
- The **Bluetooth**® function should also be activated in the device to be paired.
- The combination instrument is connected to a suitable phone.
- The combination instrument is connected to a suitable head-set.

**Warning**

Danger of accidents Headphone volume which is too high distracts attention from traffic activity.

- Always select headphone volume which is low enough for you to still clearly hear acoustic signals.

- Press the **SET** button to accept an incoming call.
- Press the **BACK** button to reject an incoming call.
- Press and hold the **UP** button to increase the audio volume.
- Press and hold **DOWN** button to reduce the audio volume.

**Info**

It is not possible to change the audio volume using the combination switch with every cellphone.

The call duration and contact are displayed. Depending on the cellphone settings, the contact is shown by name.

If necessary, accessing contacts must be enabled on the cellphone.

An incoming call is shown in a small window at the top of the combination instrument display when the navigation function is active.

You cannot navigate in the menu during an active phone conversation.

19.25 Call out

**Condition**

- **Bluetooth**® function is activated.
- The combination instrument is connected to a suitable phone.
- The combination instrument is connected to a suitable head-set.
- Press the **SET** button when the menu is closed.
- Press **UP** or **DOWN** button until **Call** appears. Press the **SET** button to open the menu.
- Press **UP** or **DOWN** button until **Last Calls** or **Favorites** is marked. Press the **SET** button to open the submenu.
- Press **UP** or **DOWN** button until the desired person is marked.
- Press **SET** button.
- ✓ The selected person is called.

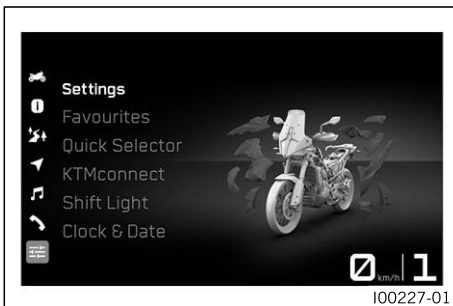
i Info

It is not possible to change the audio volume using the combination switch with every cellphone. The call duration and contact are displayed. Depending on the cellphone settings, the contact is shown by name.

Accessing contacts must be enabled on the cellphone. An incoming call is shown in a small window at the top of the combination instrument display when the navigation function is active.

You cannot navigate in the menu during an active phone conversation.

19.26 Settings

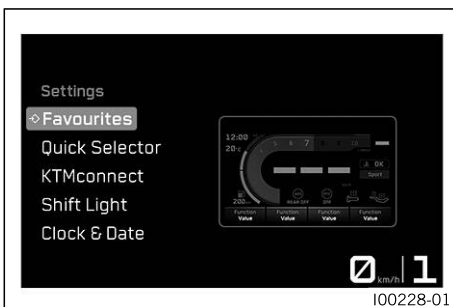


Condition

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is highlighted. Press the **SET** button to open the menu.

In the **Settings** menu, favorites, quick selections, **KTMconnect** (optional), and the shift warning light can be configured. Settings can be made for units or various values. Several functions can be enabled or disabled.

19.27 Favorites

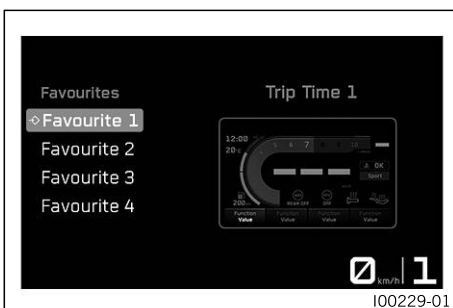


Condition

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is highlighted. Press the **SET** button to open the menu.
- Press **UP** or **DOWN** button until **Favorites** is highlighted. Press the **SET** button to open the submenu.
- Access menu item with the **UP** or **DOWN** button, and add the selected information to the **SET** display using the **Favorites** button.

Up to four sets of information can be selected in the **Favorites** menu.

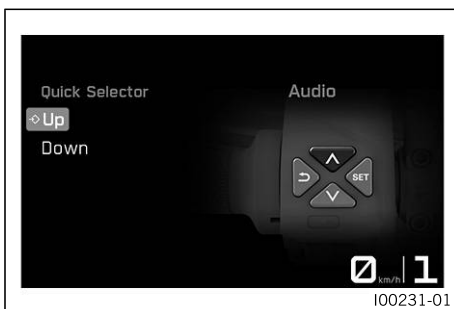
19.28 Favorites-Anzeige 1-4



Condition

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is highlighted. Press the **SET** button to open the menu.
- Press **UP** or **DOWN** button until **Favorites** is highlighted. Press the **SET** button to open the menu.
- Press **UP** or **DOWN** button to select **Favorite 1**, **Favorite 2**, **Favorite 3**, or **Favorite 4**. Press the **SET** button to open the menu.
- Press **UP** or **DOWN** button to select the desired information. Press the **SET** button to confirm the selection.

19.29 Quick Selector 1



Condition

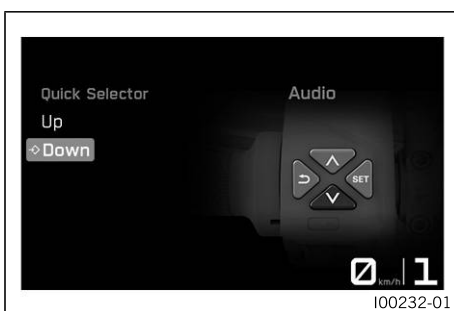
- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is highlighted.
- Press **SET** button to open the menu.
- Press **UP** or **DOWN** button until **Quick Selector 1** is highlighted. Press the **SET** button to open the menu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to set a direct selection submenu for **Quick Selector 1**.



Info

When the menu is closed, the submenu defined in **Quick Selector 1** is opened by pressing the **UP** button.

19.30 Quick Selector 2



Condition

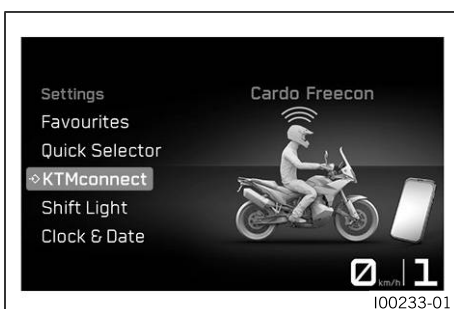
- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is highlighted.
- Press **SET** button to open the menu.
- Press **UP** or **DOWN** button until **Quick Selector 2** is highlighted. Press the **SET** button to open the menu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to set a direct selection submenu for **Quick Selector 2**.



Info

When the menu is closed, the submenu defined in **Quick Selector 2** is opened by pressing the **DOWN** button.

19.31 KTMconnect (optional)



Condition

- The motorcycle is stationary.
- **Bluetooth**® function is activated.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **KTMconnect** (optional) is marked. Press the **SET** button to open the menu.

In the **KTMconnect** menu (optional), a suitable cellphone or headset can be paired with the combination instrument via **Bluetooth**® and the audio function and navigation function can be configured.

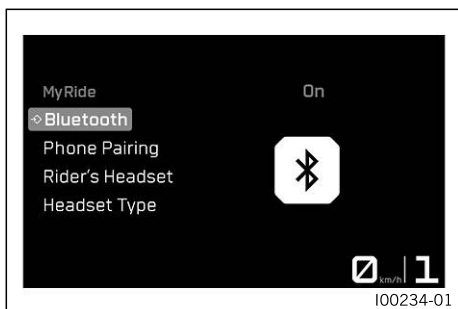


Info

Not every cellphone or headset is suitable for pairing with the combination instrument.

The standard **Bluetooth**® 2.1 must be supported.

19.32 Bluetooth

**Condition**

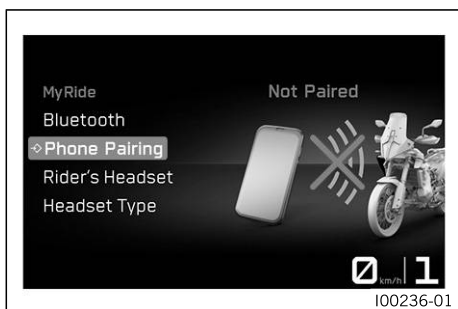
- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is highlighted.
- Press **SET** button to open the menu.
- Press **UP** or **DOWN** button until **KTMconnect** (optional) is marked. Press the **SET** button to open the menu.
- Press **UP** or **DOWN** button until **Bluetooth** is highlighted. Press the **SET** button to open the submenu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to switch the **Bluetooth**® function on or off.

i Info

The **Bluetooth**® function must be activated to pair a suitable phone or headset with the vehicle.

Not every phone and headset is suitable for pairing with the vehicle.

19.33 Pairing

**Condition**

- The motorcycle is stationary.
- **Bluetooth**® function is activated.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is highlighted. Press the **SET** button to open the menu.
- Press **UP** or **DOWN** button until **KTMconnect** (optional) is marked. Press the **SET** button to open the menu.
- Press **UP** or **DOWN** button until **Phone Pairing** is highlighted. Press the **SET** button to open the submenu.

i Info

Only one cellphone can be paired with the vehicle.

- Press **UP** or **DOWN** button until **New Pairing** is marked. Press the **SET** button to open the menu.
- The vehicle starts searching for a suitable cellphone. If the search was successful, the name of the cellphone is displayed in the **New Pairing** menu. Press the **SET** button to start the pairing.

i Info

The cellphone must be visible via **Bluetooth**® for the vehicle to find the cellphone.

- A message appears on the combination instrument indicating that the vehicle is now ready for pairing. The pairing is completed successfully by confirming the **Passkey** on the cellphone and on the combination instrument.

**Info**

Press the **UP** or **DOWN** button until **Delete Pairing** is highlighted. The paired device can be deleted by pressing the **SET** button.

Not every cellphone is suitable for pairing with the vehicle.

- Move the previously paired device into the range of the vehicle while the **Bluetooth®** function is active.
 - ✓ The device is automatically connected with the vehicle.
 - ✗ If the device is not automatically connected with the vehicle after approx. 30 seconds:
 - Switch on the vehicle again or repeat the **New Pairing** procedure.

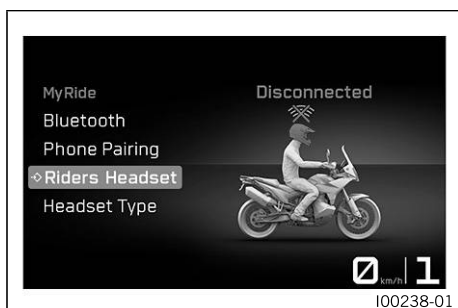
A suitable cellphone can be paired with the combination instrument in the **Phone Pairing** submenu via **Bluetooth®**.

**Info**

Not every cellphone or headset is suitable for pairing with the combination instrument.

Make sure that the end device is in the correct pairing mode for call management. If the end device is only paired for media playback, the call function may not work.

19.34 Riders Headset (optional)

**Condition**

- The motorcycle is stationary.
- **Bluetooth®** function is activated.
- The **Bluetooth®** function should also be activated in the device to be paired.
 - Press the **SET** button when the menu is closed.
 - Press the **UP** or **DOWN** button until **Settings** is highlighted. Press the **SET** button to open the menu.
 - Press **UP** or **DOWN** button until **KTMconnect** (optional) is marked. Press the **SET** button to open the menu.
 - Press **UP** or **DOWN** button until **Riders Headset** is highlighted. Press the **SET** button to open the menu.
 - Press **UP** or **DOWN** button until **New Pairing** is marked. Press the **SET** button to open the menu.
- The vehicle starts searching for a suitable headset. If the search was successful, the name of the rider's headset is displayed in the **New Pairing** submenu. Press the **SET** button to start the pairing.

**Info**

The headset must be in pairing mode for the vehicle to find the headset. Follow the instructions in the headset owner's manual.

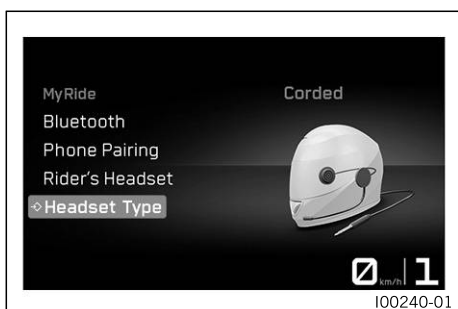
Press the **UP** or **DOWN** button until **Delete Pairing** is highlighted. The paired device can be deleted by pressing the **SET** button.

Not every headset is suitable for pairing with the vehicle.

- Move the previously paired device into the range of the vehicle while the **Bluetooth®** function is active.
 - ✓ The device is automatically connected with the vehicle.
 - ✗ If the device is not automatically connected with the vehicle after approx. 30 seconds:
 - Switch on the vehicle again or repeat the **New Pairing** procedure.

In the **Riders Headset** menu, a suitable rider headset can be paired with the vehicle.

19.35 Headset Type (optional)



Condition

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is highlighted. Press the **SET** button to open the menu.
- Press **UP** or **DOWN** button until **KTMconnect** (optional) is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Headset Type** is highlighted. Press the **SET** button to change the rider headset type.

The connection mode for the rider headset can be selected in the **Headset Type** menu.

The headset is connected to the vehicle wirelessly via **Bluetooth®** in **Bluetooth Headset** mode.

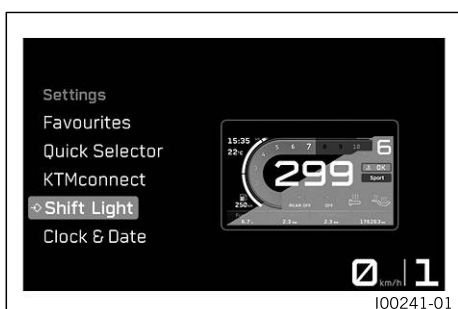
The headset is connected directly to the smartphone in **Corded Headset** mode.



Info

The **Riders Headset** menu item is only available in **Headset Type Bluetooth**.

19.36 Shift Light

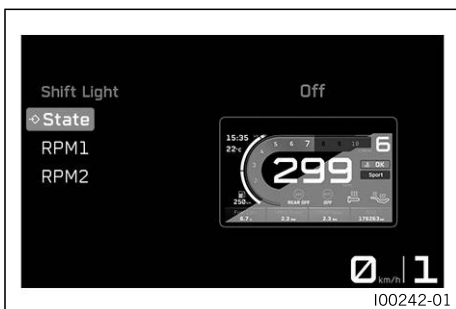


Condition

- The motorcycle is stationary.
- **ODO** > 1,000 km (621 mi).
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is highlighted. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Shift Light** is highlighted. Press the **SET** button to open the submenu.

The shift warning light can be configured in the **Shift Light** submenu.

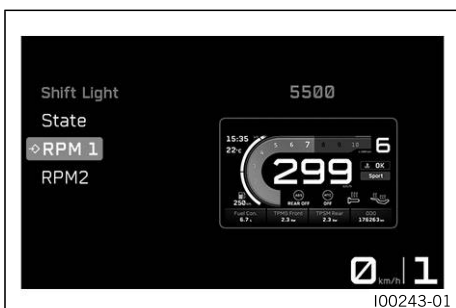
19.37 Shift Light State



Condition

- The motorcycle is stationary.
- **ODO** > 1,000 km (621 mi).
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is highlighted. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Shift Light** is highlighted. Press the **SET** button to open the submenu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to switch the shift warning light on or off.

19.38 RPM1



Condition

- The motorcycle is stationary.
- **ODO** > 1,000 km (621 mi).
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is highlighted. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Shift Light** is highlighted. Press the **SET** button to open the submenu.
- Press the **UP** or **DOWN** button until **RPM1** is highlighted. Press the **SET** button to open the submenu.
- Activate the menu item using the **UP** or **DOWN** button.
- Set the value for **SET** by pressing the **RPM1** button.



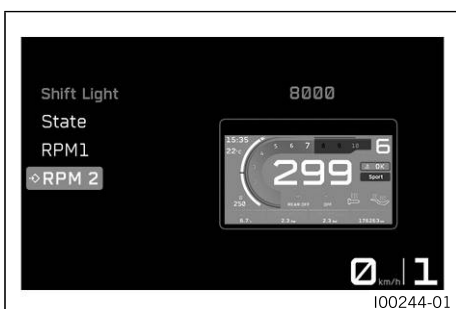
Info

RPM1 can be set in intervals of 500 between 5,500 and 10,000 rpm.

RPM1 must not be larger than **RPM2**.

If the engine speed reaches the set value **RPM1**, the shift warning light flashes.

19.39 RPM2



Condition

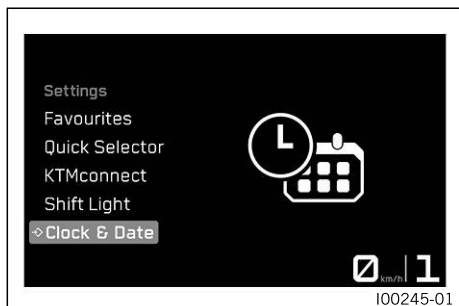
- The motorcycle is stationary.
- **ODO** > 1,000 km (621 mi).
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is highlighted. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Shift Light** is highlighted. Press the **SET** button to open the submenu.
- Press the **UP** or **DOWN** button until **RPM2** is highlighted. Press the **SET** button to open the submenu.
- Activate the menu item using the **UP** or **DOWN** button.
- Set the value for **SET** by pressing the **RPM2** button.

**Info**

RPM2 can be set in intervals of 500 between 7,000 and 10,000 rpm.

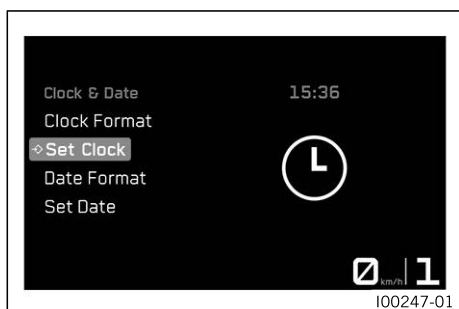
RPM2 must not be smaller than **RPM1**.

If the engine speed reaches the set value **RPM2**, the shift warning light flashes and the color changes.

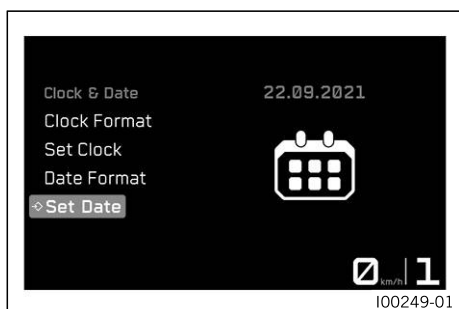
19.40 Setting the time and date**Condition**

The motorcycle is stationary.

- Press the **SET** button when the menu is closed.
- Press **UP** or **DOWN** button until **Settings** appears. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Clock & Date** is highlighted. Press the **SET** button to open the submenu.

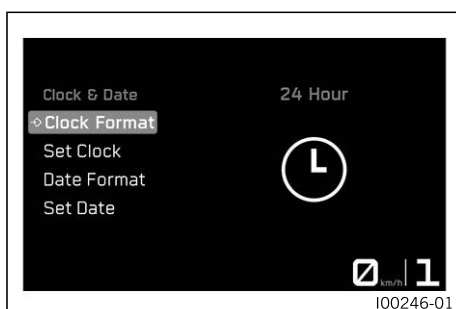
**Setting the clock**

- Press the **UP** or **DOWN** button until **Set Clock** is highlighted.
- Press the **SET** button to open the menu.
- Press **UP** or **DOWN** button until **Hours** is highlighted.
- Press the **SET** button to open the menu.
- Press **UP** or **DOWN** button until the current hour is set. Press **SET** button to select the hour.
- Press **UP** or **DOWN** button until **Minutes** is highlighted.
- Press the **SET** button to open the menu.
- Press **UP** or **DOWN** button until the current minute is set. Press **SET** button to select the minute.
- Press **BACK** button to exit the menu.

**Setting the date**

- Press **UP** or **DOWN** button until **Set Date** is highlighted.
- Press the **SET** button to open the menu.
- Press **UP** or **DOWN** button until **Day** is highlighted.
- Press the **SET** button to open the menu.
- Press **UP** or **DOWN** button until the current day is set. Press **SET** button to select the day.
- Press **UP** or **DOWN** button until **Month** is highlighted.
- Press the **SET** button to open the menu.
- Press **UP** or **DOWN** button until the current month is set. Press **SET** button to select the month.
- Press **UP** or **DOWN** button until **Year** is highlighted.
- Press the **SET** button to open the menu.
- Press **UP** or **DOWN** button until the current year is set. Press **SET** button to select the year.
- Press **BACK** button to exit the menu.

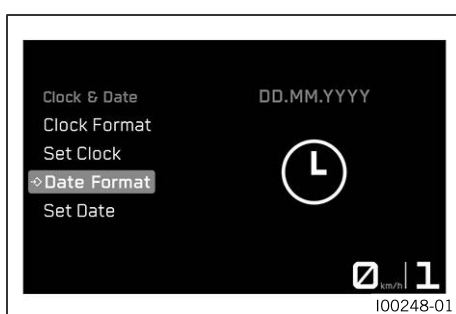
19.41 Clock Format



Condition

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is highlighted. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Clock & Date** is highlighted. Press the **SET** button to open the submenu.
- Press the **UP** or **DOWN** button until **Clock Format** is highlighted. Press the **SET** button to open the menu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to select the time format.

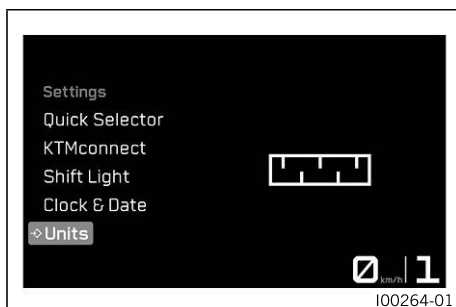
19.42 Date Format



Condition

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is highlighted. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Clock & Date** is highlighted. Press the **SET** button to open the submenu.
- Press the **UP** or **DOWN** button until **Date Format** is highlighted. Press the **SET** button to open the menu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to select the date format.

19.43 Units

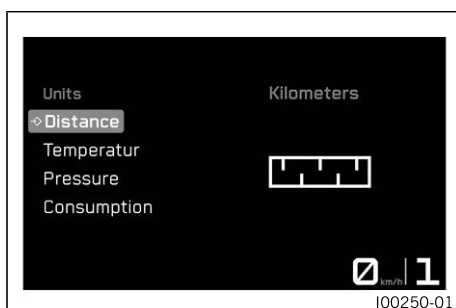


Condition

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is highlighted. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Units** is highlighted. Press **SET** button to open the submenu.

The **Units** submenu allows settings to be made for units or various values.

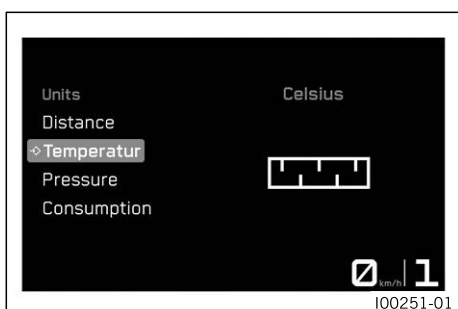
19.44 Distance



Condition

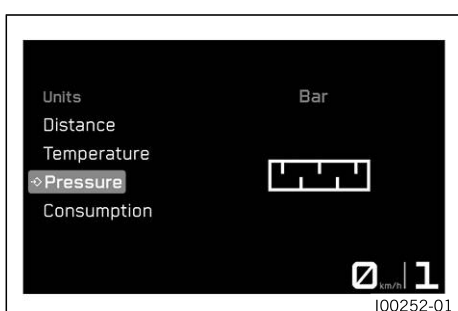
- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is highlighted. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Units** is highlighted. Press **SET** button to open the submenu.
- Press **UP** or **DOWN** button until **Distance** is highlighted. Press the **SET** button to open the submenu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to confirm the desired unit.

19.45 Temperature

**Condition**

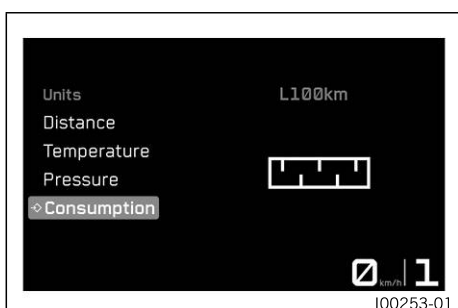
- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is highlighted. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Units** is highlighted. Press **SET** button to open the submenu.
- Press **UP** or **DOWN** button until **Temperature** is highlighted. Press the **SET** button to open the submenu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to confirm the desired unit.

19.46 Pressure

**Condition**

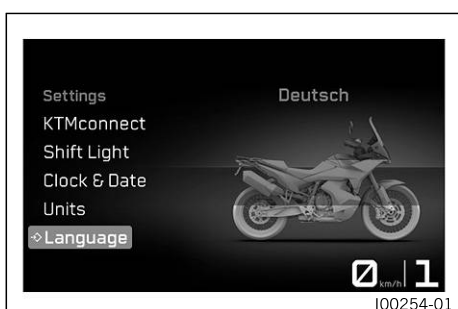
- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is highlighted. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Units** is highlighted. Press **SET** button to open the submenu.
- Press **UP** or **DOWN** button until **Pressure** is highlighted. Press the **SET** button to open the submenu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to confirm the desired unit.

19.47 Consumption

**Condition**

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is highlighted. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Units** is highlighted. Press **SET** button to open the submenu.
- Press **UP** or **DOWN** button until **Consumption** is highlighted. Press the **SET** button to open the submenu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to confirm the desired unit.

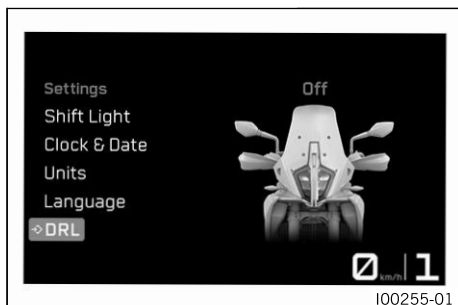
19.48 Language

**Condition**

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is highlighted. Press **SET** button to open the menu.
- Press **UP** or **DOWN** button until **Language** is highlighted. Press the **SET** button to open the submenu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to confirm the desired language.

**Info**

The menu languages are US English, UK English, German, Italian, French, and Spanish.

19.49 DRL**Condition**

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is highlighted.
- Press **SET** button to open the menu.
- Press **UP** or **DOWN** button until **DRL** is highlighted. Press the **SET** button to open the submenu.

**Warning**

Danger of accidents When visibility is poor, the daytime running light is not a substitute for the low beam.

Automatic switching between the daytime running light and low beam may only be partially available when visibility is significantly impaired due to fog, snow or rain.

- Ensure that the appropriate type of lighting is always selected.
- If necessary switch off the daytime running lights using the menu before going on a ride or when stopped so that the low beam is switched on permanently.
- Make sure that the daytime running light is deactivated with the diagnostics tool when the menu item is not available, but the low beam is required.
- Note the legal regulations regarding the daytime running light.

- Activate the menu item using the **UP** or **DOWN** button.
- Press **SET** button to switch the daytime running light on or off.

19.50 Heating (function optional)**Condition**

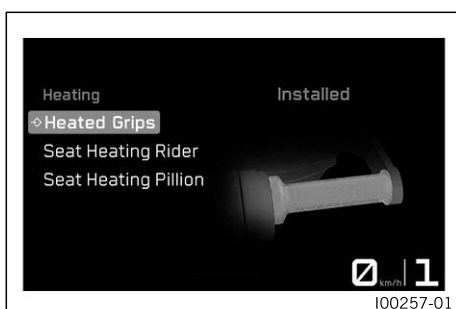
- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is highlighted. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Heating** is highlighted. Press **SET** button to open the submenu.

The heated grip, rider seat heating and passenger seat heating can be configured in the **Heating** submenu.

**Info**

In the **Settings** menu, the **Heating** submenu solely controls the visibility of **Heated Grips** and **Seat Heating** in the **Motorcycle** menu.

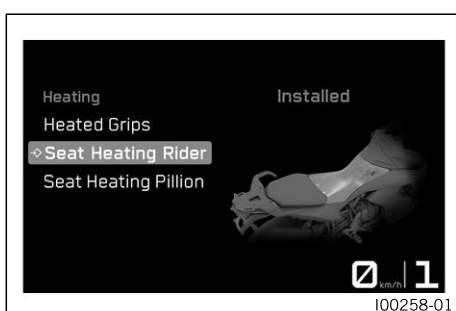
19.51 Heated Grips (function optional)



Condition

- Model with heated grip.
- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is highlighted. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Heating** is highlighted. Press **SET** button to open the submenu.
- Press **UP** or **DOWN** button until **Heated Grips** is highlighted. Press the **SET** button to open the submenu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to switch the heated grip on or off.

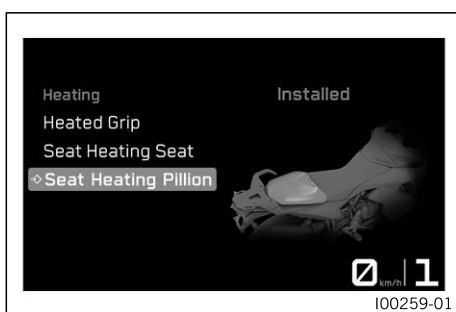
19.52 Seat Heating Rider (function optional)



Condition

- Model with seat heater.
- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is highlighted. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Heating** is highlighted. Press **SET** button to open the submenu.
- Press **UP** or **DOWN** button until **Seat Heating Rider** is highlighted. Press the **SET** button to open the submenu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to switch the front rider's seat heating on or off.

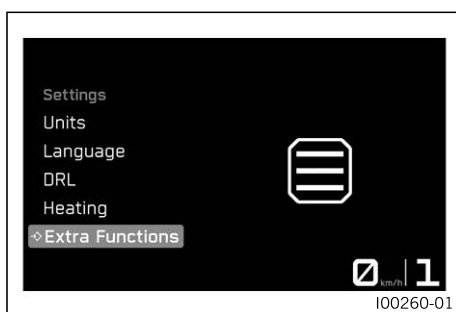
19.53 Seat Heating Pillion (function optional)



Condition

- Model with seat heater.
- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is highlighted. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Heating** is highlighted. Press **SET** button to open the submenu.
- Press **UP** or **DOWN** button until **Seat Heating Pillion** is highlighted. Press the **SET** button to open the submenu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to switch the passenger seat heating on or off.

19.54 Extra Functions



Condition

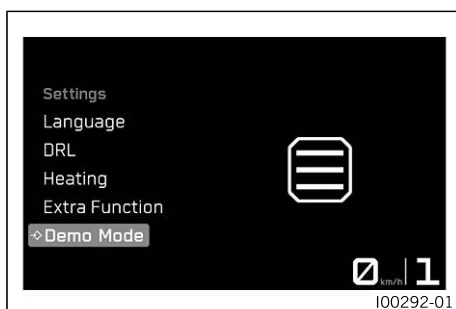
- The motorcycle is stationary.
- Motorcycle with optional supplementary function.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is highlighted.
- Press **SET** button to open the menu.
- Press **UP** or **DOWN** button until **Extra Functions** is highlighted. Press the **SET** button to open the submenu.
- Use the **UP** or **DOWN** button to navigate through the extra functions.



Info

The optional extra functions are listed. The current **KTM PowerParts** and available software are listed on the KTM website.

19.55 Demo Mode



Condition

- The motorcycle is stationary.
- Motorcycle with demo mode.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is highlighted.
- Press **SET** button to open the menu.
- Press **UP** or **DOWN** button until **Demo Mode** is highlighted. Press the **SET** button to open the submenu.
- Use the **UP** or **DOWN** button to navigate through the demo mode functions.



Info

The activated demo mode functions (📖 p. 226) are listed.

Once the demo mode expires, the optional software functions are available from an authorized KTM dealer.

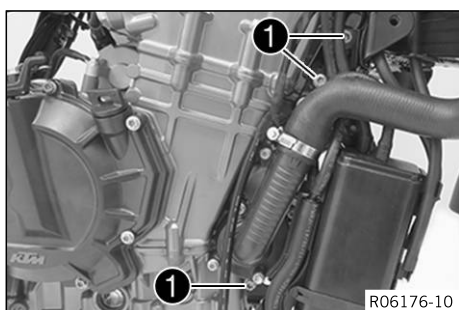
20.1 Removing the engine

Preparatory work

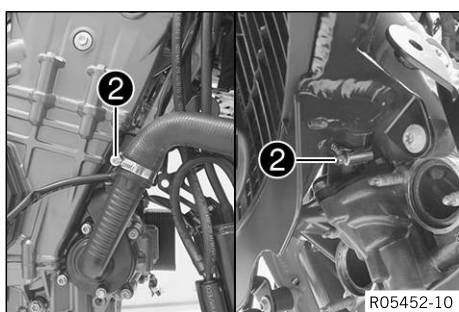
- Remove the seat. (📖 p. 120)
- Disconnect the negative cable of the 12-V battery. (📖 p. 189)
- Remove main silencer. (📖 p. 106)
- Raise motorcycle with rear lifting gear. (📖 p. 15)
- Remove the left side cover. (📖 p. 137)
- Remove the battery cover. (📖 p. 138)
- Remove left fuel tank spoiler. (📖 p. 139)
- Remove the right side cover. (📖 p. 137)
- Remove right fuel tank spoiler. (📖 p. 141)
- Remove the engine guard. (📖 p. 143)
- Remove the fuel tank. (📖 p. 120)
- Remove the exhaust system. (📖 p. 107)
- Drain the coolant. (📖 p. 383)

Main work

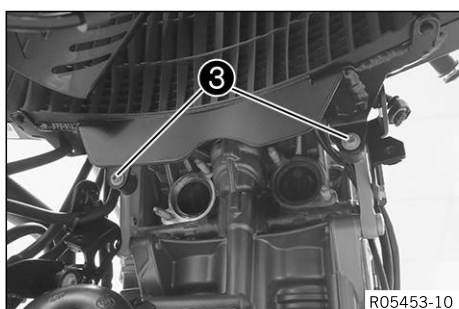
- Remove screws **1**.
- Hang the activated charcoal filter to the side.



- Release hose clips **2**.
- Pull off the radiator hoses.

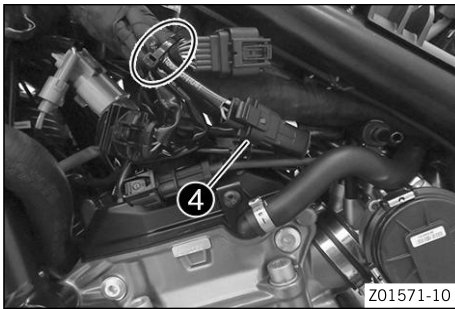


- Remove **3** screws.
- Swing the radiator forward.

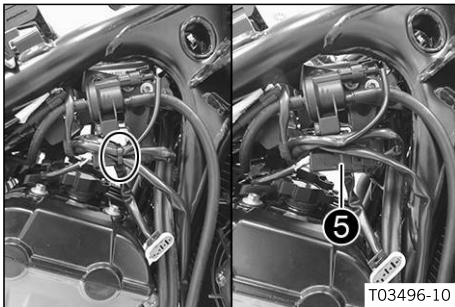


i Info

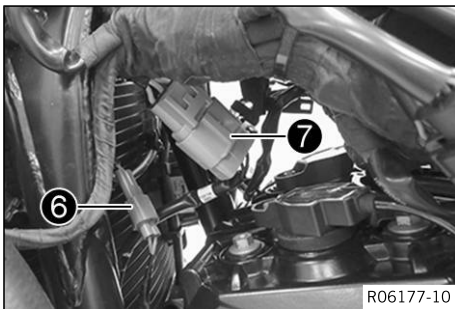
Pay attention to the cooling fins.



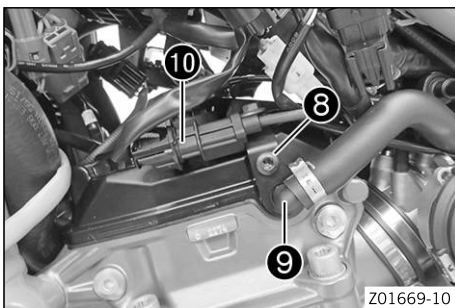
- Remove the cable tie.
- Disconnect plug-in connector **4**.



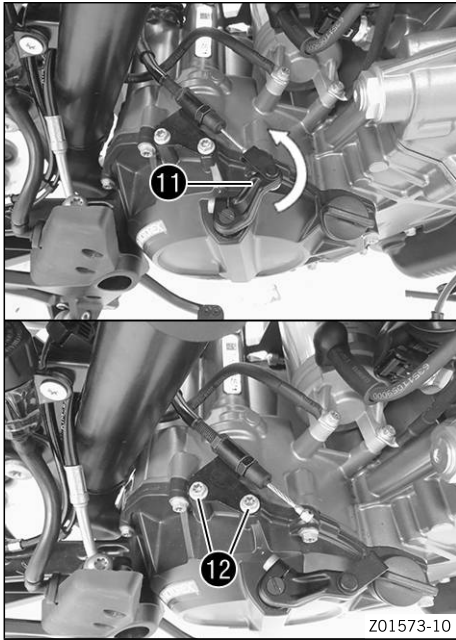
- Remove the cable tie.
- Pull off and disconnect plug-in connector **5** from the holder.



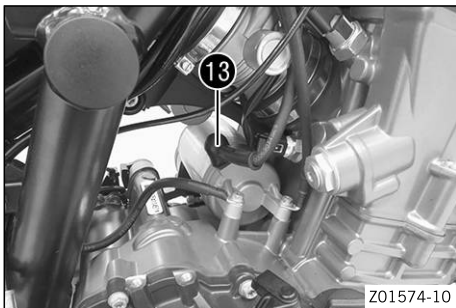
- Disconnect plug-in connectors **6** and **7**.



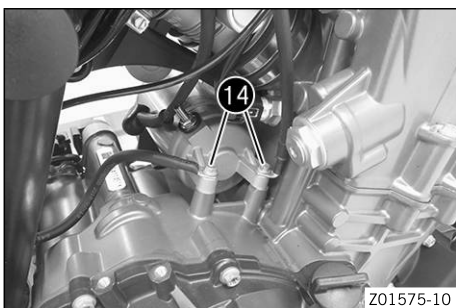
- Remove screw **8**.
- Pull off bleeder flange **9**.
- Pull out plug-in connection **10**.



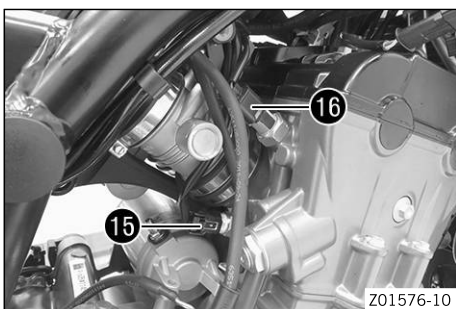
- Swivel clutch release lever **11** counterclockwise and detach the inner clutch cable.
- Remove screws **12**.
- Hang the inner clutch cable with bracket to the side.



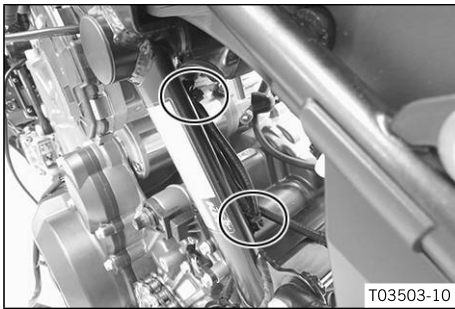
- Push back protection cap **13** and remove the nut.
- Hang the positive cable to the side.



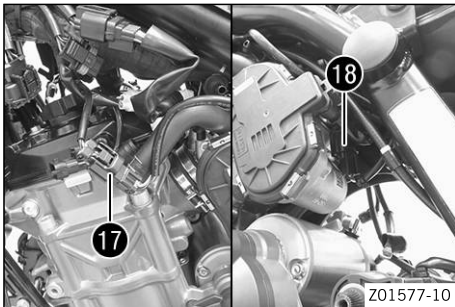
- Remove screws **14**.
- Hang the ground wire to the side.



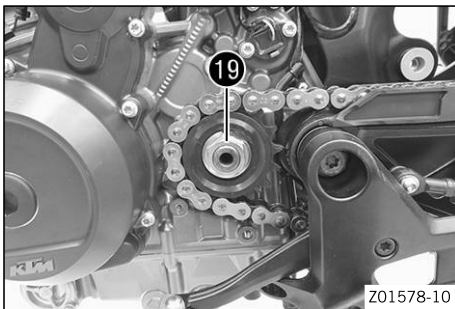
- Disconnect connector **15** of the coolant temperature sensor.
- Unplug connector **16** of the oil pressure sensor.



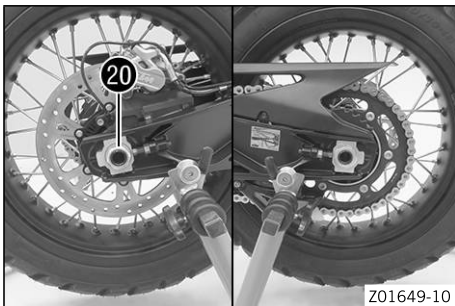
- Remove the cable ties.



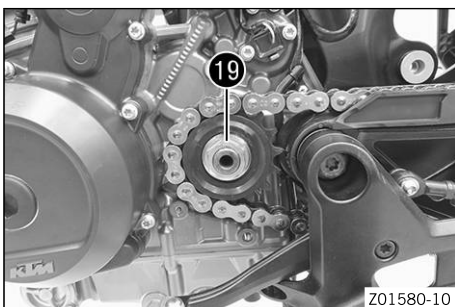
- Disconnect plug-in connectors **17** and **18**.
- Expose the cable.



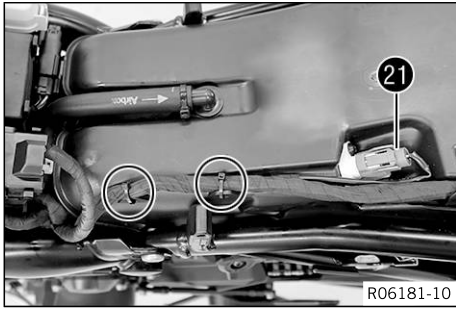
- Bend up the lock washer.
- Have an assistant operate the rear brake.
- Loosen nut **19**.



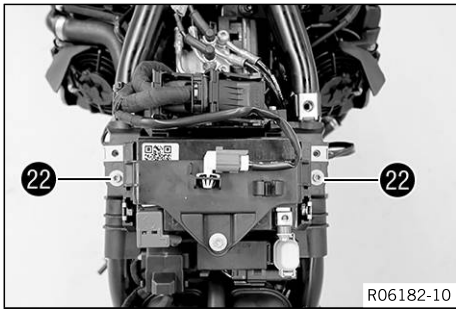
- Remove nut **20**.
- Remove the chain adjuster.
- Push the rear wheel into the foremost position.



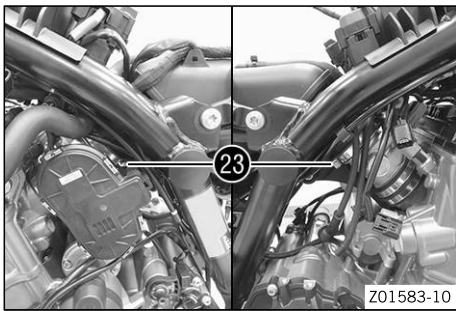
- Remove nut **19** with the lock washer.
- Take off the engine sprocket.



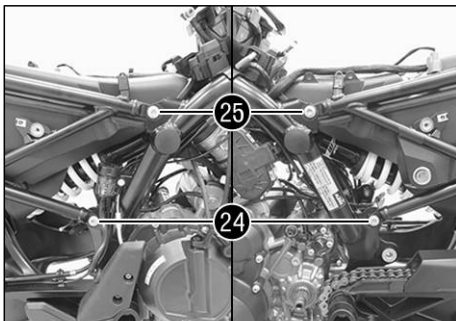
- Remove the cable ties.
- Unplug connector 21.



- Remove screws 22.

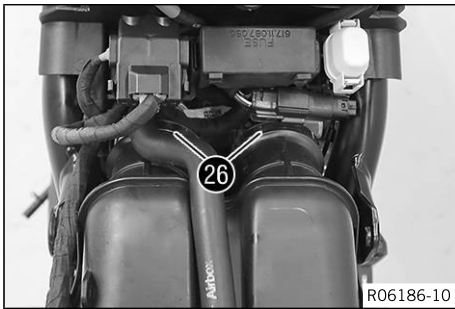


- Release hose clips 23.

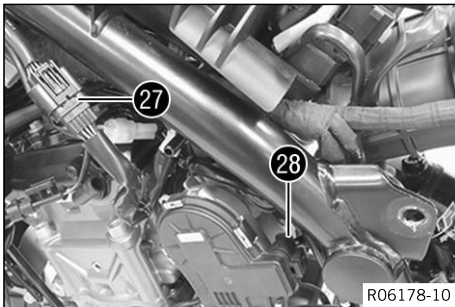


- Loosen screws 24.
- Remove screws 25.
- Swivel the subframe downward.





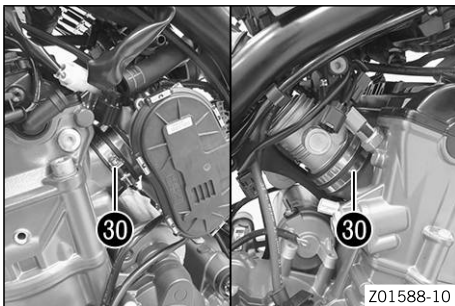
- Remove hose clips 26.



- Disconnect plug-in connector 27.
- Unplug connector 28.



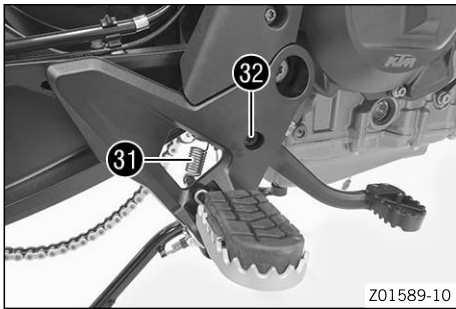
- Pull off hose 29.



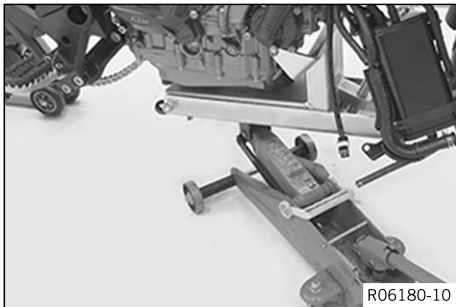
- Loosen hose clips 30.



- Pull off the throttle valve body toward the rear and remove to the side.



- Detach spring 31.
- Remove fitting 32.
- Remove the foot brake lever.



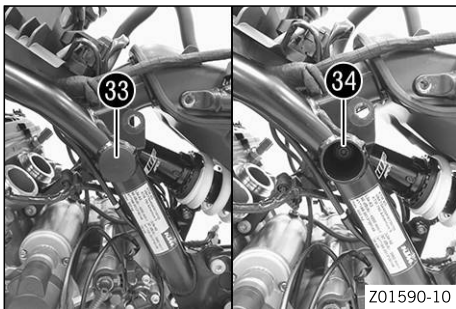
- Position the floor jack with the special tool.

Floor jack attachment (63529055000) (📖 p. 470)

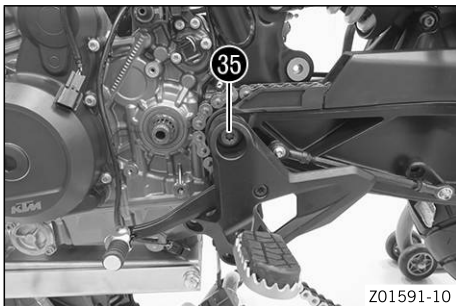
i Info

It is a good idea to have assistance when carrying out the following steps.

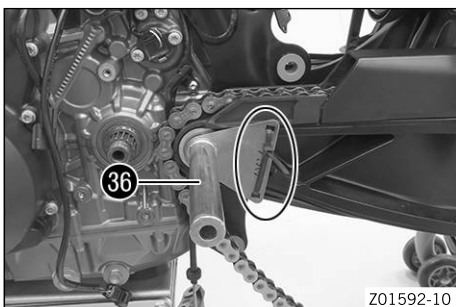
- Mount floor jack with suitable screws on the engine and align with the rubber supports.



- Remove protection cap 33.
- Loosen screw 34.

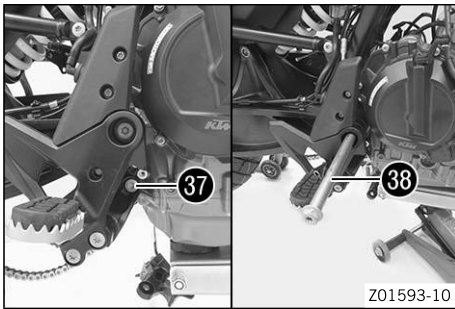


- Remove screw 35.
- Remove the footrest bracket.

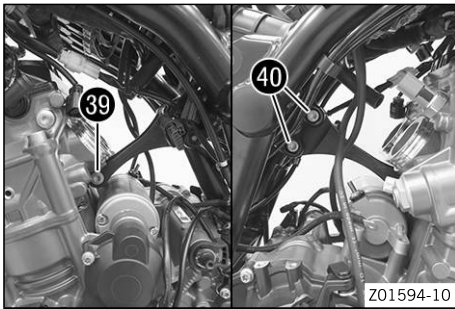


- Mount special tool 36 and secure with a cable tie.

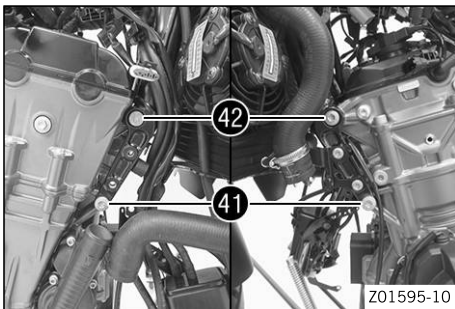
Socket pin (63529055090) (📖 p. 470)



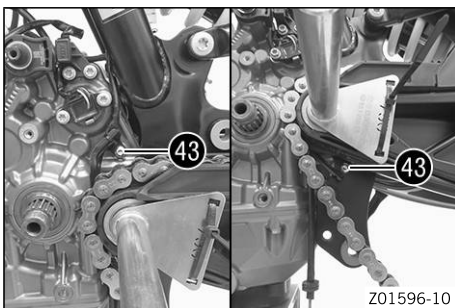
- Remove screw 37.
- Pull out swingarm pivot 38 far enough so that the engine is released but the link fork remains secured.



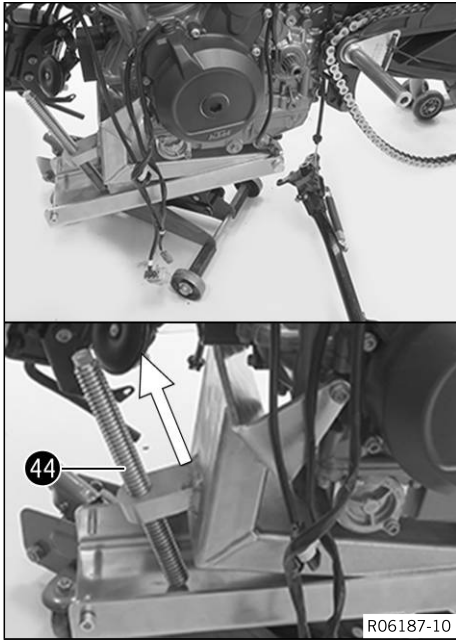
- Remove screw 39.
- Remove 40 screws.
- Take off the engine bearer.



- Remove screws 41.
- Remove screws 42.



- Remove screws 43.



- Turn screw 44 to swivel the engine so that it is released from the frame.
- Lower the engine.
- Turn engine and remove it, pulling it to the side.

i Info

The help of an assistant is useful in this step.
 Make sure that the motorcycle is sufficiently secured against falling over.
 Protect the components against damage by covering them.

20.2 Installing the engine

Preparatory work

- Lift the engine onto the special tool and secure it.

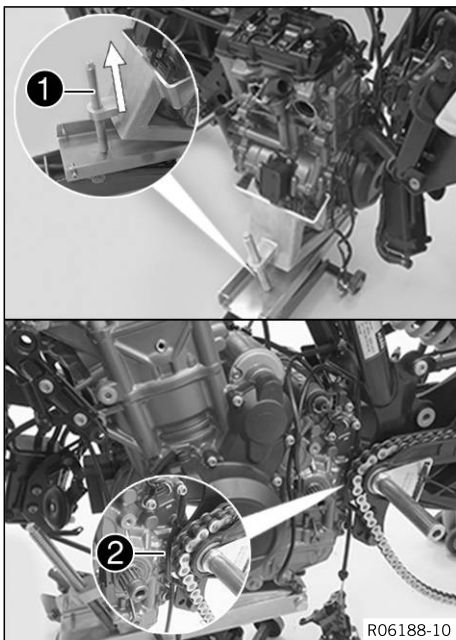
Floor jack attachment (63529055000) (📖 p. 470)

Main work

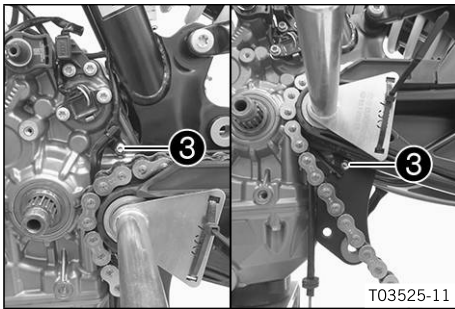
- Position the engine in the frame.

i Info

It is a good idea to have assistance when carrying out the following steps.
 Make sure that the motorcycle is sufficiently secured against falling over.
 Cover the components to protect them against damage.



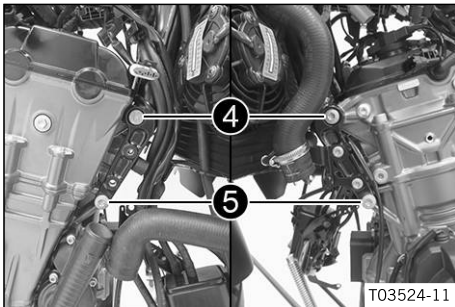
- Turn screw 1 to swivel the engine and position in the frame.
- Position cable guide 2 between the engine and the link fork.



- Mount and tighten screws **3**.

Guideline

Remaining screws, chassis	M5	5 Nm (3.7 lbf ft)
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- Mount screws **4**, but do not tighten yet.

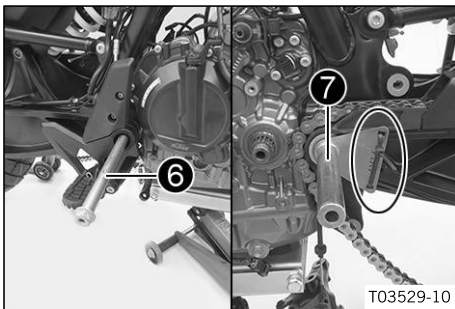
Guideline

Screw, engine bracket	M10	45 Nm (33.2 lbf ft) Loctite®243™
-----------------------	-----	--

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

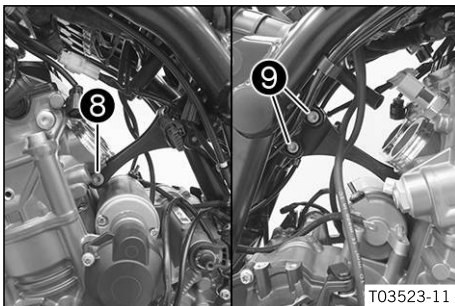
Guideline

Screw, engine bracket	M10	45 Nm (33.2 lbf ft) Loctite®243™
-----------------------	-----	--



- Remove the cable tie.
- Mount swingarm pivot **6** and remove special tool **7**.

Socket pin (63529055090) (📖 p. 470)



- Position the engine bearer.
- Mount screw **8**, but do not tighten it yet.

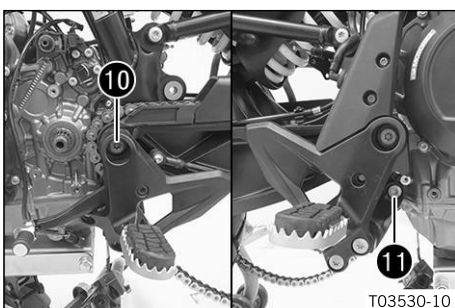
Guideline

Screw, engine bracket	M10	45 Nm (33.2 lbf ft) Loctite®243™
-----------------------	-----	--

- Mount screws **9**, but do not tighten yet.

Guideline

Screw, engine fixing arm linkage bracket	M8	25 Nm (18.4 lbf ft) Loctite®243™
--	----	--



- Position the footrest support.
- Mount screw **10**, but do not tighten it yet.

Guideline

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

i Info

The left screw of the swingarm pivot is only tightened after installing the exhaust system.

- Mount and tighten screw **11**.

Guideline

Screw, front footrest bracket	M10x40	45 Nm (33.2 lbf ft) Loctite®243™
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- Tighten screws **9**.

Guideline

Screw, engine fixing arm linkage bracket	M8	25 Nm (18.4 lbf ft) Loctite®243™
--	----	--

- Tighten screws **8**, **5**, and **4**.

Guideline

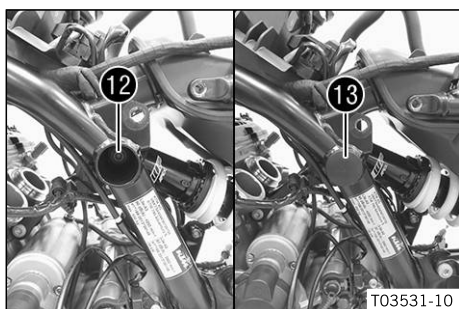
Screw, engine bracket	M10	45 Nm (33.2 lbf ft) Loctite®243™
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- Remove screw **12**.
- Mount and tighten screw **12**.

Guideline

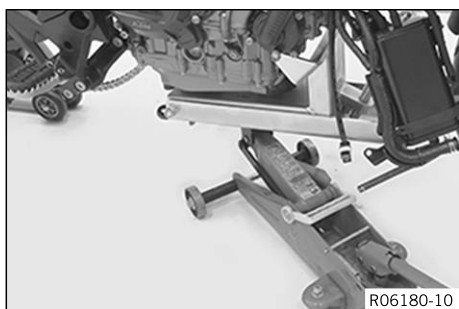
Screw, top shock absorber	M12	80 Nm (59 lbf ft) Loctite®2701™
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- Mount protection cap **13**.



- Remove the floor jack with the special tool.

Floor jack attachment (63529055000) (📖 p. 470)
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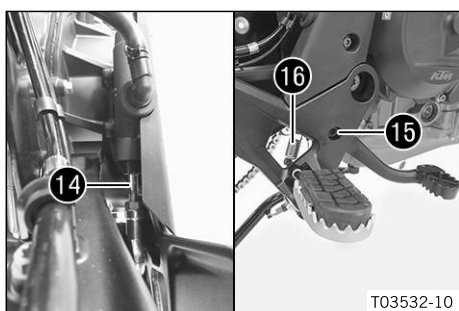


- Position the foot brake lever.
- ✓ Push rod **14** engages in the foot brake cylinder.
- Mount and tighten fitting **15**.

Guideline

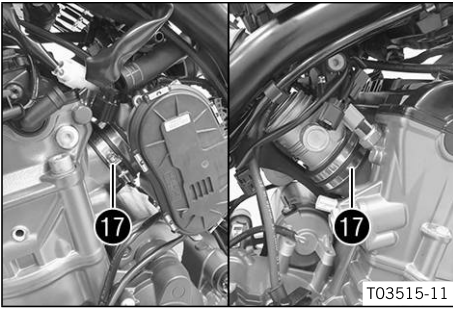
Foot brake lever, fitting	M8	25 Nm (18.4 lbf ft) Loctite®2701™
---------------------------	----	---

- Attach spring **16**.

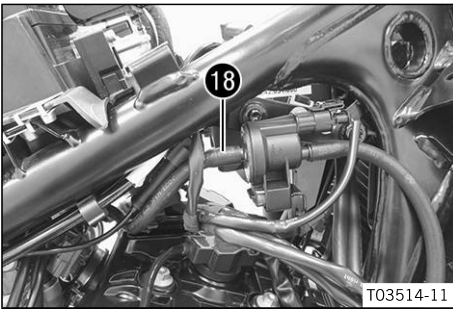


- Position the throttle valve body.

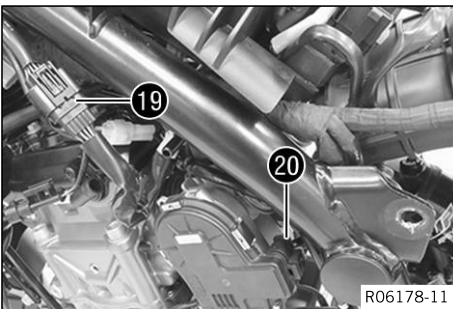




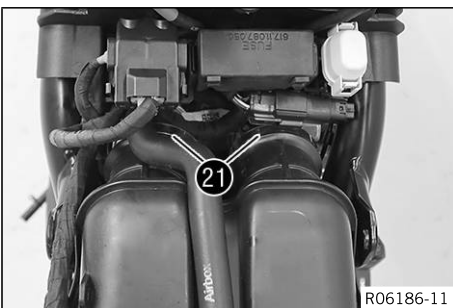
- Tighten hose clips 17.



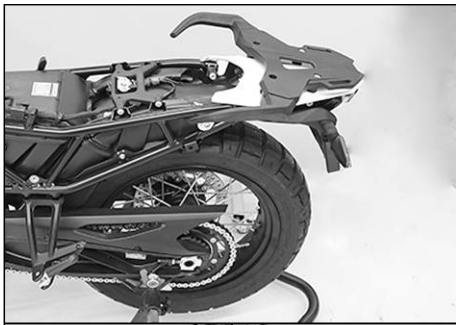
- Mount hose 18.



- Join plug-in connector 19.
- Plug in connector 20.



- Position hose clips 21.



- Position the subframe.



Info

Watch out for the intake flanges.

- Mount and tighten screws 22.

Guideline

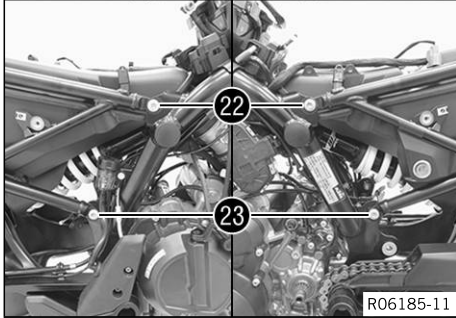
Screw, sub-frame	M10	50 Nm (36.9 lbf ft) Loctite®243™
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- Remove screws 23.

- Mount and tighten screws 23.

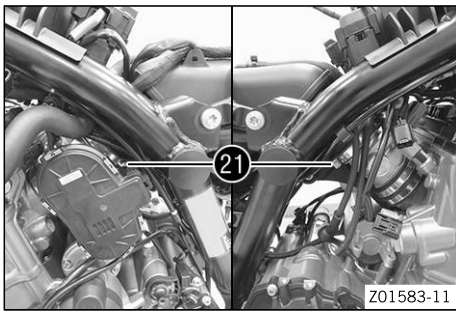
Guideline

Screw, sub-frame	M10	50 Nm (36.9 lbf ft) Loctite®243™
------------------	-----	--



R06185-11

- Tighten hose clips 21.

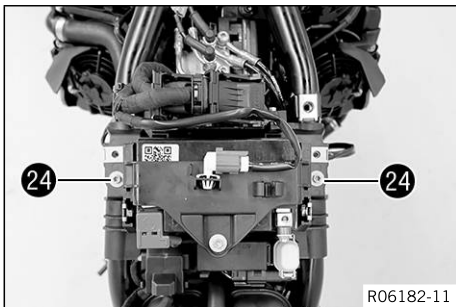


Z01583-11

- Mount and tighten screws 24.

Guideline

Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
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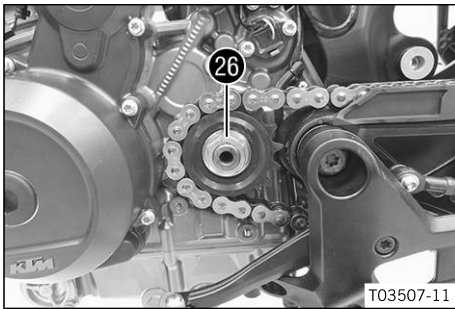
R06182-11

- Plug in connector 25.

- Mount the cable ties.



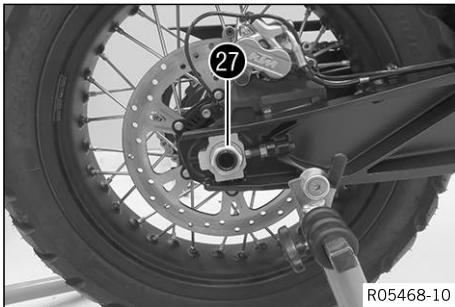
R06181-11



- Mount the engine sprocket.
- Lay a chain over the engine sprocket.
- Mount nut 26 with the lock washer, but do not tighten yet.

Guideline

Nut, engine sprocket	M20x1.5	100 Nm (73.8 lbf ft) Loctite®243™
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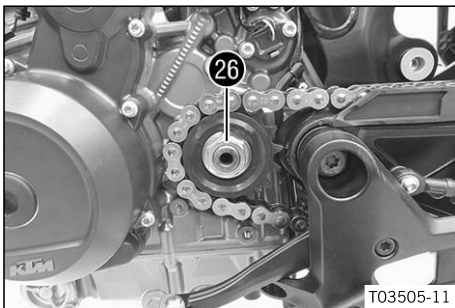


- Slide the wheel spindle in as far as it will go.
- Mount the chain adjuster.
- Push the rear wheel forward so that the chain adjusters are in contact with the screws, and tighten nut 27.

Guideline

Nut, rear wheel spindle	M25x1.5	90 Nm (66.4 lbf ft) Thread and contact area of wheel spindle greased
-------------------------	---------	---

- Check the chain tension. (📖 p. 175)

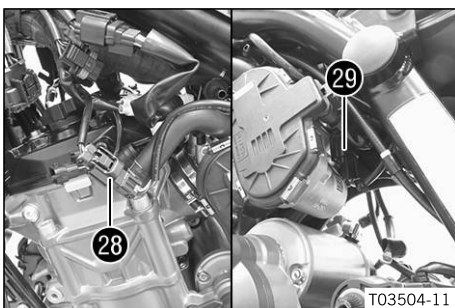


- Have an assistant operate the rear brake.
- Tighten nut 26.

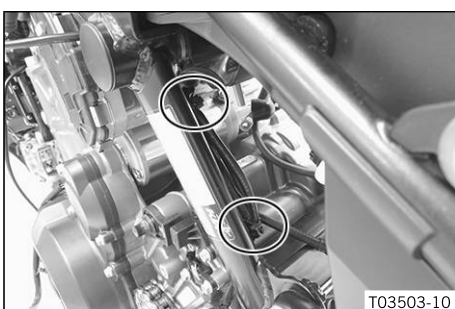
Guideline

Nut, engine sprocket	M20x1.5	100 Nm (73.8 lbf ft) Loctite®243™
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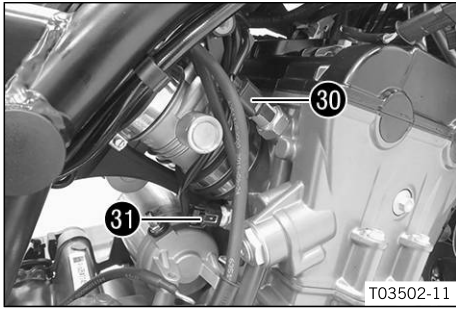
- Secure the nut with a lock washer.



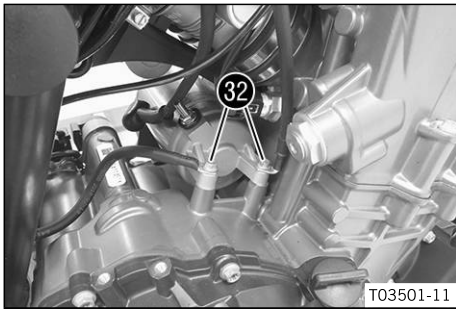
- Route the cables without tension.
- Join plug-in connectors 28 and 29.



- Mount the cable ties.



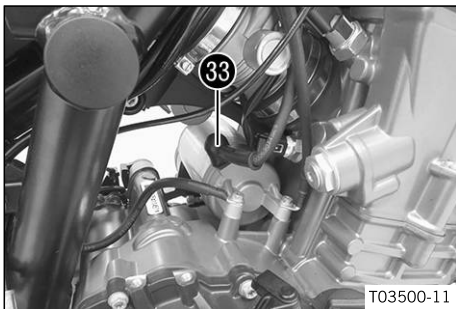
- Plug in connector 30 of the oil pressure sensor.
- Plug in connector 31 of the coolant temperature sensor.



- Position the ground wire.
- Mount and tighten screws 32.

Guideline

Screw, starter motor	M6	10 Nm (7.4 lbf ft)
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- Position the positive cable on the starter motor.
- Mount and tighten the nut.

Guideline

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

- Position protection cap 33.

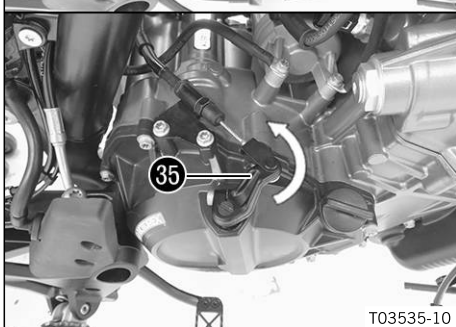


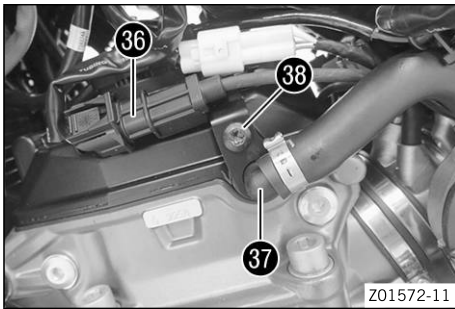
- Position inner clutch cable with bracket.
- Mount and tighten screws 34.

Guideline

Remaining screws, engine	M6	10 Nm (7.4 lbf ft)
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- Swivel clutch release lever 35 counterclockwise and hook in the inner clutch cable.
- Adjust the clutch release lever. (📖 p. 369)





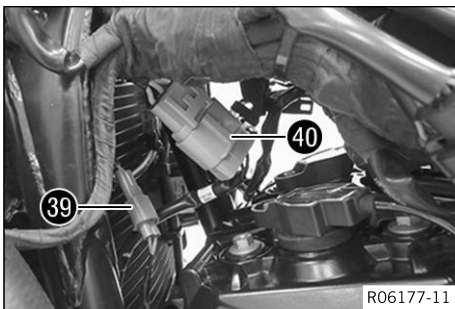
- Fitting plug-in connection 36.
- Grease the O-ring of bleeder flange 37.

Long-life grease (📖 p. 460)

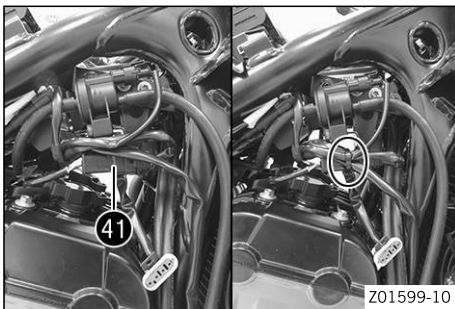
- Position the bleeder flange in the valve cover.
- Mount and tighten screw 38.

Guideline

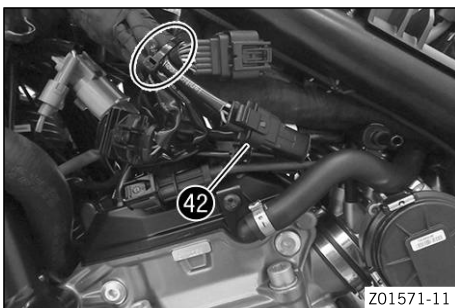
Screw, bleeder flange	EJOTALtracs® M6x12	8 Nm (5.9 lbf ft) Loctite®243™
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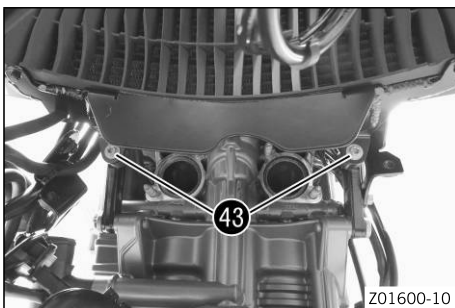
- Join plug-in connectors 39 and 40.



- Join plug-in connector 41 and position in the holder.
- Mount the cable ties.



- Join plug-in connector 42.
- Mount the cable ties.



- Position the radiator.



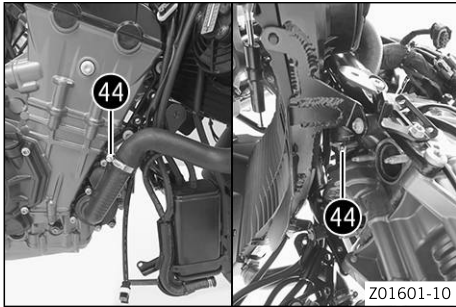
Info

Pay attention to the cooling fins.

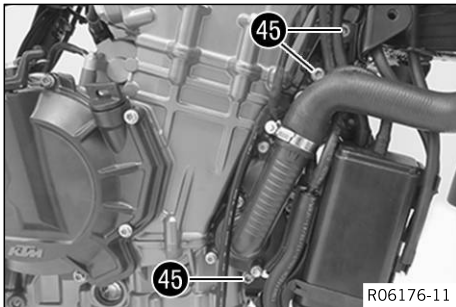
- Mount and tighten screws 43.

Guideline

Screw, radiator bracket, bottom	M6	5 Nm (3.7 lbf ft)
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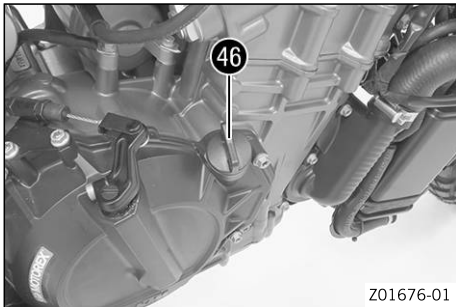
- Mount the radiator hoses.
- Position and tighten hose clips 44.



- Position the activated carbon filter.
- Mount and tighten screws 45.

Guideline

Remaining screws, chassis	M8	25 Nm (18.4 lbf ft)
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- Remove filler plug 46 with the O-ring, and fill up with engine oil.

Engine oil	2.8 l (3 qt.)	Engine oil (SAE 10W/50) (p. 458)
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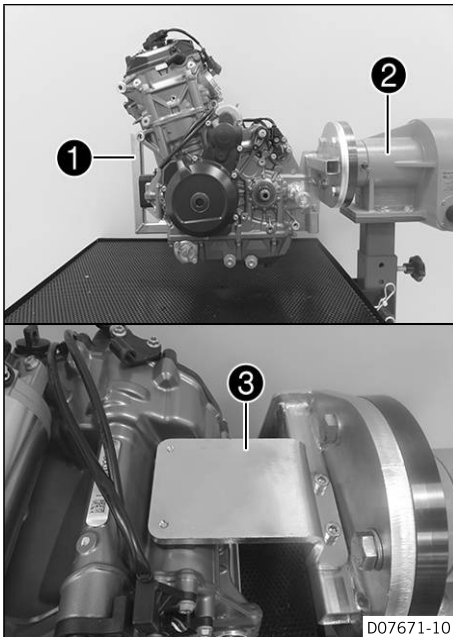
- Mount and tighten filler plug 46 with the O-ring.

Finishing work

- Install the exhaust system. (p. 110)
- Install the fuel tank. (p. 123)
- Install the engine guard. (p. 143)
- Install the right fuel tank spoiler. (p. 142)
- Install the right side cover. (p. 138)
- Install the left fuel tank spoiler. (p. 140)
- Install the battery cover. (p. 139)
- Install the left side cover. (p. 137)
- Remove the rear of the motorcycle from the lifting gear. (p. 16)
- Connect the negative cable of the 12-V battery. (p. 189)
- Mount the seat. (p. 120)
- Set the time and date.
- Fill/bleed the cooling system. (p. 384)
- Read out the trouble code memory using the KTM diagnostics tool.
- Perform the initialization run. (p. 414)
- Go for a short test ride.
- Check the engine for leaks.
- Check the engine oil level. (p. 397)
- Check the coolant level in the compensating tank. (p. 383)

20.3 Engine disassembly

20.3.1 Clamping engine into the engine work stand



- Mount special tool **1** on engine work stand **2**.

Engine work stand (61229001000) (📖 p. 467)

Engine bracket for engine work stand (63529002000)
(📖 p. 469)

- Mount the engine on special tool **1**.

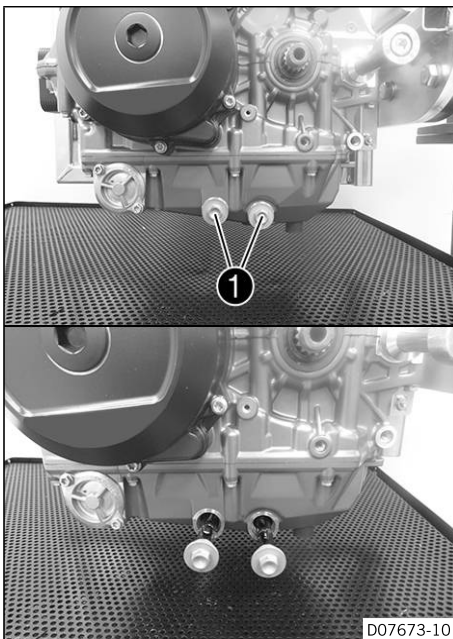


Info

Work with an assistant or a motorized hoist.

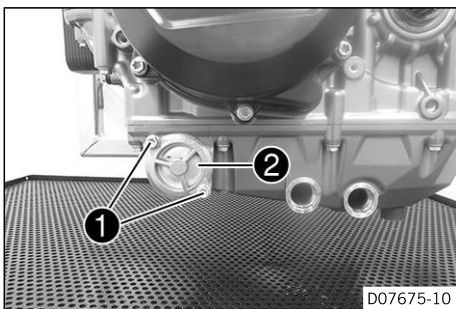
- Mount the retaining bracket **3** on the special tool **1**.

20.3.2 Draining the engine oil

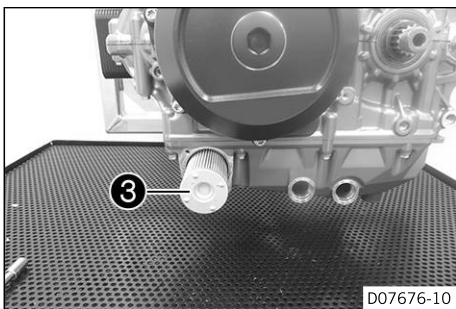


- Remove oil drain plugs **1** with the magnet, O-rings, and oil screen.
- Completely drain the engine oil.

20.3.3 Removing the oil filter



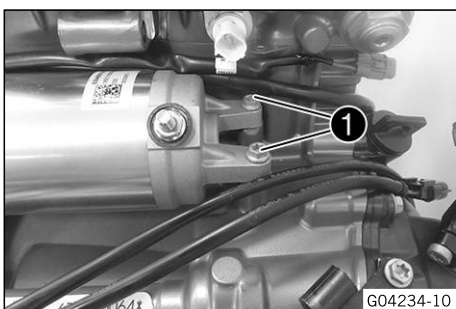
- Remove screws **1**.
- Take off oil filter cover **2** with the O-ring.



- Remove oil filter **3**.

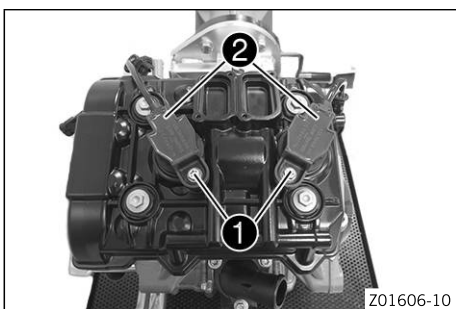
Lock ring plier (51012011000) (📖 p. 465)

20.3.4 Removing the starter motor

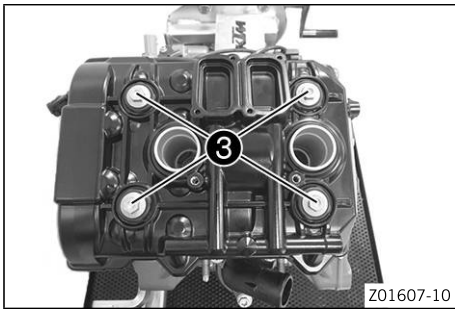


- Remove screw **1**.
- Take off the starter motor.

20.3.5 Removing the valve cover



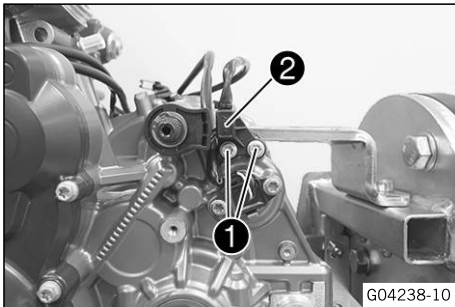
- Remove screws **1**.
- Remove ignition coils **2**.



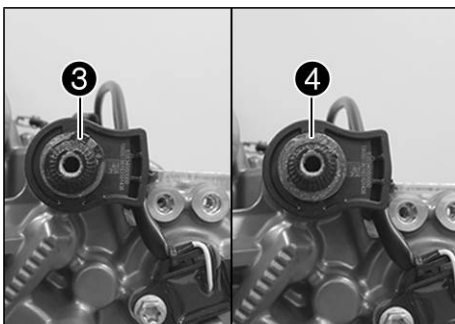
- Remove screws **3** with the gaskets.
- Take off the valve cover with the valve cover seal.



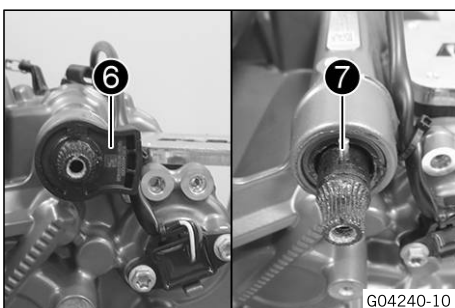
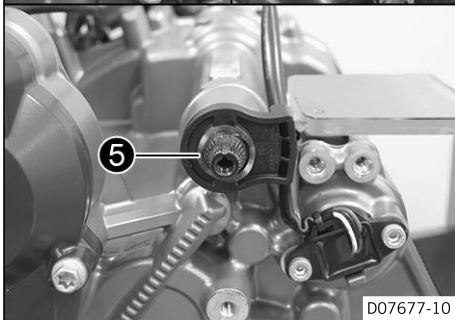
20.3.6 Removing shift shaft sensor



- Remove screws **1**.
- Take off the shift shaft sensor **2**.



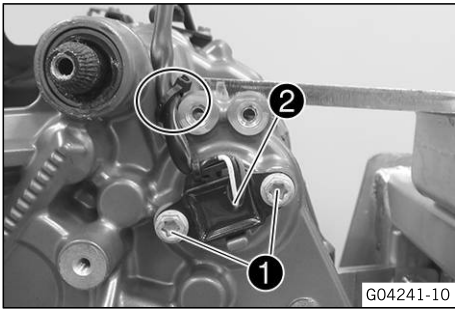
- Remove lock ring **3**.
- Remove washer **4**.
- Remove locating washer **5**.



- Take off magnetic holder **6**.
- Remove pin **7**.

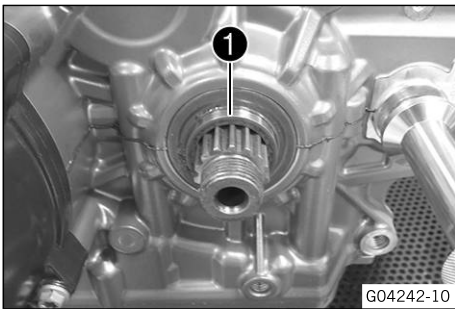


20.3.7 Removing the gear position sensor



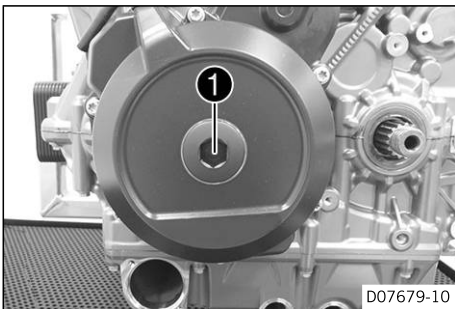
- Remove the cable tie.
- Remove screws **1**.
- Take off gear position sensor **2**.

20.3.8 Removing the spacer

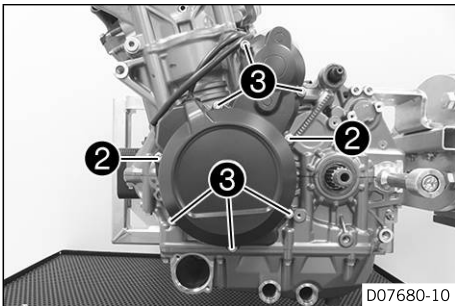


- Remove spacer **1** of the countershaft.
- Remove the O-ring.

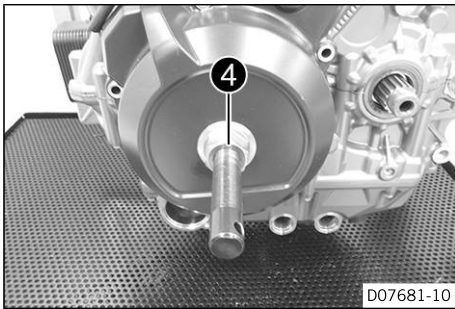
20.3.9 Removing the alternator cover



- Remove screw plug **1** with the O-ring.

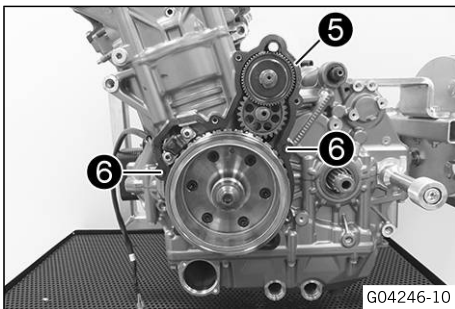


- Remove screws **2** and **3**.



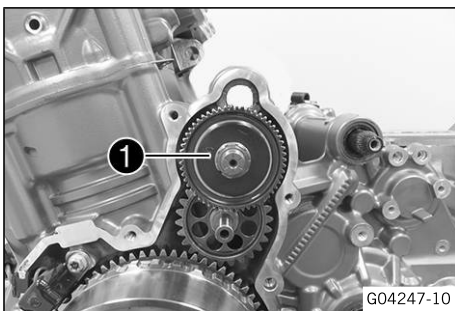
- Mount special tool **4** and pull off the alternator cover.

Puller (61229010000) (📖 p. 468)



- Take off alternator cover gasket **5**.
- Remove dowels **6**.

20.3.10 Removing the torque limiter and the starter intermediate gear

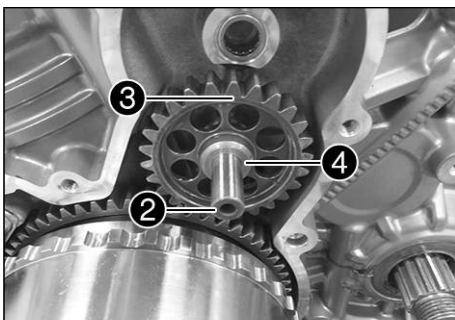


- Take off torque limiter **1** with washer.



Info

The washer usually sticks to the engine case.

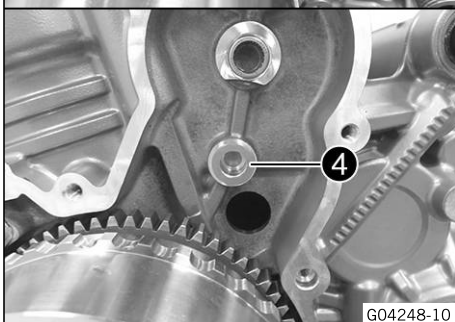


- Take off shaft **2** and starter intermediate gear **3** with needle bearing and washers **4**.

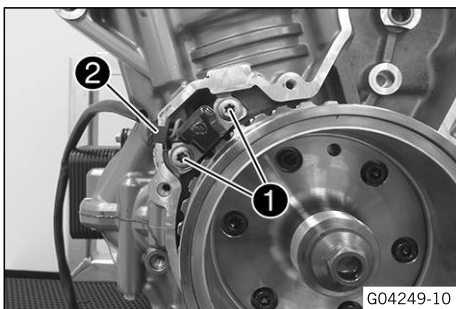


Info

The rear washer usually sticks to the engine case.

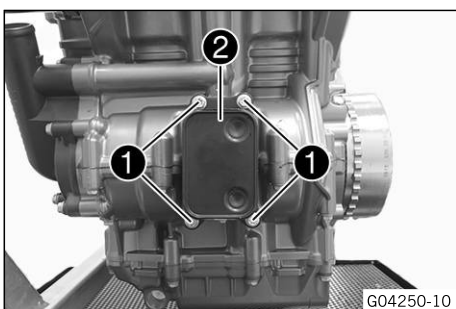


20.3.11 Removing the crankshaft speed sensor

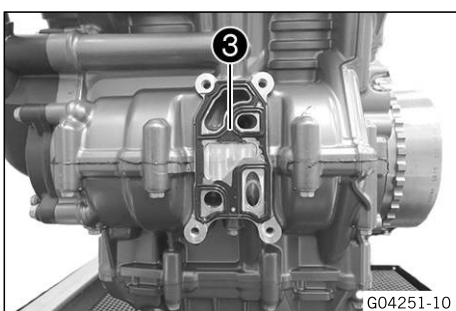


- Remove screws **1**.
- Pull rubber grommet **2** out of the engine case.
- Remove the crankshaft speed sensor.

20.3.12 Removing the oil/water heat exchanger

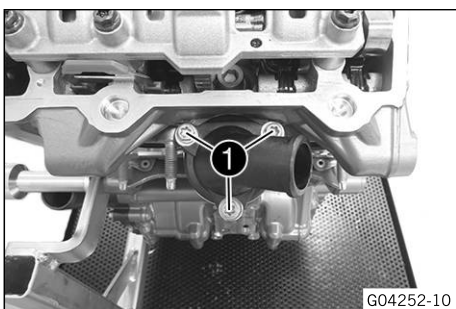


- Remove screws **1**.
- Take off oil/water heat exchanger **2**.

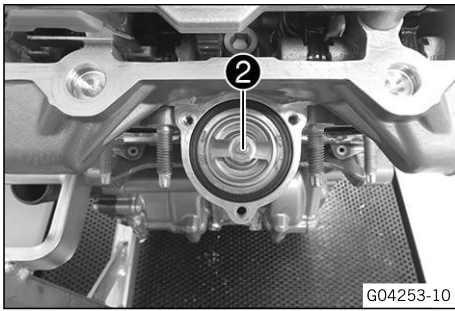


- Remove gasket **3**.

20.3.13 Removing the thermostat



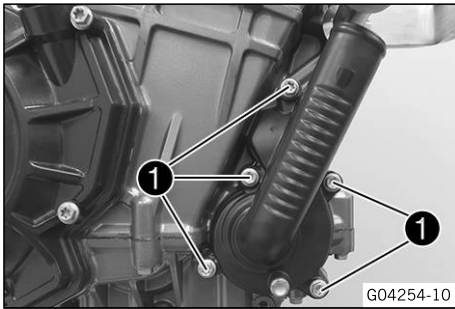
- Remove screws **1**.
- Take off the thermostat case.



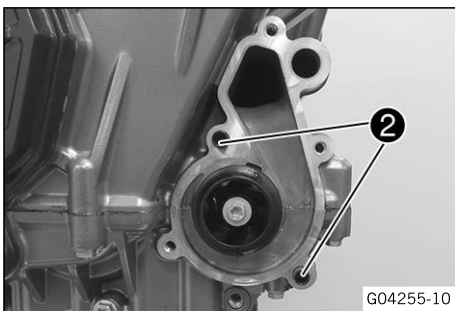
- Remove thermostat ②.



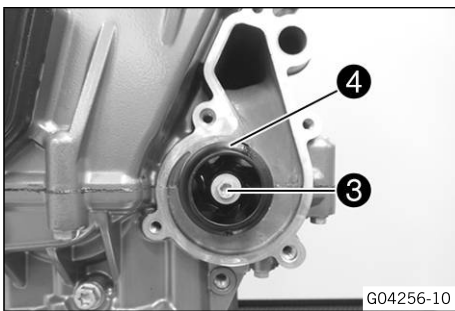
20.3.14 Removing the water pump impeller



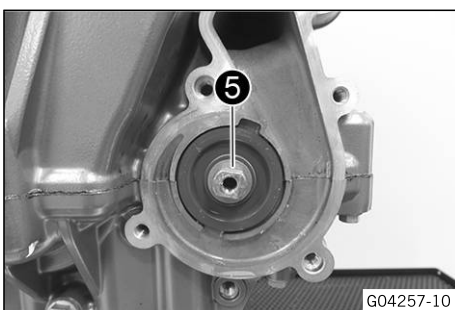
- Remove screws ①.
- Take off the water pump cover with the gasket.



- Remove dowels ②.



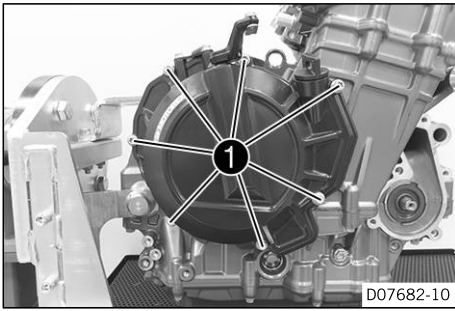
- Remove screw ③.
- Remove water pump impeller ④.



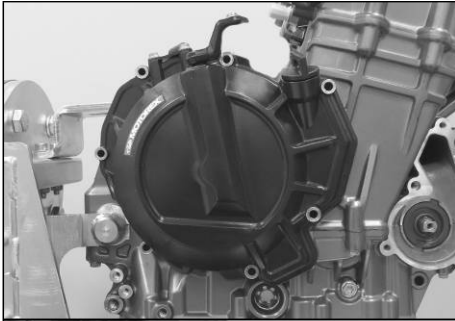
- Remove form washer ⑤.



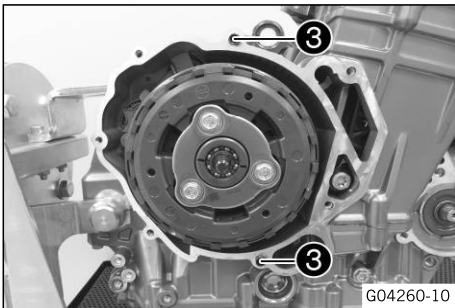
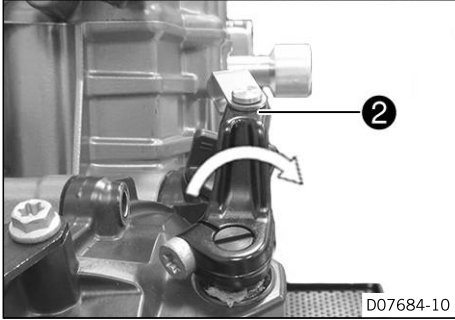
20.3.15 Removing the clutch cover



- Remove screws ①.

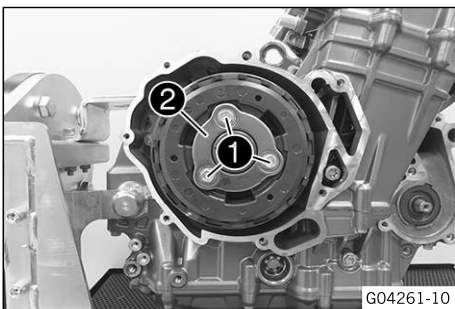


- Swivel the clutch release lever ② clockwise and take off clutch cover with clutch cover gasket.

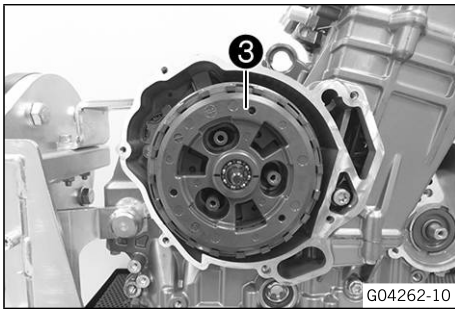


- Remove dowels ③.

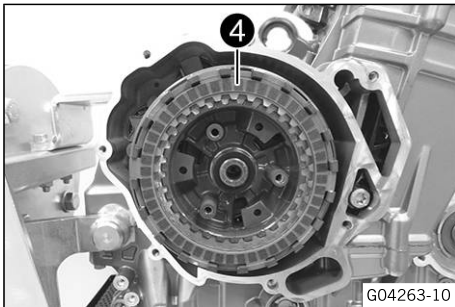
20.3.16 Removing the clutch discs



- Remove screws ①.
- Take off clutch center ② and the springs.

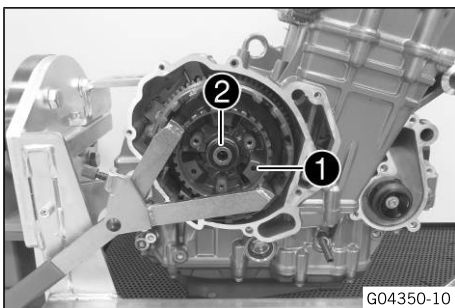


- Remove clutch pressure cap ③.



- Remove clutch discs ④, support ring, and pretension ring.

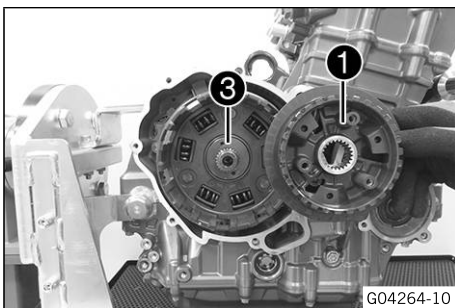
20.3.17 Removing the clutch basket



- Hold the inner clutch hub ① with the special tool.

Holding wrench (51129003000) (📖 p. 465)

- Remove nut ② with the washer.

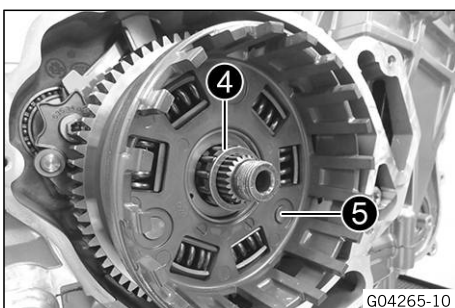


- Take off inner clutch hub ① and washer ③.



Info

The washer usually sticks to the inner clutch hub.



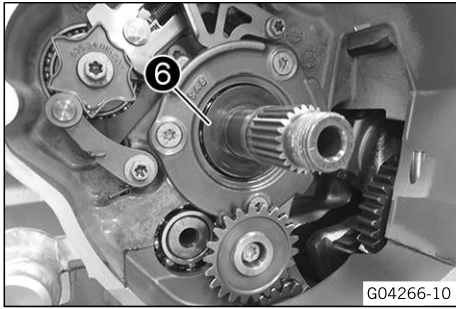
- Remove needle bearing ④.



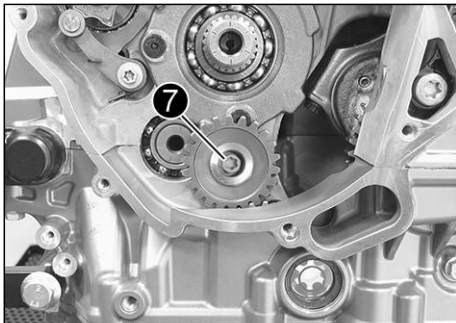
Info

Use a magnetic rod to make disassembly easier.
Do not use pliers, as otherwise the needle bearing will be damaged.

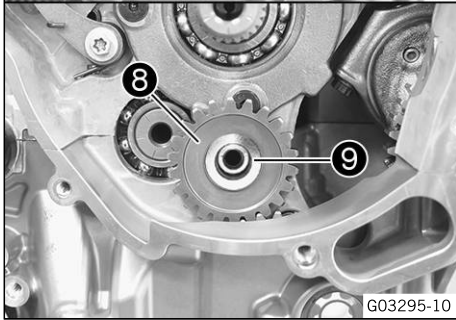
- Take off clutch basket ⑤.



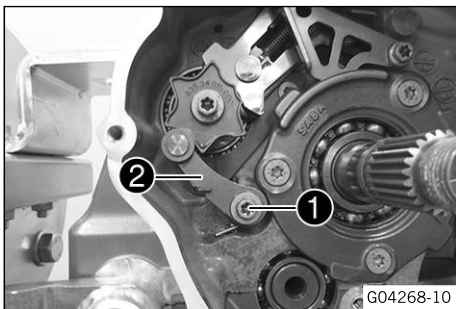
- Remove washer 6.



- Remove screw 7.
- Take off intermediate gear 8 with collar bushing 9.

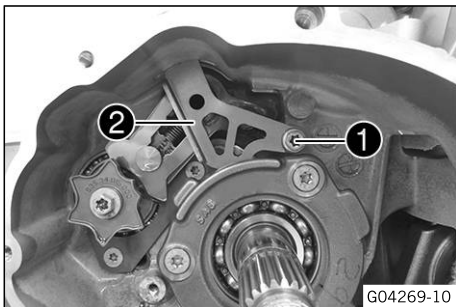


20.3.18 Removing locking lever

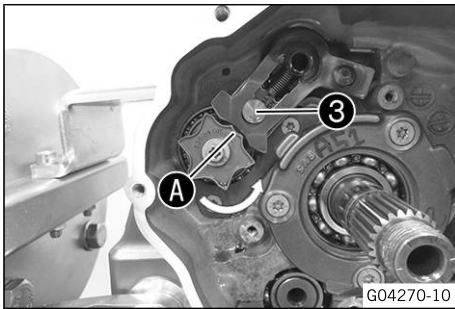


- Remove screw 1.
- Take off locking lever 2 with the sleeve and spring.

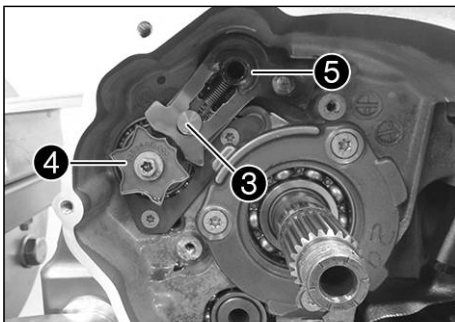
20.3.19 Removing the shift shaft



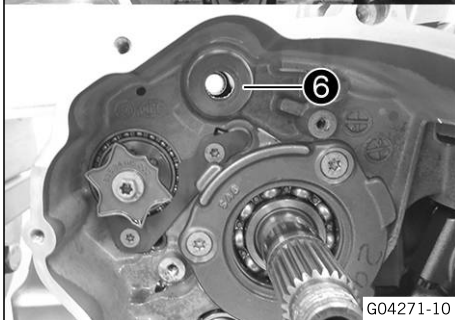
- Remove screw 1.
- Take off retaining bracket 2.



- Twist shift drum until the neutral position **A** is aligned with the sliding plate **3**.



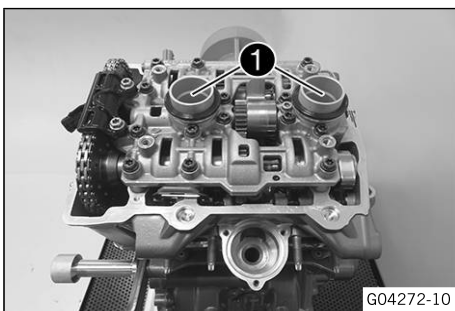
- Push sliding plate **3** away from shift drum locating unit **4**.
- Remove shift shaft **5** with washer **6**.



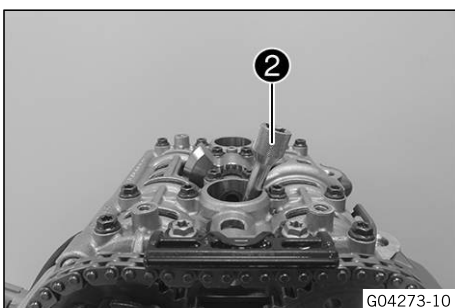
Info

The washer usually sticks to the engine case.

20.3.20 Removing the spark plugs



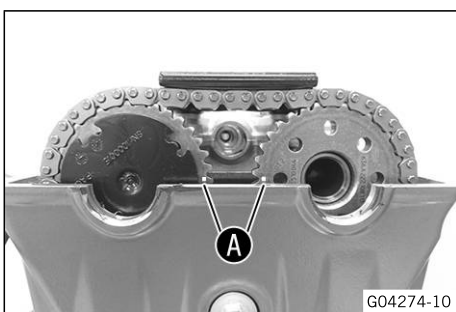
- Remove spark plug shaft inserts **1** with the gaskets.



- Remove the spark plugs using special tool **2**.

Spark plug wrench with link (77229172000) (📖 p. 473)

20.3.21 Removing the camshafts



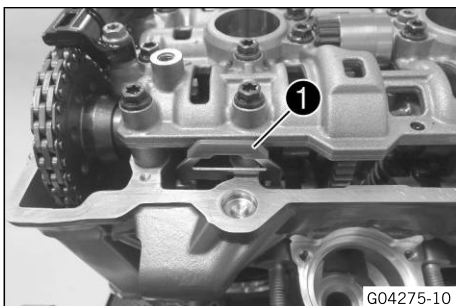
- Turn the crankshaft counterclockwise and set it to ignition top dead center of cylinder 2.

✓ The **OT2** markings **A** are aligned with the sealing surface.

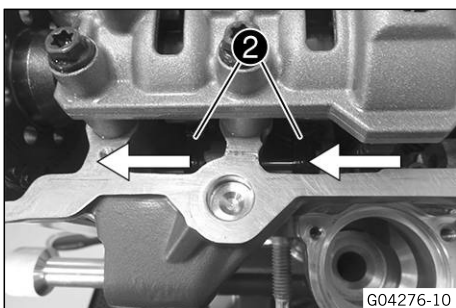


Info

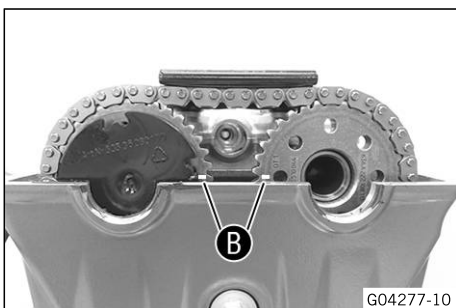
The **OT2** markings are dot markings.



- Remove cam lever clip **1**.



- Push exhaust cam lever **2** on cylinder 2 to the side.



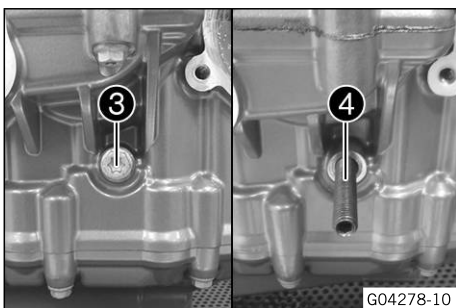
- Set the crankshaft to ignition top dead center of cylinder 1.

✓ The **OT1** markings **B** are aligned with the sealing surface.



Info

The **OT1** markings are line markings.



- Remove screw **3** with the washer.

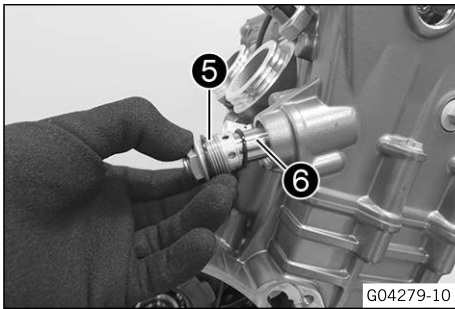


Info

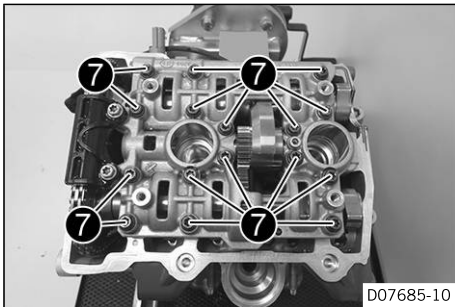
Look through the hole to check that the position hole of the crankshaft is visible.

- Mount special tool **4**.

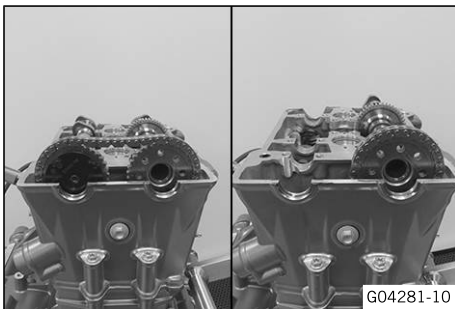
Locking screw (61229015000) (📖 p. 468)



- Remove screw 5 with the O-ring.
- Take off timing chain tensioner 6 with O-ring.

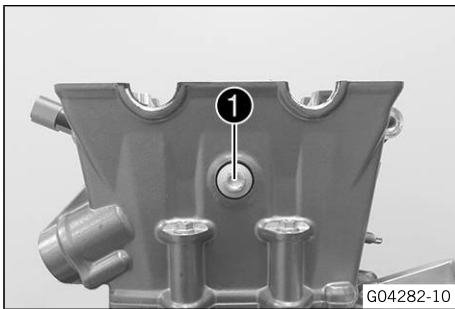


- Loosen and remove screws 7 from the outside to the inside.
- Take off camshaft bearing bridge with balancer shaft.

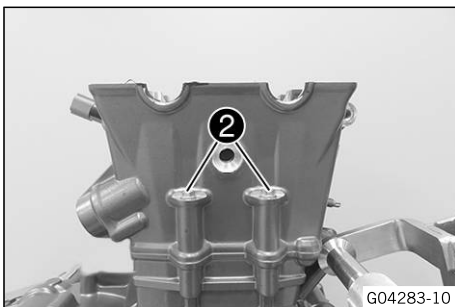


- Raise the camshafts at the rear and take the timing chain off the rear sprocket. Remove camshafts.

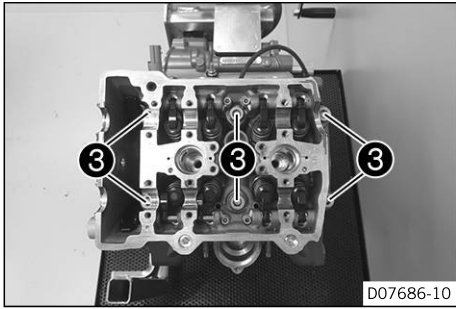
20.3.22 Removing the cylinder head



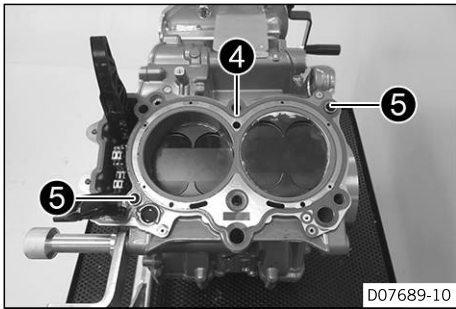
- Remove screw 1 with gasket.



- Remove screws 2.

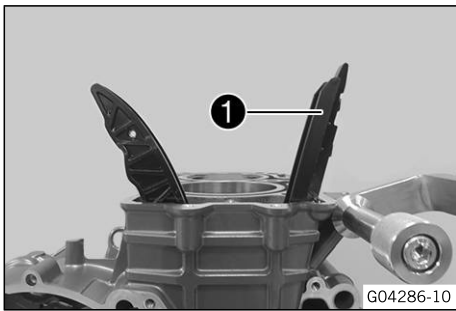


- Loosen screws **3** in a crisscross pattern and remove them with the washers.
- Take off the cylinder head.

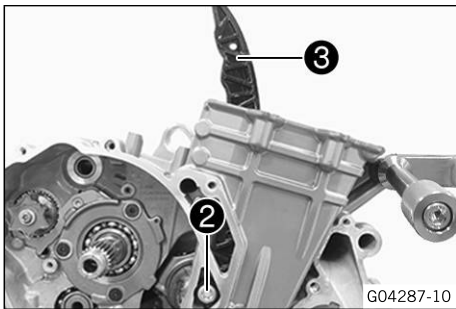


- Take off cylinder head gasket **4**.
- Remove dowels **5**.

20.3.23 Removing the timing chain rails

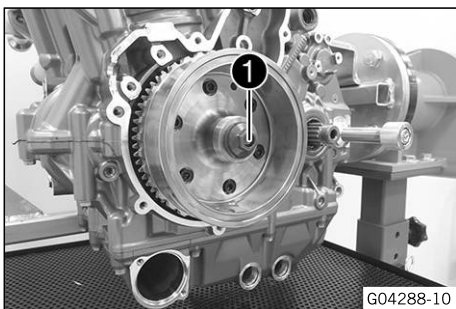


- Remove guide rail **1** upward.



- Remove screw **2**.
- Remove tensioning rail **3** with support bushing upward.

20.3.24 Removing the rotor

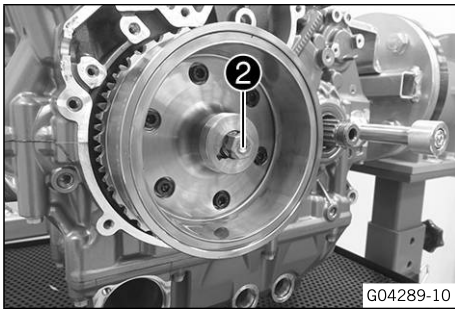


- Remove screw **1**.



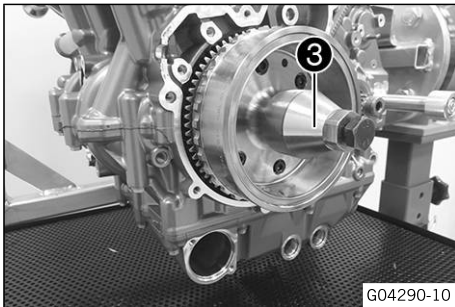
Info

The crankshaft must be blocked.



- Mount special tool **2**.

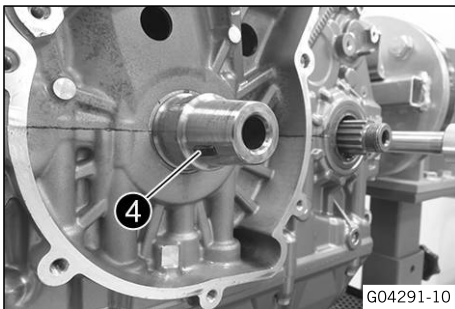
Pressing tool (61229008100) (📖 p. 468)



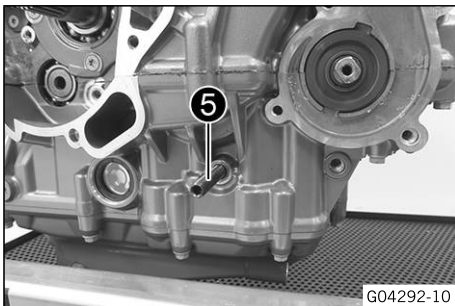
- Mount special tool **3** on the rotor.

Puller (75029021000) (📖 p. 471)

- Hold it tight using the special tool and pull off the rotor by turning the screw in.
- Remove the special tool.

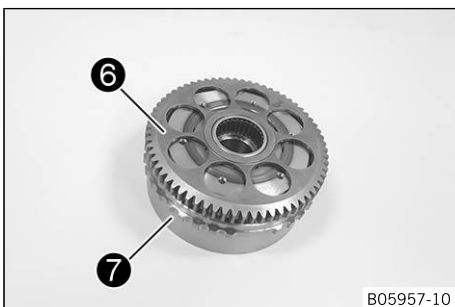


- Remove woodruff key **4**.



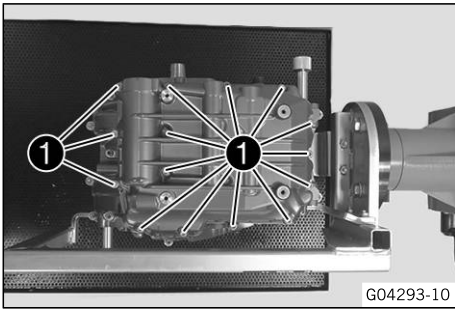
- Remove special tool **5**.

Locking screw (61229015000) (📖 p. 468)

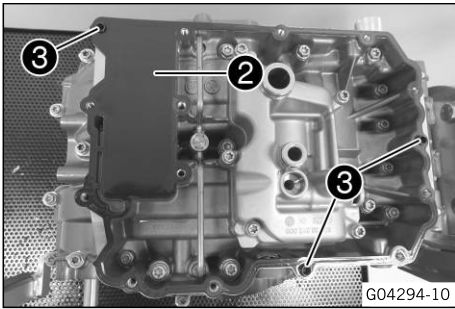


- Take off freewheel gear **6** from rotor **7**.

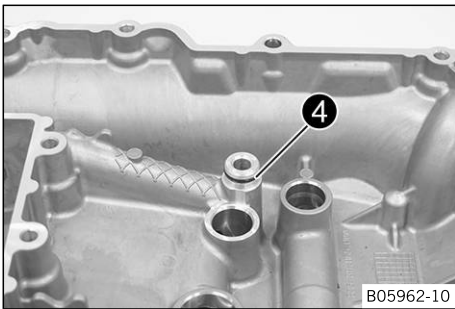
20.3.25 Removing the oil pan



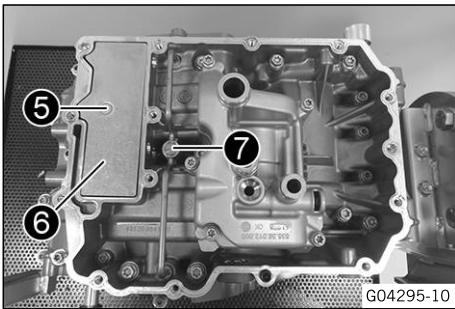
- Remove screws **1**.
- Take off oil pan.



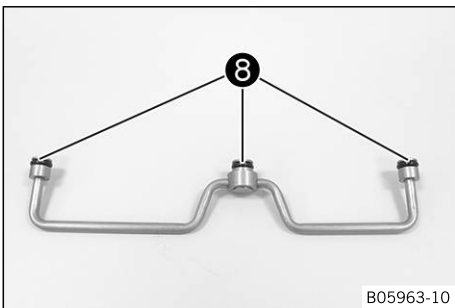
- Take off gasket **2**.
- Remove dowels **3**.



- Remove O-ring **4**.

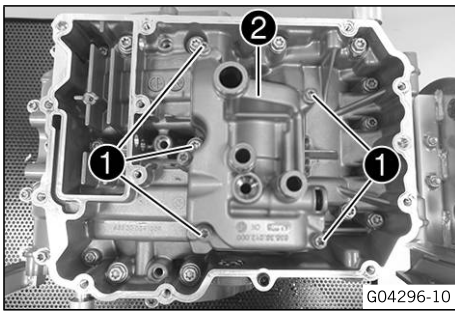


- Remove screw **5**.
- Remove pressure plate **6**.
- Take off oil line **7**.

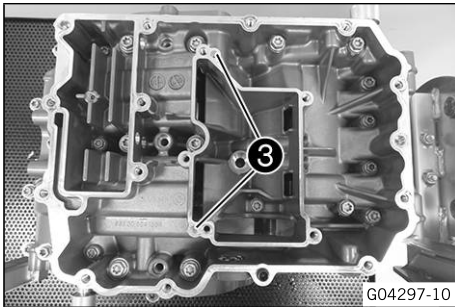


- Take off O-rings **8** from the oil line.

20.3.26 Removing the oil pump unit

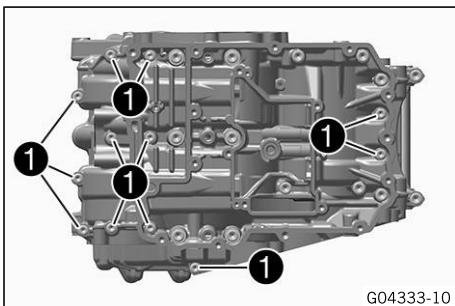


- Remove screws 1.
- Take off oil pump unit 2.

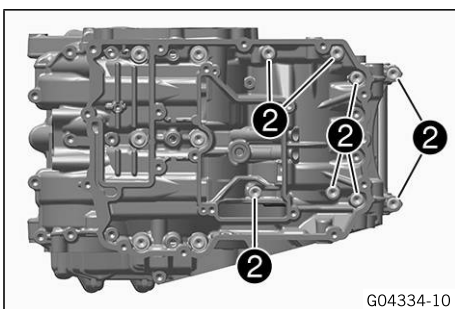


- Remove locating pins 3.

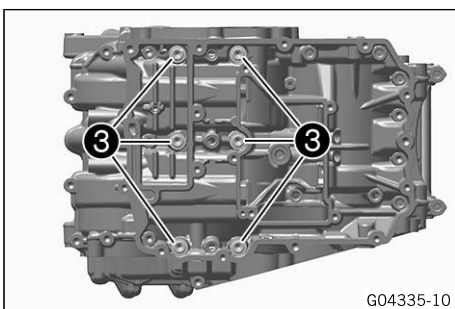
20.3.27 Removing the engine case downwards



- Remove screws 1.



- Remove screws 2.

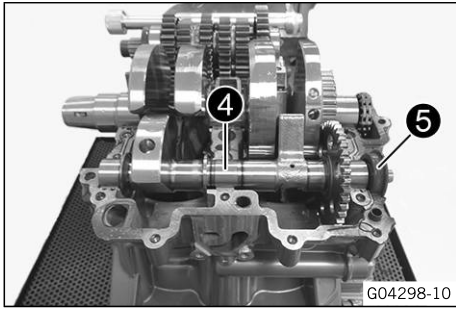


- Loosen screws 3 in a crisscross pattern and remove them with the washers.
- Take off lower section of the engine case.

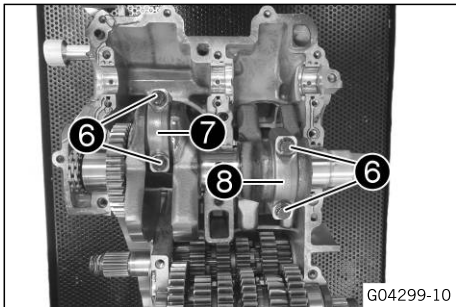


Info

Ensure that the bearing shells remain in place.



- Remove balancer shaft **4** with radial shaft seal ring **5**.



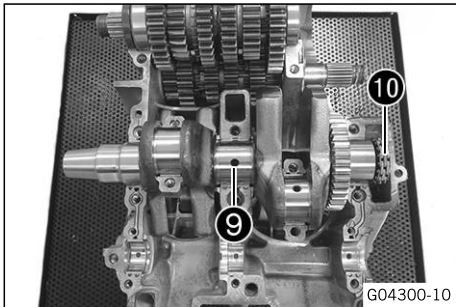
- Remove screws **6**.

Multi-tooth wrench socket (63529075000) (📖 p. 471)

- Take off conrod bearing covers **7** and **8**.

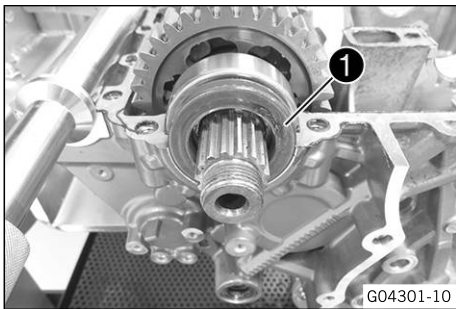
i Info

The conrod bearing covers and connecting rods are marked together and must never be mixed up.

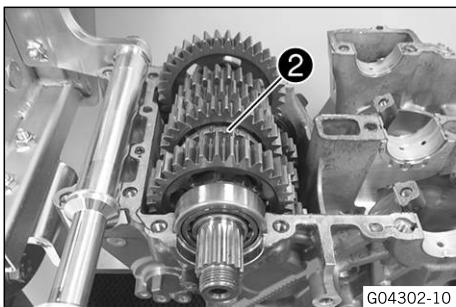


- Remove crankshaft **9** with timing chain **10**.

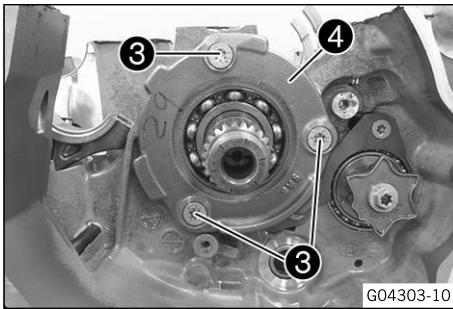
20.3.28 Removing the transmission shafts



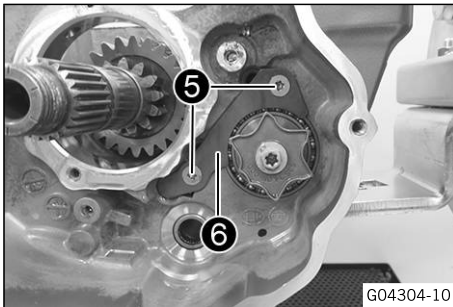
- Remove radial shaft seal ring **1**.



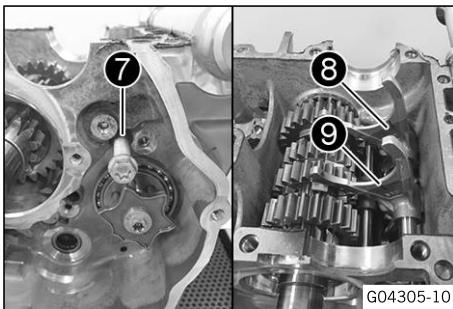
- Take off countershaft **2**.



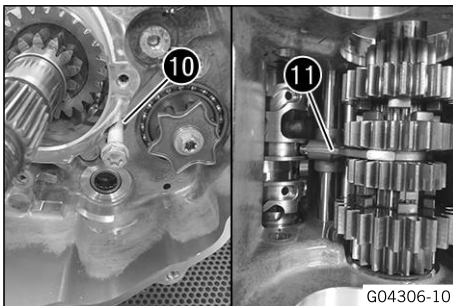
- Remove screws **3**.
- Take off bearing support **4** with bearing.



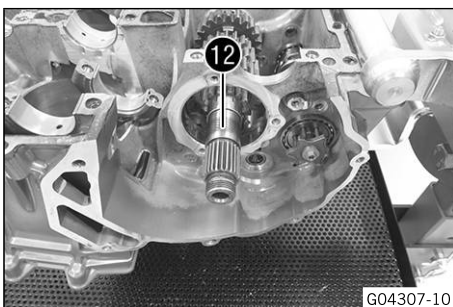
- Remove screws **5**.
- Take off retaining bracket **6**.



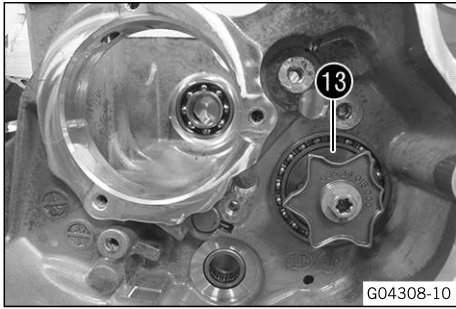
- Mount appropriate M8 screw in the shift rail **7**.
- Remove shift rail **7**.
- Remove shift forks **8** and **9**.



- Mount appropriate M8 screw in the shift rail **10**.
- Remove shift rail **10**.
- Remove shift fork **11**.

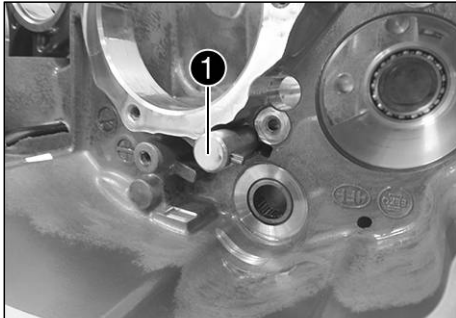


- Remove main shaft **12**.

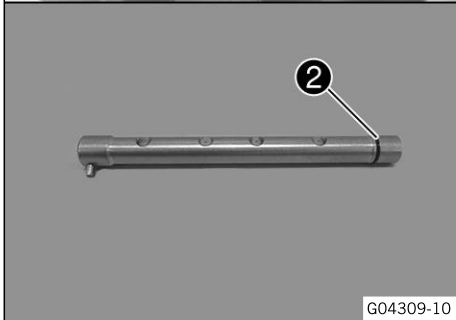


- Remove shift drum 13.

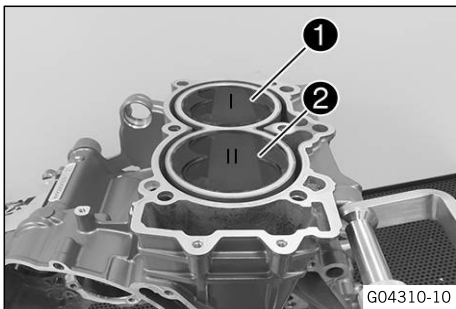
20.3.29 Removing oil spray tube



- Remove oil spray tube 1.
- Remove O-ring 2.



20.3.30 Removing the piston

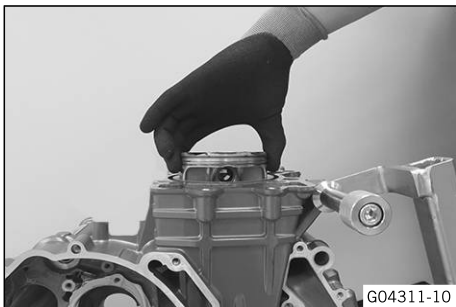


- Swing the upper section of the engine case upward.
- Mark the pistons 1 and 2.
- Remove any deposits in the upper area of the cylinders.



Info

Ensure that the cylinders are not damaged.

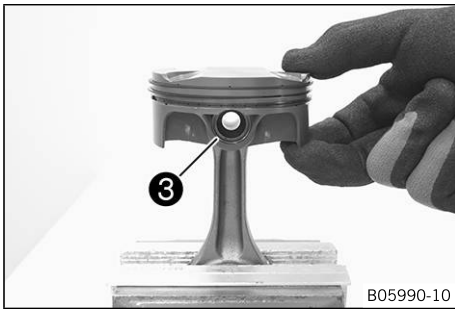


- Remove piston with connecting rod upward out of the cylinder.



Info

Make sure that the connecting rod does not damage the cylinder.

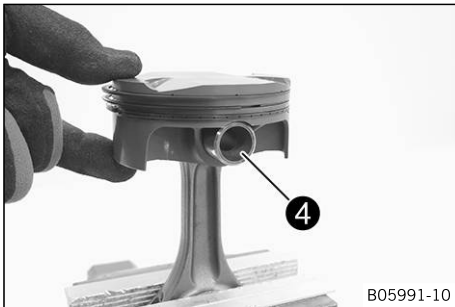


- Clamp connecting rod in the vise.

Guideline

Use soft jaws.

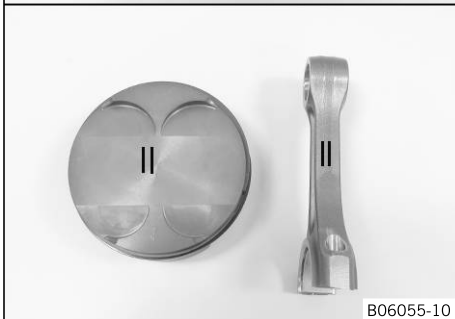
- Remove piston ring lock ③.



- Remove piston pin ④.
- Take off the piston.

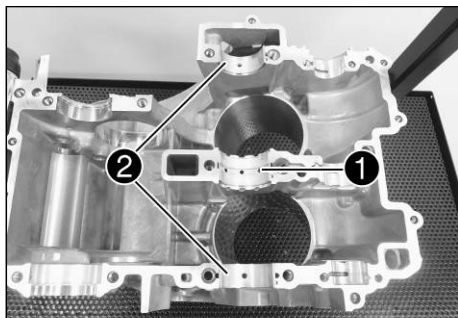


- Mark the pistons and connecting rods belonging together correspondingly.

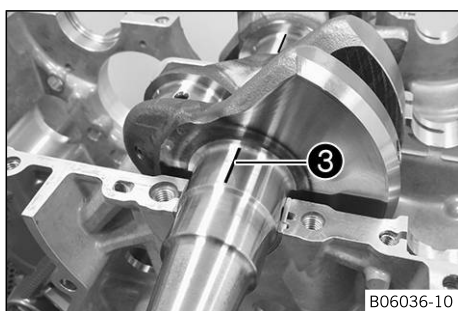
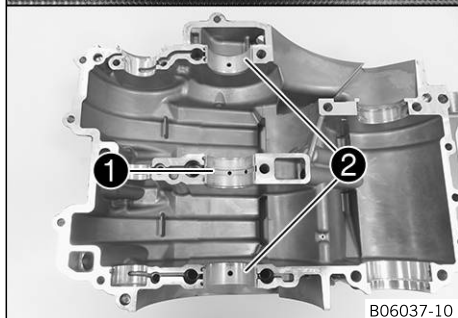


20.4 Working on individual parts

20.4.1 Checking the radial clearance of crankshaft bearings

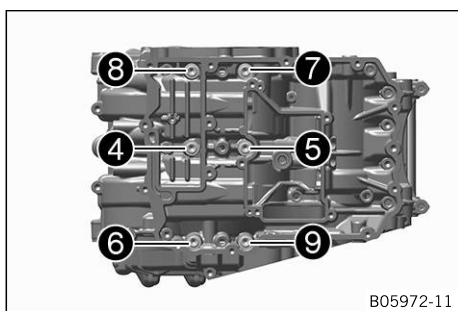


- Remove any remnants of sealing compound and clean the sections of the engine case thoroughly.
- Clean bearing shells 1 and 2.



- Position crankshaft in the upper section of the engine case.
- Insert **Plastigauge** clearance gauge 3 90° offset to the bearing joint.

Plastigauge clearance gauge (60029012000) (📖 p. 466)



- Mount lower engine case.
- Mount screws with washers and tighten in the order 4 to 9.

Guideline

Screw, engine case	M8x90	25 Nm (18.4 lbf ft) Screw support greased
--------------------	-------	--

i Info
Do not twist crankshaft.



- Remove lower section of the engine case again. Compare **Plastigauge** clearance gauge with the data on the packaging.

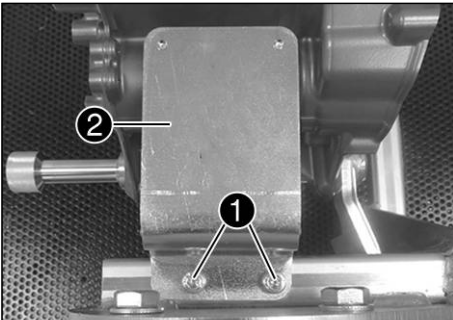
Guideline

Crankshaft bearing	
New condition	0.030 ... 0.060 mm (0.00118 ... 0.00236 in)
Wear limit	0.080 mm (0.00315 in)

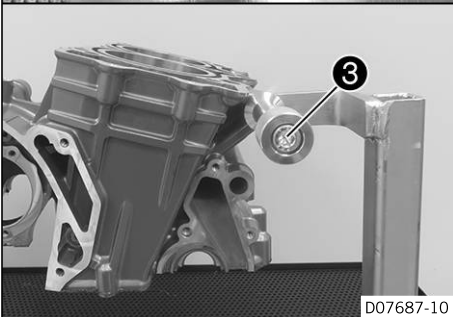
**Info**

The width of the **Plastigauge** clearance gauge indicates the bearing play.

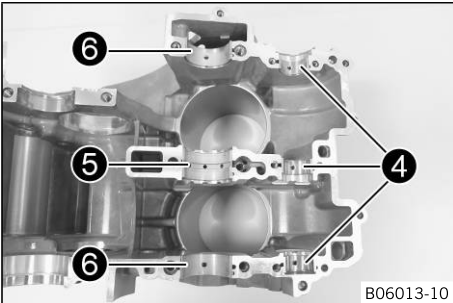
- Clean the parts.

**20.4.2 Changing the main bearing shells**

- Remove screws ①.
- Take off retaining bracket ②.
- Remove screw ③ and take off upper section of the engine case.

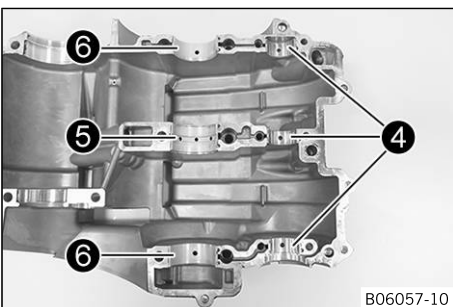


D07687-10



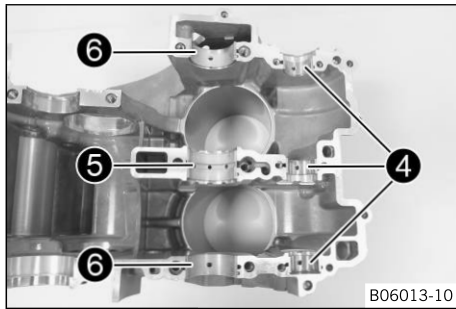
B06013-10

- Remove bearing shells ④ of the balancer shaft from the upper section of the engine case.
- Remove bearing shells ⑤ and ⑥ of the crankshaft from the upper section of the engine case.
- Clean seat of the bearing shells.



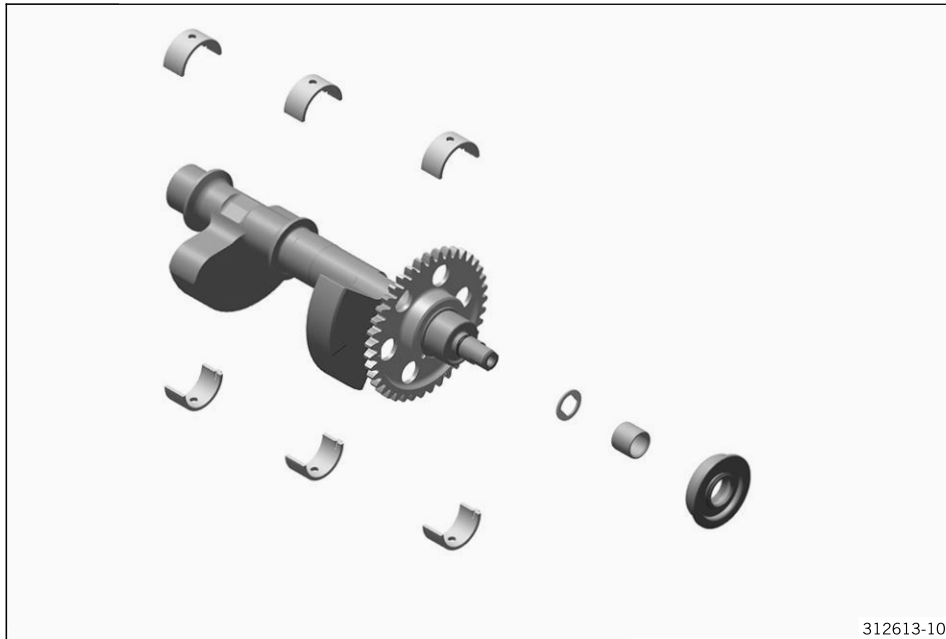
B06057-10

- Remove bearing shells ④ of the balancer shaft from the lower section of the engine case.
- Remove bearing shells ⑤ and ⑥ of the crankshaft from the lower section of the engine case.
- Clean seat of the bearing shells.
- Select the main bearing shells. (📖 p. 305)
- Mount new bearing shells ⑤ and ⑥ in the lower section of the engine case.
- Mount new bearing shells ④ in the lower section of the engine case.



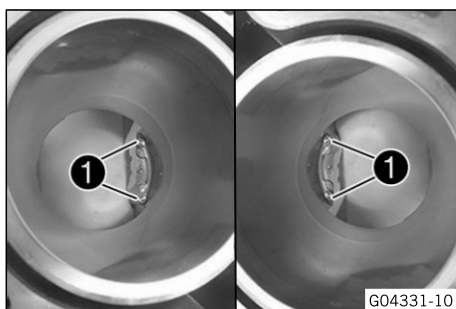
- Mount new bearing shells ⑤ and ⑥ in the upper section of the engine case.
- Mount new bearing shells and ④ in the upper section of the engine case.

20.4.3 Checking the balancer shaft

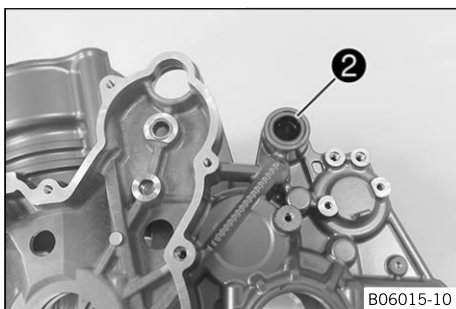


- Clean all parts well.
- Check the pivot points of the balancer shaft for damage and wear.
 - » If there is damage or wear:
 - Change the balancer shaft.
- Check the bearing shells of the balancer shaft for damage, abrasion and wear.
 - » If there is damage, abrasion or wear:
 - Change bearing shells.

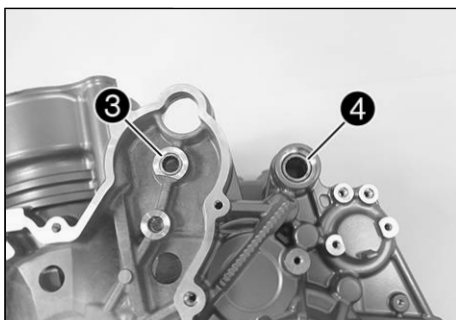
20.4.4 Working on the upper section of the engine case



- Remove oil nozzles ①.



- Remove radial shaft seal ring **2** of the shift shaft.



- Remove any remnants of the sealing compound and clean the section of the engine case thoroughly.

- Warm the section of the engine case in an oven.

Guideline

130 °C (266 °F)

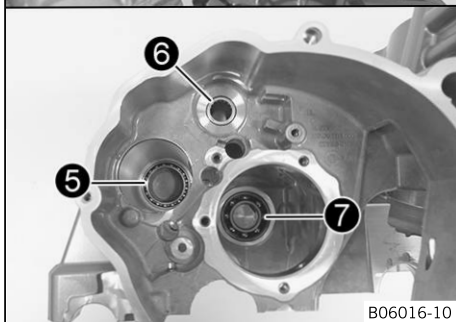
- Knock the section of the engine case with the right and left side against a level wooden board. This will cause the bearings to drop out of the bearing seats.



Info

Any bearings that remain in the section of the engine case must be removed using a suitable tool.

A washer is located behind the bearing **7**. Make sure that this washer is not damaged.



- Warm the section of the engine case again.

Guideline

130 °C (266 °F)

- Insert new cold bearings **3** and **4** in the bearing seat on the left side of the heated section of the engine case; if necessary, use a suitable pressing tool to push them all the way in and make them flush.



Info

When pressing in, ensure that the section of the engine case lies flat in order to prevent damage.

Only press the bearings in using the outer bearing race; otherwise, the bearings will be damaged when they are pressed in.

- Insert new cold bearings **5**, **6** and **7** in the bearing seat on the right side of the heated section of the engine case; if necessary, use a suitable pressing tool to push them all the way in and make them flush.



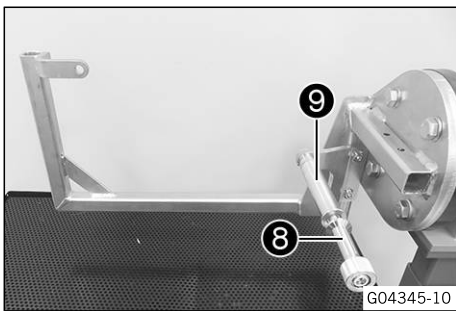
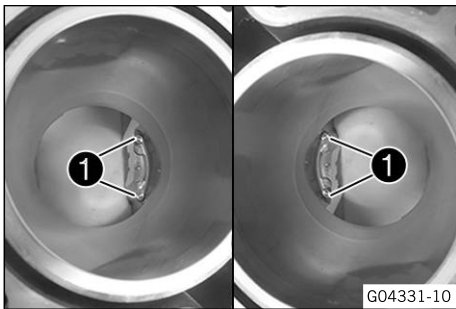
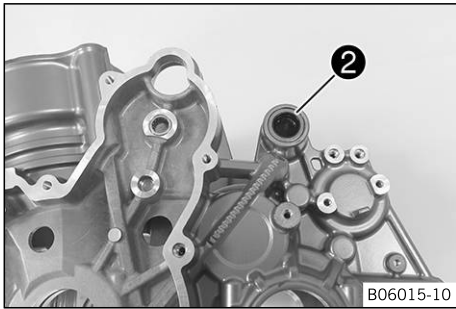
Info

Do not forget the washer under the bearing **7**.

When pressing in, ensure that the section of the engine case lies flat in order 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 new radial shaft seal ring **2** of the shift shaft from the outside to the inside with the open side facing in.

i Info

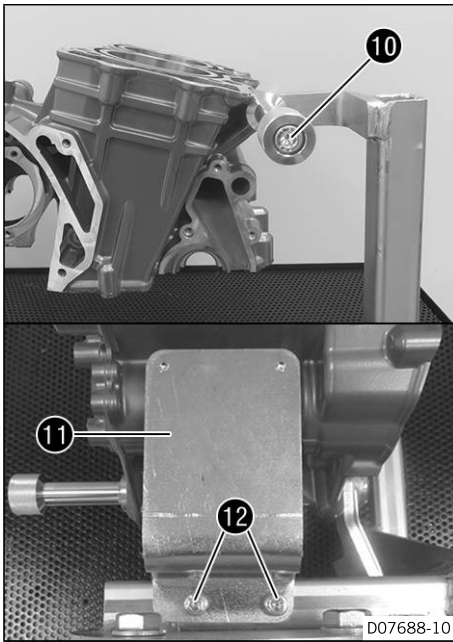
The radial shaft seal ring must be flush on the outside.

- Blow compressed air through all oil channels and oil nozzles, and check that they are clear.
- Mount and tighten oil nozzles **1**.

Guideline

Oil nozzle for piston cooling	M5	2 Nm (1.5 lbf ft)
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- Remove screw **8**.
- Take off case bushing **9**.
- Check the case bushing for damage and wear.
 - » If there is damage or wear:
 - Change case bushing.
- Position case bushing **9** on the engine work stand.
- Mount and tighten screw **8**.



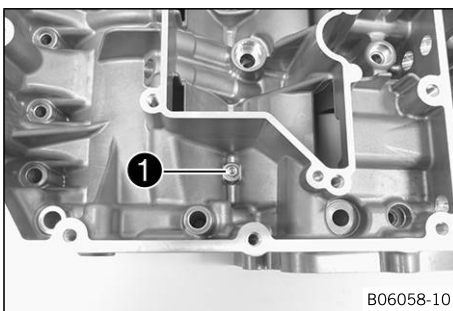
- Position upper section of the engine case in the engine work stand, mount screw 10 and tighten.

Engine work stand (61229001000) (p. 467)

Engine bracket for engine work stand (63529002000) (p. 469)

- Position retaining bracket 11.
- Mount and tighten screws 12.

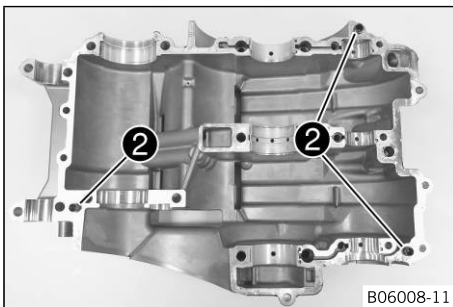
20.4.5 Working on the lower section of the engine case



- Remove oil nozzle 1.
- Blow compressed air through all oil channels and oil nozzles, and check that they are clear.
- Mount and tighten oil nozzle 1.

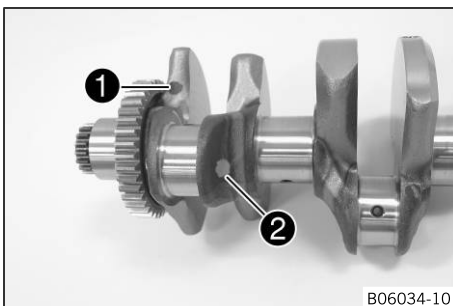
Guideline

Nozzle, engine vent	M5	2 Nm (1.5 lbf ft)
---------------------	----	-------------------



- Swivel section of the engine case.
- Check that dowels 2 are seated correctly.

20.4.6 Selecting the main bearing shells



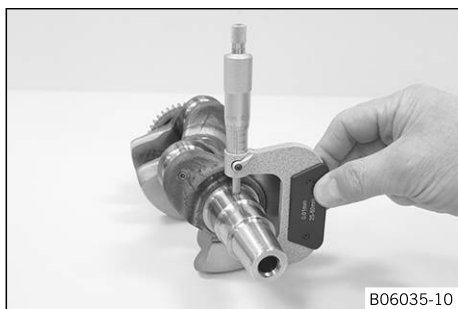
New crankshaft

- Select the new bearing shells according to color coding 1.



Info

Color coding 2 refers to the conrod bearing.



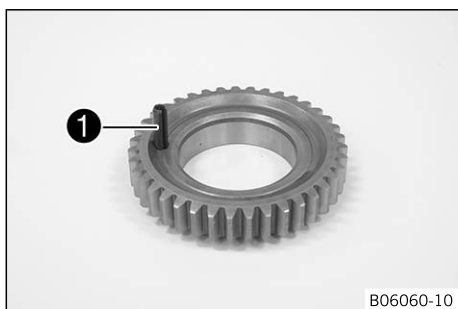
Used crankshaft

- Measure all main bearing shells and select the new bearing shells accordingly.

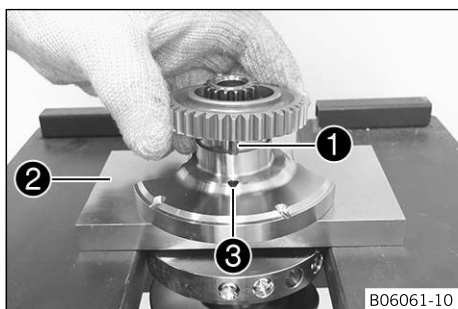
Guideline

Crankshaft - main bearing diameter	
Blue	37.985 ... 37.995 mm (1.49547 ... 1.49586 in)
Red	37.995 ... 38.005 mm (1.49586 ... 1.49626 in)

20.4.7 Installing the primary gear wheel



- Mount cylinder pin **1** in the primary gear wheel.



- Position the crankshaft with special tool **2** in the press.

Separator plate (79429009000) (📖 p. 473)

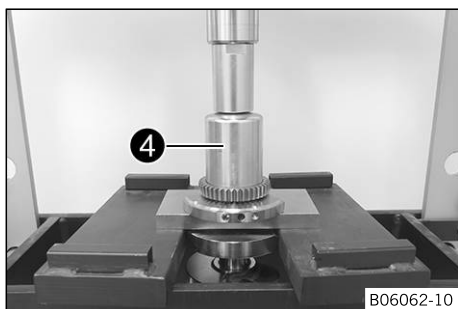
- Heat up primary gear wheel.

Guideline

150 °C (302 °F)

- Position primary gear wheel on the crankshaft.

✓ Cylinder pin **1** engages in hole **3**.



- Mount primary gear wheel all the way with special tool **4**.

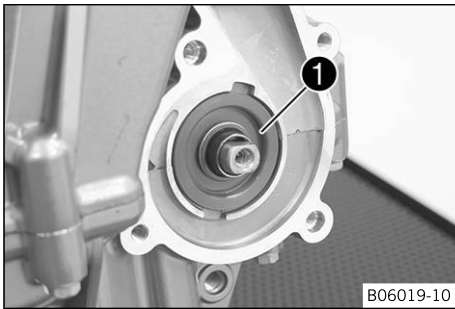
Pressing tool (61229016000) (📖 p. 468)

✓ The marking is visible after mounting.

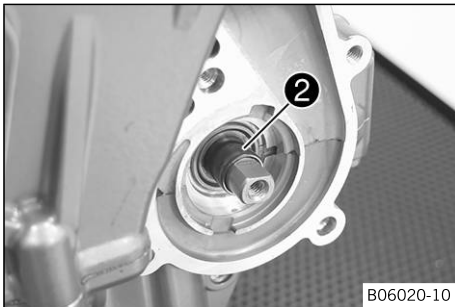
20.4.8 radial shaft seal ring of water pump, changing

Preparatory work

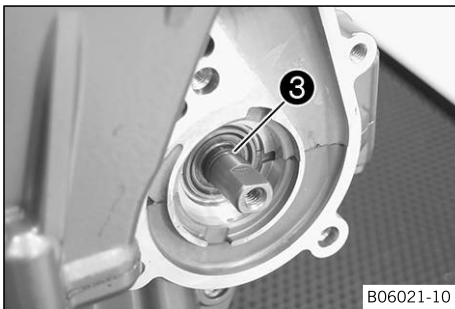
- Remove the water pump impeller. (📖 p. 285)

**Main work**

- Remove radial shaft seal ring **1** of the water pump.

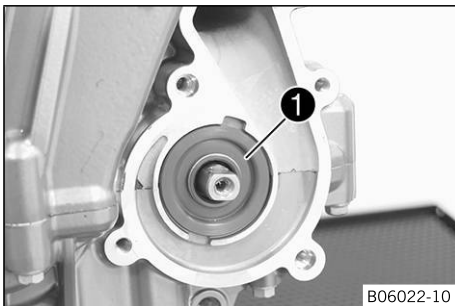


- Remove water pump impeller **2**.



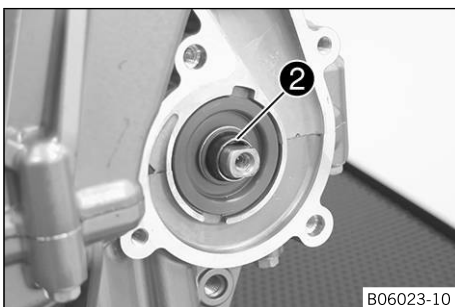
- Remove O-ring **3**.
- Grease and mount the new O-ring **3**.

Long-life grease (📖 p. 460)



- Grease and mount new radial shaft seal ring **1**.

Long-life grease (📖 p. 460)



- Mount the new water pump impeller **2**.

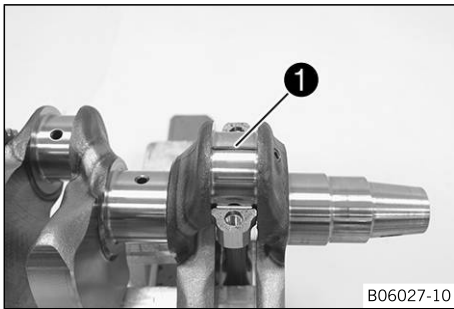
Finishing work

- Mount the water pump cover. (📖 p. 361)



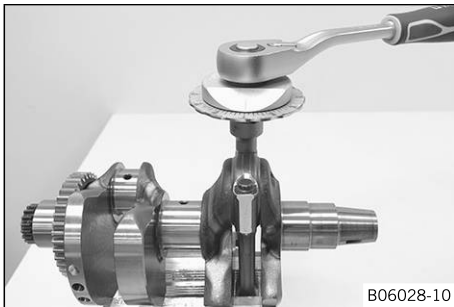
20.4.9 Checking the radial clearance of lower conrod bearing

i Info
Perform operations for both connecting rods.



- Position the bearing shells. Insert **Plastigauge** clearance gage ① 90° offset to the bearing joint.

Plastigauge clearance gauge (60029012000) (📖 p. 466)



- Position the conrod bearing cover. Mount and tighten the screws.

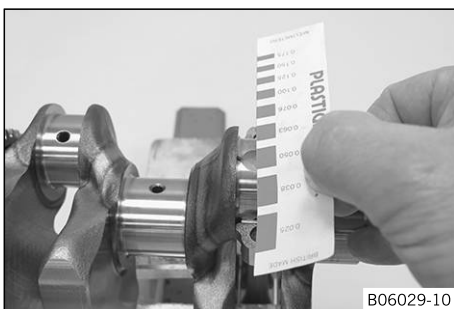
Guideline

Screw, conrod bearing	M8x0.75	1st stage 5 Nm (3.7 lbf ft) 2nd stage 20 Nm (14.8 lbf ft) 3rd stage 90° Screw support and thread oiled
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Multi-tooth wrench socket (63529075000) (📖 p. 471)

Angle disc (60029010000) (📖 p. 465)

i Info
Do not twist connecting rod.



- Remove the conrod bearing cover again. Compare **Plastigauge** clearance gauge with the data on the packaging.

Guideline

Connecting rod - radial clearance of lower conrod bearing	
New condition	0.030 ... 0.060 mm (0.00118 ... 0.00236 in)
Wear limit	0.080 mm (0.00315 in)

i Info
The width of the **Plastigauge** clearance gauge indicates the bearing play.

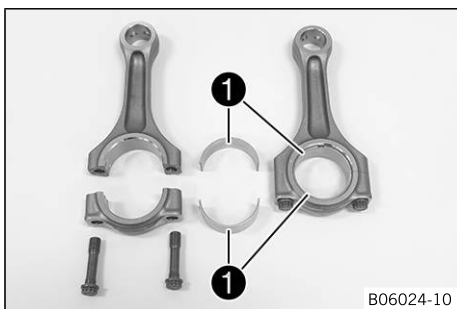
- Clean the parts.

20.4.10 Changing the conrod bearing

i Info
Perform operations for both connecting rods.

Condition

Connecting rod removed



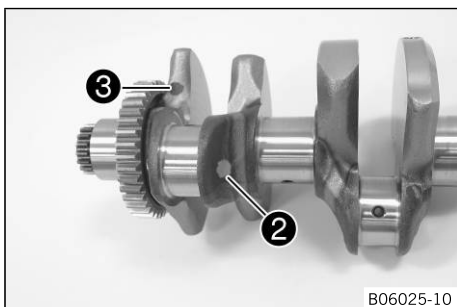
Main work

- Take off bearing cover and remove bearing shells ①.



Info

The conrod bearing cover and connecting rod are jointly marked. Make sure that each conrod bearing cover is mounted on the same connecting rod.



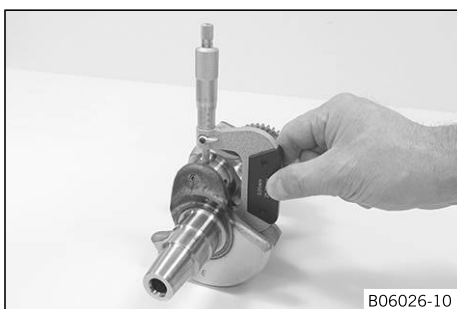
New crankshaft

- Select the new bearing shells according to color coding ②.



Info

Color coding ③ refers to the crankshaft bearing.



Used crankshaft

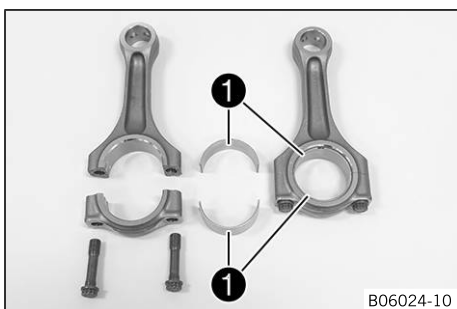
- Measure the crank pin diameter and select the new bearing shells accordingly.

Guideline

Crankshaft - crank pin diameter	
Blue	37.983 ... 37.993 mm (1.49539 ... 1.49578 in)
Red	37.993 ... 38.003 mm (1.49578 ... 1.49618 in)

- Check pivot points for damage and abrasion.
 - » If damage or abrasion is discernible:
 - Change the crankshaft.

- Mount new bearing shells ① on conrod bearing cover and connecting rod.



Info

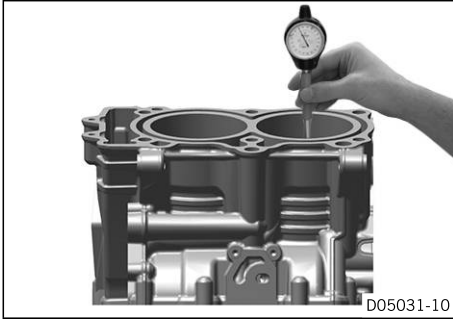
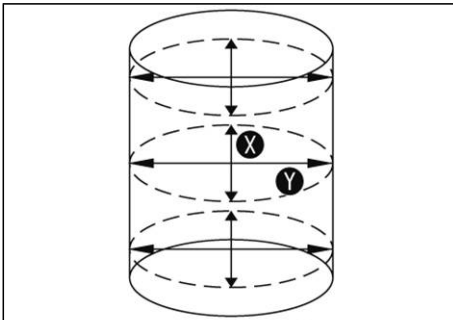
The conrod bearing cover and connecting rod are jointly marked. Make sure that each conrod bearing cover is mounted on the same connecting rod.

Finishing work

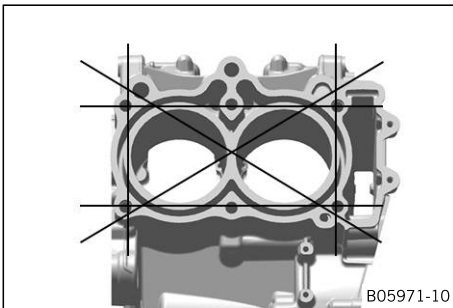
- Check the radial clearance of lower conrod bearing. (📖 p. 308)



20.4.11 Checking/measuring the cylinder



D05031-10



B05971-10

- Check the cylinder bearing surface for damage.
 - » If the cylinder bearing surface is damaged:
 - Change the cylinder and piston.
- Measure the bore diameter at several locations on the X- and Y-axes using a micrometer to identify oval wear.

Guideline

Cylinder - bore diameter	
Size	90.700 ... 90.712 mm (3.57086 ... 3.57133 in)

- Using a straightedge and the special tool, check the sealing surface of the cylinder head for distortion.

Feeler gauge (79129941000) (📖 p. 473)

Cylinder/cylinder head - sealing area distortion	≤ 0.05 mm (≤ 0.002 in)
--	------------------------

- » If the measured value does not meet specifications:
 - Change engine case.

20.4.12 Checking/measuring the piston



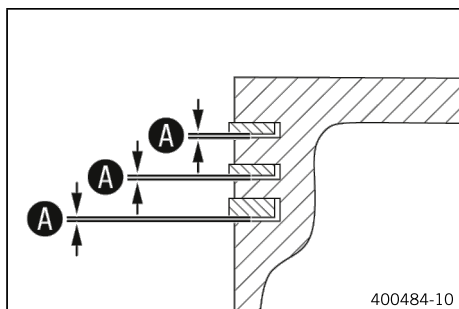
D05033-10

- Check the piston bearing surface for damage.
 - » If the piston bearing surface is damaged:
 - Replace the piston and, if necessary, the cylinder.
- Check that the piston rings move easily in the piston ring grooves.
 - » If the piston ring is stiff:
 - Clean the piston ring groove.

i Tip
An old piston ring can be used to clean the piston ring groove.

- Check the piston rings for damage.
 - » If the piston ring is damaged:
 - Change the piston ring.

i Info
Mount the piston ring with the marking facing upward.



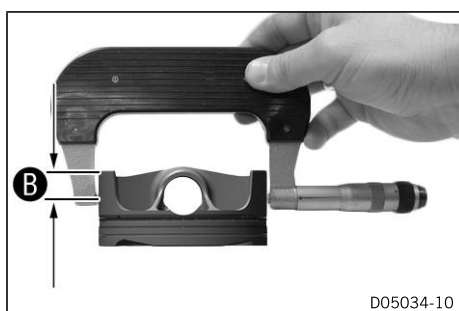
- Use the special tool to measure clearance **A** of the piston rings in the piston ring groove.

Guideline

Piston ring - groove clearance	
First ring (rectangular ring)	≤ 0.08 mm (≤ 0.0031 in)
Second ring (lower compression ring)	≤ 0.08 mm (≤ 0.0031 in)
Oil scraper ring	≤ 0.06 mm (≤ 0.0024 in)

Feeler gauge (79129941000) (📖 p. 473)

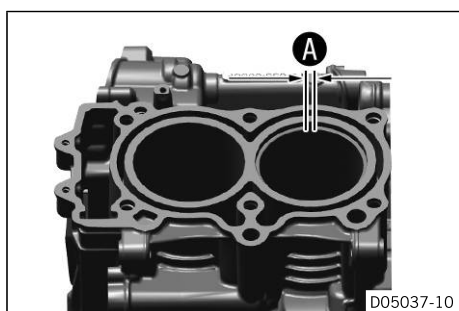
- » If clearance **A** is larger than the specified value:
 - Change the piston and piston rings.
 - Check/measure the cylinder. (📖 p. 310)
- Check piston pin for discoloration, signs of wear or flaking of the coating.
 - » If the piston pin exhibits significant discoloration/signs of wear, or the coating is flaking:
 - Change the piston pin.
- Place the piston pin in the connecting rod and check the seating for play.
 - » If the piston pin seating has excessive play:
 - Change the connecting rod and piston pin.
- Measure the piston at the piston skirt, at right angles to the piston pin, at a distance **B**.



Guideline

Piston - diameter	
Size	90.200 ... 90.450 mm (3.55117 ... 3.56102 in)
Distance B	6 mm (0.24 in)

20.4.13 Checking the piston ring end gap



- Remove the piston ring from the piston.
- Place the piston ring in the cylinder and align with the piston.

Guideline

Below the upper edge of the cylinder	10 mm (0.39 in)
--------------------------------------	-----------------

- Measure end gap **A** with a feeler gauge.

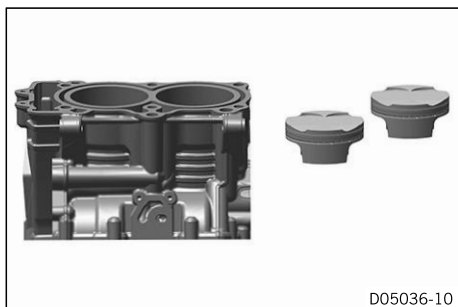
Guideline

Piston ring end gap	
Compression rings	≤ 0.80 mm (≤ 0.0315 in)
Oil scraper ring	≤ 0.10 mm (≤ 0.0039 in)

- » If the end gap is greater than the specified value:
 - Check/measure the cylinder. (📖 p. 310)
- » If cylinder wear lies within the specified tolerance:
 - Change the piston ring.

- Mount the piston ring with the marking facing toward the piston head.

20.4.14 Determining the piston/cylinder mounting clearance

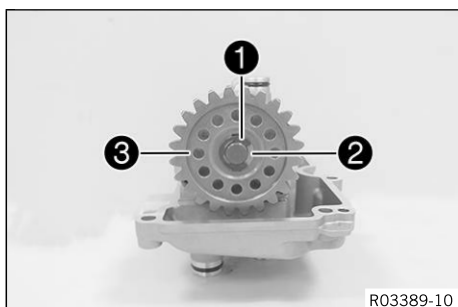


- Check/measure the cylinder. (📖 p. 310)
- Check/measure the piston. (📖 p. 310)
- The smallest piston/cylinder mounting clearance is the result of the smallest cylinder bore diameter minus the largest piston diameter. The largest piston/cylinder mounting clearance is the result of the largest cylinder bore diameter minus the smallest piston diameter.

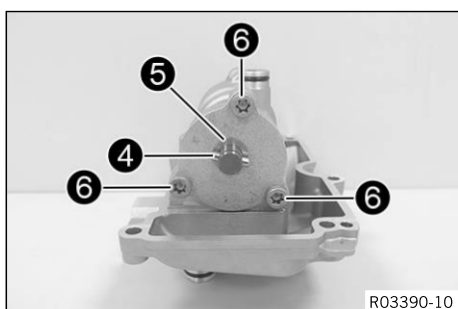
Guideline

Piston/cylinder - mounting clearance	
New condition	0.035 ... 0.070 mm (0.00138 ... 0.00276 in)
Wear limit	0.10 mm (0.0039 in)

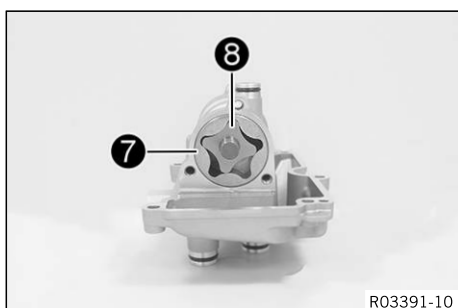
20.4.15 Removing the oil pumps



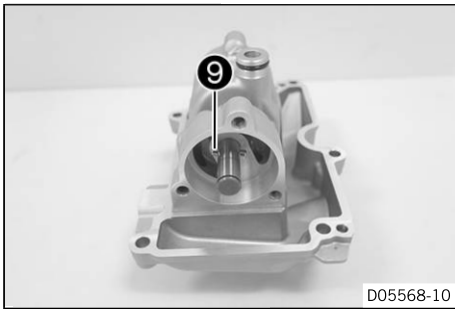
- Remove lock ring **1** and washer **2**.
- Take off oil pump gear wheel **3**.



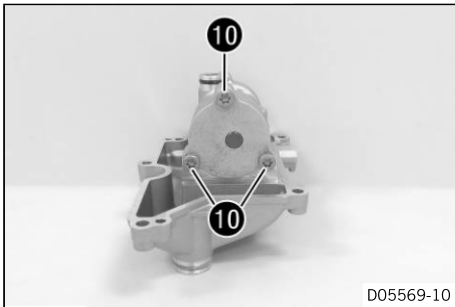
- Remove pin **4** and washer **5**.
- Remove screws **6**.
- Take off the oil pump cover.



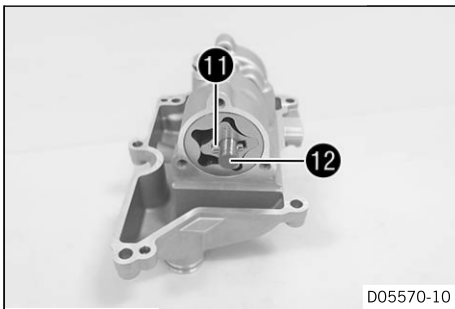
- Remove external rotor **7**.
- Remove internal rotor **8**.



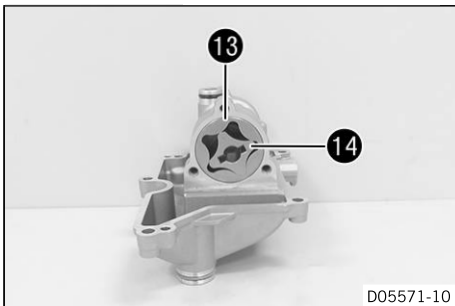
- Remove pin 9.



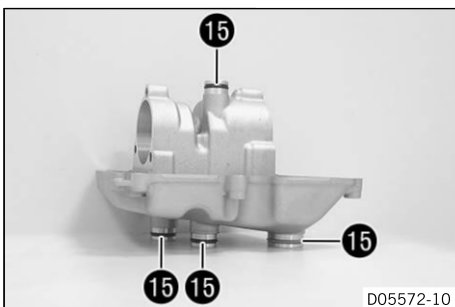
- Remove screws 10.
- Take off the oil pump cover.



- Remove pin 11 and oil pump shaft 12.



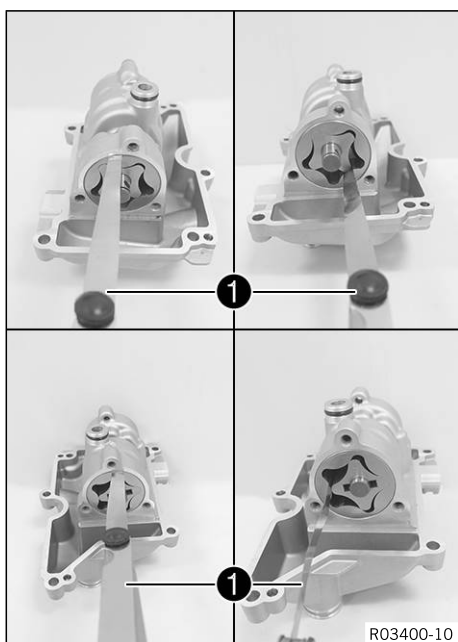
- Remove external rotor 13 and internal rotor 14.



- Remove O-rings 15.



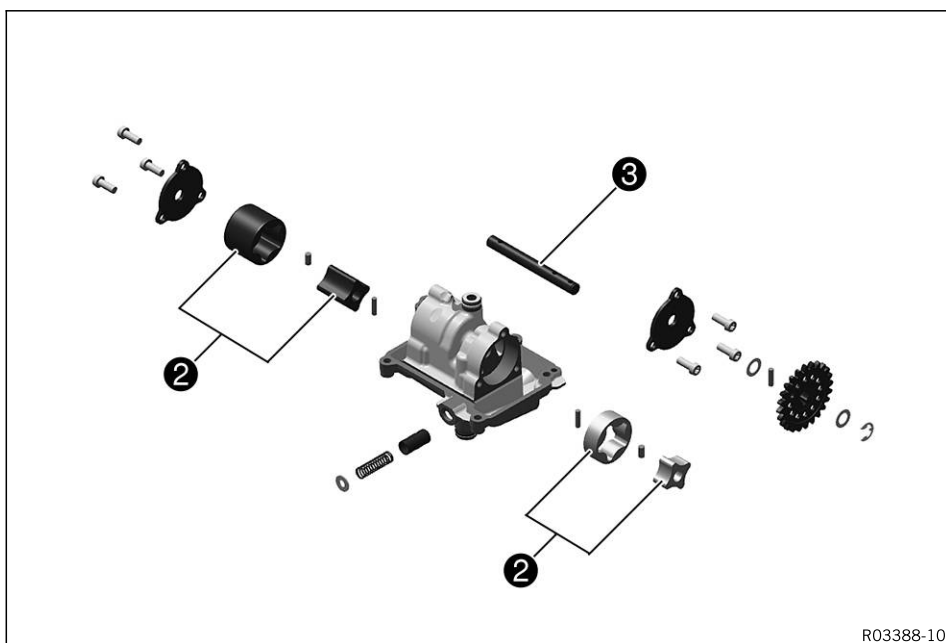
20.4.16 Checking the oil pumps for wear



- Use a feeler gauge **1** to measure the play between the external rotor and oil pump housing as well as between the external rotor and internal rotor.

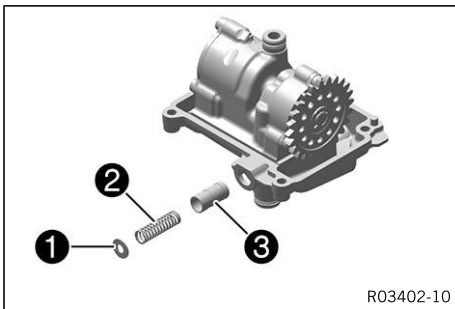
Oil pump	
Play between external rotor and oil pump housing	$\leq 0.15 \text{ mm}$ ($\leq 0.0059 \text{ in}$)
Clearance, external rotor/internal rotor	$\leq 0.20 \text{ mm}$ ($\leq 0.0079 \text{ in}$)
Axial play	0.03 ... 0.08 mm (0.0012 ... 0.0031 in)

- » If the measured value does not meet specifications:
 - Change the oil pump and, if necessary, the oil pump housing.



- Check the internal rotor and external rotor of oil pumps **2** for damage and wear.
 - » If there is damage or wear:
 - Change the oil pumps.
- Check oil pump shaft **3** for damage and wear.
 - » If there is damage or wear:
 - Change the oil pump shaft.
- Check both oil pump covers for damage and wear.
 - » If there is damage or wear:
 - Change the oil pump cover.

20.4.17 Checking the oil pressure control valve



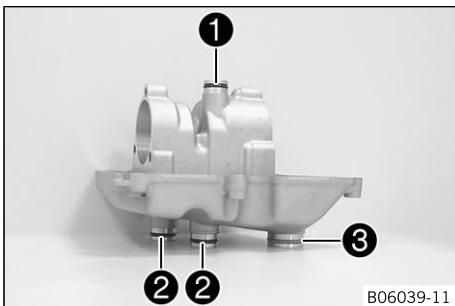
- Remove washer **1**.
- Remove spring **2**.
- Measure the length of spring **2**.

Oil pressure regulator valve - minimum length spring	42.0 mm (1.654 in)
---	--------------------

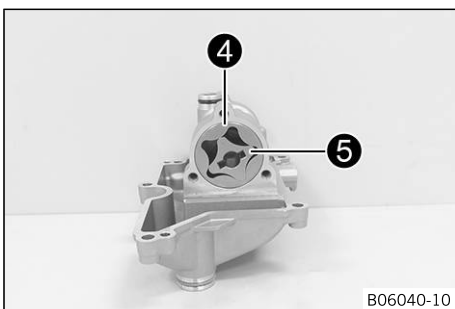
- » If the measured length is less than the specified value:
 - Change the spring.
- Check control piston **3** for damage and wear.
 - » If there is damage or wear:
 - Change the control piston.
- Check the control piston for smooth operation in the oil pump housing.
 - » If the control piston is stiff:
 - Change the control piston or the oil pump housing.
- Thoroughly oil control piston **3** and spring **2** and mount them.
- Mount washer **1**.



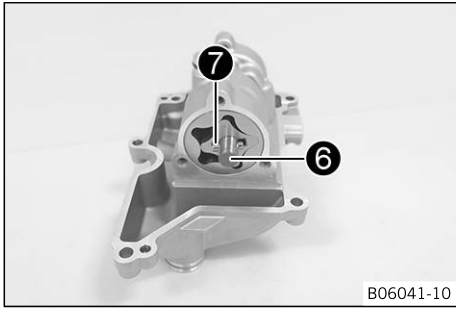
20.4.18 Installing the oil pumps



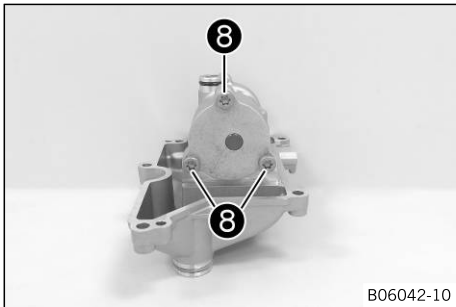
- Mount and grease the new O-rings **1**, **2** and **3**.



- Mount external rotor **4** and internal rotor **5**.
 - ✓ The rounded side of the external rotor must face the oil pump housing.
- Oil the parts.



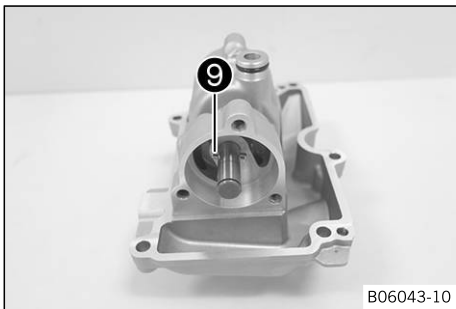
- Mount oil pump shaft **6** with pin **7**.



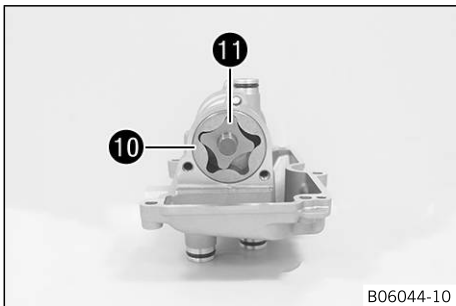
- Position the oil pump cover.
- Mount and tighten screws **8**.

Guideline

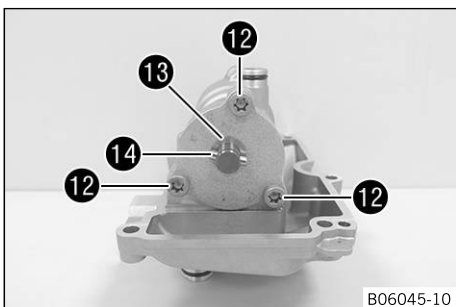
Screw, oil pump cover	M6	10 Nm (7.4 lbf ft) Loctite®243™
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- Mount pin **9**.



- Mount external rotor **10** and internal rotor **11**.
- ✓ The rounded side of the external rotor must face the oil pump housing.
- Oil the parts.

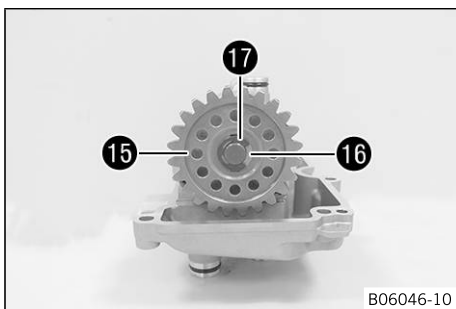


- Position the oil pump cover.
- Mount and tighten screws **12**.

Guideline

Screw, oil pump cover	M6	10 Nm (7.4 lbf ft) Loctite®243™
-----------------------	----	---

- Mount washer **13**.
- Mount pin **14**.



- Mount oil pump gear wheel 15.
- Mount washer 16 and lock ring 17.

20.4.19 Preparing timing chain tensioner for installation



- Fully compress the timing chain tensioner.

i Info
This requires considerable force since the oil has to be pressed out.

- Release the timing chain tensioner.
✓ Without pressure, the timing chain tensioner expands fully.



- Place two compensating disks or similar aids next to the piston of the timing chain tensioner. This should ensure that when pushed down, the piston does not fully withdraw.

Guideline

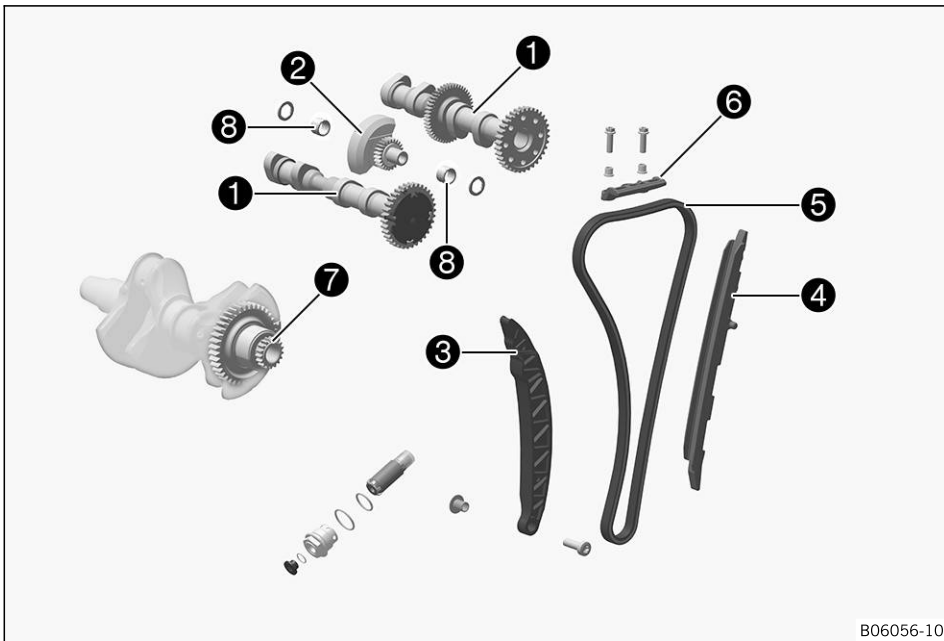
Thickness of the compensating disks	2 ... 2.5 mm (0.08 ... 0.098 in)
-------------------------------------	----------------------------------

- Release the timing chain tensioner.
✓ The latching system locks and the piston stops moving.

End position of piston after latching	3 mm (0.12 in)
---------------------------------------	----------------

i Info
This position is necessary for installation.
If the timing chain tensioner is now pressed in once more (while it is installed) and then pulled out no more than halfway (preventing it from coming out fully), the latching system locks and the timing chain tensioner can no longer be compacted; this function is necessary to ensure sufficient tension of the timing chain, even at low oil pressure.

20.4.20 Checking the timing assembly



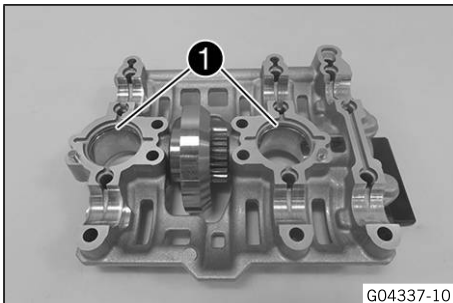
B06056-10

- Clean all parts well.
- Check camshafts **1** for damage and wear.
 - » If there is damage or wear:
 - Change the camshafts.
- Check balancer shaft **2** for damage and wear.
 - » If there is damage or wear:
 - Change the balancer shaft.
- Check tensioning rail **3** for damage and wear.
 - » If there is damage or wear:
 - Change the tensioning rail.
- Check guide rail **4** for damage and wear.
 - » If there is damage or wear:
 - Change the guide rail.
- Check timing chain **5** for damage and wear.
 - » If there is damage or wear:
 - Change the timing chain.
- Check the timing chain links for smooth operation. Let the timing chain hang down freely.
 - » The chain links no longer align in a straight line:
 - Change the timing chain.
- Check guide rail **6** for damage and wear.
 - » If there is damage or wear:
 - Change the guide rail.
- Check timing chain sprocket **7** for damage and wear.
 - » If there is damage or wear:
 - Change the crankshaft.
- Check balancer shaft bearing **8** for damage and wear.
 - » If there is damage or wear:
 - Change the balancer bearing.

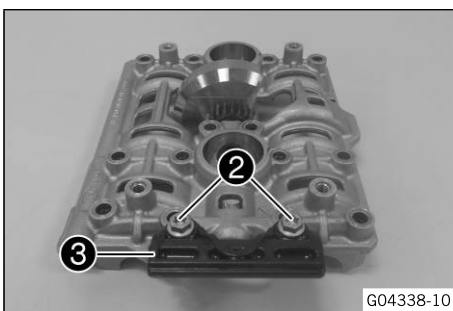
- Check the O-rings ⑨ of the timing chain tensioner for damage and wear.
 - » If there is damage or wear:
 - Change the O-rings.



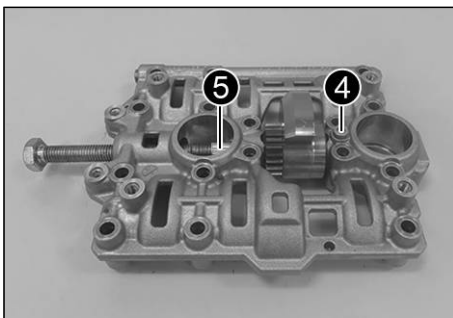
20.4.21 Working on the camshaft bearing bridge



- Remove O-rings ①.

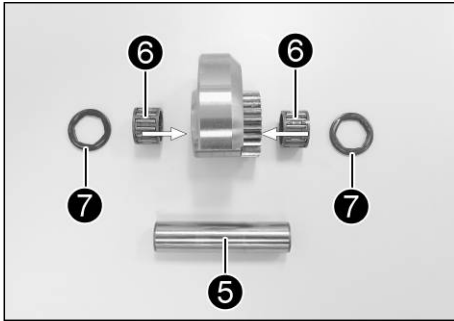


- Remove screws ②.
- Take off guide rail ③.

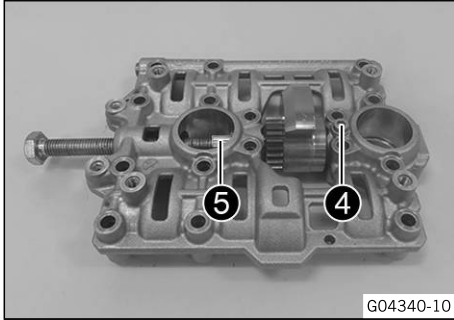


- Remove screw ④.
- Pull out spindle ⑤ of the balancer shaft with appropriate screw M10.
- Remove balancer shaft with needle bearings ⑥ and washers ⑦.

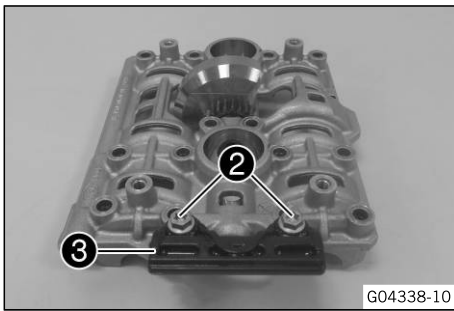




- Mount new needle bearings **6** in the balancer shaft and oil.
- Position balancer shaft with washers **7** in the camshaft bearing bridge.
- Mount spindle **5** of the balancer shaft in the center between the spark plug shafts.
- Mount and tighten screw **4**.
- Remove screw M10.



G04340-10

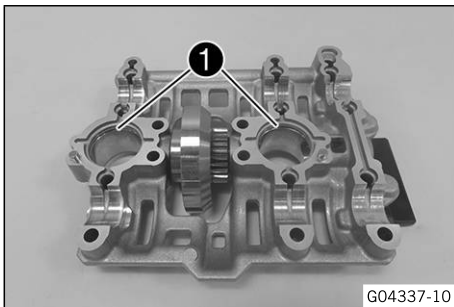


G04338-10

- Position guide rail **3**.
- Mount and tighten screws **2**.

Guideline

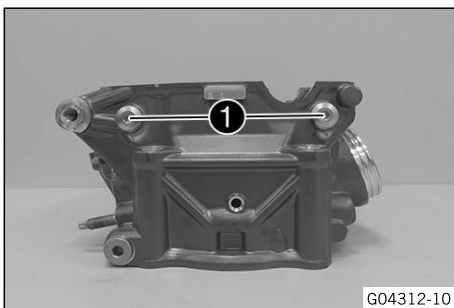
Screw, upper guide rail	M6	8 Nm (5.9 lbf ft) Loctite®243™
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G04337-10

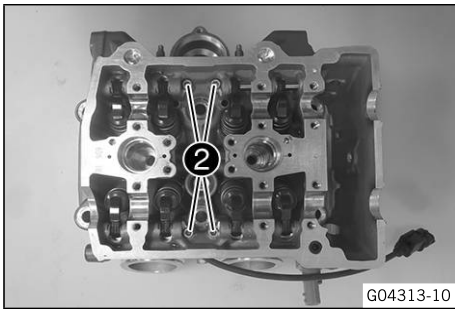
- Mount and grease the new O-rings **1**.

20.4.22 Working on the cylinder head

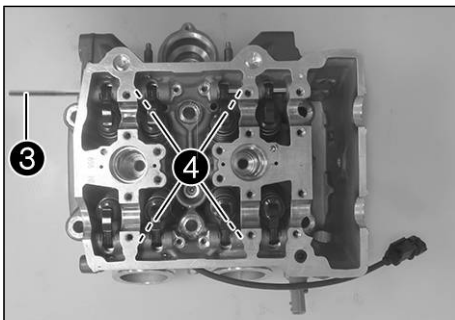


G04312-10

- Remove screw plugs **1** with the O-rings.



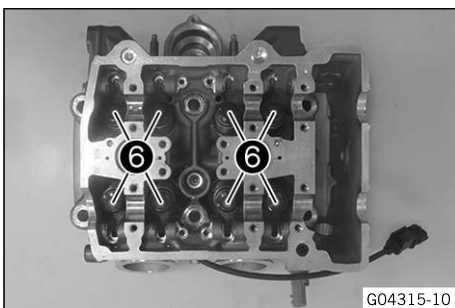
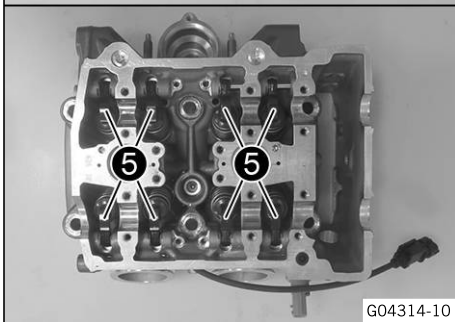
- Remove screws ②.



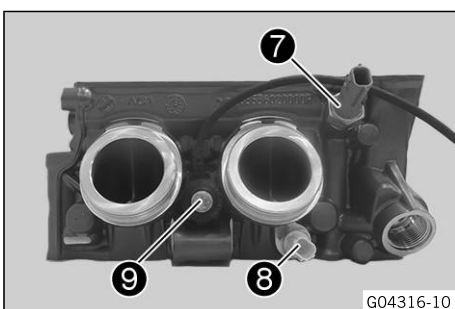
- Mount disassembly tool M4 e.g. a spoke ③.

Spoke (26110071159)

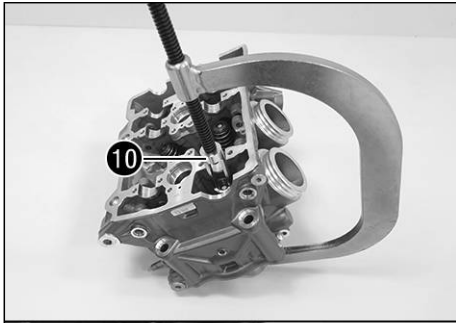
- Remove cam lever shafts ④.
- Take off cam lever ⑤.



- Remove shims ⑥ and label according to their normal built-in position.



- Remove oil pressure sensor ⑦ with O-ring.
- Remove coolant temperature sensor ⑧ with the O-ring.
- Remove knock sensor ⑨.

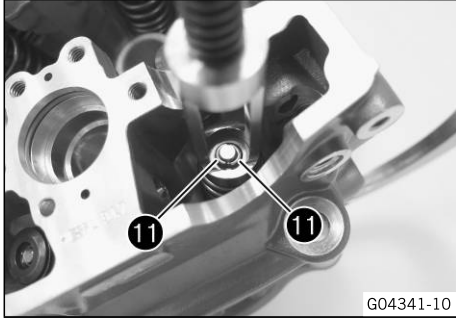


- Tension valve spring with special tool 10.

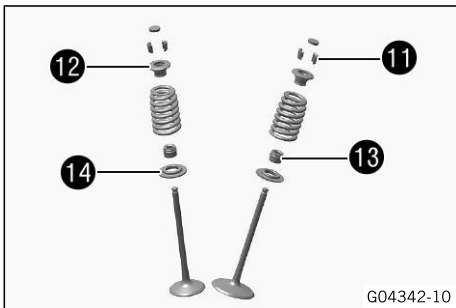
Valve spring mounter (59029019000) (📖 p. 465)

Insert for valve spring lever (63529060000) (📖 p. 470)

- Remove valve collets 11 and release the valve spring.



G04341-10

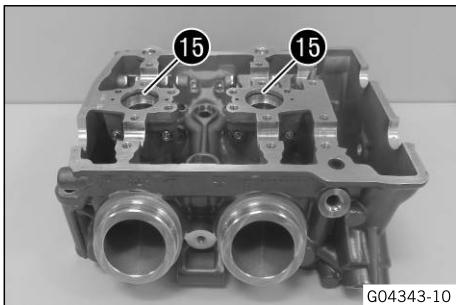


G04342-10

- Remove valve spring retainers 12, valve springs, valve stem seals 13 and valve spring seats 14.

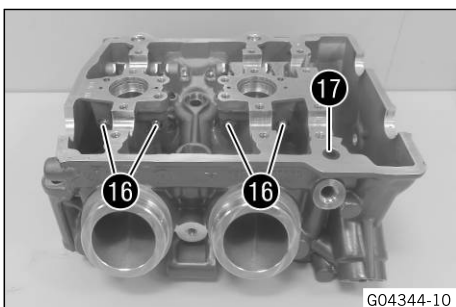
i Info

Place the valves in a box according to their normal built-in position and label them.



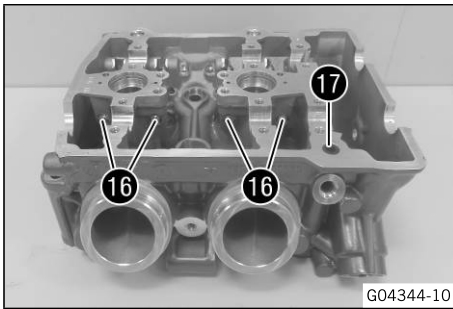
G04343-10

- Remove O-rings 15.



G04344-10

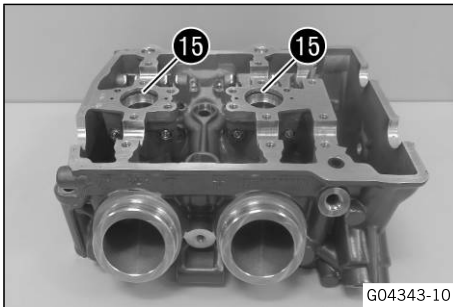
- Remove oil nozzles 16.
- Remove oil screen 17 and clean it.
- Check the cylinder head. (📖 p. 325)



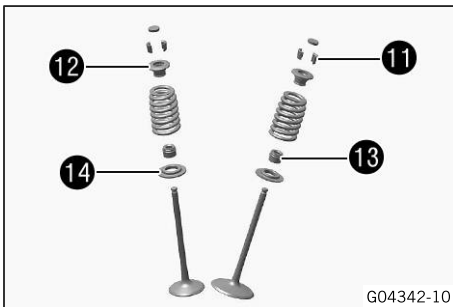
- Mount oil screen 17.
- Mount oil nozzles 16.

Guideline

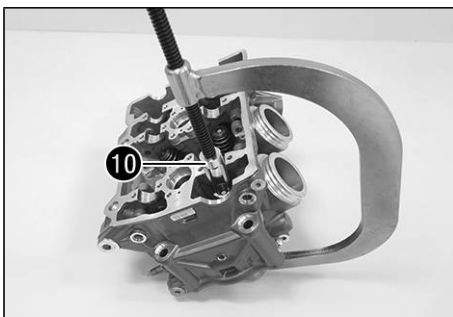
Oil nozzle in cylinder head	M5	2 Nm (1.5 lbf ft)
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- Mount and grease O-rings 15.



- Mount valve spring seats 14 and new valve stem seals 13.
- Mount valve spring retainers 12 and valve springs.

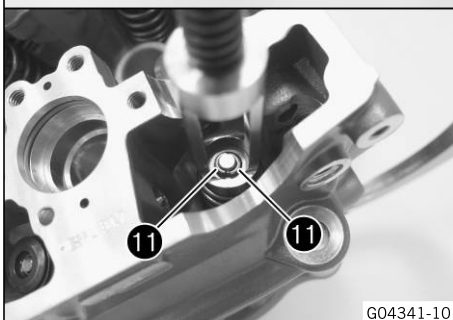


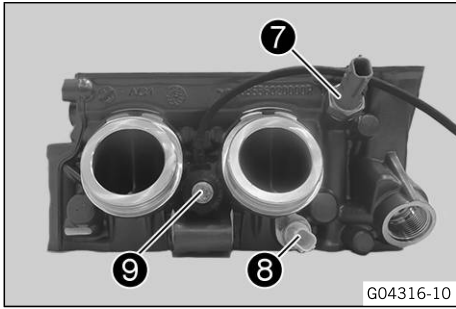
- Tension valve spring with special tool 10.

Valve spring mouter (59029019000) (📖 p. 465)
Insert for valve spring lever (63529060000) (📖 p. 470)

- Mount valve collets 11. Release the tension on the valve spring.

i Info
When mounting the valve collets, check they are seated properly; preferably use a little grease to secure the valve collets on the valve.





G04316-10

- Mount and tighten knock sensor ⑨.

Guideline

Screw, knock sensor	M8	20 Nm (14.8 lbf ft)
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- Mount coolant temperature sensor ⑧ with the new O-ring.

Guideline

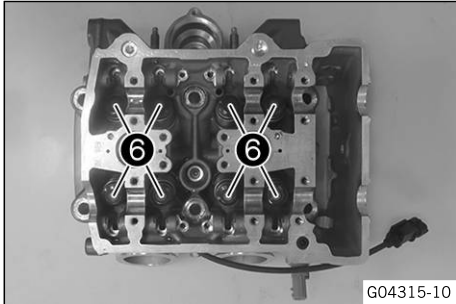
Coolant temperature sensor	M10x1.25	10 Nm (7.4 lbf ft)
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- Mount oil pressure sensor ⑦ with new O-ring.

Guideline

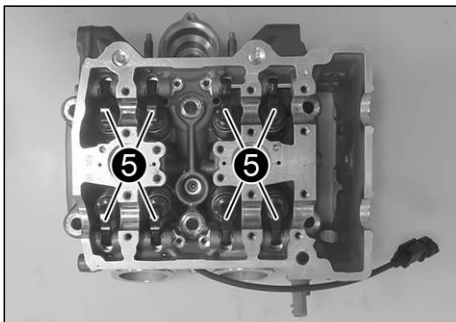
Oil pressure sensor	M10x1	10 Nm (7.4 lbf ft)
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- Place shims ⑥ into the valve spring retainer according to their normal built-in position.

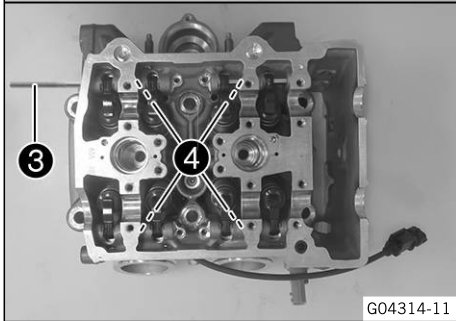


G04315-10

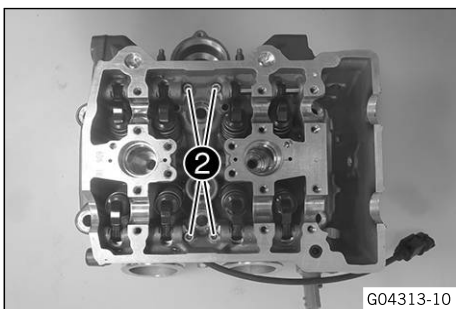
- Position cam levers ⑤.
- Mount cam lever shafts ④.
- Remove disassembly tool ③.



G04314-11



G04314-11

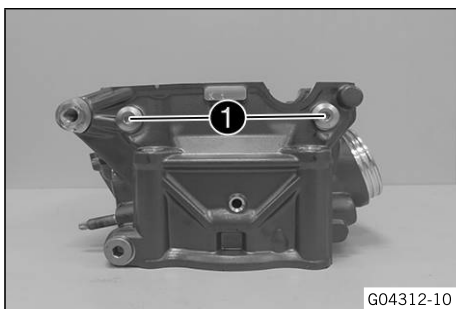


G04313-10

- Mount and tighten screws ②.

Guideline

Screw, cam lever axial lock	M5	6 Nm (4.4 lbf ft) Loctite®243™
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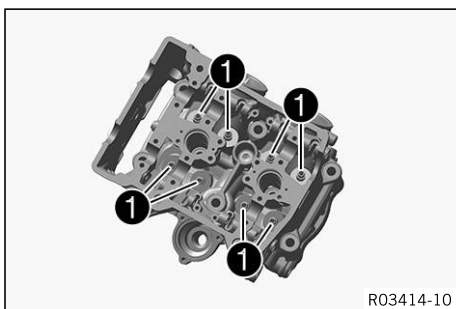


- Mount screw plugs **1** with new O-rings.

Guideline

Screw plug, cam lever axis	M10x1	8 Nm (5.9 lbf ft)
----------------------------	-------	-------------------

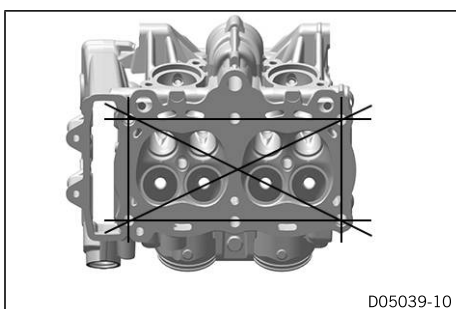
20.4.23 Checking the cylinder head



- Check valve guides **1** using the special tool.

Limit plug gauge (77029026000) (📖 p. 472)

- » If the special tool is easy to insert into the valve guide:
 - Change the valve guide and valve.
- Check the sealing surface of the spark plug thread and the valve seats for damage and cracking.
 - » If there is damage or cracking:
 - Change the cylinder head.

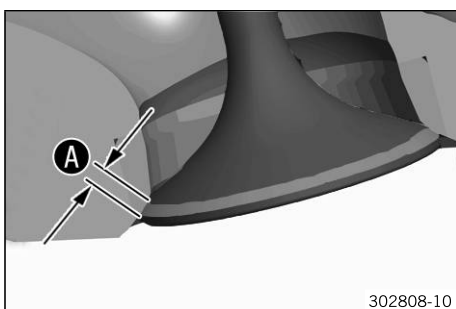


- Check the sealing surface of the cylinder for distortion using a straightedge and the special tool.

Feeler gauge (79129941000) (📖 p. 473)

Cylinder/cylinder head - sealing area distortion	$\leq 0.05 \text{ mm } (\leq 0.002 \text{ in})$
--	---

- » If the measured value does not meet specifications:
 - Change the cylinder head.



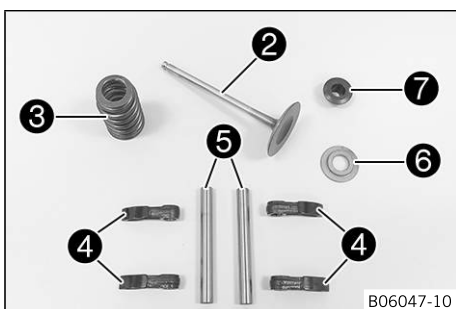
- Check sealing seat **A** of the valves.

Valve - sealing seat width	
Intake	2.80 mm (0.1102 in)

Valve - sealing seat width	
Exhaust	3.00 mm (0.1181 in)

- » If the measured value does not meet specifications:
 - Machine the valve seat.

- Blow compressed air through all oil channels and oil nozzles, and check that they are clear.



- Check valve **2** for damage and wear.

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

- Check the valve for run-out.

Valve - run-out	
On the valve plate	$\leq 0.05 \text{ mm } (\leq 0.002 \text{ in})$
On the valve stem	$\leq 0.05 \text{ mm } (\leq 0.002 \text{ in})$

- » If the measured value does not meet specifications:
 - Change the valve.

- Check the valve stem diameter.

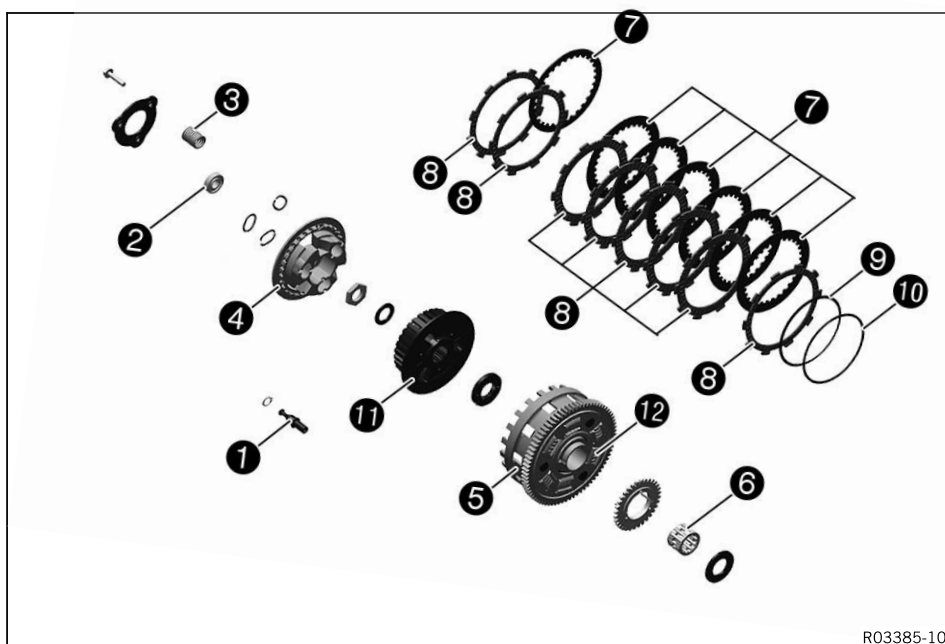
Valve - valve stem diameter	
Exhaust	4.95 ... 4.97 mm (0.1949 ... 0.1957 in)
Intake	4.97 ... 4.99 mm (0.1957 ... 0.1965 in)

- » If the measured value does not meet specifications:
 - Change the valve.
- Check valve spring ③ for damage and wear.
 - » If there is damage or wear:
 - Change the valve spring.
- Measure the length of the valve springs.

Valve spring	
Minimum length (without valve spring seat)	44.0 mm (1.732 in)

- » If the measured value does not meet specifications:
 - Change the valve springs.
- Check cam levers ④ for damage and wear.
 - » If there is damage or wear:
 - Change the cam lever.
- Check cam lever shafts ⑤ for damage and wear.
 - » If there is damage or wear:
 - Change the cam lever shaft.
- Check valve spring seat ⑥ for damage and wear.
 - » If there is damage or wear:
 - Change the valve spring seat.
- Check valve spring retainer ⑦ for damage and wear.
 - » If there is damage or wear:
 - Change the valve spring retainer.

20.4.1



- Check clutch push rod **1** for damage and wear.
 - » If there is damage or wear:
 - Change clutch push rod.
- Check axial bearing **2** for damage and wear.
 - » If there is damage or wear:
 - Change the axial bearing.
- Check the length of clutch springs **3**.

Clutch spring - length	$\geq 43.0 \text{ mm } (\geq 1.693 \text{ in})$
------------------------	---

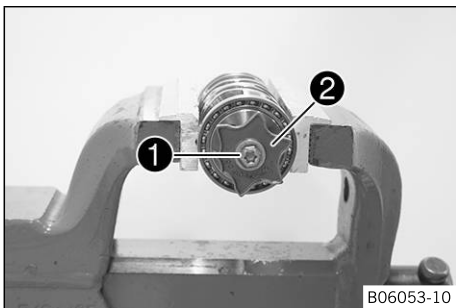
- » If the clutch spring length is shorter than specified:
 - Change all clutch springs.
- Check the contact surface of clutch pressure cap **4** for damage and wear.
 - » If there is damage or wear:
 - Change the clutch pressure cap.
- Check the thrust surfaces of the clutch facing discs in clutch basket **5** for damage and wear.
 - » If there is damage or wear:
 - Change the clutch disc pack and the clutch basket.
- Check needle bearing **6** for damage and wear.
 - » If there is damage or wear:
 - Change the needle bearing.
- Check intermediate clutch discs **7** for damage and wear.
 - » If the intermediate clutch discs are not level and are pitted:
 - Change the clutch disc pack.
- Check clutch facing discs **8** for discoloration and scoring.
 - » If there is discoloration or scoring:
 - Change the clutch disc pack.
- Check the thickness of the clutch disc pack.

Clutch disc pack - thickness

New condition	35.60 ... 36.40 mm (1.4016 ... 1.4331 in)
Wear limit	34.80 mm (1.3701 in)

- » If the clutch disc pack does not meet specifications:
 - Change the clutch disc pack.
- Check pretension ring **9** and support ring **10** for damage and wear.
 - » If there is damage or wear:
 - Change the pretension ring and support ring.
- Check inner clutch hub **11** for damage and wear.
 - » If there is damage or wear:
 - Change the inner clutch hub.
- Check springs **12** of the clutch basket for damage and wear.
 - » If there is damage, wear or play in the direction of rotation:
 - Change the clutch basket.

20.4.25 Removing the shift drum locating unit

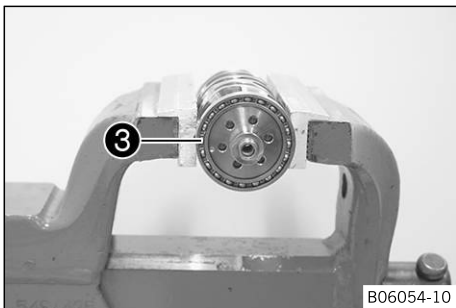


- Clamp shift drum.

Guideline

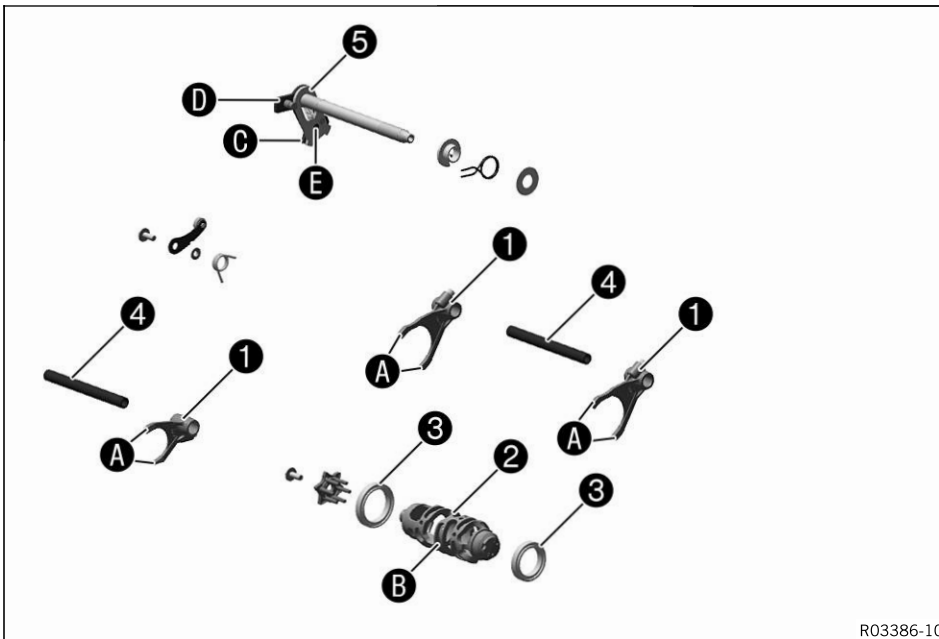
Use soft jaws.

- Remove screw **1**.
- Take off the shift drum locating unit **2**.



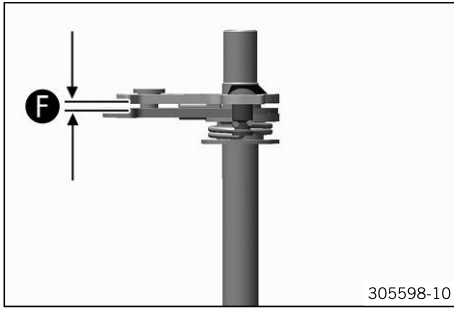
- Remove bearing **3**.

20.4.26 Checking the shift mechanism



R03386-10

- Check shift forks **1** on plate **A** for damage and wear (visual check).
 - » If there is damage or wear:
 - Change the shift fork and gear wheel pair.
- Check shift grooves **B** of shift drum **2** for wear.
 - » If the shift groove is worn:
 - Change the shift drum.
- Check the seat of the shift drum in bearings **3**.
 - » If the shift drum is not seated correctly:
 - Change the shift drum and/or the bearing.
- Check bearings **3** for ease of movement and wear.
 - » If the bearings are stiff or are worn:
 - Change the bearings.
- Check shift rails **4** on a flat surface for run-out.
 - » If there is run-out:
 - Change the shift rail.
- Check the shift rails for scoring, wear and smooth operation in the shift forks.
 - » If there is scoring or corrosion, or if the shift fork is stiff:
 - Change the shift rail.
- Check sliding plate **5** in contact areas **C** for wear.
 - » If the sliding plate is worn:
 - Change the sliding plate.
- Check return surface **D** on the sliding plate for wear.
 - » If deep notches are present:
 - Change the sliding plate.
- Check guide pin **E** for looseness and wear.
 - » If the guide pin is loose and/or worn:
 - Change the sliding plate.
- Preassemble the shift shaft. (📖 p. 330)

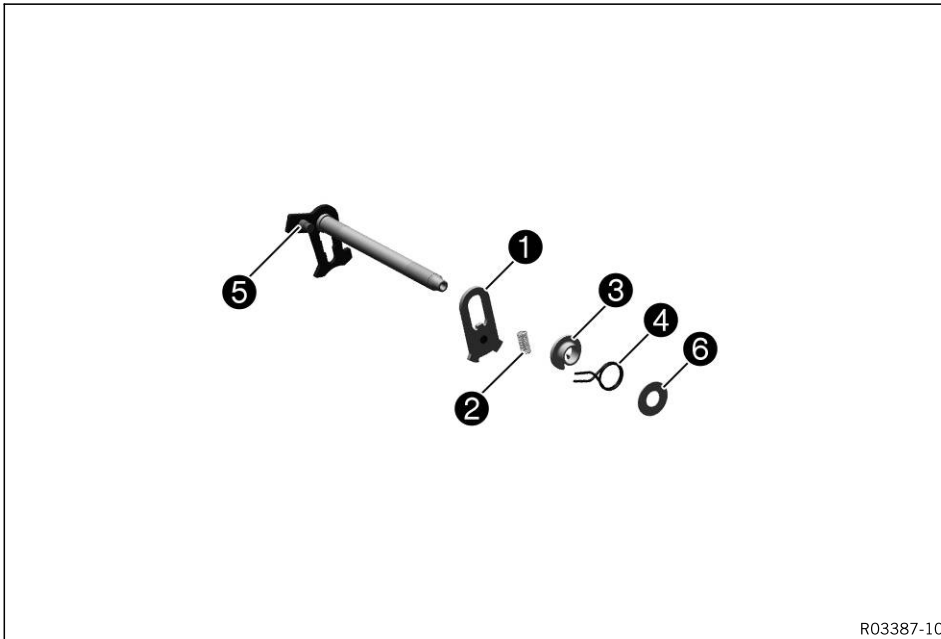


- Check clearance **F** between the sliding plate and the shift quadrant.

Shift shaft - play in sliding plate/shift quadrant	0.40 ... 0.80 mm (0.0157 ... 0.0315 in)
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- » If the measured value does not meet specifications:
 - Change the sliding plate.

20.4.27 Preassembling the shift shaft



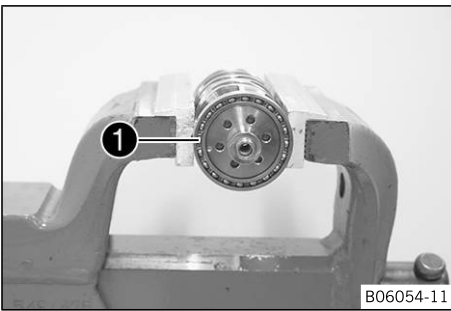
- Fix the short end of the shift shaft in a vise.

Guideline

Use soft jaws.

- Mount sliding plate **1** with the guide pin facing down and attach the guide pin to the shift quadrant.
- Mount pressure spring **2**.
- Push on spring guide **3**, push return spring **4** over the spring guide with the offset end facing upward and lift the offset end over abutment bolt **5**.
- Mount stop disk **6**.

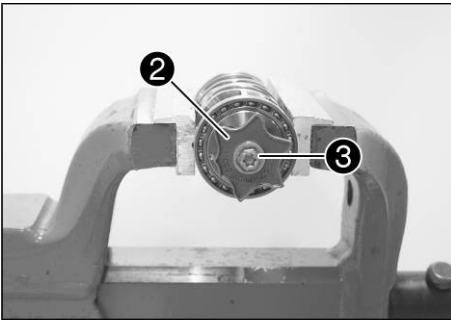
20.4.28 Installing the shift drum locating unit



- Clamp shift drum.
- Guideline

Use soft jaws.

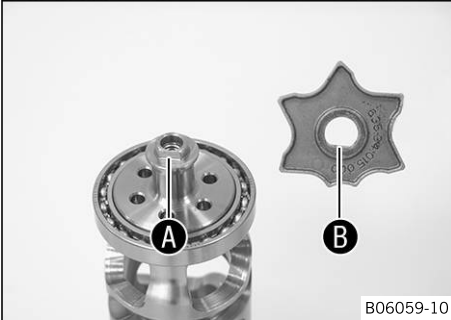
- Mount bearing 1.



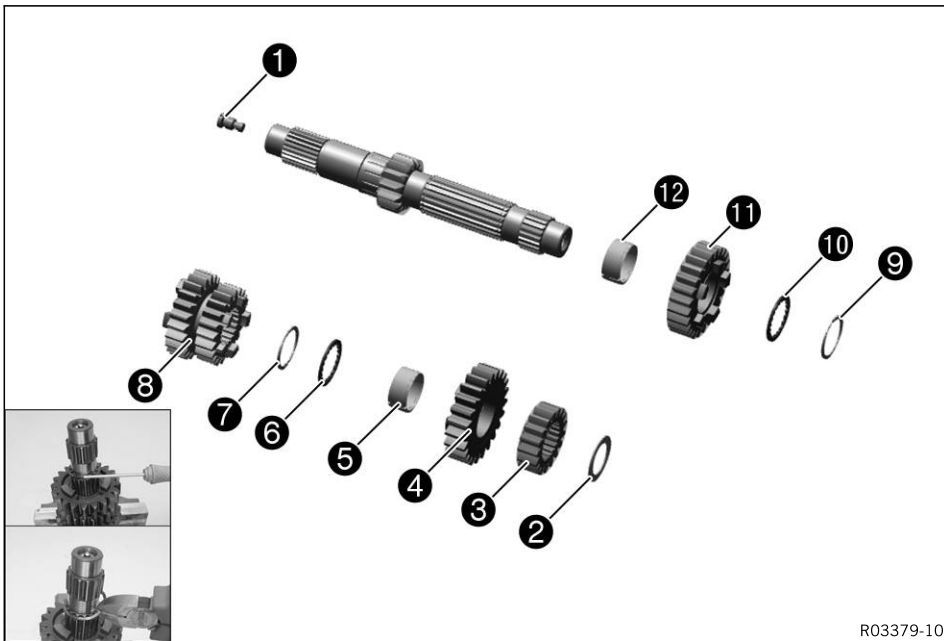
- Position shift drum locating unit 2.
- ✓ The flat surface A of the shift drum engages in the flat surface B of the shift drum locating unit.
- Mount and tighten screw 3.

Guideline

Screw, shift drum locating	M6	10 Nm (7.4 lbf ft) Loctite®243™
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20.4.29 Disassembling the main shaft



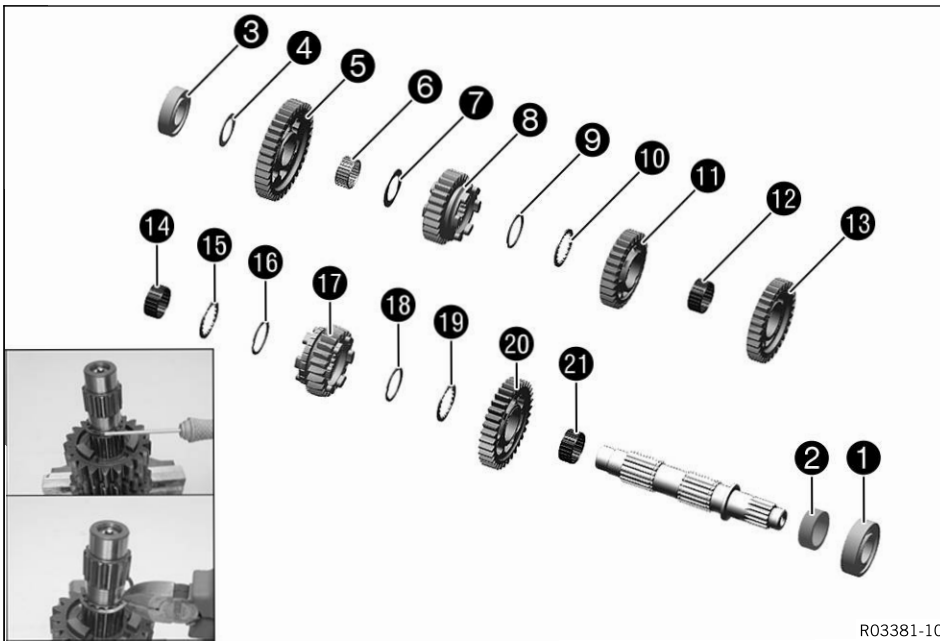
- Remove oil nozzle **1**.
- Secure the main shaft in the vise with the gear teeth facing downward.

Guideline

Use soft jaws.

- Remove stop disk **2** and second-gear fixed gear **3**.
- Remove sixth-gear idler gear **4**.
- Remove needle bearing **5** and stop disk **6**.
- Remove lock ring **7**.
- Remove third/fourth-gear sliding gear **8**.
- Remove lock ring **9**.
- Remove stop disk **10** and fifth-gear idler gear **11**.
- Remove needle bearing **12**.

20.4.30 Disassembling the countershaft



- Remove bearing **1** with distance sleeve **2**.
- Secure the countershaft in the bench vise with the toothed end facing downward.

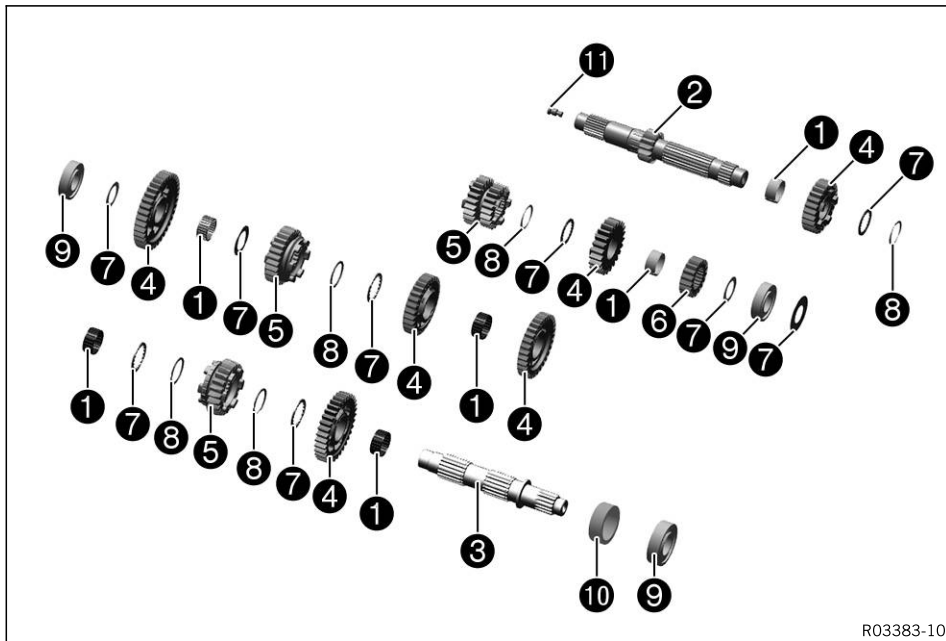
Guideline

Use soft jaws.

- Remove bearing **3**.
- Remove stop disk **4** and first-gear idler gear **5**.
- Remove needle bearing **6** and stop disk **7**.
- Remove the fifth-gear sliding gear **8** and lock ring **9**.
- Remove stop disk **10** and fourth-gear idler gear **11**.
- Remove needle bearing **12** and third-gear idler gear **13**.
- Remove needle bearing **14** and stop disk **15**.
- Remove lock ring **16** and sixth-gear sliding gear **17**.
- Remove lock ring **18** and stop disk **19**.
- Remove second-gear idler gear **20** and needle bearing **21**.



20.4.31 Checking the transmission



R03383-10

- Check needle bearings **1** for damage and wear.
 - » If there is damage or wear:
 - Change the needle bearing.
- Check the pivot points of main shaft **2** and countershaft **3** for damage and wear.
 - » If there is damage or wear:
 - Change the main shaft and/or countershaft.
- Check the tooth profiles of main shaft **2** and countershaft **3** for damage and wear.
 - » If there is damage or wear:
 - Change the main shaft and/or countershaft.
- Check the pivot points of idler gears **4** for damage and wear.
 - » If there is damage or wear:
 - Change the gear wheel pair.
- Check the shift dogs of idler gears **4** and sliding gears **5** for damage and wear.
 - » If there is damage or wear:
 - Change the gear wheel pair.
- Check the tooth faces of idler gears **4**, sliding gears **5**, and fixed gear **6** for damage and wear.
 - » If there is damage or wear:
 - Change the gear wheel pair.
- Check the tooth profiles of sliding gears **5** for damage and wear.
 - » If there is damage or wear:
 - Change the gear wheel pair.
- Check sliding gear **5** for smooth operation in the profile of main shaft **2**.
 - » If the fixed gear is stiff:
 - Change the sliding gear or the main shaft.
- Check sliding gears **5** for smooth operation in the profile of countershaft **3**.
 - » If the fixed gear is stiff:
 - Change the sliding gear or the countershaft.
- Check stop disks **7** for damage and wear.

- » If there is damage or wear:
 - Change the stop disks.
- Use new lock rings ⑧ with every repair.
- Check bearings ⑨ for damage and wear.
 - » If there is damage or wear:
 - Change the bearings.
- Check distance sleeve ⑩ for damage and wear.
 - » If there is damage or wear:
 - Change distance sleeve.
- Check oil nozzle ⑪ to ensure that they are free.
 - » If the oil nozzle is blocked:
 - Clean the oil nozzle and change as necessary.

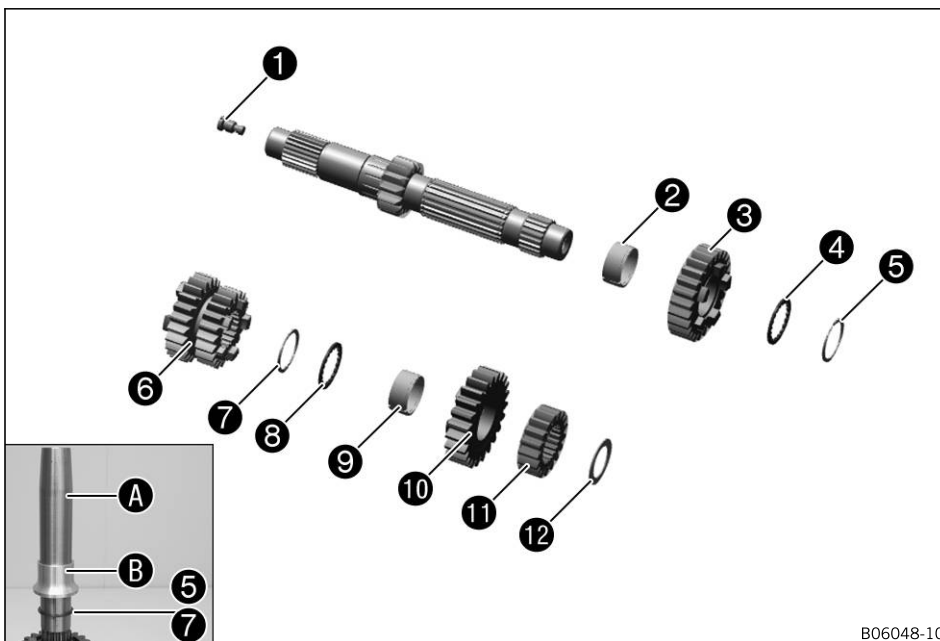


20.4.32 Assembling the main shaft

i Info
Use new lock rings with every repair.

Preparatory work

- Carefully lubricate all parts before assembling.
- Check the transmission. (📖 p. 334)



B06048-10

Main work

- Mount and tighten oil nozzle ①.

Guideline

Oil nozzle for clutch lubrication	M8	5 Nm (3.7 lbf ft)	Loctite®243™
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i Info
Ensure that there is no thread locker in the hole.

- Secure the main shaft in the vise with the gear teeth facing downward.

Guideline

Use soft jaws.

- Mount needle bearing ②, and mount fifth-gear idler gear ③ with the shift dogs facing up.
- Mount stop disk ④.
- Position special tool A on the transmission shaft.

Mounting tool for lock ring (76629032000) (📖 p. 472)

- Position new lock ring ⑤ on special tool A and push down with sleeve B.
- ✓ The lock ring engages in the groove of the transmission shaft.
- Attach third/fourth-gear sliding gear ⑥ with the small gear wheel facing up.
- Position special tool A on the transmission shaft.

Mounting tool for lock ring (76629032000) (📖 p. 472)

- Position new lock ring ⑦ on special tool A and push down with sleeve B.
- ✓ The lock ring engages in the groove of the transmission shaft.
- Mount stop disk ⑧ and needle bearing ⑨.
- Mount sixth-gear idler gear ⑩ with the shift dogs facing downward.
- Mount second-gear fixed gear ⑪ with the collar facing downward and mount stop disk ⑫.
- Finally, check all the gear wheels for smooth operation.

20.4.33 Assembling the countershaft

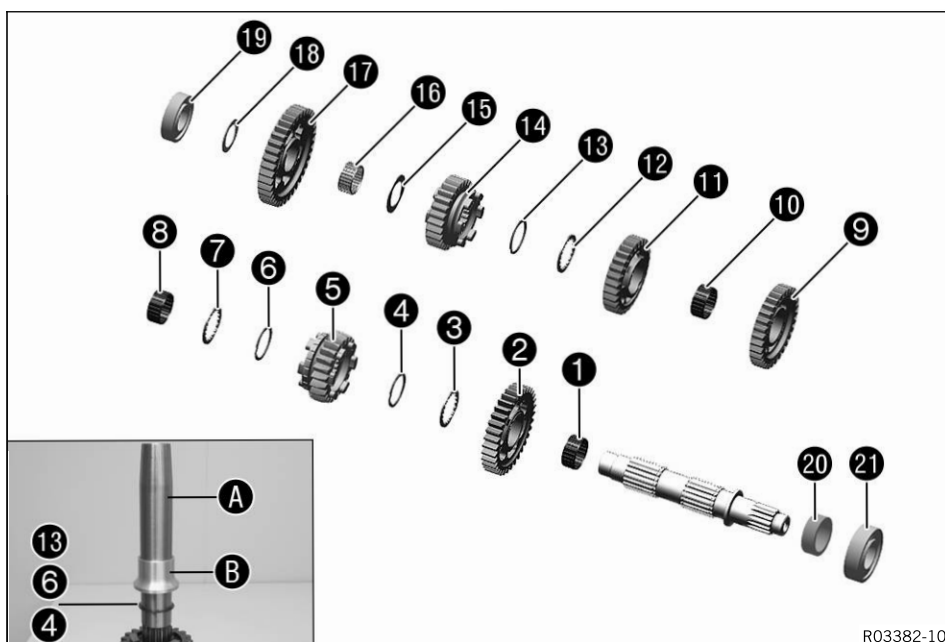


Info

Use new lock rings with every repair.

Preparatory work

- Carefully lubricate all parts before assembling.
- Check the transmission. (📖 p. 334)



Main work

- Secure the countershaft in the bench vise with the toothed end facing downward.

Guideline

Use soft jaws.

- Mount needle bearing **1** and second-gear idler gear **2** onto the countershaft with the protruding collar facing downward.
- Mount stop disk **3**.
- Position special tool **A** on the transmission shaft.

Mounting tool for lock ring (63529032000) (📖 p. 469)

- Position new lock ring **4** on special tool **A** and push down with sleeve **B**.
 ✓ The lock ring engages in the groove of the transmission shaft.
- Mount the sixth-gear sliding gear **5** with the shift groove facing up.
- Position special tool **A** on the transmission shaft.

Mounting tool for lock ring (63529032000) (📖 p. 469)

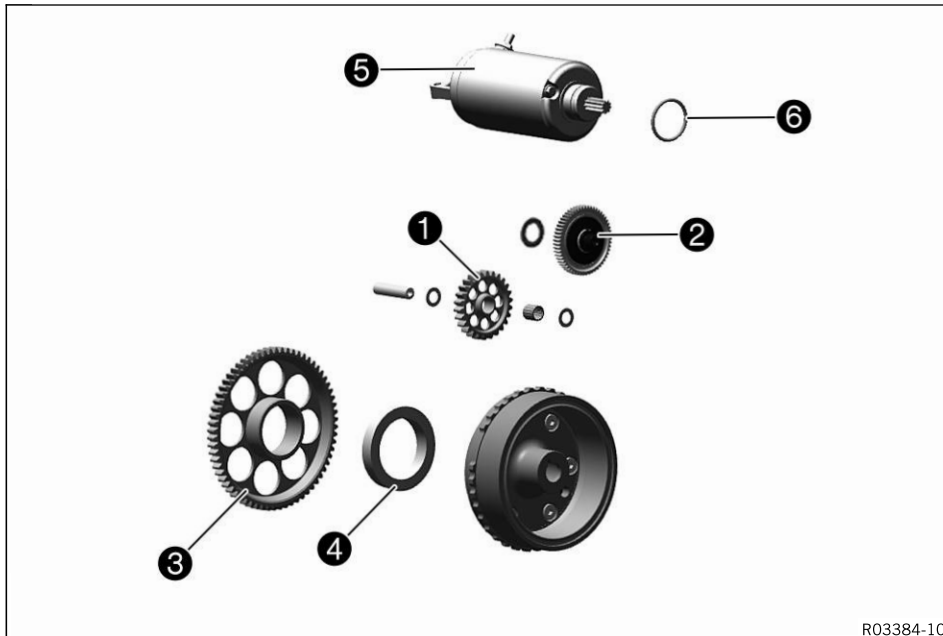
- Position new lock ring **6** on special tool **A** and push down with sleeve **B**.
 ✓ The lock ring engages in the groove of the transmission shaft.
- Mount stop disk **7**.
- Mount needle bearing **8** and the third-gear idler gear **9** with the collar facing up.
- Mount needle bearing **10** and the fourth-gear idler gear **11** with the collar facing down.
- Mount stop disk **12**.
- Position special tool **A** on the transmission shaft.

Mounting tool for lock ring (63529032000) (📖 p. 469)

- Position new lock ring **13** on special tool **A** and push down with sleeve **B**.
 ✓ The lock ring engages in the groove of the transmission shaft.
- Mount the fifth-gear sliding gear **14** with the shift groove facing down and stop disk **15**.
- Mount needle bearing **16** and first-gear idler gear **17** with the recess facing down, and stop disk **18**.
- Mount bearing **19**.

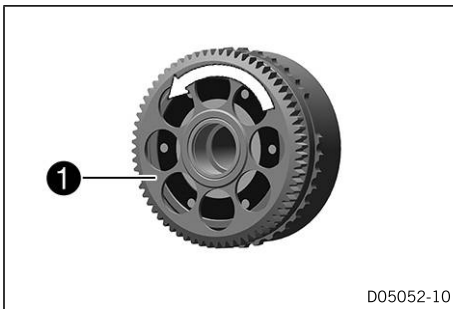
- Take the countershaft out of the vise.
- Mount distance sleeve **20** with bearing **21**.
- Finally, check all the gear wheels for smooth operation.

20.4.34 Checking the electric starter drive



- Check the gear teeth and bearing of starter intermediate gear **1** for damage and wear.
 - » If there is damage or wear:
 - Change the starter intermediate gear.
- Check the gear teeth and bearing of torque limiter **2** for damage and wear.
 - » If there is damage or wear:
 - Change torque limiter.
- Check gear mesh and bearing of freewheel gear **3** for damage and wear.
 - » If there is damage or wear:
 - Change freewheel gear or bearing.
- Check freewheel **4** for damage and wear.
 - » If there is damage or wear:
 - Change the freewheel.
- Check the gear teeth of the starter motor **5** for damage and wear.
 - » If there is damage or wear:
 - Change starter motor.
- Change O-ring **6** of the 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.

20.4.35 Checking the freewheel

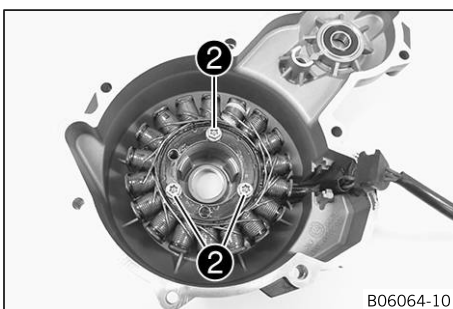


- Insert freewheel gear **1** into the freewheel hub while turning the freewheel gear counterclockwise; do not wedge it.
- Check the locking action of freewheel gear **1**.
 - » The freewheel gear cannot be turned counterclockwise and does not block clockwise:
 - Change the freewheel.

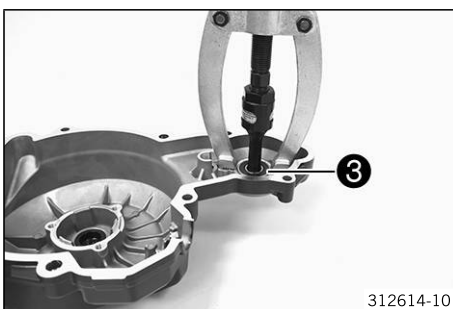
20.4.36 Working on the alternator cover



- Remove the cable retainer **1**.
- Pull the rubber grommet out of the engine case.



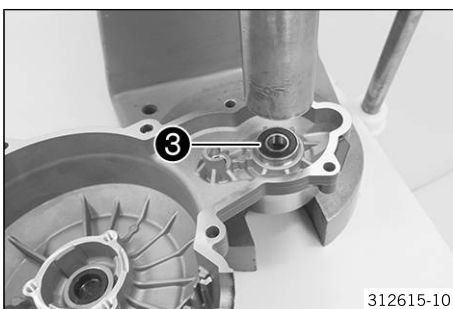
- Remove screws **2**.
- Remove the stator.



- Remove bearing **3** using the special tool.

Bearing puller (15112017000) (📖 p. 464)

Internal bearing puller (15112018000) (📖 p. 464)
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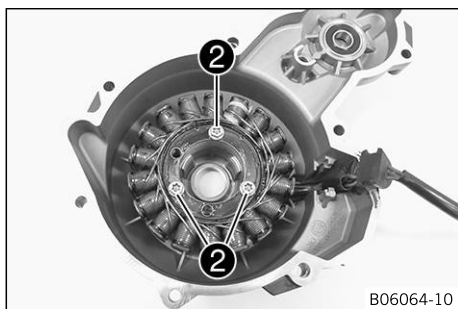


- Press in new bearing **3** all the way using a suitable tool.



Info

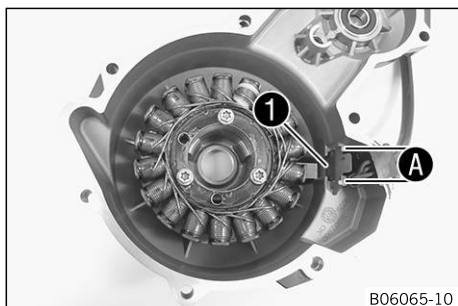
Provide suitable support for the alternator cover while pressing in.



- Position the stator.
- Mount and tighten screws **2**.

Guideline

Screw, stator	M6	10 Nm (7.4 lbf ft) Loctite®243™
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- Apply sealing compound lightly in the area of the rubber grommet.

Loctite® 5910

- Position the rubber grommet in the alternator cover.
- Position the cable retainer **1**.
- ✓ The retaining bracket engages in the attachment **A**.

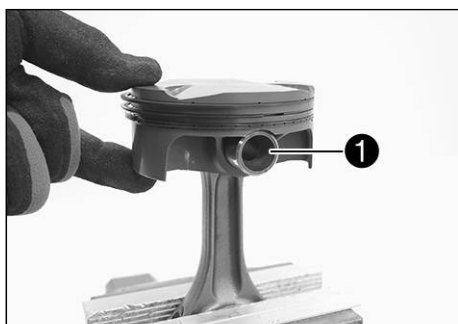
20.5 Engine assembly

20.5.1 Installing the piston



Info

The operations are the same for both pistons.

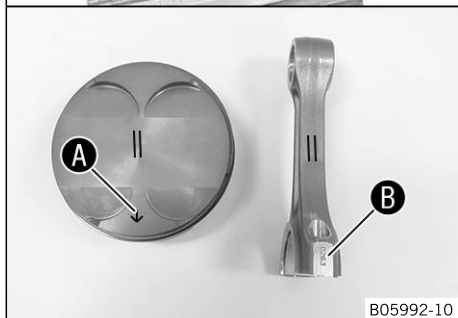


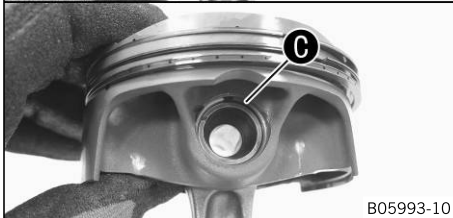
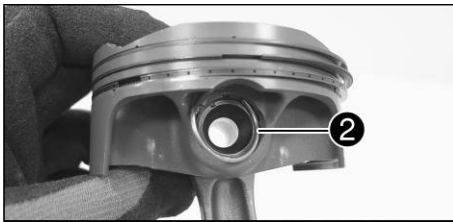
- Clamp connecting rod in the vise.

Guideline

Use soft jaws.

- Position piston on the associated connecting rod.
- Mount piston pin **1**.
- ✓ The piston marking **A** and lettering **B** of the connecting rod point forward after assembly.





B05993-10

- Position the new piston ring lock ②.
- Insert the special tool and press it with force towards the piston.
- Turn the special tool clockwise, thereby pushing the piston ring lock into the groove.

Insertion for piston ring lock (77629030000) (📖 p. 473)

- Ensure that the piston ring lock is in the correct position on both sides.
- ✓ The open side ③ of the piston ring lock faces upwards.

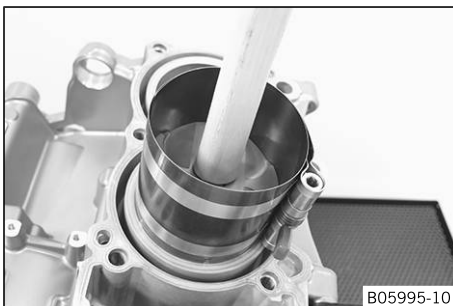


B05994-10

- Oil the cylinder and piston.
- Shift the gap of the piston rings by 120°.
- Mount special tool ③ on the piston.

Piston ring compressor (60029015000) (📖 p. 466)

- Clamp the piston rings together using the special tool.



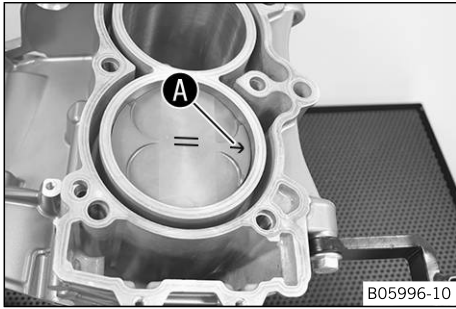
B05995-10

- Position the piston with the special tool on the cylinder.
- Tap lightly on the piston ring compressor from the top with a plastic hammer so that it lies flush with the cylinder.

i Info
The special tool must press the piston rings together properly and lie flush with the cylinder.

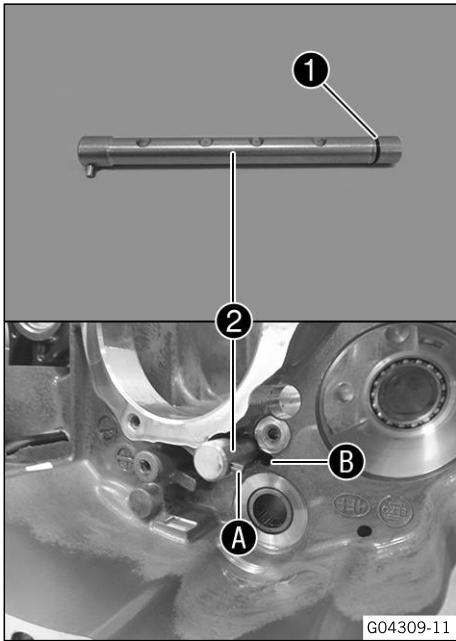
- Drive the piston into the cylinder by striking it carefully with the hammer handle.

i Info
The piston rings should not catch or they will be damaged.



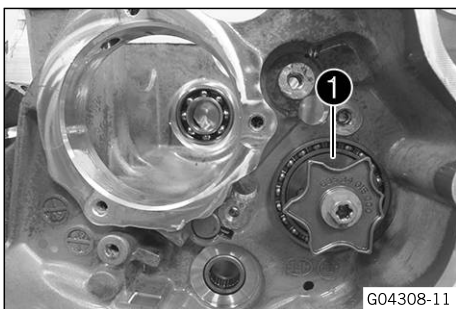
- Ensure that piston marking **A** faces the exhaust side.

20.5.2 Installing the oil spray tube



- Mount the new O-ring **1** on the oil spray tube **2**.
- Mount the oil spray tube.
- ✓ The pin **A** engages in the recess **B**.

20.5.3 Installing the transmission shafts

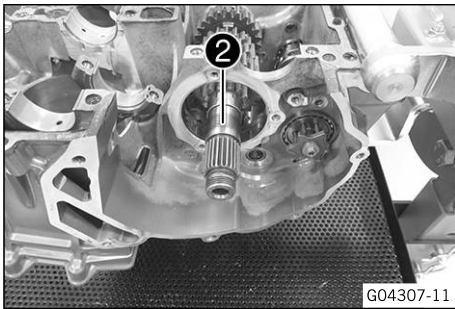


Preparatory work

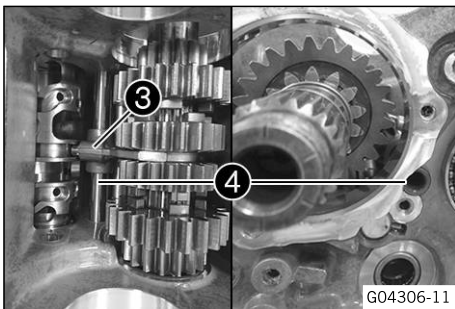
- Oil all bearings.

Main work

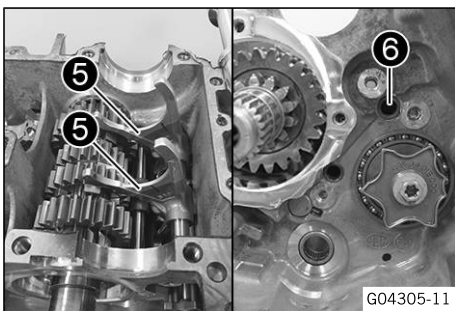
- Mount shift drum **1**.



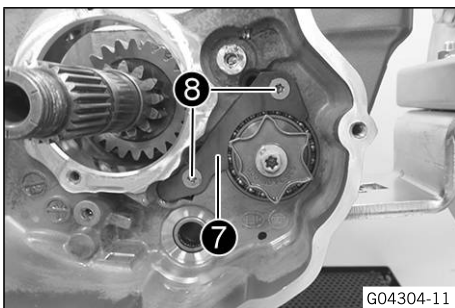
- Mount main shaft ②.



- Position shift fork ③.
- Mount shift rail ④.



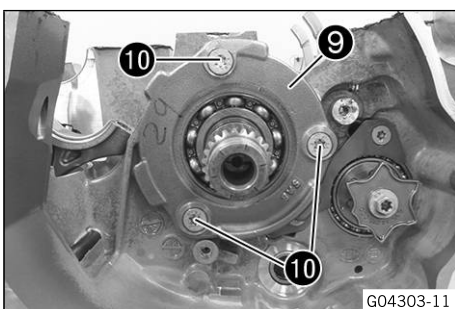
- Position shift forks ⑤.
- Mount shift rail ⑥.



- Position retaining bracket ⑦.
- Mount and tighten screws ⑧.

Guideline

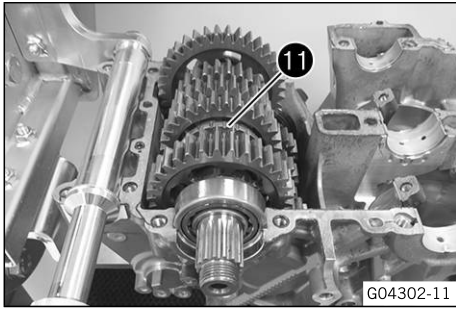
Screw, shift drum retaining bracket	M5	6 Nm (4.4 lbf ft) Loctite®243™
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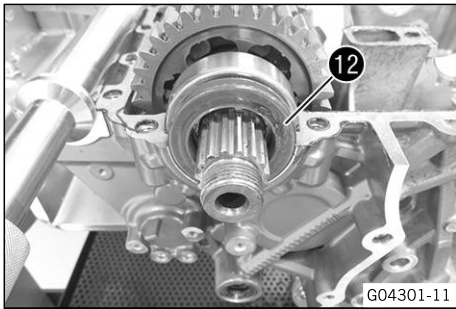
- Position bearing support ⑨ with bearing.
- Mount and tighten screws ⑩.

Guideline

Screw, main shaft bearing support	M6	10 Nm (7.4 lbf ft) Loctite®243™
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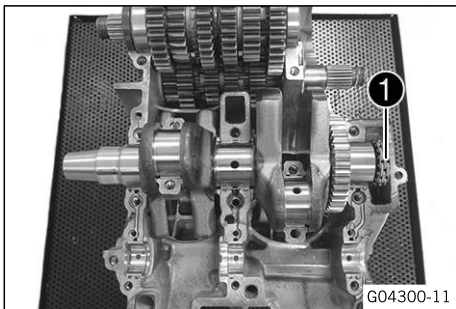


- Position countershaft **11**.

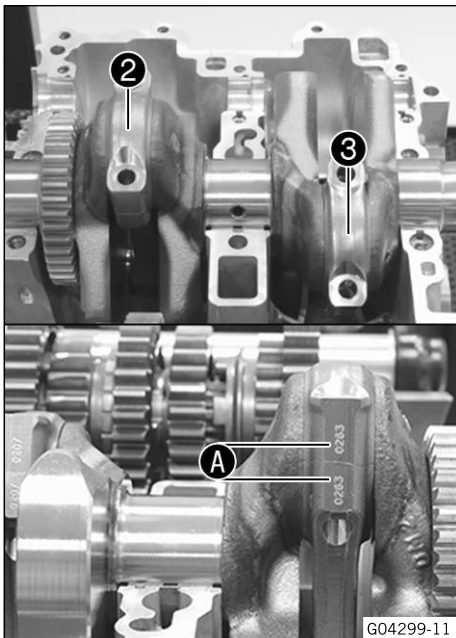


- Mount radial shaft seal ring **12**.

20.5.4 Installing the lower engine case



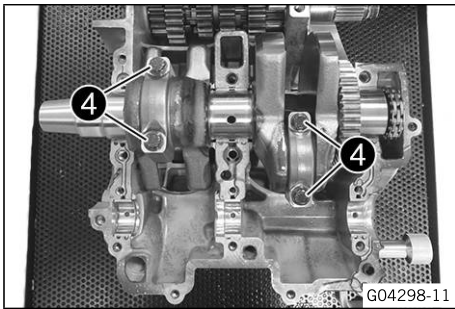
- Oil the bearing shells.
- Position crankshaft with timing chain **1**.



- Oil the bearing shells.
- ✓ There is no oil or grease on the connecting rod joint face.
- Position conrod bearing covers **2** and **3** on the associated connecting rod.

i Info

The markings **A** on the connecting rod and conrod bearing cover must be identical and legible from the front.



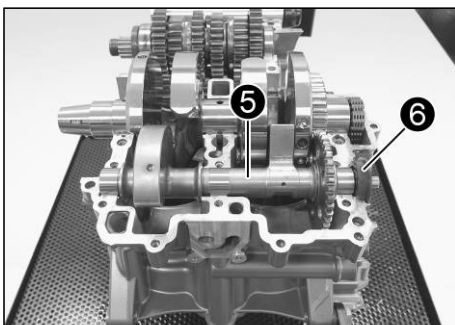
- Mount and tighten new screws ④.

Guideline

Screw, conrod bearing	M8x0.75	1st stage 5 Nm (3.7 lbf ft) 2nd stage 20 Nm (14.8 lbf ft) 3rd stage 90° Screw support and thread oiled
-----------------------	---------	--

Multi-tooth wrench socket (63529075000) (📖 p. 471)

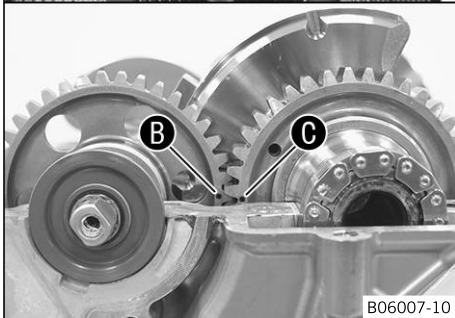
Angle disc (60029010000) (📖 p. 465)

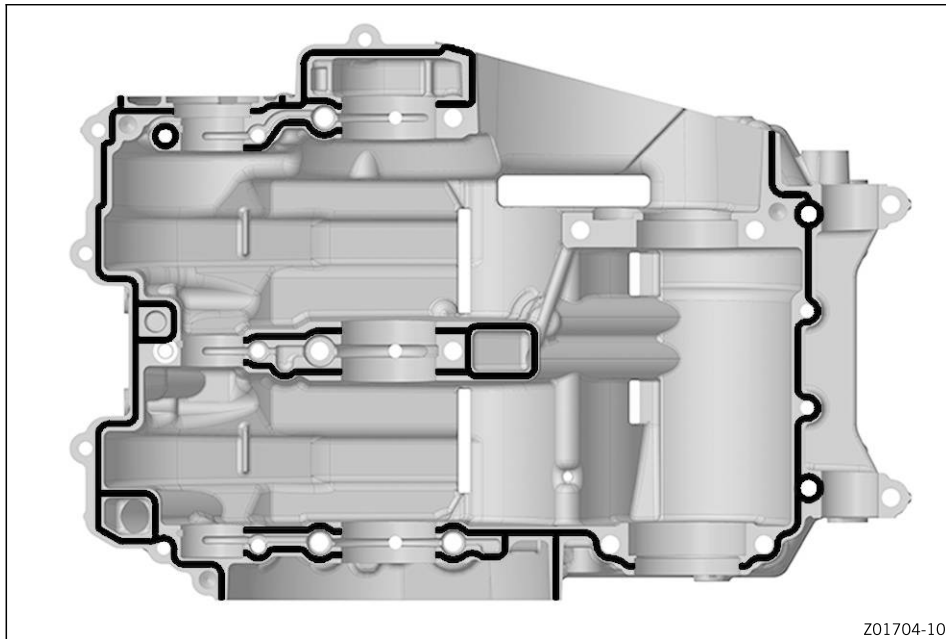


- Oil the bearing shells.
- Position balancer shaft ⑤ with new greased radial shaft seal ring ⑥.

Long-life grease (📖 p. 460)

- ✓ Align markings ② and ③.





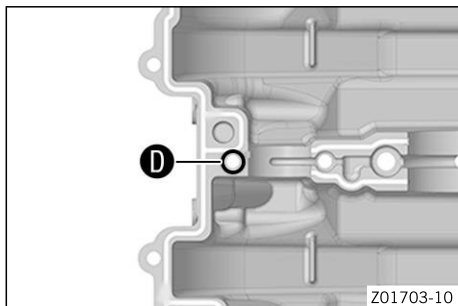
- Degrease the sealing surface. Apply sealing compound to the lower section of the engine case.

Loctite® 5910

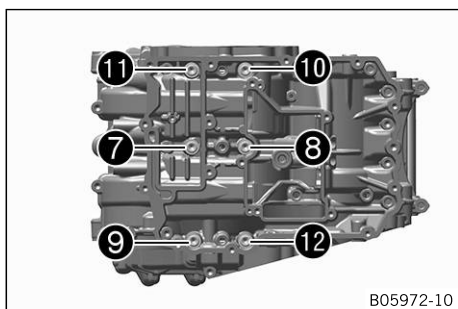


Info

Ensure that the dowels are seated properly.



- Position O-ring **D**.



- Mount lower engine case. If necessary, strike lightly again with a rubber mallet.

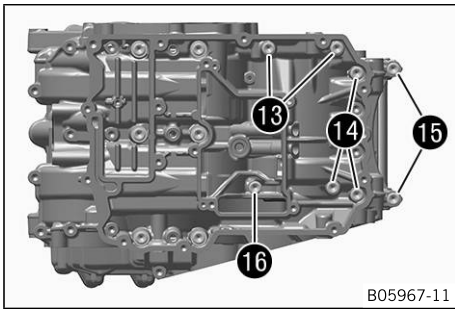


Info

Do not use the screws to pull the two sections of the engine case together.

- Mount screws with washers and tighten in the order **7** to **12**.
Guideline

Screw, engine case	M8x90	25 Nm (18.4 lbf ft) Screw support greased
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- Mount and tighten screws 13.

Guideline

Screw, engine case	M8x90	25 Nm (18.4 lbf ft) Screw support greased
--------------------	-------	--

- Mount and tighten screws 14.

Guideline

Screw, engine case	M8x65	25 Nm (18.4 lbf ft) Screw support greased
--------------------	-------	--

- Mount and tighten screws 15.

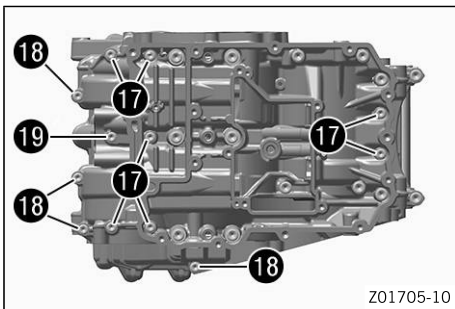
Guideline

Screw, engine case	M8x55	25 Nm (18.4 lbf ft) Screw support greased
--------------------	-------	--

- Mount and tighten screw 16.

Guideline

Screw, engine case	M8x45	25 Nm (18.4 lbf ft) Screw support greased
--------------------	-------	--



- Mount and tighten screws 17.

Guideline

Screw, engine case	M6x60	12 Nm (8.9 lbf ft)
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- Mount and tighten screws 18.

Guideline

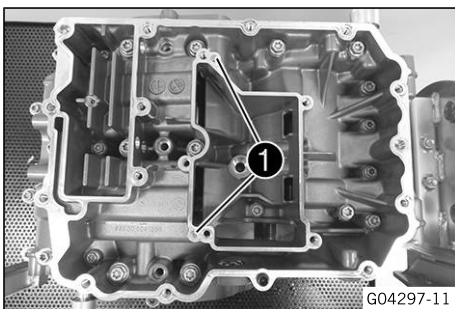
Screw, engine case	M6x30	12 Nm (8.9 lbf ft)
--------------------	-------	--------------------

- Mount and tighten screw 19 with washer.

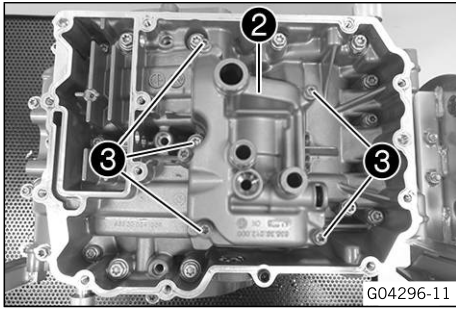
Guideline

Screw, engine case	M8x65	25 Nm (18.4 lbf ft) Screw support greased
--------------------	-------	--

20.5.5 Installing the oil pump unit



- Mount locating pins 1.

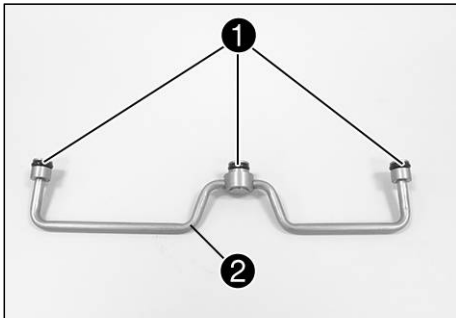


- Grease O-rings of the oil pump.
- Position oil pump unit ②.
- Mount and tighten screws ③.

Guideline

Screw, oil pump unit	M6	10 Nm (7.4 lbf ft)
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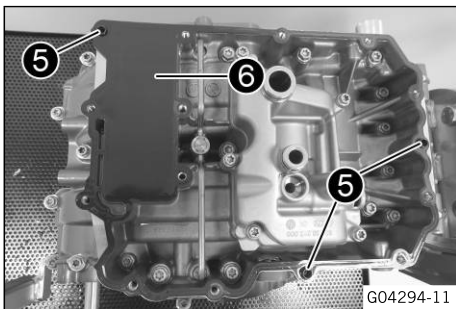
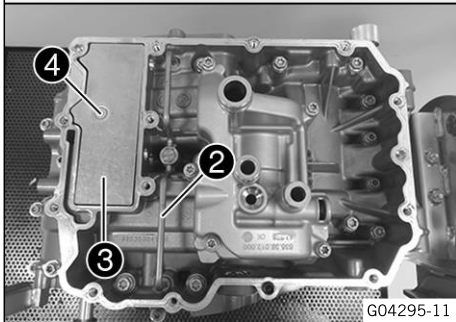
20.5.6 Installing the oil pan



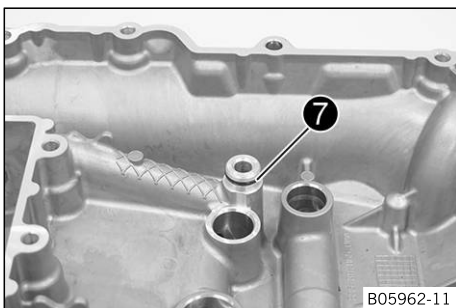
- Grease the new O-rings ① and mount on the oil line ②.
- Mount oil line ②.
- Position pressure plate ③.
- Mount and tighten screw ④.

Guideline

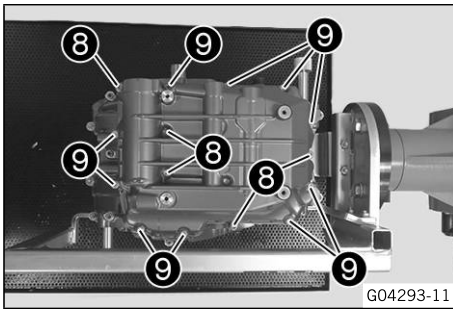
Screw, pressure plate	M5	3 Nm (2.2 lbf ft) Loctite®243™
-----------------------	----	--



- Mount dowels ⑤.
- Mount gasket ⑥.



- Grease and mount the new O-ring ⑦.



- Position oil pan.
- Mount screws **8** but do not tighten yet.

Guideline

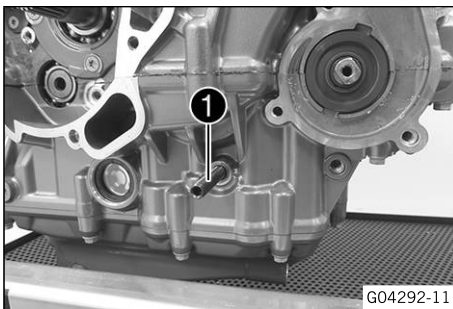
Screw, oil pan	M6x35	10 Nm (7.4 lbf ft)
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- Mount screws **9** and tighten all screws in a crisscross pattern.

Guideline

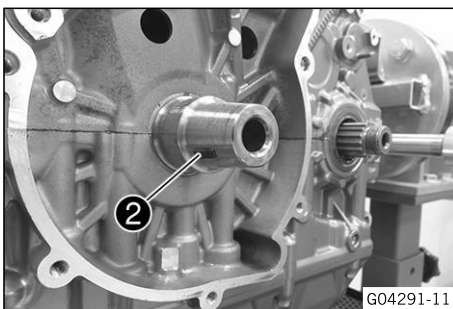
Screw, oil pan	M6x30	10 Nm (7.4 lbf ft)
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20.5.7 Installing the rotor

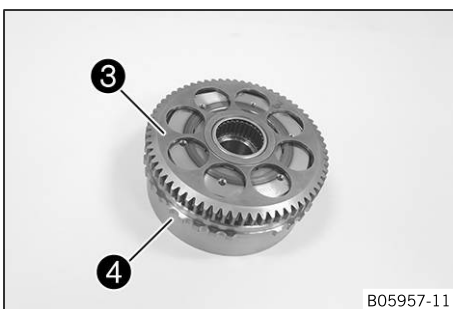


- Position crankshaft to cylinder 1 TDC and lock with special tool **1**.

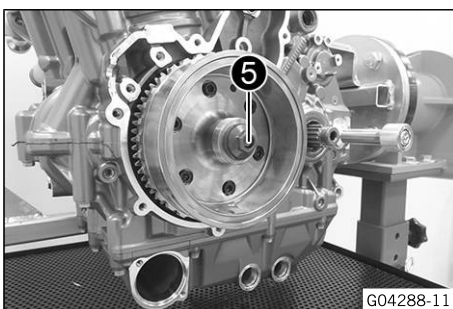
Locking screw (61229015000) (📖 p. 468)
--



- Mount woodruff key **2**.



- Turn the freewheel gear **3** counterclockwise and mount in the rotor **4**.



- Mount the rotor with the freewheel gear.



Info

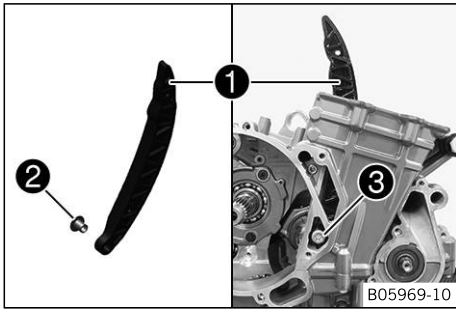
Ensure that the woodruff key is seated properly.

- Mount and tighten screw **5**.

Guideline

Screw, rotor	M12x1.5	90 Nm (66.4 lbf ft) Thread greased
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20.5.8 Installing the timing chain rails



- Position tensioning rail ① with support bushing ②.
- Mount and tighten screw ③.

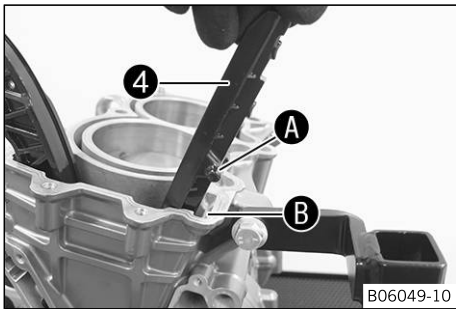
Guideline

Screw, tensioning rail	M8	15 Nm (11.1 lbf ft) Loctite®243™
------------------------	----	--

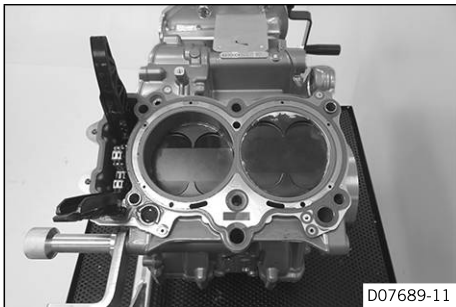
i Info

Ensure that there is no thread locker on the collar of the screw; otherwise, the tensioning rail may lock and break.

- Check the tensioning rail for freedom of movement.
- Position guide rail ④ from above in the engine case.
- ✓ Holder ⑤ engages in the recess ⑥.



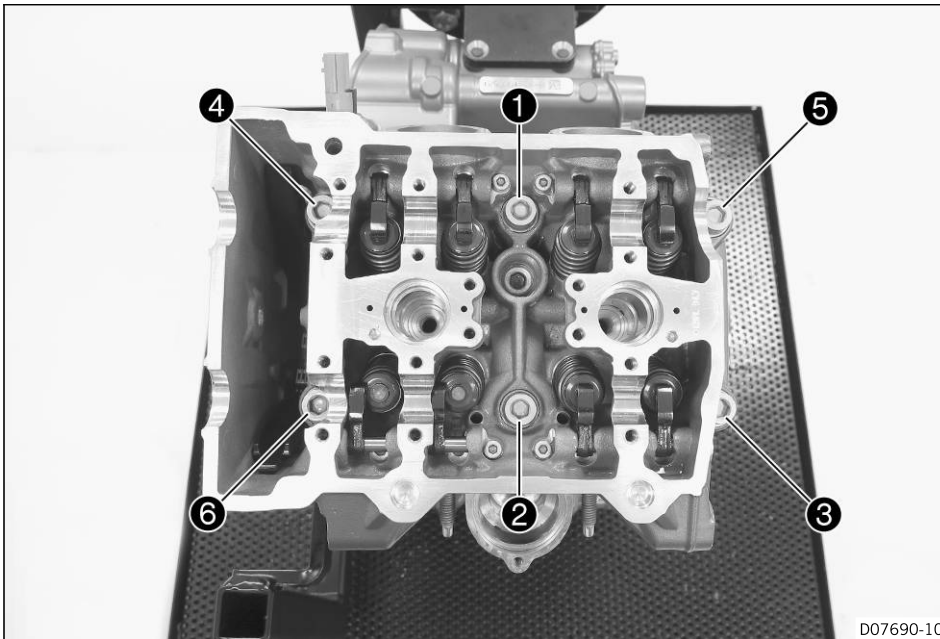
20.5.9 Installing the cylinder head



- Put the new cylinder head gasket in place.

i Info

Ensure that the dowels are seated properly.



- Position the cylinder head.
- Mount cylinder head screws with washers and tighten step by step in the order from ❶ to ❷.

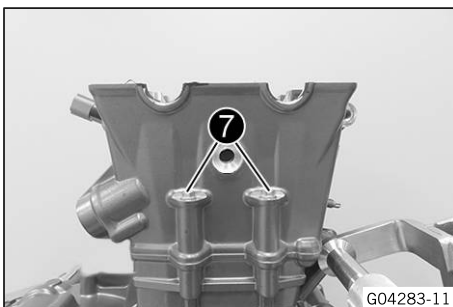
Guideline

Screw, cylinder head	M10x1.25	Tightening sequence: Observe tightening sequence. 1st stage 5 Nm (3.7 lbf ft) 2nd stage 15 Nm (11.1 lbf ft) 3rd stage 90° 4th stage 90° Screw support greased/thread oiled
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Info

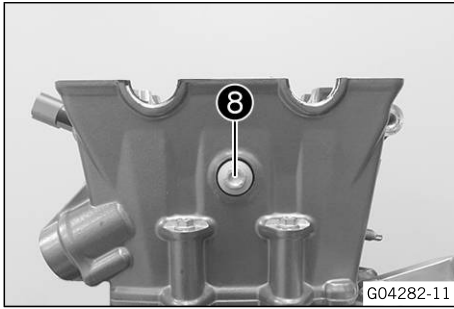
Always use new cylinder head screws.



- Mount and tighten screws ❷.

Guideline

Screw, cylinder head	M6	10 Nm (7.4 lbf ft)
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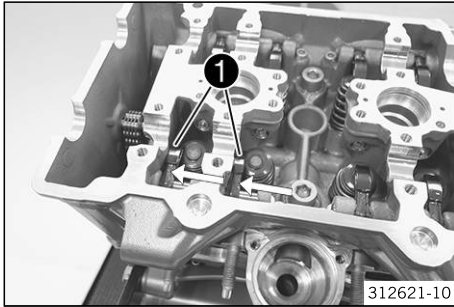


- Mount and tighten screw **8** with gasket.

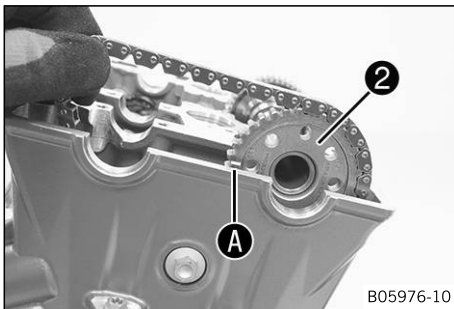
Guideline

Screw, timing chain shaft	M6	10 Nm (7.4 lbf ft)
---------------------------	----	--------------------

20.5.10 Installing the camshafts



- Push exhaust cam lever **1** on cylinder 2 to the side.



- Pull up the timing chain and position the exhaust camshaft **2**.

i **Info**

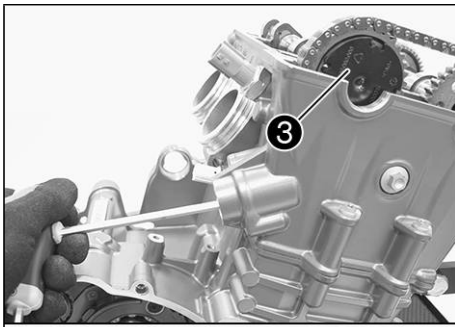
The drive gear wheel for the balancer shaft is located in the exhaust camshaft.

- Place timing chain over rear sprocket of the exhaust camshaft and keep taut.

✓ The **OT1** marking **A** is aligned with the sealing surface.

i **Info**

The **OT1** markings are line markings.

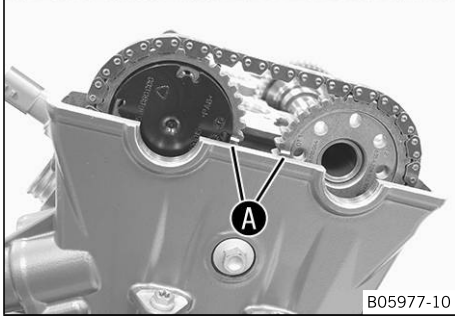


- Slip in intake camshaft **3**.

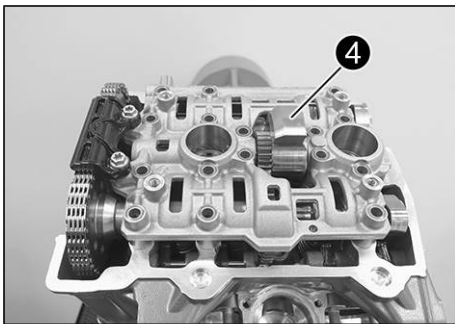
i Info
The centrifuge of the engine vent is located on the intake camshaft.

- Keep the timing chain taut.
 The **OT1** markings **A** are aligned with the sealing surface.

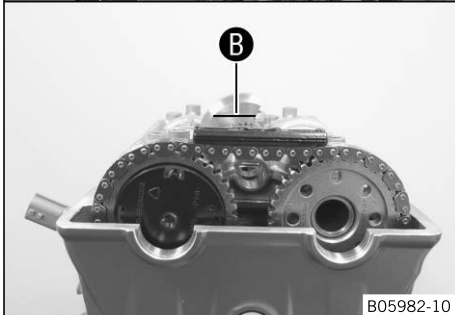
i Info
The **OT1** markings are line markings.



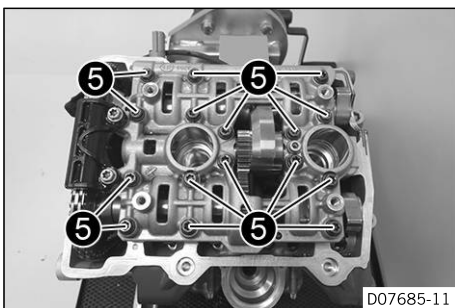
B05977-10



- Mount camshaft bearing bridge with balancer shaft **4**.
 The marking **B** of the balancer shaft is aligned parallel to the sealing surface.



B05982-10

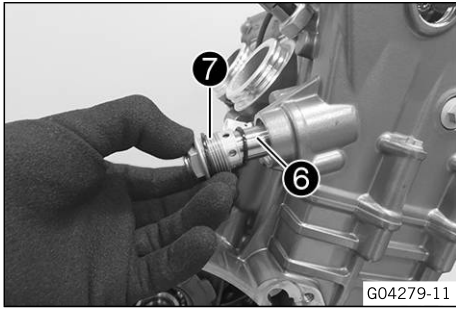


D07685-11

- Mount screws **5** and tighten them from the inside to the outside.

Guideline

Screw, camshaft bearing bridge	M6	10 Nm (7.4 lbf ft)
--------------------------------	----	--------------------

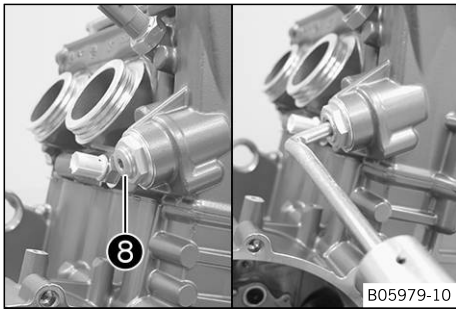


G04279-11

- After it has been positioned in the installation location, insert timing chain tensioner **6** with a new O-ring.
- Mount and tighten screw plug **7** with new O-ring.

Guideline

Plug, timing chain tensioner	M24x1.5	25 Nm (18.4 lbf ft)
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B05979-10

- Remove screw **8** with the O-ring and use a special tool to push the timing chain tensioner toward the timing chain.

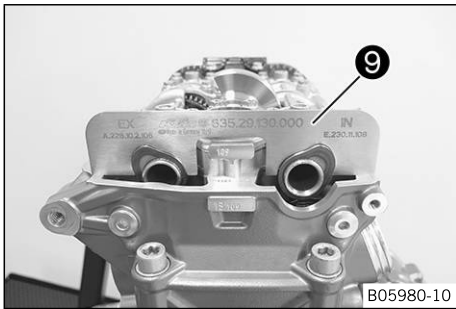
Release device for timing chain tensioner (61229021000) (📖 p. 469)

✓ The timing chain tensioner unlocks.

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

Guideline

Screw, unlocking of timing chain tensioner	M10x1	8 Nm (5.9 lbf ft)
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B05980-10

- Remove the special tool.

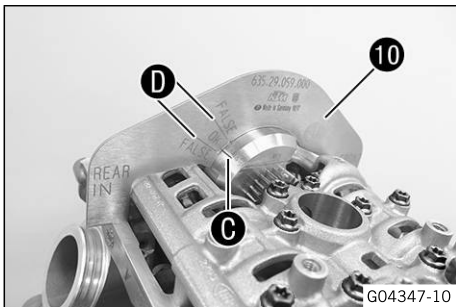
Locking screw (61229015000) (📖 p. 468)

- Crank the engine several times.
- Turn the crankshaft counterclockwise to ignition top dead center of cylinder 1 and lock it using special tool.

Locking screw (61229015000) (📖 p. 468)

- Check position of the camshafts with special tool **9**.

Setting gauge (63529530000) (📖 p. 471)

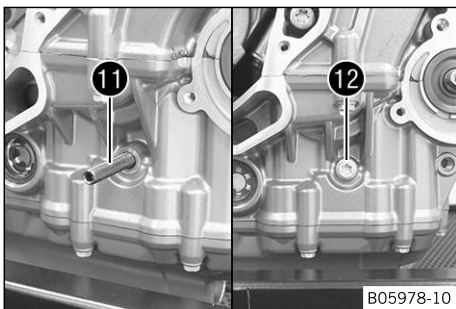


G04347-10

- Check position of the balancer shaft with special tool **10**.

Setting gauge (63529059000) (📖 p. 470)

✓ Marking **C** of the balancer shaft is located in area **D** of the adjusting gage.



B05978-10

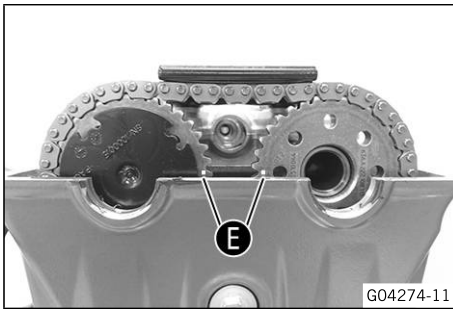
- Remove special tool **11**.

Locking screw (61229015000) (📖 p. 468)

- Mount and tighten screw **12** and washer.

Guideline

Screw plug, locking screw	M8	15 Nm (11.1 lbf ft)
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- Turn the crankshaft counterclockwise by the specified value and set it to ignition top dead center of cylinder 2.

Guideline

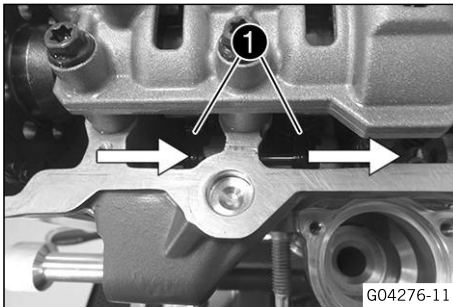
435°

- ✓ The **OT2** markings **E** are aligned with the sealing surface.

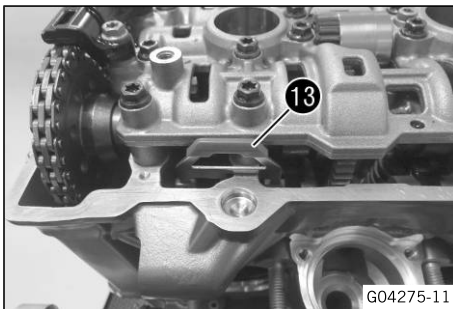


Info

The **OT2** markings are dot markings.

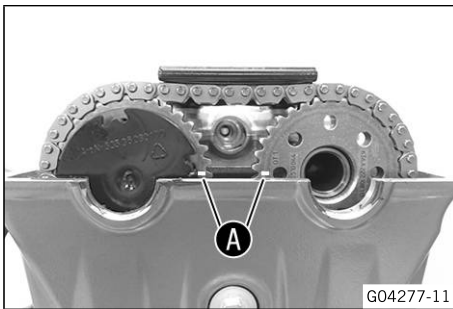


- Position exhaust cam lever **1** on cylinder 2.



- Mount cam lever clip **13**.

20.5.11 Checking the valve clearance



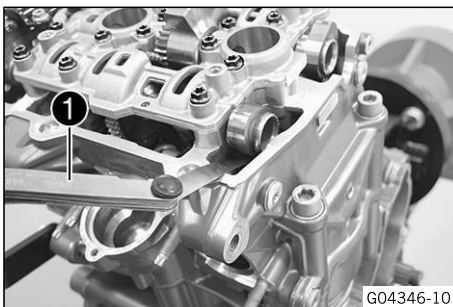
- Crank the engine several times.
- Turn the crankshaft counterclockwise and set it to ignition top dead center of cylinder 1.

- ✓ The **OT1** markings **A** are aligned with the sealing surface.



Info

The **OT1** markings are line markings.

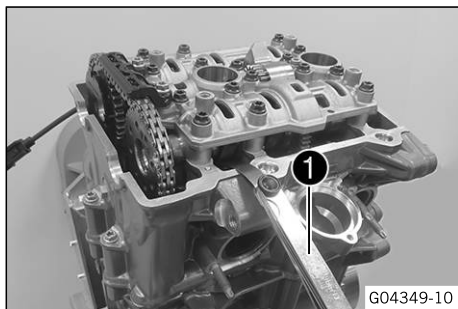
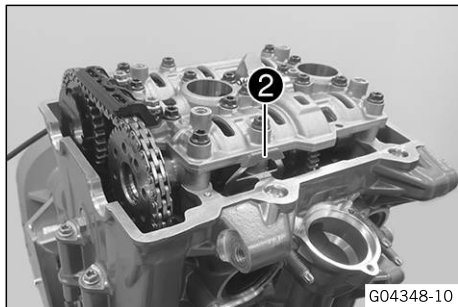
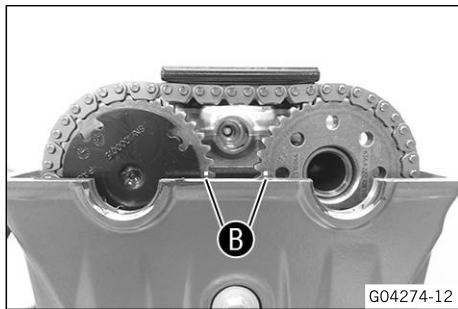


- Check the valve clearance at the exhaust valves and the intake valves between the camshaft and cam lever using the special tool **1**.

Guideline

Valve play, cold	
Intake at: 20 °C (68 °F)	0.10 ... 0.15 mm (0.0039 ... 0.0059 in)
Exhaust at: 20 °C (68 °F)	0.15 ... 0.20 mm (0.0059 ... 0.0079 in)

Feeler gauge (79129941000) (📖 p. 473)



» If the valve clearance does not meet specifications:

- Adjust the valve clearance. (📖 p. 356)

- Turn the crankshaft counterclockwise by the specified value and set it to ignition top dead center of cylinder 2.

Guideline

435°

- ✓ The **OT2** markings **B** are aligned with the sealing surface.

i **Info**

The **OT2** markings are dot markings.

- Remove cam lever clip **2**.

- Check the valve clearance at the exhaust valves and the intake valves between the camshaft and cam lever using the special tool **1**.

Guideline

Valve play, cold	
Intake at: 20 °C (68 °F)	0.10 ... 0.15 mm (0.0039 ... 0.0059 in)
Exhaust at: 20 °C (68 °F)	0.15 ... 0.20 mm (0.0059 ... 0.0079 in)

Feeler gauge (79129941000) (📖 p. 473)

» If the valve clearance does not meet specifications:

- Adjust the valve clearance. (📖 p. 356)

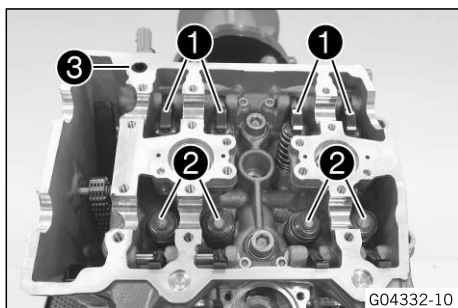
20.5.12 Adjusting the valve clearance and cleaning the oil screen

Preparatory work

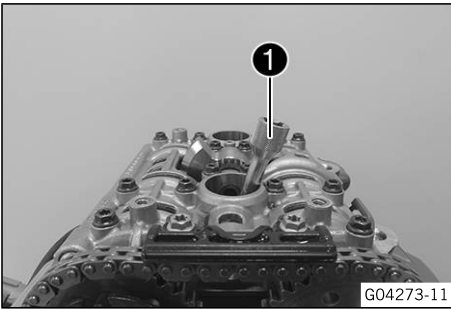
- Remove the camshafts. (📖 p. 290)

Main work

- Swing up cam lever **1**.
- Remove shims **2** and set them down according to the installation position.
- Correct the shims based on the results of the valve clearance check.
- Insert suitable shims.
- Clean oil screen **3**.
- Install the camshafts. (📖 p. 352)
- Check the valve clearance. (📖 p. 355)



20.5.13 Installing the spark plugs

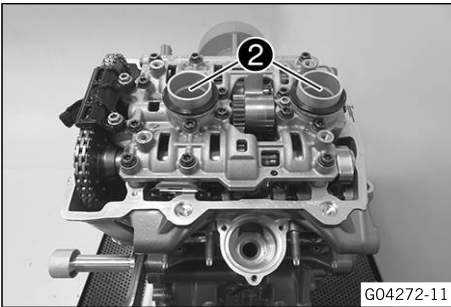


- Mount and tighten the spark plugs using a special tool **1**.

Guideline

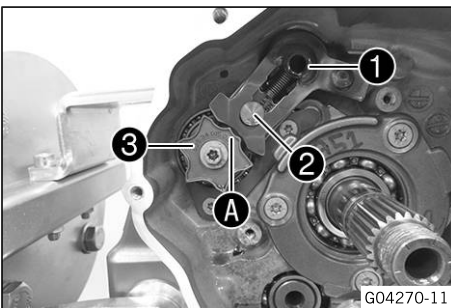
Spark plug	M10	11 Nm (8.1 lbf ft)
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Spark plug wrench with link (77229172000) (📖 p. 473)		
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- Grease the O-rings and mount spark plug shaft inserts **2** with gasket.

20.5.14 Installing the shift shaft

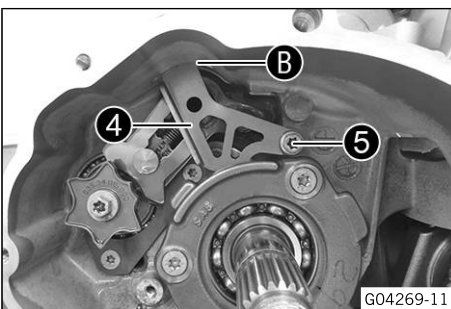


- Slide shift shaft **1** with the washer into the bearing seat.
- Push sliding plate **2** away from shift drum locating unit **3**. Insert the shift shaft all the way.

i Info

The neutral position **A** must be aligned with the sliding plate **2** for assembly.

- Let the sliding plate engage in the shift drum locating unit.
- Shift through the transmission.

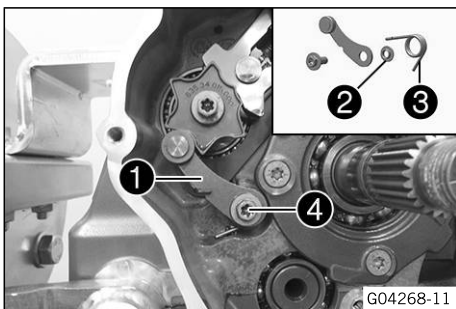


- Position retaining bracket **4** in the groove **B**.
- Mount and tighten screw **5**.

Guideline

Screw, shift shaft retaining bracket	M6	10 Nm (7.4 lbf ft) Loctite®243™
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20.5.15 Installing the locking lever

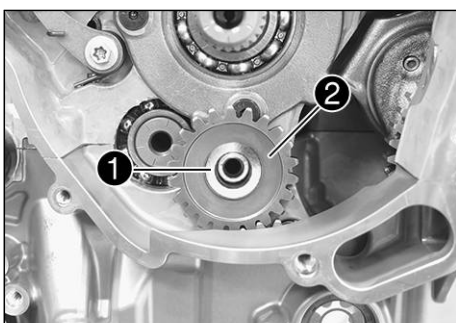


- Position locking lever **1** with sleeve **2** and spring **3**.
- Mount and tighten screw **4**.

Guideline

Screw, locking lever	M6	10 Nm (7.4 lbf ft) Loctite®243™
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20.5.16 Installing the clutch basket



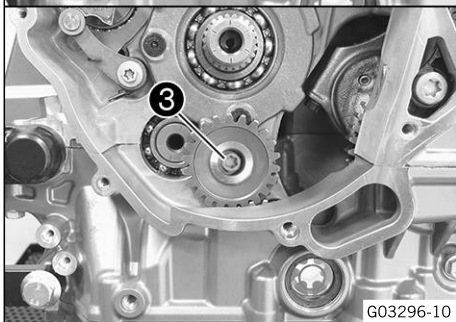
- Oil collar bushing **1** thoroughly.
- Position collar bushing **1** with oil pump idler gear **2**.
- Mount and tighten screw **3**.

Guideline

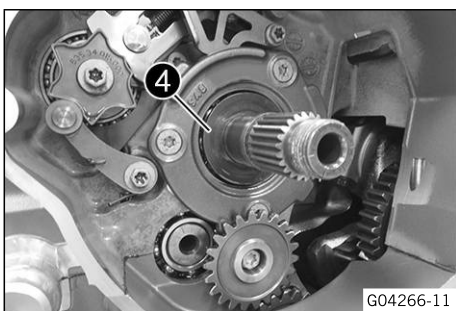
Screw, oil pump idler gear	M8	15 Nm (11.1 lbf ft) Loctite®243™
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i **Info**

The screw **3** must always be replaced.



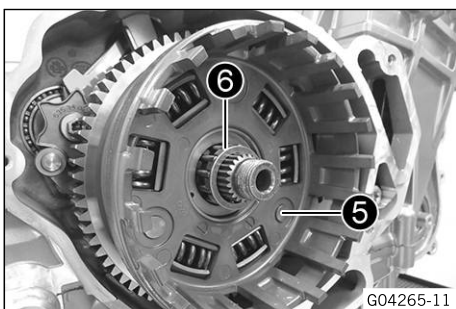
- Mount washer **4**.



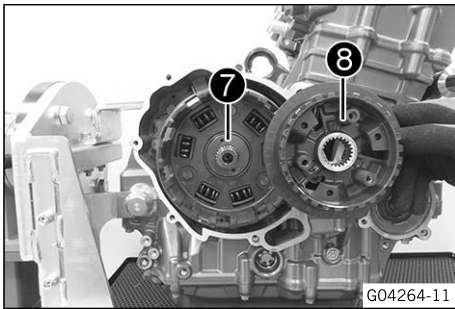
- Position the clutch basket **5**.

i **Info**

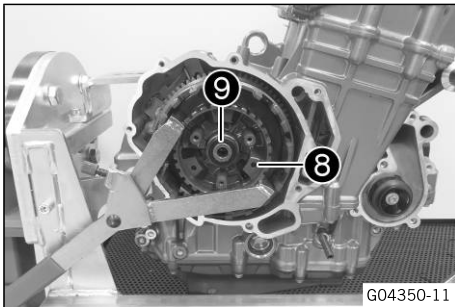
Turn the clutch basket and oil pump idler gear backwards and forwards slightly to help them mesh more easily.



- Mount needle bearing **6**.



- Mount washer **7** and inner clutch hub **8**.



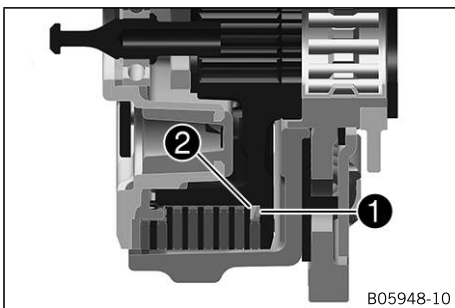
- Mount nut **9** with the washer.
- Use a special tool to hold the inner clutch hub **8** and tighten the nut **9**.

Guideline

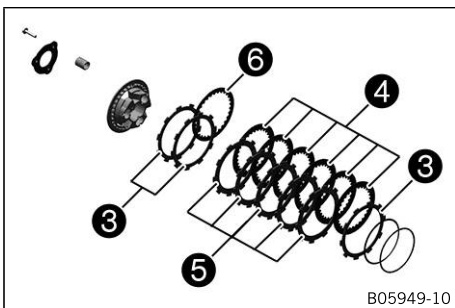
Nut, inner clutch hub	M20x1.5	135 Nm (99.6 lbf ft)
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Holding wrench (51129003000) (📖 p. 465)		
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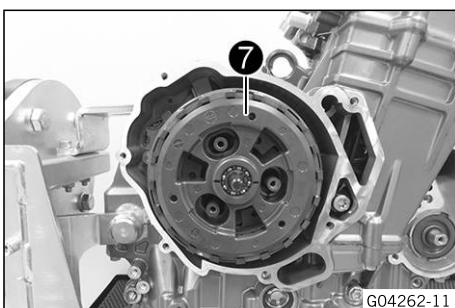
20.5.17 Installing the clutch discs



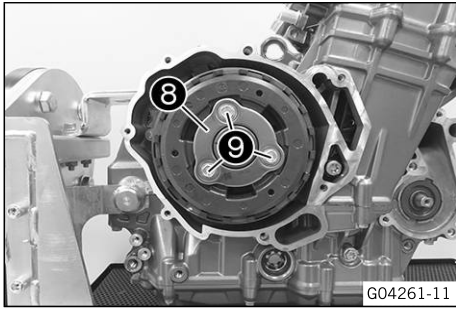
- Mount support ring **1** and pretension ring **2**.
- ✓ The pretension ring rests against the support ring on the inside and the outside faces away from the support ring.



- Thoroughly oil the clutch facing discs.
- Mount a clutch facing disc **3** with a larger inside diameter.
- Alternately mount 6 intermediate clutch discs **4** and 5 of the same clutch facing discs **5**.
- Alternately mount 2 clutch facing discs **3** and an intermediate clutch disc **6** with a larger inside diameter.
- The outer clutch facing disc must be mounted offset by one mesh.



- Position clutch pressure cap **7**.
- ✓ The gear teeth of the outer intermediate clutch disc engage in the clutch pressure cap.
- ✓ The clutch pressure cap rests flush against the outer clutch facing disc.

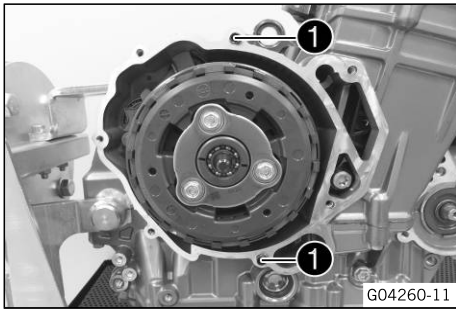


- Position clutch center **8** and the springs.
- Mount and tighten screws **9**.

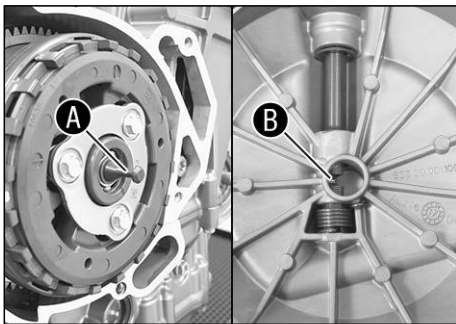
Guideline

Screw, clutch spring	M6	8 Nm (5.9 lbf ft)
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20.5.18 Installing the clutch cover



- Mount dowels **1**.

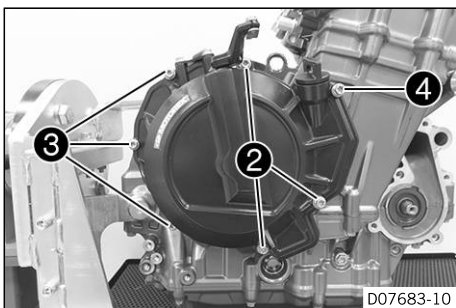


- Position the clutch cover with the clutch cover gasket.
- ✓ Clutch push rod **A** engages in groove **B**.



Info

Swivel clutch release lever counterclockwise.



- Mount screws **2**, but do not tighten yet.

Guideline

Screw, clutch cover	M6x30	10 Nm (7.4 lbf ft)
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- Mount screws **3**, but do not tighten yet.

Guideline

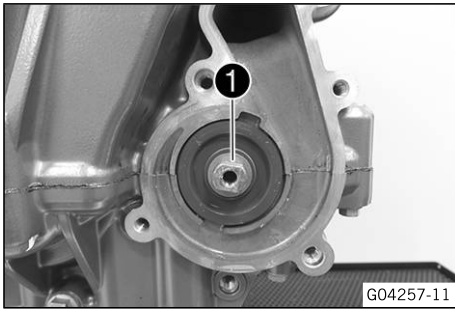
Screw, clutch cover	M6x25	10 Nm (7.4 lbf ft)
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- Mount screw **4** and tighten all screws in a crisscross pattern.

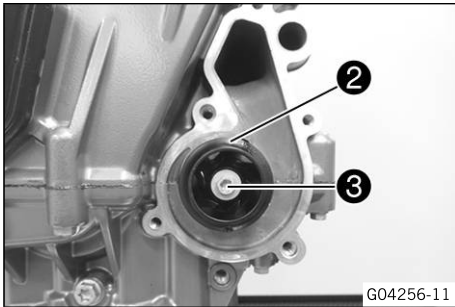
Guideline

Screw, clutch cover	M6x35	10 Nm (7.4 lbf ft)
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20.5.19 Mounting the water pump cover



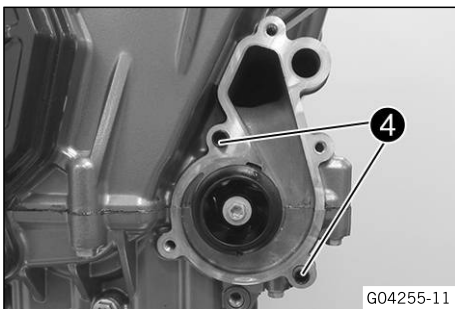
- Mount form washer **1**.



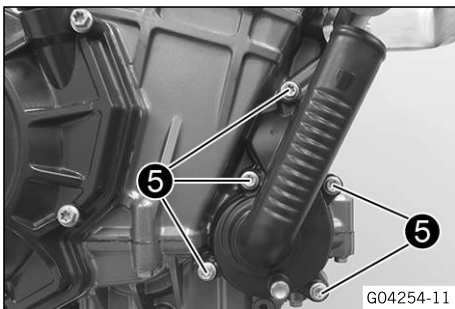
- Mount water pump impeller **2**.
- Mount and tighten screw **3**.

Guideline

Screw, water pump wheel	M6	10 Nm (7.4 lbf ft) Loctite®243™
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- Mount dowels **4**.

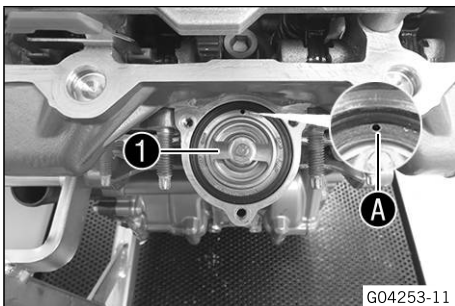


- Position water pump cover with the gasket.
- Mount and tighten screws **5**.

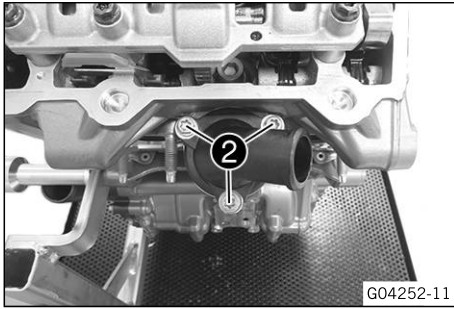
Guideline

Screw, water pump cover	M6	10 Nm (7.4 lbf ft) Loctite®243™
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20.5.20 Installing the thermostat



- Position thermostat **1** with the gasket.
- ✓ Drill hole **A** must face upward.

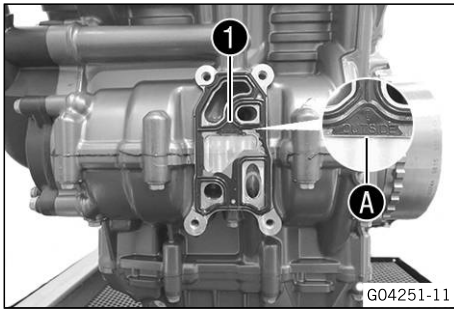


- Position the thermostat case.
- Mount and tighten screws ②.

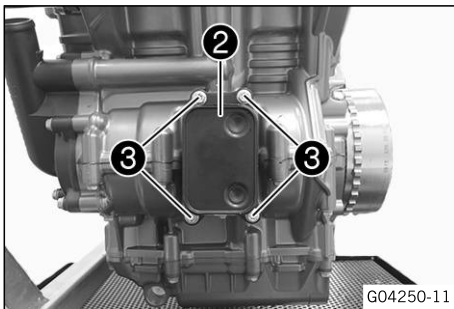
Guideline

Screw, thermostat case	M5	6 Nm (4.4 lbf ft) Loctite®243™
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20.5.21 Installing the oil/water heat exchanger



- Position gasket ①.
- ✓ The **OUTSIDE** marking A is legible.

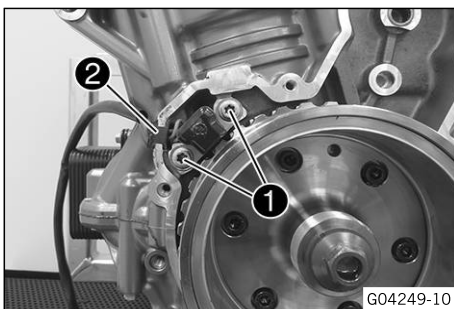


- Position oil/water heat exchanger ②.
- Mount and tighten screws ③.

Guideline

Screw, oil/water heat exchanger	M6	10 Nm (7.4 lbf ft) Loctite®243™
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20.5.22 Installing the crankshaft speed sensor



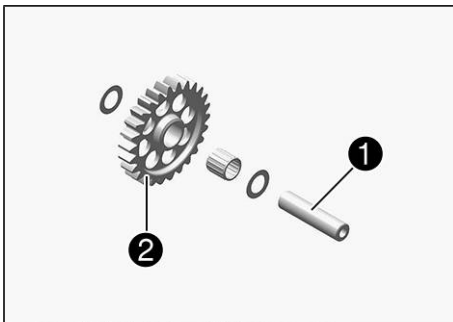
- Position the crankshaft speed sensor.
- Mount and tighten screws ①.

Guideline

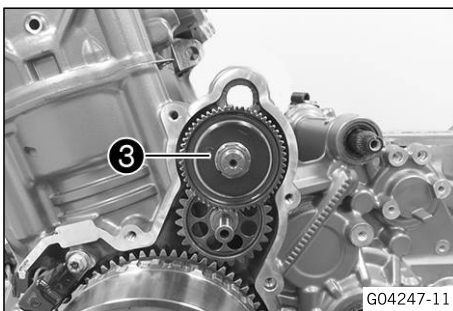
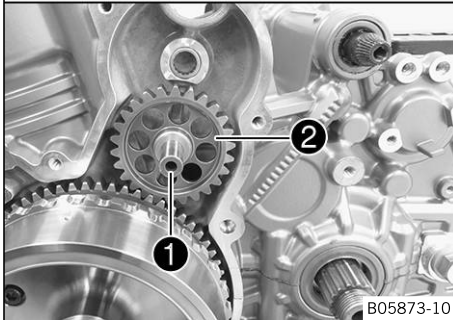
Screw, crankshaft speed sensor	M5	6 Nm (4.4 lbf ft) Loctite®243™
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- Position the cable and position rubber grommet ② in the engine case.

20.5.23 Installing the torque limiter and the starter intermediate gear

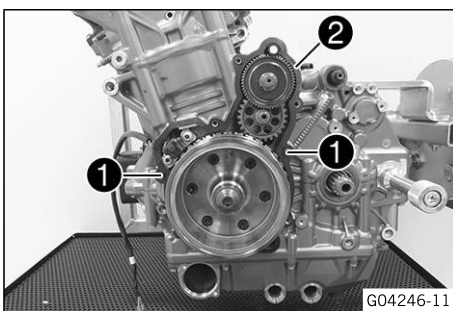


- Mount shaft ① and starter intermediate gear ② with the needle bearing and the washers.



- Mount torque limiter ③ with the rear washer.

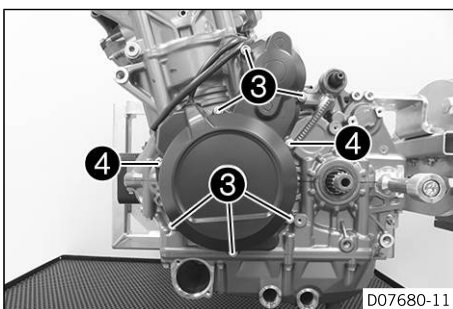
20.5.24 Installing the alternator cover



- Apply sealing compound lightly in the area of the rubber grommet.

Loctite® 5910

- Mount dowels ① and put alternator cover gasket ② in place.



- Position the alternator cover.
- Mount and tighten screws ③.

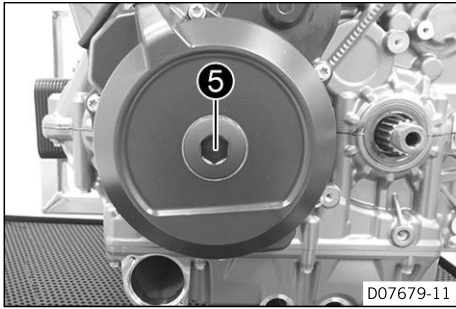
Guideline

Screw, alternator cover	M6x30	10 Nm (7.4 lbf ft)
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- Mount and tighten screws ④.

Guideline

Screw, alternator cover	M6x35	10 Nm (7.4 lbf ft)
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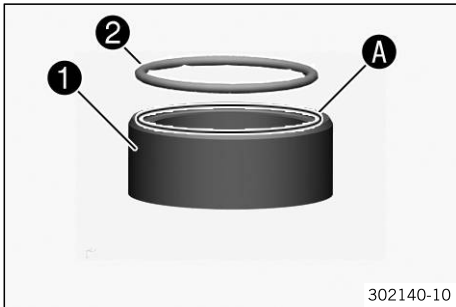


- Mount and tighten screw plug **5** with the O-ring.

Guideline

Screw plug, alternator cover	M24x1.5	8 Nm (5.9 lbf ft)
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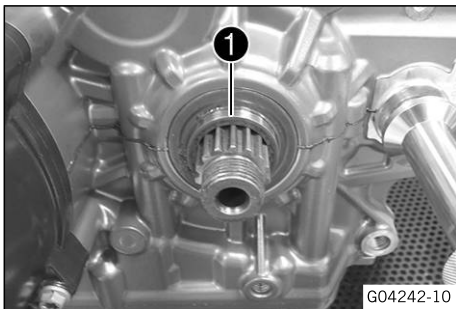
20.5.25 Installing the spacer



- Before mounting, grease spacer **1** in area **A** and O-ring **2**.

Long-life grease (📖 p. 460)

- Position the O-ring in the recess of the spacer.



- Grease the radial shaft seal ring.

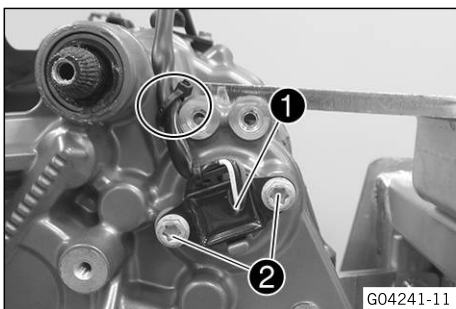
Long-life grease (📖 p. 460)

- Push spacer **1** with the O-ring onto the countershaft with a twisting motion.

✓ The recess with the O-ring faces inward.

✓ The radial shaft seal ring rests against the spacer along its entire circumference.

20.5.26 Installing the gear position sensor



- Position gear position sensor **1**.

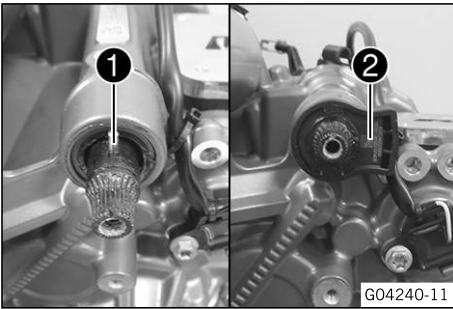
- Mount and tighten screws **2**.

Guideline

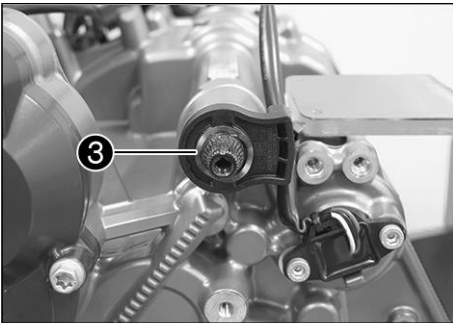
Screw, gear position sensor	M5	6 Nm (4.4 lbf ft) Loctite®243™
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- Secure the cable with a cable tie.

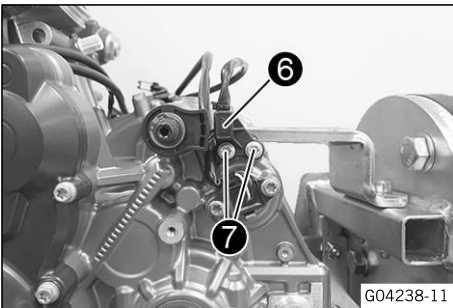
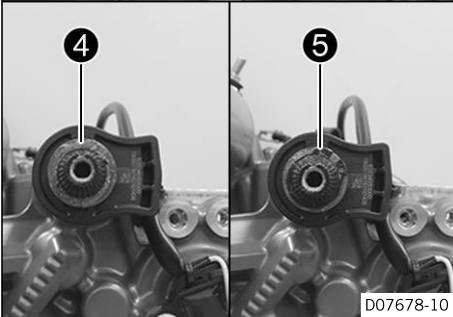
20.5.27 Installing the shift shaft sensor



- Mount pin ①.
- Mount magnetic holder ②.



- Mount locating washer ③.
- Mount washer ④.
- Mount lock ring ⑤.

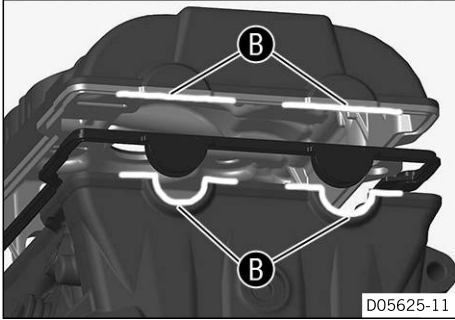
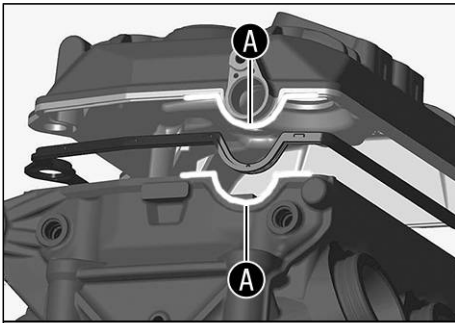


- Position the shift shaft sensor ⑥.
- Mount and tighten screws ⑦.

Guideline

Screw, shift shaft sensor	M5	6 Nm (4.4 lbf ft) Loctite®243™
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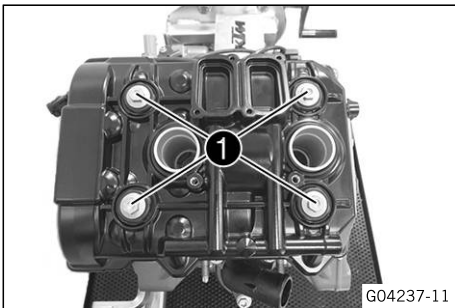
20.5.28 Installing the valve cover



D05625-11

- Clean and degrease the valve cover seal.
- Apply a thin layer of sealing compound to areas **A** and **B**.

Loctite® 5910

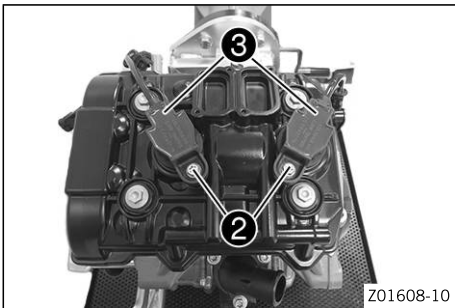


G04237-11

- Position the valve cover with the valve cover seal.
- Mount and tighten screws **1** with the gaskets.

Guideline

Screw, valve cover	M6	10 Nm (7.4 lbf ft)
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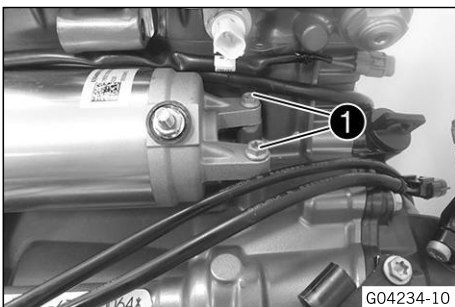
Z01608-10

- Mount ignition coils **2**.
- Mount and tighten screws **3**.

Guideline

Screw, ignition coil	M6	8 Nm (5.9 lbf ft)
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20.5.29 Installing the starter motor



G04234-10

- Grease the O-ring and mount the starter motor.

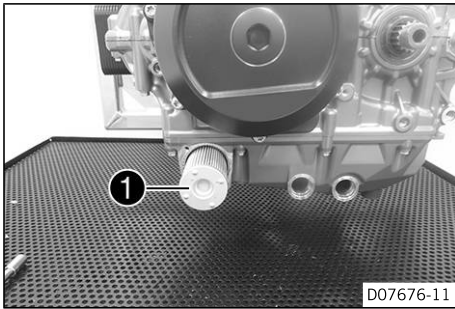
Long-life grease (📖 p. 460)

- Mount and tighten screw **1**.

Guideline

Screw, starter motor	M6	10 Nm (7.4 lbf ft)
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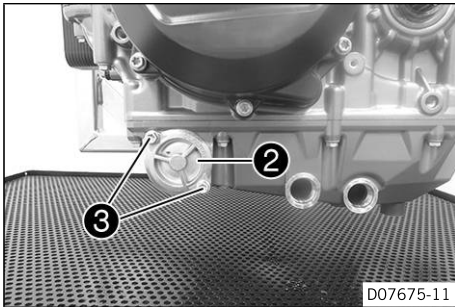
20.5.30 Installing the oil filter



- Tilt the motorcycle to one side and fill the oil filter housing to about $\frac{1}{3}$ full with engine oil.

Engine oil (SAE 10W/50) (📖 p. 458)

- Mount oil filter **1**.

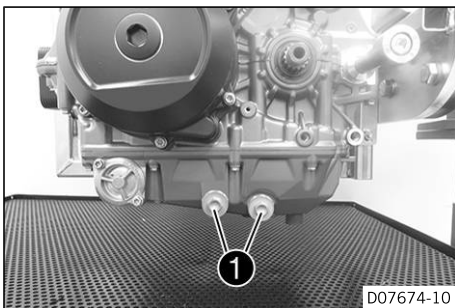


- Oil the O-ring of oil filter cover **2**. Mount the oil filter cover.
- Mount and tighten screws **3**.

Guideline

Screw, oil filter cover	M5	6 Nm (4.4 lbf ft)
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20.5.31 Installing the oil drain plug

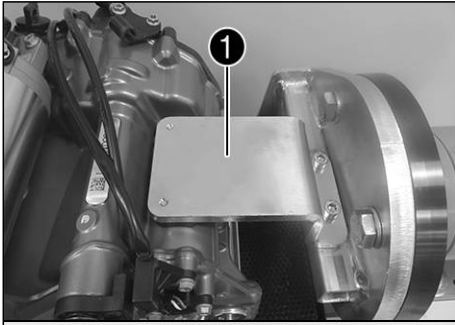


- Mount the new O-rings.
- Mount and tighten the oil drain plugs **1** with the magnet, O-rings, and oil screen.

Guideline

Plug, oil screen	M20x1.5	20 Nm (14.8 lbf ft)
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20.5.32 Removing the engine from the engine work stand

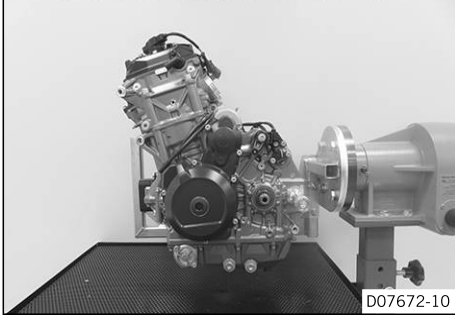


- Remove retaining bracket ①.
- Remove the engine from the engine work stand.

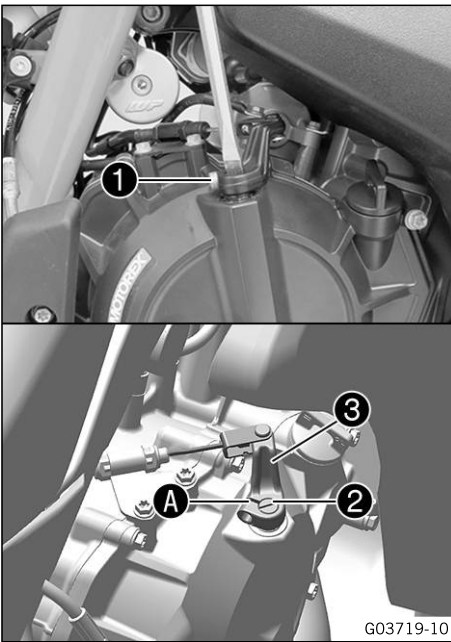


Info

Work with an assistant or a motorized hoist.



21.1 Adjusting the clutch release lever

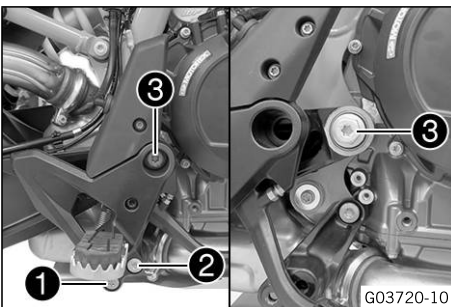


- Remove screw ①.
- Use a screwdriver to turn clutch release shaft ② counter-clockwise as far as it will go and hold.
- Position clutch release lever ③.
- ✓ Align clamping slot A 90° to the direction of travel.
- Mount and tighten screw ①.

Guideline

Screw, clutch release lever	M6	10 Nm (7.4 lbf ft) Loctite®243™
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21.2 Checking the clutch



Main work

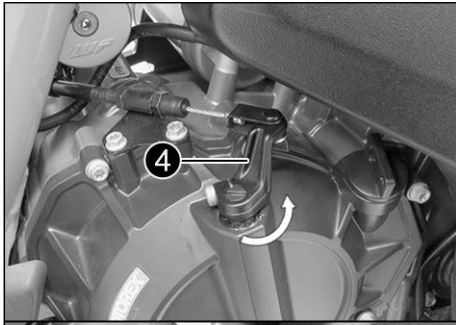
- Remove screw ① and bushing.
- Remove screw ②.
- Remove screw ③.
- Take off footrest bracket and hang to the side.



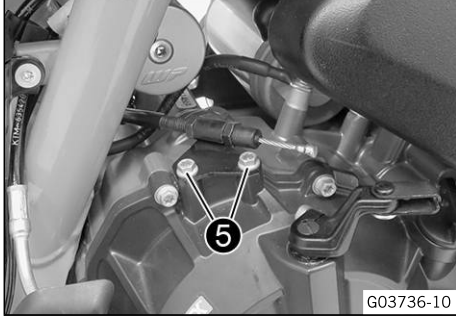
Info

Cover the components to protect them against damage.

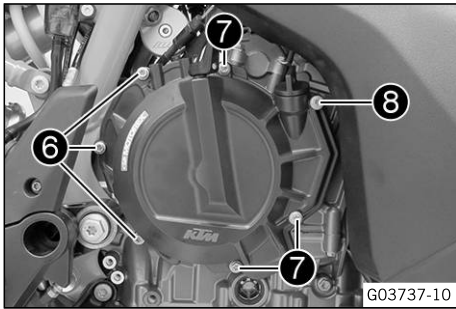
- Mount screw ③, but do not tighten.



- Swivel clutch release lever ④ counterclockwise and detach the inner clutch cable.
- Remove screws ⑤.
- Hang the inner clutch cable with bracket to the side.



G03736-10

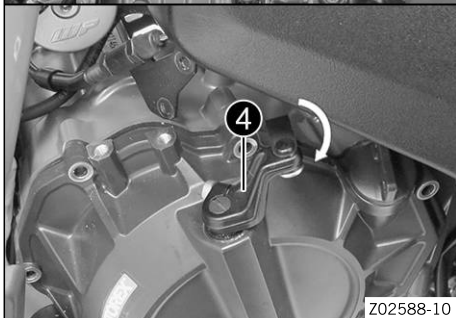


- Remove screws ⑥ and ⑦.
- Remove screw ⑧.

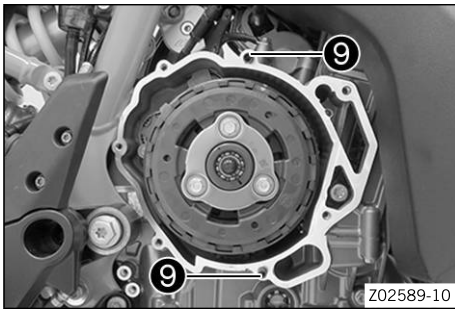
G03737-10



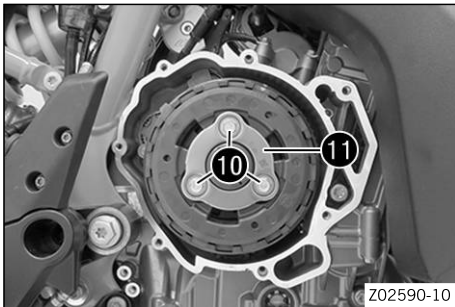
- Swivel the clutch release lever ④ clockwise and take off clutch cover with clutch cover gasket.



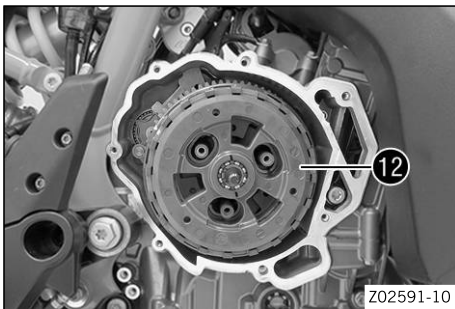
Z02588-10



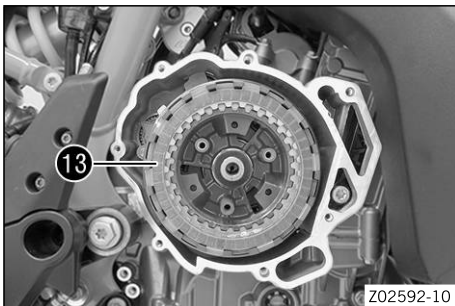
- Remove dowels 9.



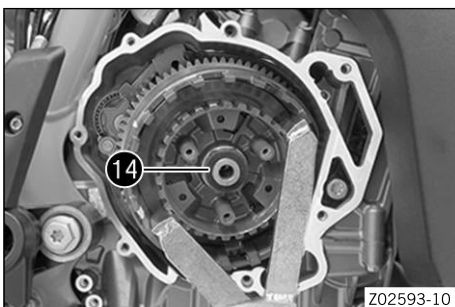
- Remove screws 10.
- Take off clutch pressure cap stop 11 and the springs.



- Take off clutch pressure cap 12.



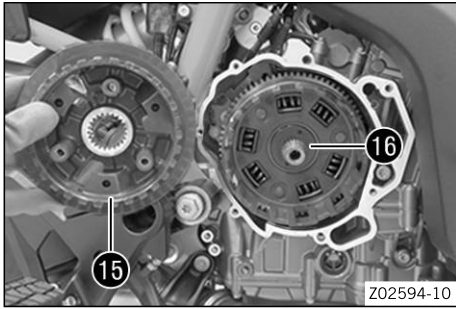
- Remove clutch discs 13, support ring, and pretension ring.



- Hold the inner clutch hub with the special tool.

Holding wrench (51129003000) (📖 p. 465)

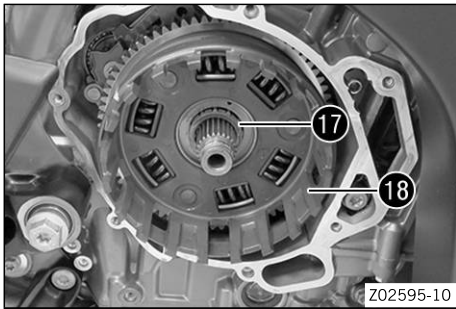
- Remove nut 14 with washer.



- Take off inner clutch hub **15** and washer **16**.

i Info

The washer usually sticks to the inner clutch hub.

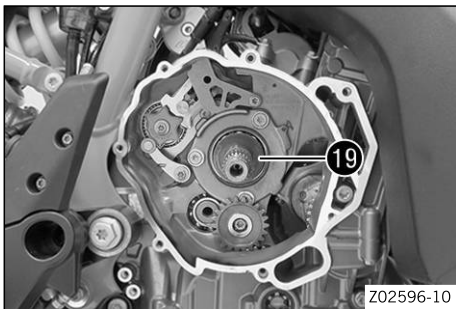


- Remove needle bearing **17**.

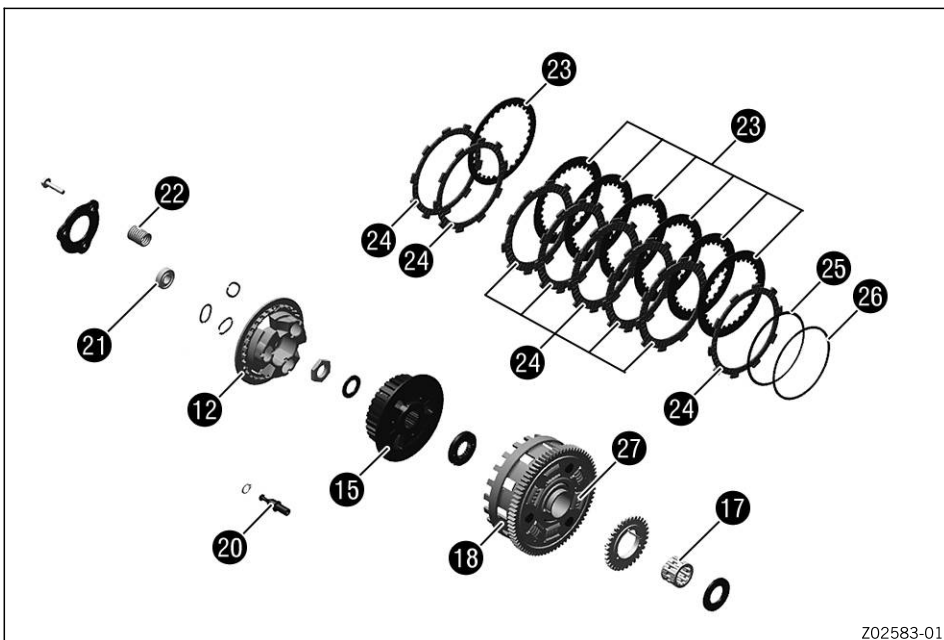
i Info

Use a magnetic rod to make disassembly easier.
Do not use pliers, as otherwise the needle bearing will be damaged.

- Take off clutch basket **18**.



- Remove washer **19**.



- Check clutch push rod **20** for damage and wear.
 - » If there is damage or wear:
 - Change clutch push rod.
- Check axial bearing **21** for damage and wear.

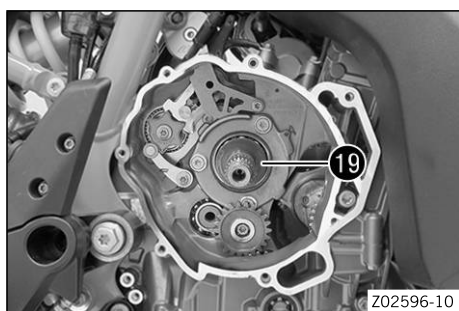
- » If there is damage or wear:
 - Change the axial bearing.
- Check the length of clutch springs 22.

Clutch spring - length	≥ 43.0 mm (≥ 1.693 in)
------------------------	------------------------

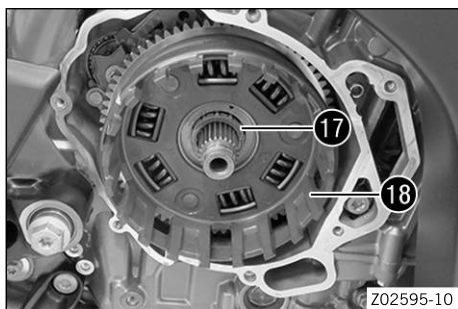
- » If the clutch spring length is shorter than specified:
 - Change all clutch springs.
- Check the contact surface of clutch pressure cap 12 for damage and wear.
 - » If there is damage or wear:
 - Change the clutch pressure cap.
- Check the thrust surfaces of the clutch facing discs in clutch basket 18 for damage and wear.
 - » If there is damage or wear:
 - Change the clutch disc pack and the clutch basket.
- Check needle bearing 17 for damage and wear.
 - » If there is damage or wear:
 - Change the needle bearing.
- Check intermediate clutch discs 23 for damage and wear.
 - » If the intermediate clutch discs are not level and are pitted:
 - Change the clutch disc pack.
- Check clutch facing discs 24 for discoloration and scoring.
 - » If there is discoloration or scoring:
 - Change the clutch disc pack.
- Check the thickness of the clutch disc pack.

Clutch disc pack - thickness	
New condition	35.60 ... 36.40 mm (1.4016 ... 1.4331 in)
Wear limit	34.80 mm (1.3701 in)

- » If the clutch disc pack does not meet specifications:
 - Change the clutch disc pack.
- Check pretension ring 25 and support ring 26 for damage and wear.
 - » If there is damage or wear:
 - Change the pretension ring and support ring.
- Check inner clutch hub 15 for damage and wear.
 - » If there is damage or wear:
 - Change the inner clutch hub.
- Check springs 27 of the clutch basket for damage and wear.
 - » If there is damage, wear or play in the direction of rotation:
 - Change the clutch basket.



- Mount washer 19.

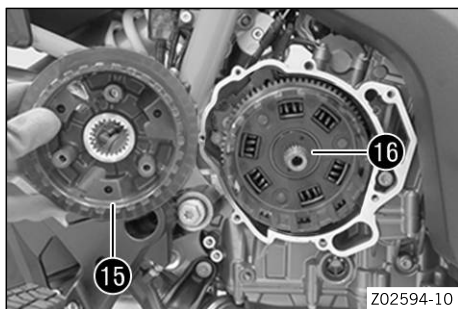


- Position the clutch basket **18**.

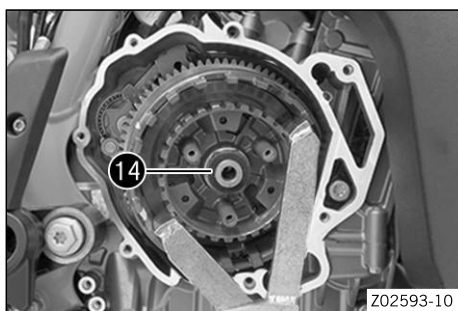
i Info

Turn the clutch basket and oil pump idler gear backwards and forwards slightly to help them mesh more easily.

- Mount needle bearing **17**.



- Mount washer **16** and inner clutch hub **15**.

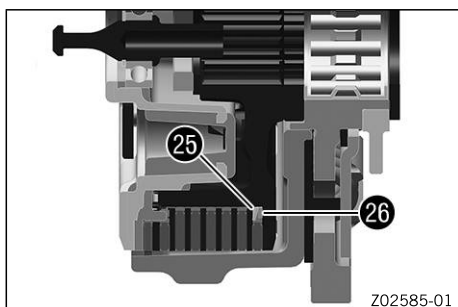


- Mount nut **14** with washer.
- Hold the inner clutch hub with the special tool and tighten the nut.

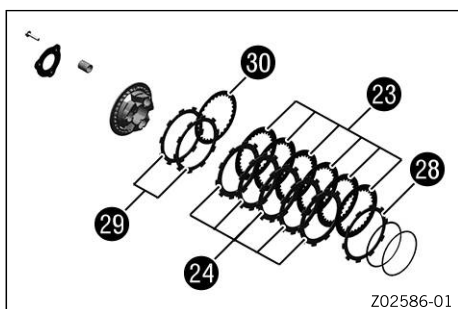
Guideline

Nut, inner clutch hub	M20x1.5	135 Nm (99.6 lbf ft)
-----------------------	---------	-------------------------

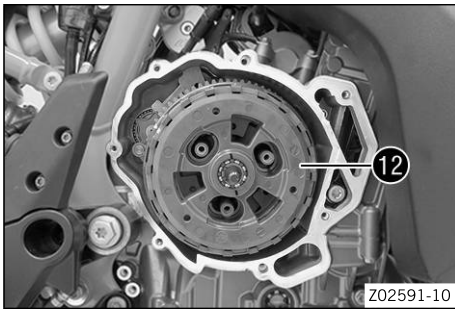
Holding wrench (51129003000) (📖 p. 465)



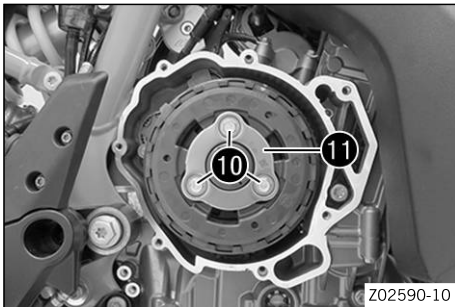
- Mount support ring **26** and pretension ring **25**.
- ✓ The pretension ring rests against the support ring on the inside and the outside faces away from the support ring.



- Thoroughly oil the clutch facing discs.
- Mount a clutch facing disc **28** with a larger inside diameter.
- Alternately mount 6 intermediate clutch discs **23** and 5 of the same clutch facing discs **24**.
- Alternately mount 2 clutch facing discs **29** and an intermediate clutch disc **30** with a larger inside diameter.
- The outer clutch facing disc must be mounted offset by one mesh.



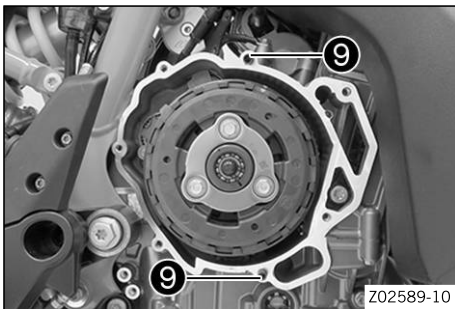
- Position clutch pressure cap 12.
- ✓ The gear teeth of the outer intermediate clutch disc engage in the clutch pressure cap.
- ✓ The clutch pressure cap rests flush against the outer clutch facing disc.



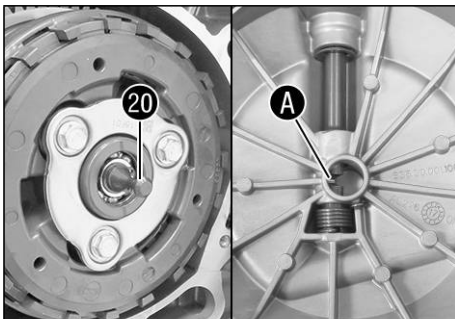
- Position clutch pressure cap stop 11 and the springs.
- Mount and tighten screws 10.

Guideline

Screw, clutch spring	M6	8 Nm (5.9 lbf ft)
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- Mount dowels 9.

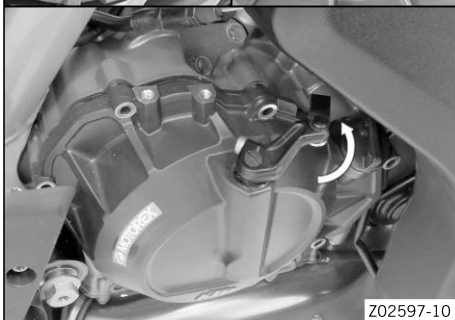


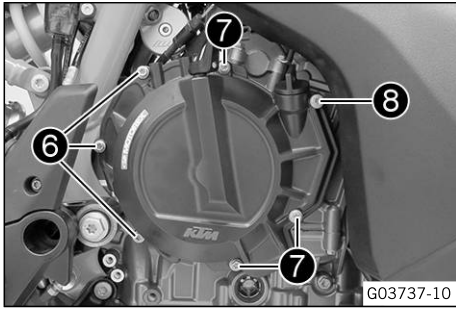
- Position the clutch cover with the clutch cover gasket.
- ✓ Clutch push rod 20 engages in groove A.



Info

Swivel clutch release lever counterclockwise.





- Mount screws **7**, but do not tighten yet.

Guideline

Screw, clutch cover	M6x30	10 Nm (7.4 lbf ft)
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- Mount screws **6**, but do not tighten yet.

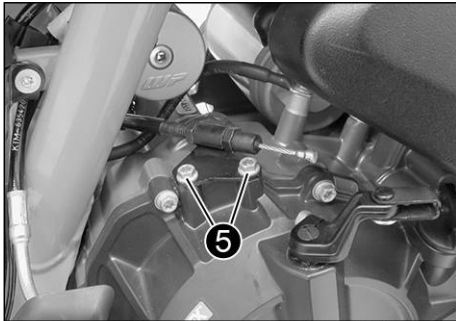
Guideline

Screw, clutch cover	M6x25	10 Nm (7.4 lbf ft)
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- Mount screw **8** and tighten all screws in a crisscross pattern.

Guideline

Screw, clutch cover	M6x35	10 Nm (7.4 lbf ft)
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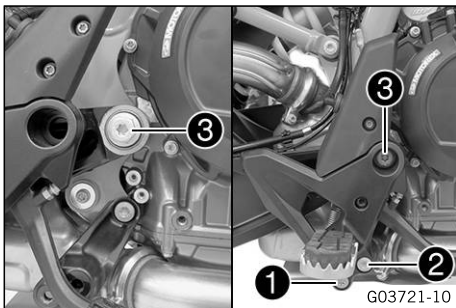
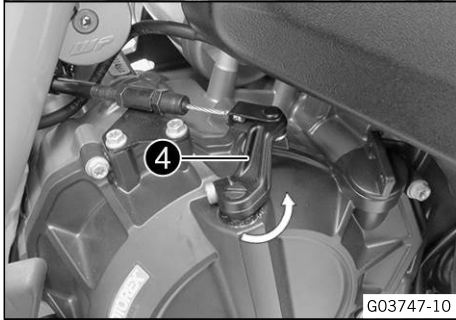
- Position inner clutch cable with bracket.

- Mount and tighten screws **5**.

Guideline

Remaining screws, engine	M6	10 Nm (7.4 lbf ft)
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- Swivel clutch release lever **4** counterclockwise and hook in the inner clutch cable.



- Remove screw **3** from the swingarm pivot.

- Position the footrest support.

- Mount and tighten screw **3**.

Guideline

Screw, swingarm pivot	M12	100 Nm (73.8 lbf ft)
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- Mount and tighten screw **2**.

Guideline

Screw, front footrest bracket	M10x30	45 Nm (33.2 lbf ft) Loctite®243™
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- Mount and tighten screw **1** and bushing.

Guideline

Screw, front footrest bracket	M10x40	45 Nm (33.2 lbf ft) Loctite®243™
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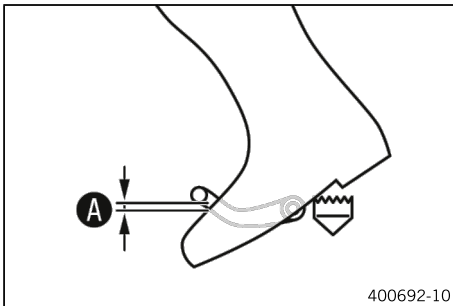
Finishing work

- Adjust the clutch release lever. (📖 p. 369)
- Check the engine oil level. (📖 p. 397)

22.1 Checking the basic position of the shift lever

i Info

When driving, the shift lever must not touch the rider's boot when in the basic position.
If the shift lever is permanently touching the boot, the transmission will be subject to excessive load; this can cause a malfunction of the quickshifter + (optional).

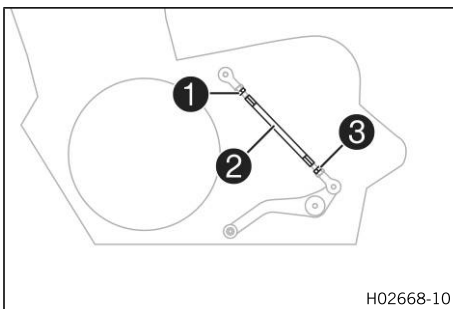


- Sit on the vehicle in the riding position and determine distance **A** between the upper edge of your boot and the shift lever.

Distance between shift lever and upper edge of boot	10 ... 20 mm (0.39 ... 0.79 in)
---	---------------------------------

- » If the distance does not meet specifications:
 - Adjust the basic position of the shift lever. (📖 p. 377)

22.2 Adjusting the basic position of the shift lever



- Loosen nut **1**, holding threaded rod **2**.
- Loosen nut **3**, holding threaded rod **2**.

i Info
Nut **3** has a left-handed thread.

- Turn threaded rod **2** to adjust the shift lever.

i Info
The range of adjustment is limited.
The shift lever must not come into contact with any other vehicle components during the shift procedure.

- Tighten nut **3** while holding threaded rod **2**.

Guideline

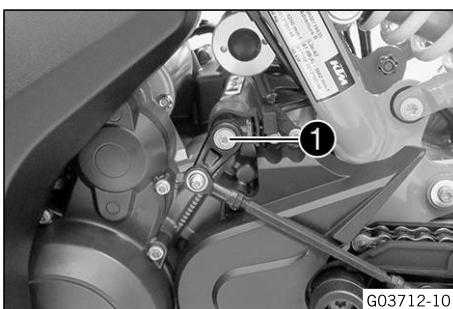
Nut, shift rod	M6LH	6 Nm (4.4 lbf ft)
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- Tighten nut **1** while holding threaded rod **2**.

Guideline

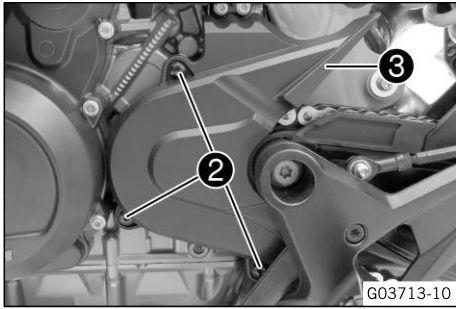
Nut, shift rod	M6	6 Nm (4.4 lbf ft)
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22.3 Changing the gear position sensor

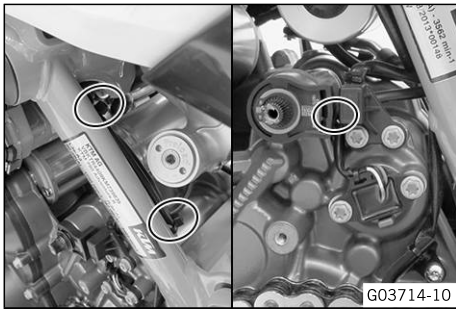


Main work

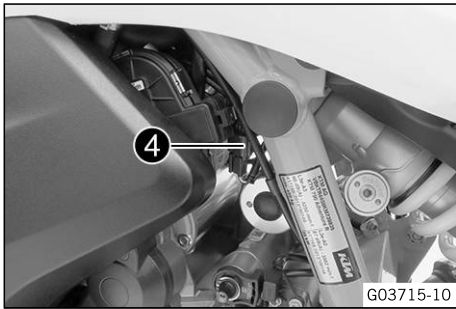
- Remove screw **1** with washers.
- Hang the bell crank with the shift linkage to the side.



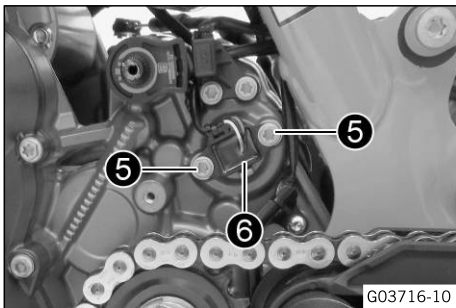
- Remove ② screws.
- Take off engine sprocket cover ③.



- Remove the cable ties.



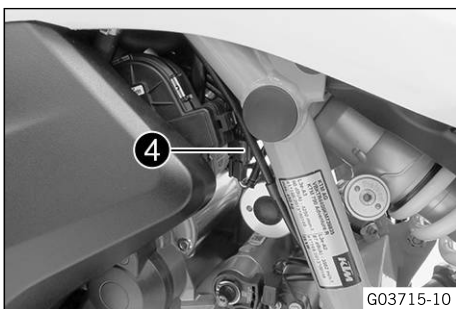
- Disconnect plug-in connector ④.
- Expose the cable.



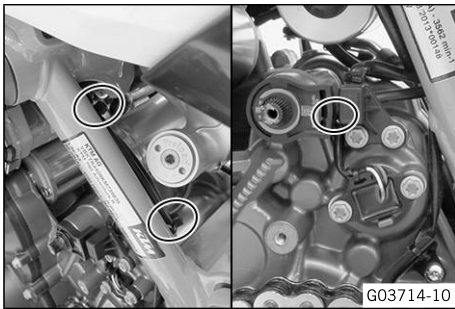
- Remove screws ⑤.
- Take off gear position sensor ⑥.
- Position a new gear position sensor.
- Mount and tighten screws ⑤.

Guideline

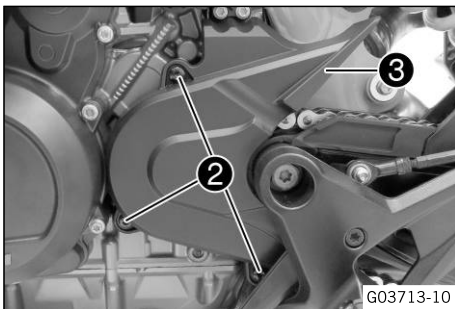
Screw, gear position sensor	M5	6 Nm (4.4 lbf ft) Loctite®243™
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- Route the cable without tension.
- Join plug-in connector ④.



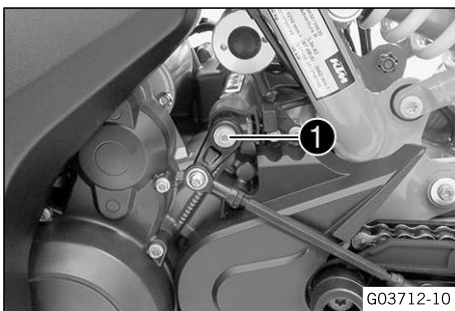
- Mount the cable ties.



- Position engine sprocket cover ③.
- Mount and tighten screws ②.

Guideline

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

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

- Mount and tighten screw ① with washers.

Guideline

Screw, shift lever	M6	14 Nm (10.3 lbf ft) Loctite®243™
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Finishing work

- Program the gear position sensor. (📖 p. 379)
- Program the shift shaft sensor. (📖 p. 381)

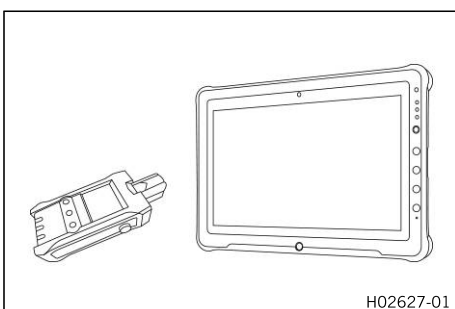
22.4 Program the gear position sensor

Condition

The diagnostics tool is connected and running.

Main work

- Execute "**Engine control unit**" > "**Functions**" > "**Neutral gear calibration**".
- Switch the ignition off and on again.
 - ✓ The green idle indicator lamp **N** lights up.



Final steps

- Program the shift shaft sensor. (📖 p. 381)

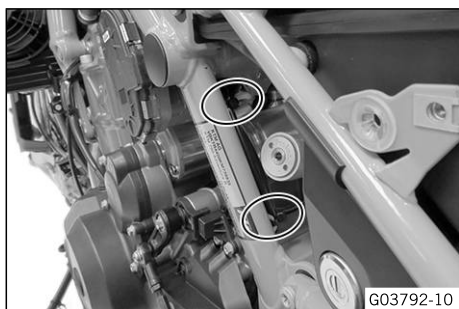
22.5 Changing the shift shaft sensor

Preparatory work

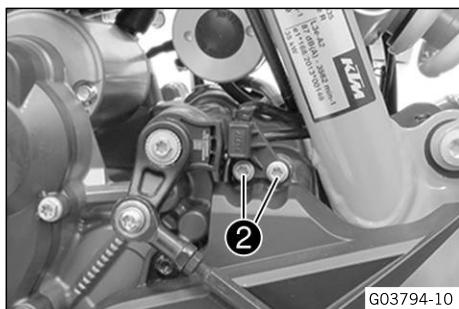
- Remove the seat. (📖 p. 120)
- Remove the left side cover. (📖 p. 137)
- Remove the battery cover. (📖 p. 138)
- Remove left fuel tank spoiler. (📖 p. 139)
- Remove the right side cover. (📖 p. 137)
- Remove right fuel tank spoiler. (📖 p. 141)
- Remove the engine guard. (📖 p. 143)
- Remove the fuel tank. (📖 p. 120)

Main work

- Remove the cable ties.



- Disconnect plug-in connector **1**.
- Expose the cable.



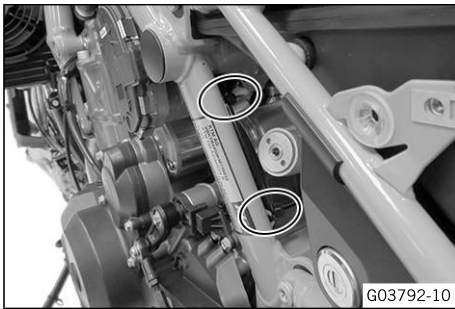
- Remove screws **2**.
- Take off the shift shaft sensor.
- Position the new shift shaft sensor.
- Mount and tighten the screws.

Guideline

Screw, shift shaft sensor	M5	6 Nm (4.4 lbf ft) Loctite®243™
---------------------------	----	--



- Route the cable without tension.
- Join plug-in connector **1**.



- Mount the cable ties.

Finishing work

- Install the fuel tank. (📖 p. 123)
- Install the engine guard. (📖 p. 143)
- Install the right fuel tank spoiler. (📖 p. 142)
- Install the right side cover. (📖 p. 138)
- Install the left fuel tank spoiler. (📖 p. 140)
- Install the battery cover. (📖 p. 139)
- Install the left side cover. (📖 p. 137)
- Mount the seat. (📖 p. 120)
- Program the shift shaft sensor. (📖 p. 381)



22.6 Programming the shift shaft sensor

Condition

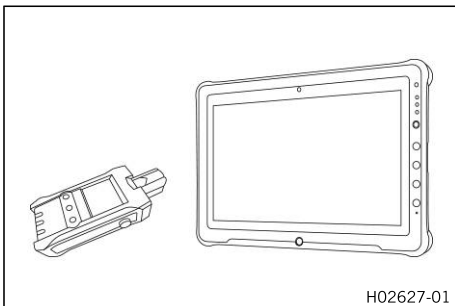
The diagnostics tool is connected and running.

Preliminary work

- Program the gear position sensor. (📖 p. 379)

Main work

- Execute **"Engine control unit" > "Functions" > "Quickshifter calibration"**.



23.1 Checking the coolant fill level and antifreeze



Warning

Danger of scalding During motorcycle operation, the coolant gets very hot and is under pressure.

- Do not open the radiator, the radiator hoses or other cooling system components if the engine or the cooling system are at operating temperature.
- Allow the cooling system and the engine to cool down before you open the radiator, the radiator hoses or other components of the cooling system.
- In the event of scalding, rinse the area affected immediately with lukewarm water.



Warning

Danger of poisoning Coolant is 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.

Preparatory work

- Park the motorcycle on a horizontal surface.
- Remove the seat. (📖 p. 120)
- Remove the right side cover. (📖 p. 137)
- Remove the battery cover. (📖 p. 138)
- Remove right fuel tank spoiler. (📖 p. 141)

Main work

- Remove radiator cap ❶ and cover of the compensating tank ❷.
- Check the antifreeze in the coolant.

-25 ... -45 °C (-13 ... -49 °F)

- » If the antifreeze in the coolant does not match the specified value:
 - Correct the antifreeze in the coolant.

- Check the coolant level.

The radiator must be filled completely.

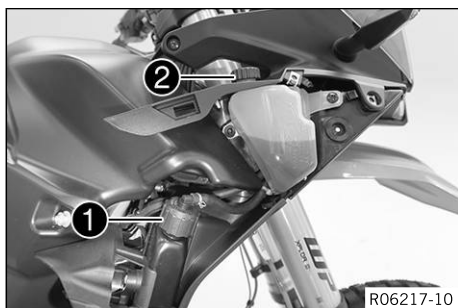
The coolant level in the compensating tank must be between **MIN** and **MAX**.

- » If the coolant level does not match the specified value:
 - Check the coolant level and the reason for the loss.

- Mount the radiator cap and the cover of the compensating tank.

Finishing work

- Install the right fuel tank spoiler. (📖 p. 142)
- Install the battery cover. (📖 p. 139)
- Install the right side cover. (📖 p. 138)
- Mount the seat. (📖 p. 120)



23.2 Checking the coolant level in the compensating tank



Warning

Danger of scalding During motorcycle operation, the coolant gets very hot and is under pressure.

- Do not open the radiator, the radiator hoses or other cooling system components if the engine or the cooling system are at operating temperature.
- Allow the cooling system and the engine to cool down before you open the radiator, the radiator hoses or other components of the cooling system.
- In the event of scalding, rinse the area affected immediately with lukewarm water.



Warning

Danger of poisoning Coolant is 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.

The radiator is completely full.

- Park the motorcycle on a horizontal surface.
- Check the coolant level in the compensating tank.

The coolant level must be between **MIN** and **MAX**.

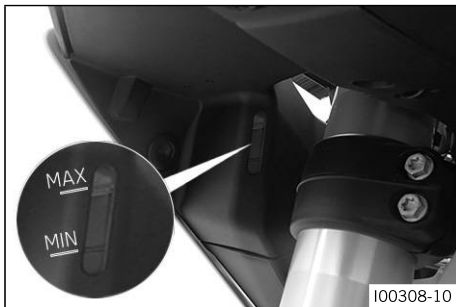
- » If there is no coolant in the compensating tank:
 - Check the cooling system for leaks.



Info

Do not start up the motorcycle!

- Fill/bleed the cooling system. (📖 p. 384)
- » If the coolant level in the compensating tank is not at the required level, but the tank is not empty:
 - Correct the coolant level in the compensating tank. (📖 p. 387)



23.3 Draining the coolant



Warning

Danger of scalding During motorcycle operation, the coolant gets very hot and is under pressure.

- Do not open the radiator, the radiator hoses or other cooling system components if the engine or the cooling system are at operating temperature.
- Allow the cooling system and the engine to cool down before you open the radiator, the radiator hoses or other components of the cooling system.
- In the event of scalding, rinse the area affected immediately with lukewarm water.



Warning

Danger of poisoning Coolant is 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.

Preparatory work

- Remove the engine guard. (📖 p. 143)
- Remove the seat. (📖 p. 120)
- Remove the right side cover. (📖 p. 137)
- Remove the battery cover. (📖 p. 138)
- Remove right fuel tank spoiler. (📖 p. 141)

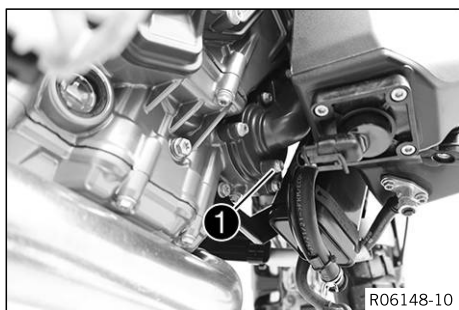
Main work

- Position the motorcycle upright.
- Position an appropriate container under the engine.
- Remove screw ❶ with the seal ring.
- Remove the radiator cap.
- Completely drain the coolant.
- Mount and tighten screw ❶ with a new seal ring.

Guideline

Screw, water pump cover	M6	10 Nm (7.4 lbf ft) Loctite®243™
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- Mount the radiator cap.



23.4 Filling/bleeding the cooling system



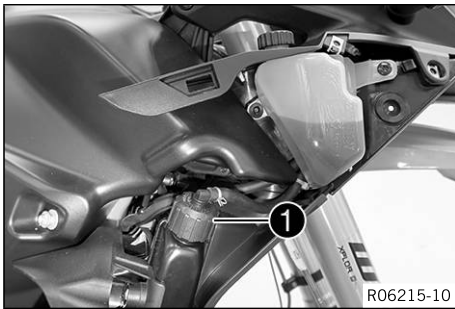
Warning

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 fuel tank spoiler has been removed on the left and right.

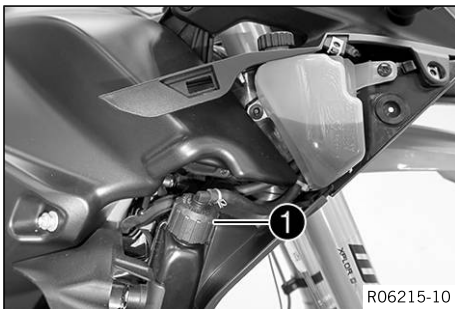


- Remove radiator cap ❶.



- Remove bleeder screw ❷.
- Tilt the vehicle slightly to the right.
- Pour in coolant until it emerges without bubbles at the vent hole, and then mount and tighten bleeder screw ❷ immediately.

Coolant	1.60 l (1.69 qt.)	Coolant (📖 p. 458)
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- Completely fill the radiator with coolant.
- Mount radiator cap ❶.
- Check the coolant level in the compensating tank. (📖 p. 383)
- Rest the vehicle on the side stand.



Danger

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

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

- Start the engine and run it until the fan starts.
- Stop the engine and allow it to cool down.
- After the engine has cooled down, check the coolant level in the radiator and in the compensating tank again and add more coolant if necessary.



23.5 Changing the coolant



Warning

Danger of scalding During motorcycle operation, the coolant gets very hot and is under pressure.

- Do not open the radiator, the radiator hoses or other cooling system components if the engine or the cooling system are at operating temperature.
- Allow the cooling system and the engine to cool down before you open the radiator, the radiator hoses or other components of the cooling system.
- In the event of scalding, rinse the area affected immediately with lukewarm water.



Warning

Danger of poisoning Coolant is 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

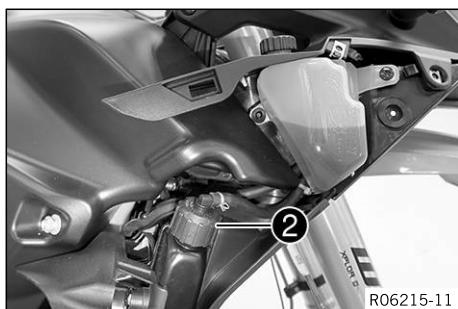
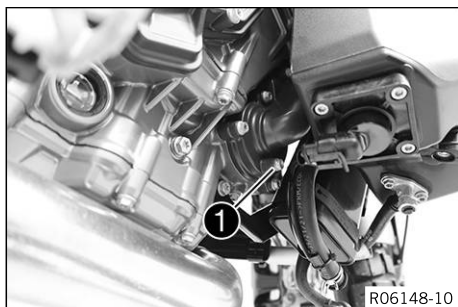
The engine is cold.

Preparatory work

- Remove the engine guard. (📖 p. 143)
- Remove the seat. (📖 p. 120)
- Remove the left side cover. (📖 p. 137)
- Remove the battery cover. (📖 p. 138)
- Remove left fuel tank spoiler. (📖 p. 139)
- Remove the right side cover. (📖 p. 137)
- Remove right fuel tank spoiler. (📖 p. 141)

Main work

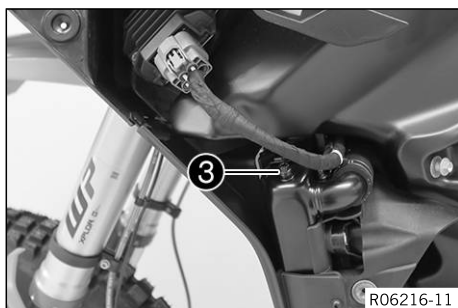
- Position the motorcycle upright.
- Position an appropriate container under the engine.
- Remove screw ❶ with the seal ring.



- Remove radiator cap ❷.
- Completely drain the coolant.
- Mount and tighten screw ❶ with a new seal ring.

Guideline

Screw plug, water pump drain hole	EJOTALtracs® Plus 60x14	8 Nm (5.9 lbf ft) Loctite®243™
-----------------------------------	--------------------------------	--



- Remove bleeder screw ❸.
- Tilt the vehicle slightly to the right.
- Pour in coolant until it emerges without bubbles at the vent hole, and then mount and tighten bleeder screw ❸ immediately.

Coolant	1.60 l (1.69 qt.)	Coolant (📖 p. 458)
---------	----------------------	--------------------

- Completely fill the radiator with coolant.
- Mount radiator cap ❷.
- Check the coolant level in the compensating tank. (📖 p. 383)
- Rest the vehicle on the side stand.



Danger

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

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

- Start the engine and run it until the fan starts.
- Stop the engine and allow it to cool down.
- After the engine has cooled down, check the coolant level in the radiator and in the compensating tank again and add more coolant if necessary.

Finishing work

- Install the right fuel tank spoiler. (📖 p. 142)
- Install the right side cover. (📖 p. 138)
- Install the left fuel tank spoiler. (📖 p. 140)
- Install the battery cover. (📖 p. 139)
- Install the left side cover. (📖 p. 137)
- Mount the seat. (📖 p. 120)
- Install the engine guard. (📖 p. 143)



23.6 Correcting the coolant level in the compensating tank



Warning

Danger of scalding During motorcycle operation, the coolant gets very hot and is under pressure.

- Do not open the radiator, the radiator hoses or other cooling system components if the engine or the cooling system are at operating temperature.
- Allow the cooling system and the engine to cool down before you open the radiator, the radiator hoses or other components of the cooling system.
- In the event of scalding, rinse the area affected immediately with lukewarm water.



Warning

Danger of poisoning Coolant is harmful to health.

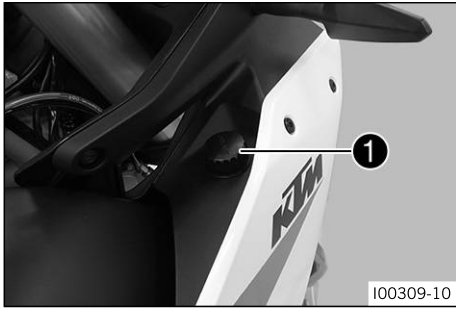
- Keep coolant out of the reach of children.
- Do not allow coolant to come into contact with the skin, the eyes and clothing.
- Consult a doctor immediately if coolant is swallowed.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly 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.
The radiator is completely full.

Preparatory work

- Check the coolant level in the compensating tank. (📖 p. 383)



Main work

- Remove cover ❶ of the compensating tank.



- Add coolant until the coolant reaches the specified level.

Guideline

The coolant level must be between **MIN** and **MAX**.

Coolant (📖 p. 458)

- Mount cover ❶ of the compensating tank.

Guideline

Compensating tank cover	-	1.1 Nm (0.81 lbf ft)
-------------------------	---	-------------------------

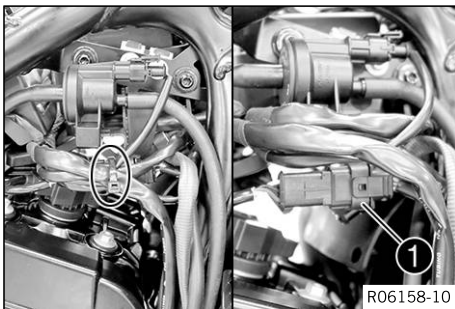
24.1 Checking the valve clearance

Preparatory work

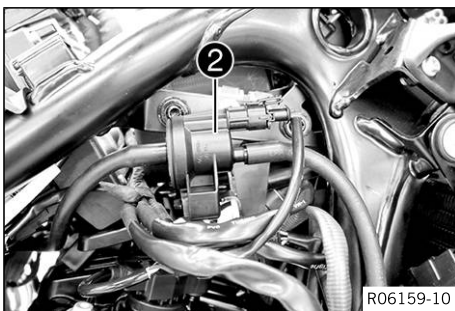
- Remove the seat. (📖 p. 120)
- Remove the left side cover. (📖 p. 137)
- Remove the battery cover. (📖 p. 138)
- Remove left fuel tank spoiler. (📖 p. 139)
- Remove the right side cover. (📖 p. 137)
- Remove right fuel tank spoiler. (📖 p. 141)
- Remove the engine guard. (📖 p. 143)
- Remove the fuel tank. (📖 p. 120)
- Raise motorcycle with rear lifting gear. (📖 p. 15)

Main work

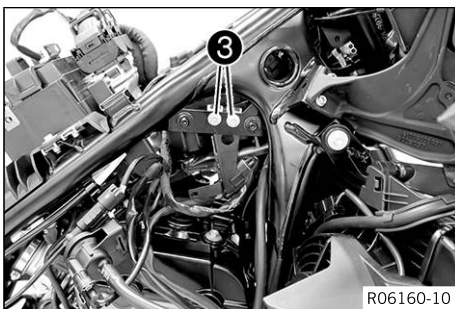
- Remove the cable tie.
- Pull off and disconnect plug-in connector **1** from the holder.



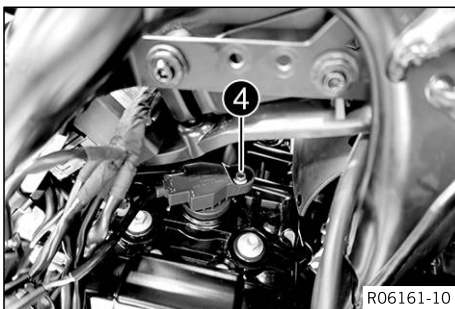
- Pull fuel vapor valve **2** off the holder and hang it to the side.

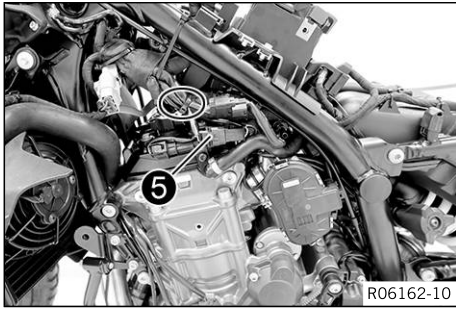


- Remove screws **3**.
- Hang the holder to the side.

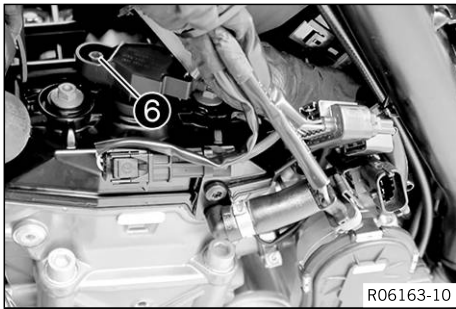


- Remove screw **4**.
- Remove the ignition coil.

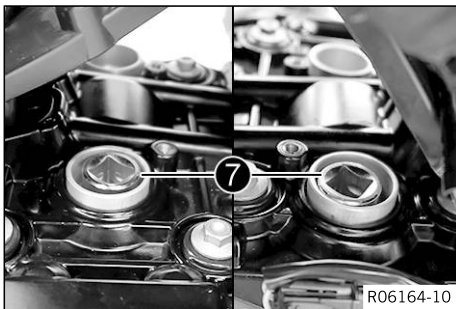




- Remove the cable tie.
- Disconnect plug-in connector **5**.

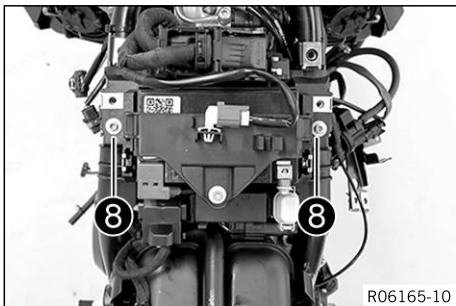


- Remove screw **6**.
- Remove the ignition coil.

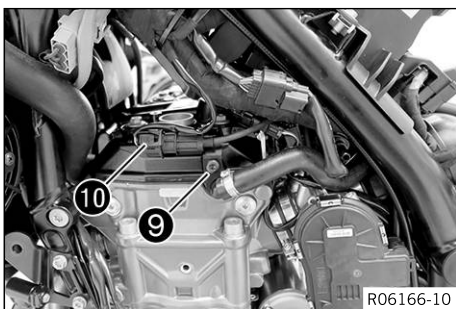


- Remove spark plugs using special tool **7**.

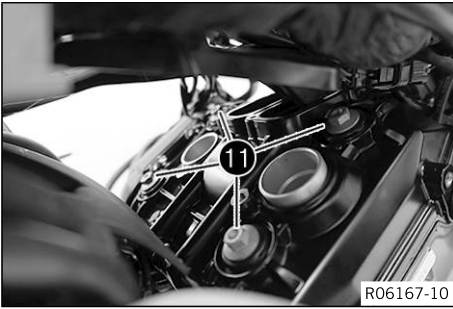
Spark plug wrench with link (77229172000) (📖 p. 473)



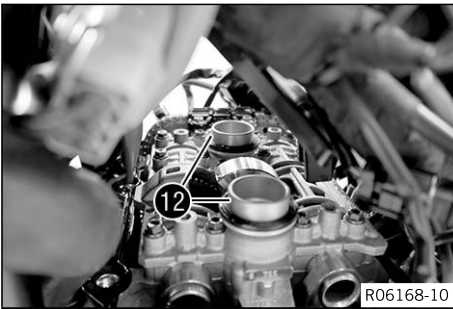
- Remove screws **8**.
- Press the battery compartment upwards.



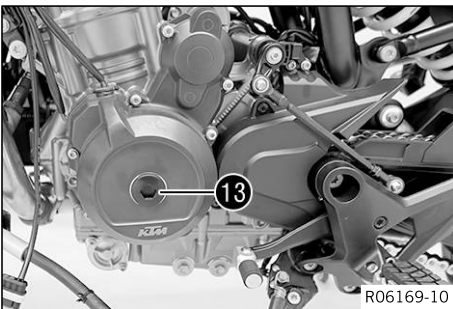
- Remove screw **9** with the retaining bracket.
- Disconnect plug-in connector **10**.
- Pull off bleeder flange and hang it to the side.



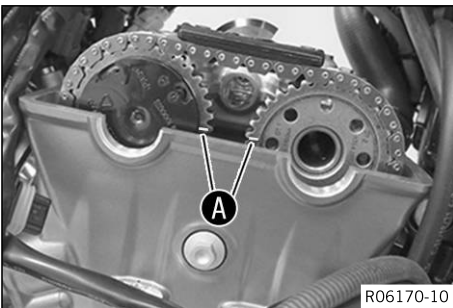
- Remove screws **11** with the gaskets.
- Take off the valve cover with the valve cover seal.



- Remove spark plug shaft inserts **12** with the gaskets.

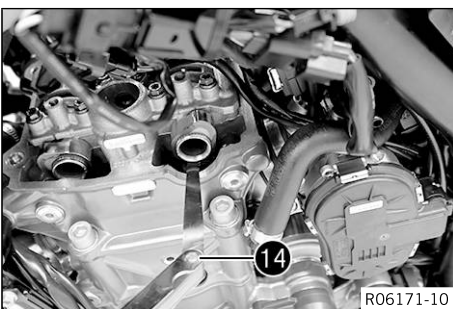


- Remove screw plug **13** with the O-ring.



- Crank the engine several times.
- Turn the crankshaft counterclockwise and set it to ignition top dead center of cylinder 1.
- ✓ The **OT1** markings **A** are aligned with the sealing surface.

i Info
The **OT1** markings are line markings.



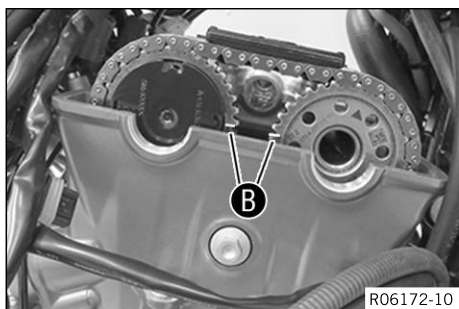
- Check the valve clearance at the exhaust valves and the intake valves between the camshaft and cam lever using the special tool **14**.

Guideline

Valve play, cold	
Intake at: 20 °C (68 °F)	0.10 ... 0.15 mm (0.0039 ... 0.0059 in)
Exhaust at: 20 °C (68 °F)	0.15 ... 0.20 mm (0.0059 ... 0.0079 in)

Feeler gauge (79129941000) (📖 p. 473)

- » If the valve clearance does not meet specifications:
 - Adjust the valve clearance. (📖 p. 396)



- Turn the crankshaft counterclockwise by the specified value and set it to ignition top dead center of cylinder 2.

Guideline

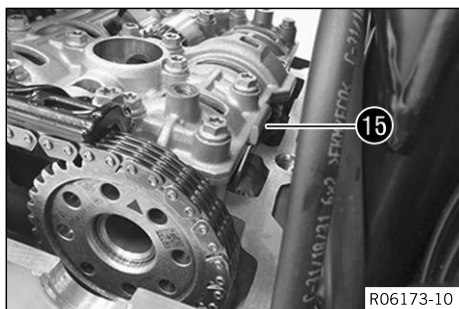
435°

- ✓ The **OT2** markings **(B)** are aligned with the sealing surface.

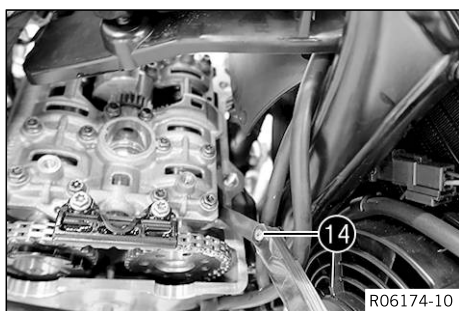


Info

The **OT2** markings are dot markings.



- Remove cam lever clip **(15)**.



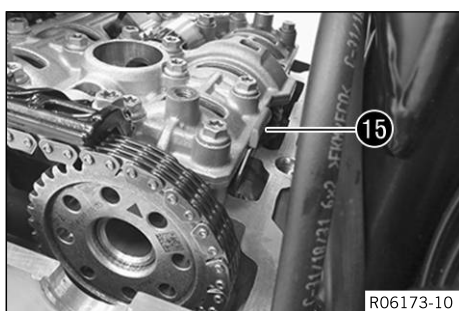
- Check the valve clearance at the exhaust valves and the intake valves between the camshaft and cam lever using the special tool **(14)**.

Guideline

Valve play, cold	
Intake at: 20 °C (68 °F)	0.10 ... 0.15 mm (0.0039 ... 0.0059 in)
Exhaust at: 20 °C (68 °F)	0.15 ... 0.20 mm (0.0059 ... 0.0079 in)

Feeler gauge (79129941000) (📖 p. 473)

- » If the valve clearance does not meet specifications:
 - Adjust the valve clearance. (📖 p. 396)

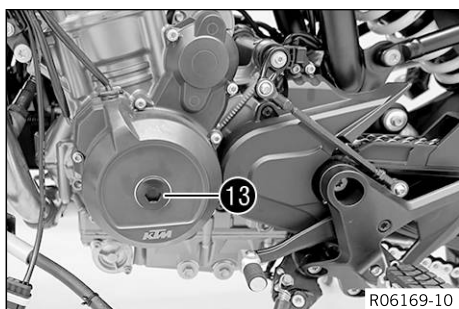


- Mount cam lever clip **(15)**.



Info

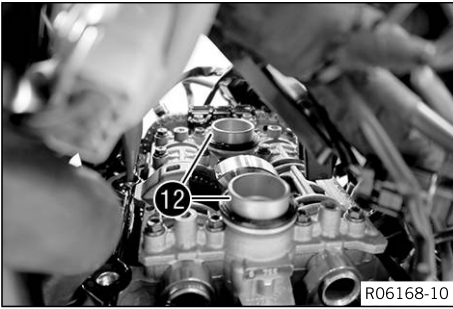
Check for correct positioning of the exhaust cam lever.



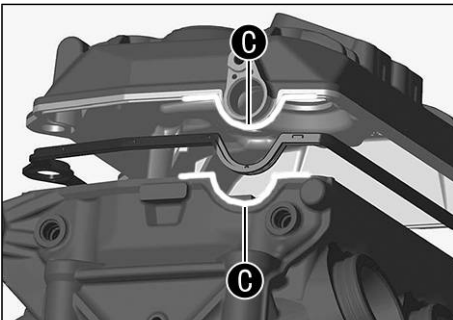
- Mount and tighten screw plug **(13)** with the O-ring.

Guideline

Screw plug, alternator cover	M24x1.5	8 Nm (5.9 lbf ft)
------------------------------	---------	-------------------

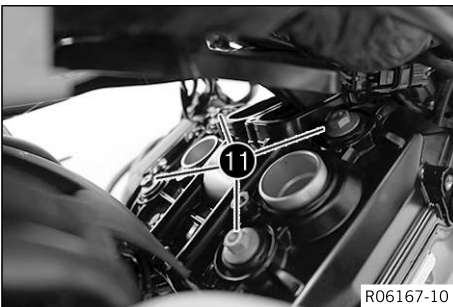
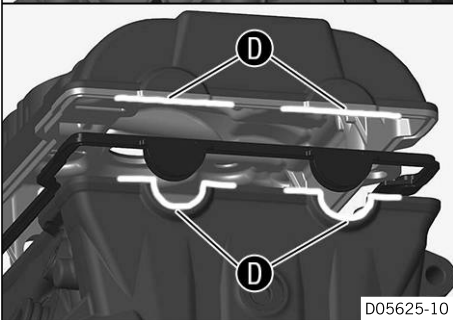


- Grease the O-rings and mount spark plug shaft inserts **12** with the gaskets.



- Clean and degrease the sealing surfaces.
- Apply a thin layer of sealing compound to areas **C** and **D**.

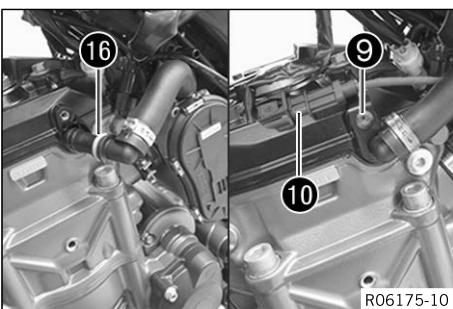
Loctite® 5910



- Position the valve cover with the valve cover seal.
- Mount and tighten screws **11** with the gaskets.

Guideline

Screw, valve cover	M6	10 Nm (7.4 lbf ft)
--------------------	----	--------------------



- Grease O-ring **16**.

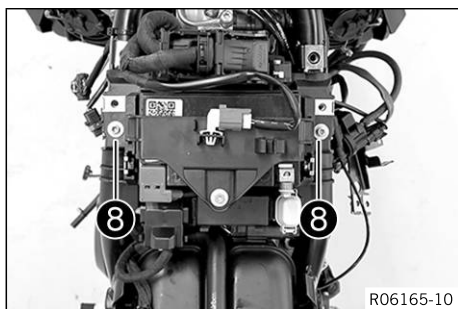
Long-life grease (📖 p. 460)

- Position the bleeder flange in the valve cover.
- Mount and tighten screw **9** with retaining bracket.

Guideline

Screw, bleeder flange	EJOTALtracs® M6x12	8 Nm (5.9 lbf ft) Loctite®243™
-----------------------	------------------------------	--

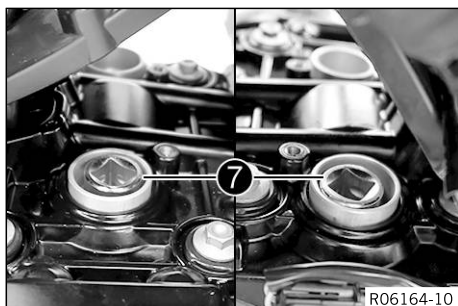
- Join plug-in connector **10**.



- Position the battery compartment.
- Mount and tighten screws **8**.

Guideline

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



- Mount and tighten the spark plugs using special tool **7**.

Guideline

Spark plug	M10	11 Nm (8.1 lbf ft)
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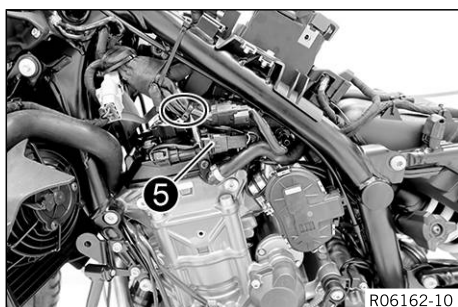
Spark plug wrench with link (77229172000) (📖 p. 473)		
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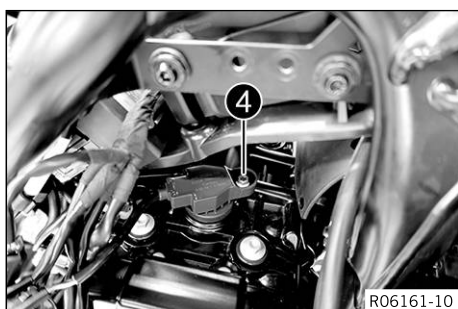
- Mount the ignition coil.
- Mount and tighten screw **6**.

Guideline

Screw, ignition coil	M6	8 Nm (5.9 lbf ft)
----------------------	----	-------------------



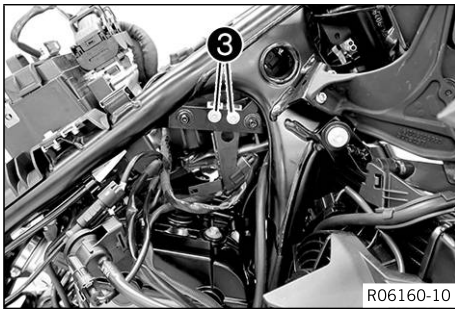
- Join plug-in connector **5**.
- Route the cable without tension and secure with the cable ties.



- Mount the ignition coil.
- Mount and tighten screw **4**.

Guideline

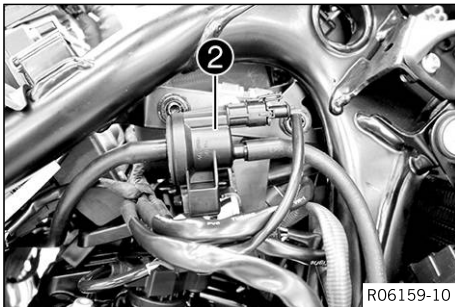
Screw, ignition coil	M6	8 Nm (5.9 lbf ft)
----------------------	----	-------------------



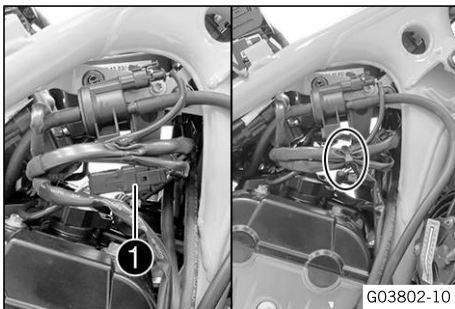
- Position the holder.
- Mount and tighten screws ③.

Guideline

Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
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- Position fuel vapor valve ② on the holder.



- Join plug-in connector ① and position it on the holder.
- Route the cable without tension and secure with the cable ties.

Finishing work

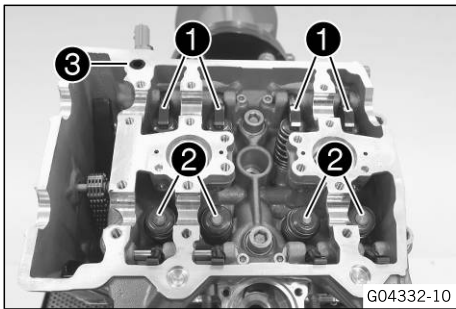
- Remove the rear of the motorcycle from the lifting gear. (📖 p. 16)
- Install the fuel tank. (📖 p. 123)
- Install the engine guard. (📖 p. 143)
- Install the right fuel tank spoiler. (📖 p. 142)
- Install the right side cover. (📖 p. 138)
- Install the left fuel tank spoiler. (📖 p. 140)
- Install the battery cover. (📖 p. 139)
- Install the left side cover. (📖 p. 137)
- Mount the seat. (📖 p. 120)



24.2 Adjusting the valve clearance and cleaning the oil screen

i Info

For purposes of illustration, the following steps are shown with the engine removed. Removal is not necessary.



Preparatory work

- Remove the camshafts. (📖 p. 290)

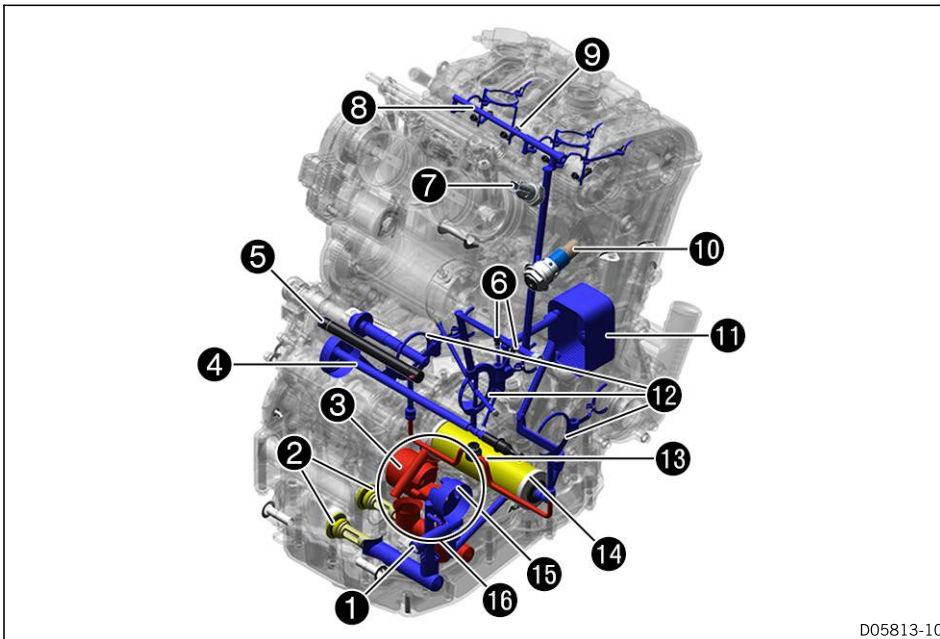
Main work

- Swing up cam lever ①.
- Remove shims ② and set them down according to the installation position.
- Correct the shims based on the results of the valve clearance check.
- Insert suitable shims.
- Clean oil screen ③.

Finishing work

- Install the camshafts. (📖 p. 352)

25.1 Oil circuit



D05813-10

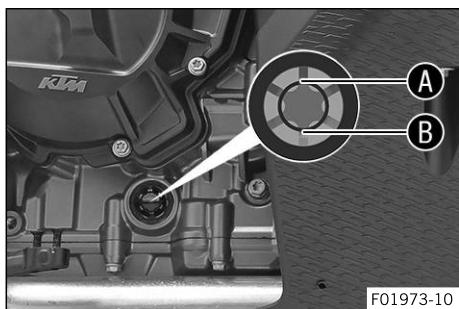
- ① Oil pressure control valve
- ② Oil screens
- ③ Suction pump
- ④ Clutch lubrication
- ⑤ Oil spray tube
- ⑥ Oil nozzles for piston cooling
- ⑦ Oil pressure sensor
- ⑧ Cam lever shaft
- ⑨ Oil nozzles for cam follower lubrication
- ⑩ Timing chain tensioner
- ⑪ Oil/water heat exchanger
- ⑫ Conrod bearing lubrication
- ⑬ Oil line
- ⑭ Oil filter
- ⑮ Force pump
- ⑯ Oil pump unit

25.2 Checking the engine oil level



Info

The engine oil level must be checked at normal engine operating temperature.



F01973-10

- Stand motorcycle upright on a horizontal surface.
- Check the engine oil level.

i Info
After switching off the engine, wait one minute before checking the level.

The engine oil must be between marking **A** and marking **B** of the oil level viewer.

- » If the engine oil level is below the marking **B**:
 - Add engine oil. (📖 p. 402)
- » If the engine oil level is above the marking **A**:
 - Correct engine oil level.

25.3 Checking the oil pressure



Warning

Danger of scalding Engine and gear oil get very hot when the motorcycle is ridden.

- Wear suitable protective clothing and safety gloves.
- In the event of scalding, rinse the area affected immediately with lukewarm water.



Note

Environmental hazard Hazardous substances cause environmental damage.

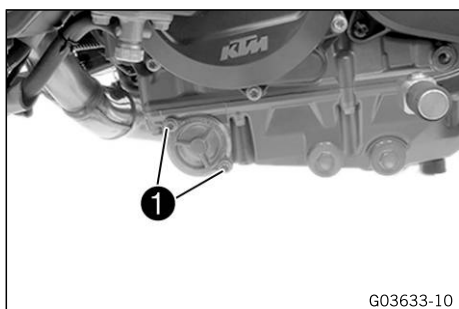
- Dispose of oils, grease, filters, fuel, cleaning agents, brake fluid, etc., correctly and in compliance with the applicable regulations.

Preparatory work

- Remove the engine guard. (📖 p. 143)

Main work

- Position an appropriate container under the engine.
- Remove screws **1**.
- Take off the oil filter cover with the O-ring.
- Remove the oil filter.



G03633-10

Lock ring plier (51012011000) (📖 p. 465)



G03632-10

- Position the special tool with the O-ring.

Oil pressure adapter (75029094000) (📖 p. 472)

- Mount and tighten the screws.

Guideline

Screw, oil filter cover	M5	6 Nm (4.4 lbf ft)
-------------------------	----	-------------------

- Connect the pressure testing tool to the special tool without the T-plate.

Pressure testing tool (61029094000) (📖 p. 467)

- Check the engine oil level. (📖 p. 397)



Danger

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

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

- Start the engine and allow it to warm up.
- Check the oil pressure.

Oil pressure	
Coolant temperature: ≥ 70 °C (≥ 158 °F) Engine speed: Idle speed	≥ 1.4 bar (≥ 20 psi)
Coolant temperature: ≥ 70 °C (≥ 158 °F) Engine speed: 6,000 rpm	≥ 2.4 bar (≥ 35 psi)

- » If the measured value is less than the specified value:
 - Check the oil pumps for wear. Check that all oil holes are clear.
- Switch off the engine.



Warning

Danger of burns Some vehicle components become very hot when the vehicle is operated.

- Wear suitable protective clothing and safety gloves.
- In the event of scalding, rinse the area affected immediately with lukewarm water.

- Remove the special tools.
- Grease the O-ring of the oil filter cover.
- Mount the oil filter cover.
- Mount and tighten the screws.

Guideline

Screw, oil filter cover	M5	6 Nm (4.4 lbf ft)
-------------------------	----	-------------------

Finishing work

- Check the engine oil level. (📖 p. 397)
- Install the engine guard. (📖 p. 143)



25.4 Changing the engine oil and oil filter, cleaning the oil screens



Warning

Danger of scalding Engine and gear oil get very hot when the motorcycle is ridden.

- Wear suitable protective clothing and safety gloves.
- In the event of scalding, rinse the area affected immediately with lukewarm water.



Note

Environmental hazard Hazardous substances cause environmental damage.

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



Info

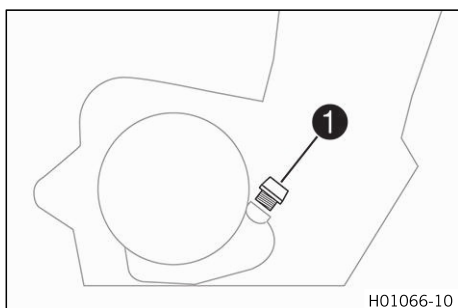
Drain the engine oil while the engine is at operating temperature.

Preparatory work

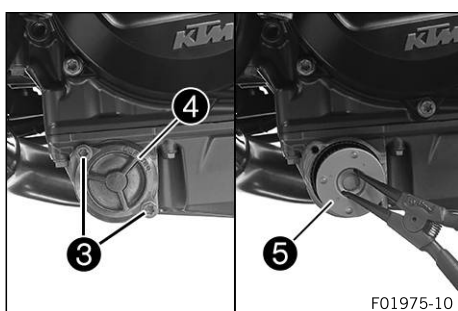
- Remove the engine guard. (📖 p. 143)

Main work

- Rest the motorcycle on its side stand on a horizontal surface.
- Position an appropriate container under the engine.
- Remove filler plug **1** with the O-ring.



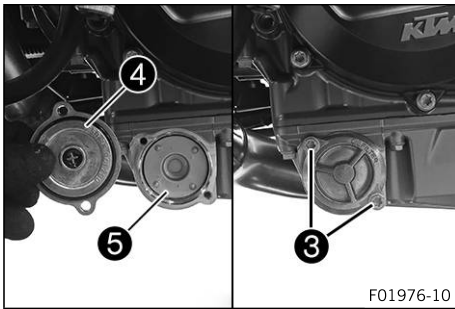
- Remove oil drain plugs **2** along with the magnets, the O-rings, and the oil screens.



- Remove screws **3**. Take off oil filter cover **4** with the O-ring.
- Pull oil filter **5** out of the oil filter housing.

Lock ring plier (51012011000) (📖 p. 465)

- Allow the engine oil to drain completely.
- Thoroughly clean the parts and the sealing surfaces.



F01976-10

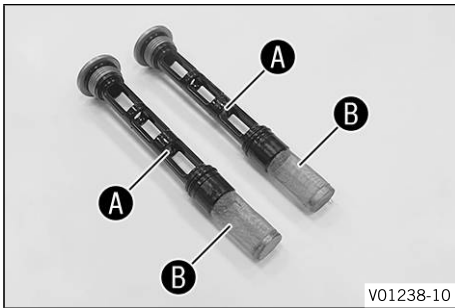
- Insert new oil filter **5**.

i Info
Only insert the oil filter by hand.

- Oil the new O-ring of the oil filter cover. Position oil filter cover **4**.
- Mount and tighten screws **3**.

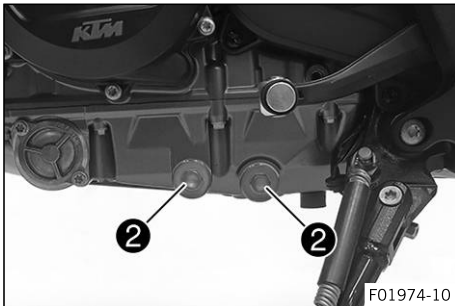
Guideline

Screw, oil filter cover	M5	6 Nm (4.4 lbf ft)
-------------------------	----	-------------------



V01238-10

- Thoroughly clean magnets **A** and oil screens **B** of the oil drain plugs.



F01974-10

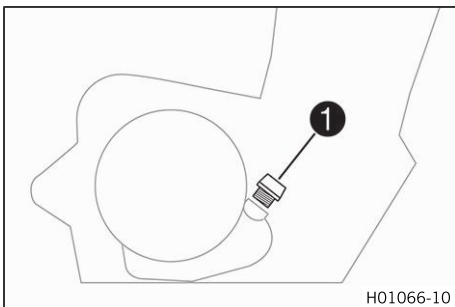
- Mount the oil drain plugs **2** with magnets and new seal rings, and tighten.

Guideline

Plug, oil screen	M20x1.5	20 Nm (14.8 lbf ft)
------------------	---------	---------------------

- Fill up with engine oil at the clutch cover.

Engine oil	2.8 l (3 qt.)	Engine oil (SAE 10W/50) (📖 p. 458)
------------	---------------	------------------------------------



H01066-10

- Mount and tighten filler plug **1** with the O-ring.

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

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

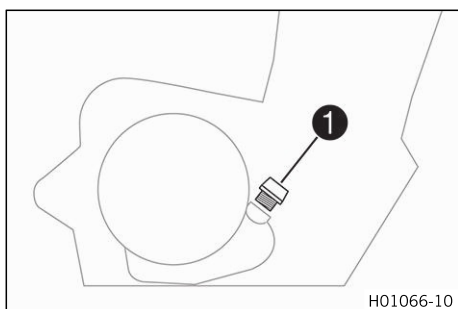
- Start the engine and check it for leaks.

Finishing work

- Check the engine oil level. (📖 p. 397)
- Install the engine guard. (📖 p. 143)

25.5 Adding engine oil

i Info
Too little engine oil or poor-quality engine oil will result in premature wear of the engine.



Main work

- Remove filler plug **1** with the O-ring.
- Fill engine oil to the middle of the level viewer.

Engine oil (SAE 10W/50) (📖 p. 458)

i Info
In order to achieve optimal engine oil performance, it is not advisable to mix different engine oils.
KTM recommends changing the engine oil where necessary.

- Mount and tighten filler plug **1** with the O-ring.

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

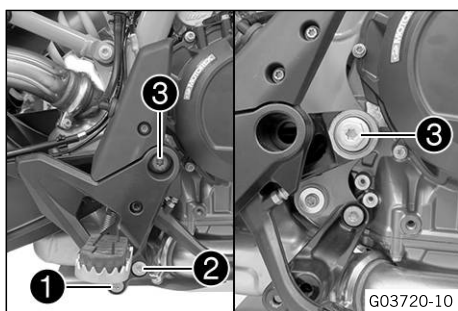
- Always make sure there is sufficient ventilation when running the engine.
- Use effective exhaust extraction when starting or running the engine in an enclosed space.

- Start the engine and check for leaks.

Finishing work

- Check the engine oil level. (📖 p. 397)

25.6 Checking/cleaning the oil nozzle for clutch lubrication

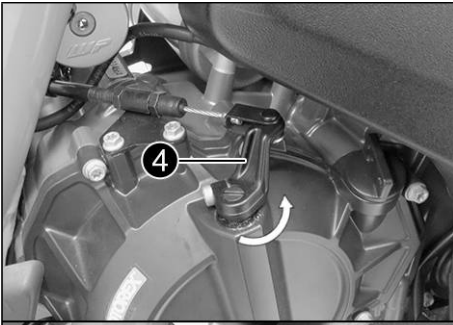


Main work

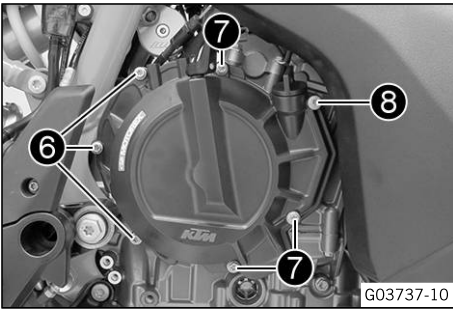
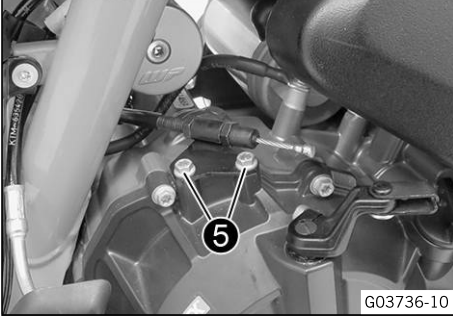
- Remove screw **1** and bushing.
- Remove screw **2**.
- Remove screw **3**.
- Take off footrest bracket and hang to the side.

i Info
Cover the components to protect them against damage.

- Mount screw **3**, but do not tighten.



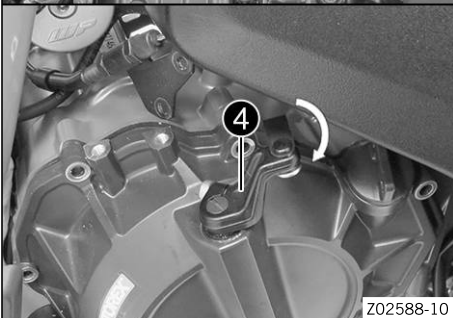
- Swivel clutch release lever **4** counterclockwise and detach the inner clutch cable.
- Remove screws **5**.
- Hang the inner clutch cable with bracket to the side.

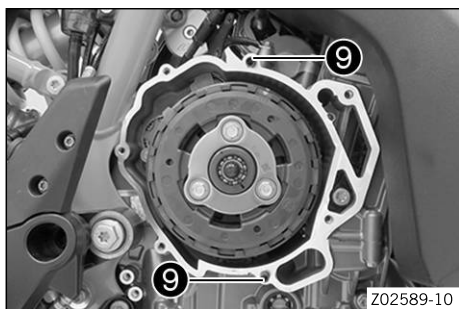


- Remove screws **6** and **7**.
- Remove screw **8**.

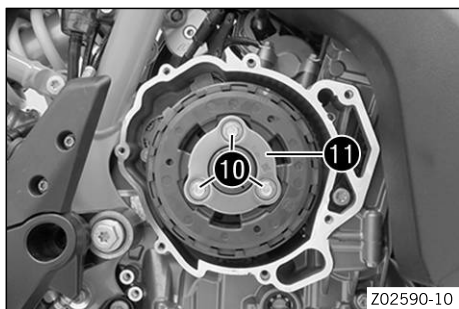


- Swivel the clutch release lever **4** clockwise and take off clutch cover with clutch cover gasket.

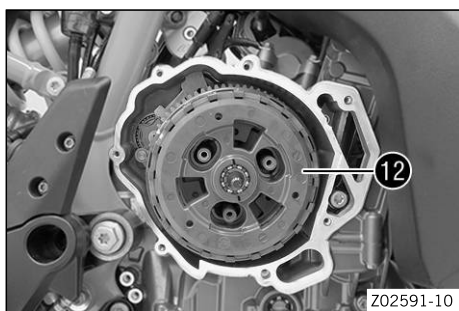




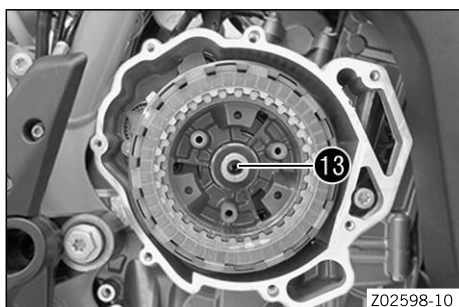
- Remove dowels 9.



- Remove screws 10.
- Take off clutch center 11 and the springs.



- Take off clutch pressure cap 12.



- Remove oil nozzle 13.
- Clean the thread of the main shaft.

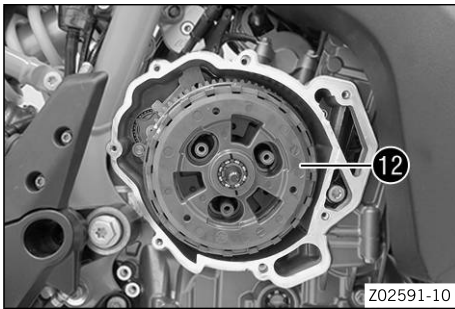
i Info
Ensure that there is no thread locking material in the hole.

- Check that the oil nozzle for clutch lubrication is not blocked.
 - » If the oil nozzle is blocked:
 - Clean the oil nozzle and change as necessary.
- Mount and tighten oil nozzle 13.

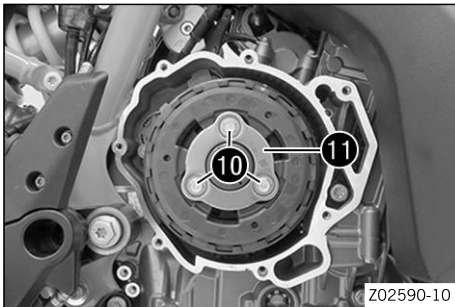
Guideline

Oil nozzle for clutch lubrication	M8	5 Nm (3.7 lbf ft) Loctite®243™
-----------------------------------	----	--

i Info
Ensure that there is no thread locking material in the hole.



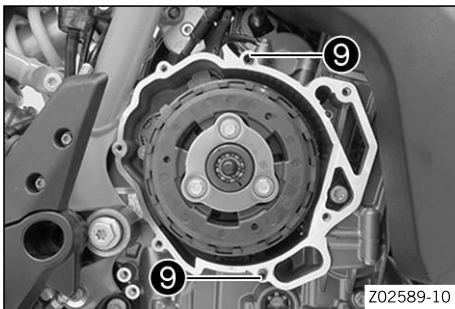
- Position clutch pressure cap 12.
- ✓ The gear teeth of the outer intermediate clutch disc engage in the clutch pressure cap.
- ✓ The clutch pressure cap rests flush against the outer clutch facing disc.



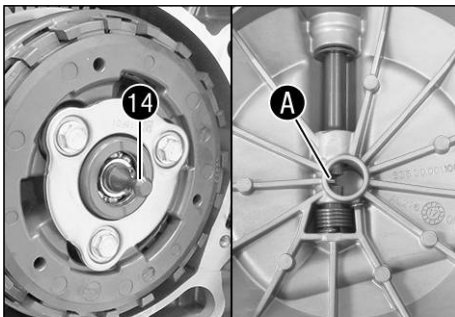
- Position clutch center 11 and the springs.
- Mount and tighten screws 10.

Guideline

Screw, clutch spring	M6	8 Nm (5.9 lbf ft)
----------------------	----	-------------------



- Mount dowels 9.

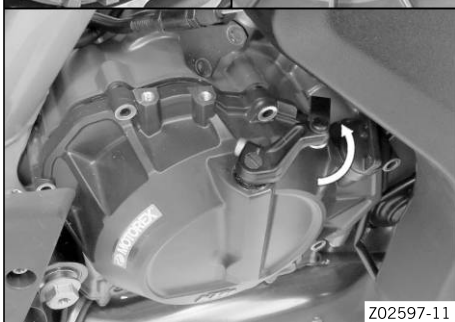


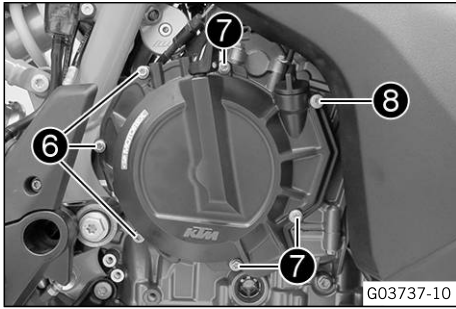
- Position the clutch cover with the clutch cover gasket.
- ✓ Clutch push rod 14 engages in groove A.



Info

Swivel clutch release lever counterclockwise.





- Mount screws **7**, but do not tighten yet.

Guideline

Screw, clutch cover	M6x30	10 Nm (7.4 lbf ft)
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- Mount screws **6**, but do not tighten yet.

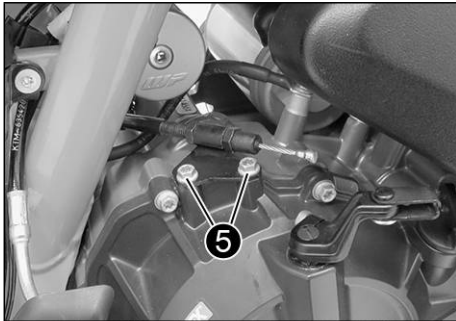
Guideline

Screw, clutch cover	M6x25	10 Nm (7.4 lbf ft)
---------------------	-------	--------------------

- Mount screw **8** and tighten all screws in a crisscross pattern.

Guideline

Screw, clutch cover	M6x35	10 Nm (7.4 lbf ft)
---------------------	-------	--------------------



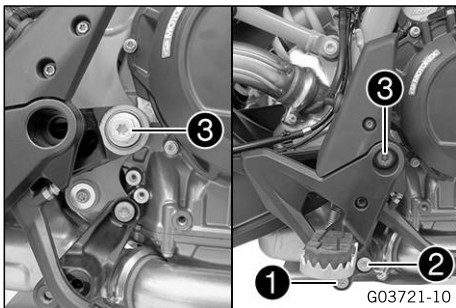
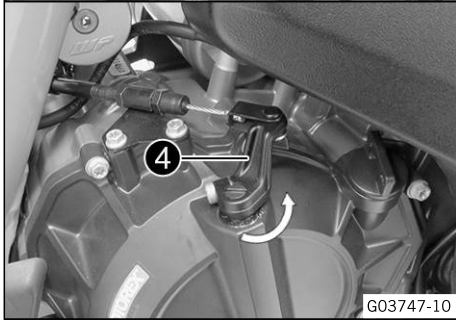
- Position inner clutch cable with bracket.

- Mount and tighten screws **5**.

Guideline

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

- Swivel clutch release lever **4** counterclockwise and hook in the inner clutch cable.



- Remove screw **3** from the swingarm pivot.

- Position the footrest support.

- Mount and tighten screw **3**.

Guideline

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

- Mount and tighten screw **2**.

Guideline

Screw, front footrest bracket	M10x30	45 Nm (33.2 lbf ft) Loctite®243™
-------------------------------	--------	--

- Mount and tighten screw **1** and bushing.

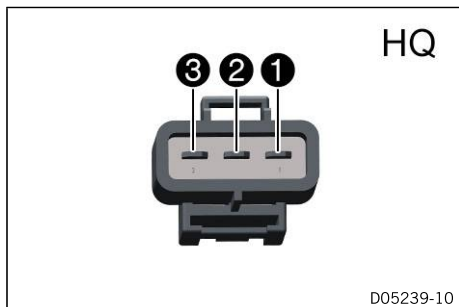
Guideline

Screw, front footrest bracket	M10x40	45 Nm (33.2 lbf ft) Loctite®243™
-------------------------------	--------	--

Finishing work

- Check the engine oil level. (📖 p. 397)

26.1 Alternator – checking the stator winding



Condition

The stator is disconnected.

Stator winding measurement I – check the resistance.

- Ω Measure the resistance between the specified points.
Stator, connector **HQ** pin **1** – Stator, connector **HQ** pin **2**

Alternator	
Stator winding resistance at: 20 °C (68 °F)	0.18 ... 0.22 Ω

- » If the indicated value does not correspond to the setpoint value:
 - Change the stator.

Stator winding measurement II – check the resistance.

- Ω Measure the resistance between the specified points.
Stator, connector **HQ** pin **1** – Stator, connector **HQ** pin **3**

Alternator	
Stator winding resistance at: 20 °C (68 °F)	0.18 ... 0.22 Ω

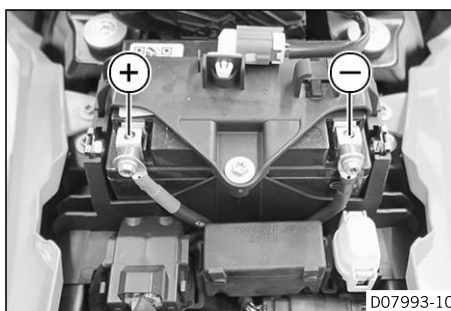
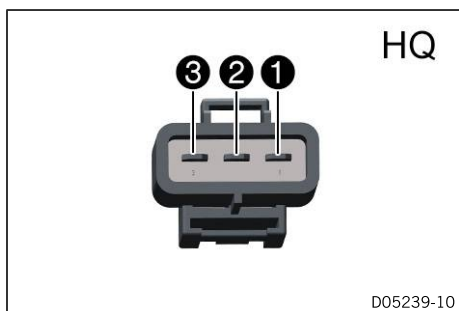
- » If the indicated value does not correspond to the setpoint value:
 - Change the stator.

Stator winding measurement III – check the resistance.

- Ω Measure the resistance between the specified points.
Stator, connector **HQ** pin **2** – Stator, connector **HQ** pin **3**

Alternator	
Stator winding resistance at: 20 °C (68 °F)	0.18 ... 0.22 Ω

- » If the indicated value does not correspond to the setpoint value:
 - Change the stator.

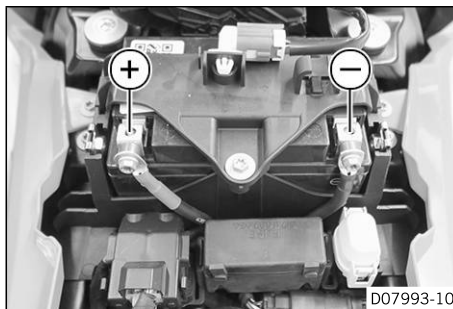
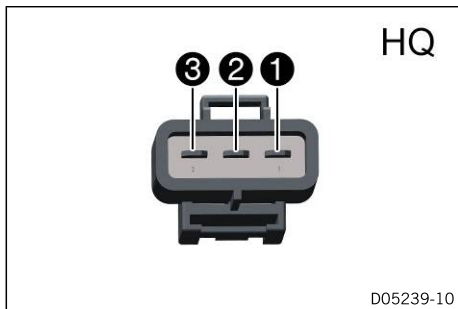


Stator winding I – check the short circuit to ground (terminal 31).

- Ω Measure the resistance between the specified points.
Stator, connector **HQ** pin **1** – Measuring point **Ground (-)**

Resistance	$\infty \Omega$
------------	-----------------

- » If the indicated value does not correspond to the setpoint value:
 - Change the stator.

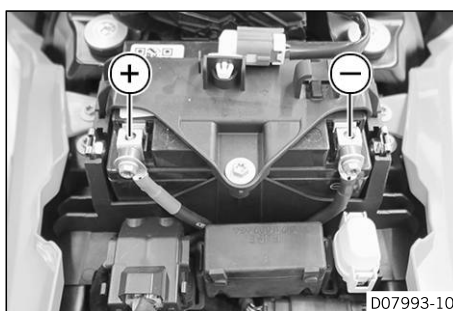
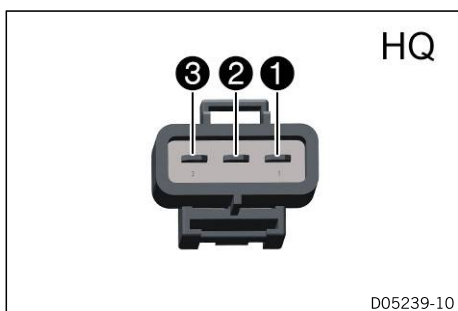


Stator winding II – check the short circuit to ground (terminal 31).

- Measure the resistance between the specified points.
Stator, connector **HQ** pin **2** – Measuring point **Ground (-)**

Resistance	∞ Ω
------------	-----

- » If the indicated value does not correspond to the setpoint value:
 - Change the stator.



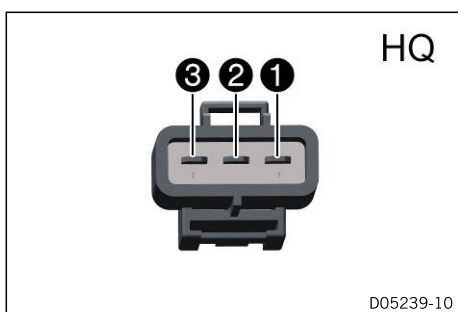
Stator winding III – check the short circuit to ground (terminal 31).

- Measure the resistance between the specified points.
Stator, connector **HQ** pin **3** – Measuring point **Ground (-)**

Resistance	∞ Ω
------------	-----

- » If the indicated value does not correspond to the setpoint value:
 - Change the stator.

- Start the motorcycle to check the function. (📖 p. 21)



Stator winding measurement I – check the voltage.

- Measure the voltage between the specified points.
Stator, connector **HQ** pin **1** – Stator, connector **HQ** pin **2**

i Info
The results of the measurements on the individual coils must not deviate significantly.

Alternator	
Alternating voltage stator winding at 4000 rpm: 20 °C (68 °F)	≥ 50 V

- » If the indicated value does not correspond to the setpoint value:
 - Change the stator.

Stator winding measurement II – check the voltage.

- **V** Measure the voltage between the specified points.
Stator, connector **HQ** pin **1** – Stator, connector **HQ** pin **3**

i Info
The results of the measurements on the individual coils must not deviate significantly.

Alternator	
Alternating voltage stator winding at 4000 rpm: 20 °C (68 °F)	≥ 50 V

- » If the indicated value does not correspond to the setpoint value:
 - Change the stator.

Stator winding measurement III – check the voltage.

- **V** Measure the voltage between the specified points.
Stator, connector **HQ** pin **2** – Stator, connector **HQ** pin **3**

i Info
The results of the measurements on the individual coils must not deviate significantly.

Alternator	
Alternating voltage stator winding at 4000 rpm: 20 °C (68 °F)	≥ 50 V

- » If the indicated value does not correspond to the setpoint value:
 - Change the stator.



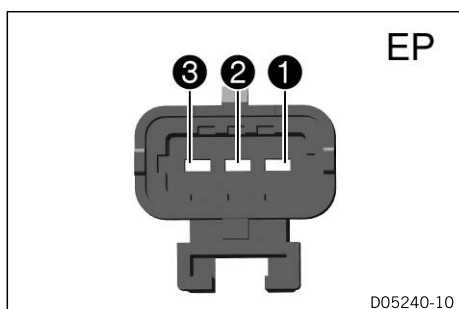
26.2 Ignition coil - checking the primary winding

Preparatory work


- Remove the seat. (📖 p. 120)
- Remove the left side cover. (📖 p. 137)
- Remove the battery cover. (📖 p. 138)
- Remove left fuel tank spoiler. (📖 p. 139)
- Remove the right side cover. (📖 p. 137)
- Remove right fuel tank spoiler. (📖 p. 141)
- Remove the engine guard. (📖 p. 143)
- Remove the fuel tank. (📖 p. 120)

Main work

- Disconnect ignition coil 1, cylinder 1.




Ignition coil, cylinder 1 - check the primary winding resistance.

-  Measure the resistance between the specified points.
Ignition coil pin 1 – Ignition coil pin 3

Ignition coil	
Primary winding resistance at: 20 °C (68 °F)	0.70 ... 0.90 Ω

- » If the displayed value does not correspond to nominal value:
 - Change the ignition coil.
- Disconnect ignition coil 2, cylinder 2.

Ignition coil, cylinder 2 - check the primary winding resistance.

-  Measure the resistance between the specified points.
Ignition coil pin 1 – Ignition coil pin 3

Ignition coil	
Primary winding resistance at: 20 °C (68 °F)	0.70 ... 0.90 Ω

- » If the displayed value does not correspond to nominal value:
 - Change the ignition coil.

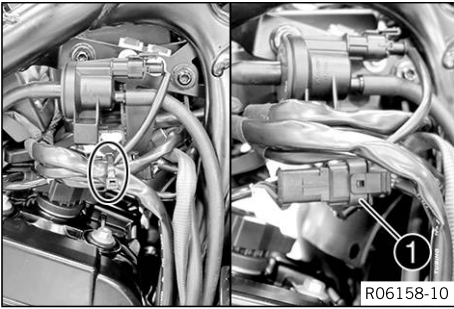
Finishing work

- Install the fuel tank. (📖 p. 123)
- Install the engine guard. (📖 p. 143)
- Install the right fuel tank spoiler. (📖 p. 142)
- Install the right side cover. (📖 p. 138)
- Install the left fuel tank spoiler. (📖 p. 140)
- Install the battery cover. (📖 p. 139)
- Install the left side cover. (📖 p. 137)
- Mount the seat. (📖 p. 120)

26.3 Changing the spark plugs

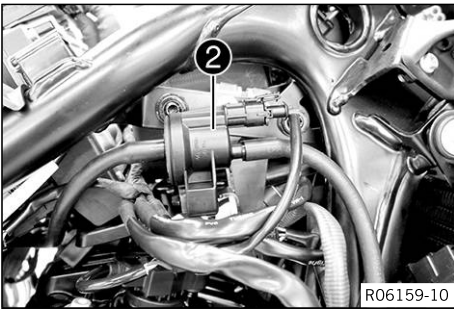
Preparatory work

- Remove the seat. (📖 p. 120)
- Remove the left side cover. (📖 p. 137)
- Remove the battery cover. (📖 p. 138)
- Remove left fuel tank spoiler. (📖 p. 139)
- Remove the right side cover. (📖 p. 137)
- Remove right fuel tank spoiler. (📖 p. 141)
- Remove the engine guard. (📖 p. 143)
- Remove the fuel tank. (📖 p. 120)

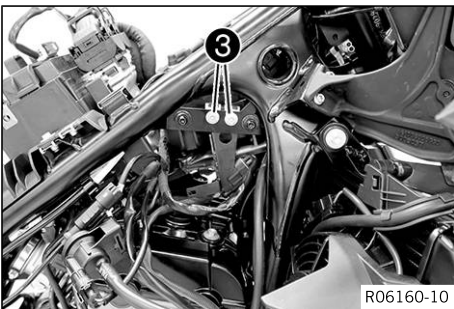


Main work

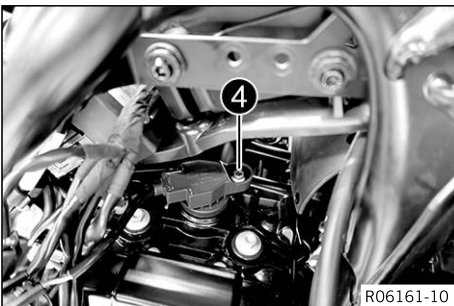
- Remove the cable tie.
- Pull off and disconnect plug-in connector 1 from the holder.



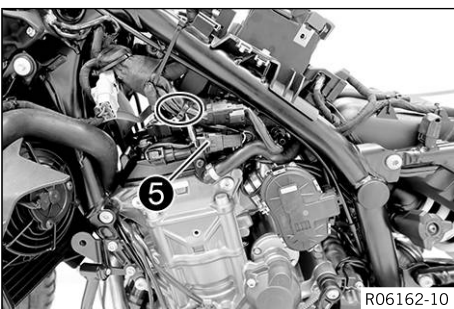
- Pull fuel vapor valve 2 off the holder and hang it to the side.



- Remove screws 3.
- Hang the holder to the side.



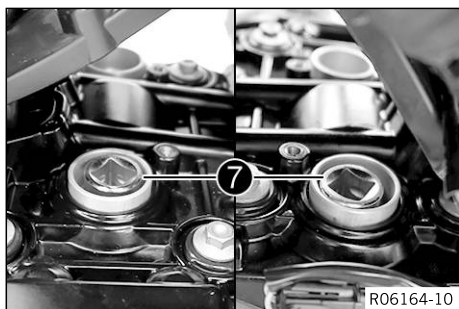
- Remove screw 4.
- Remove the ignition coil.



- Remove the cable tie.
- Disconnect plug-in connector 5.



- Remove screw 6.
- Remove the ignition coil.



- Remove spark plugs using special tool 7.

Spark plug wrench with link (77229172000) (📖 p. 473)

- Mount and tighten the new spark plugs using the special tool.
- Guideline

Spark plug	M10	11 Nm (8.1 lbf ft)
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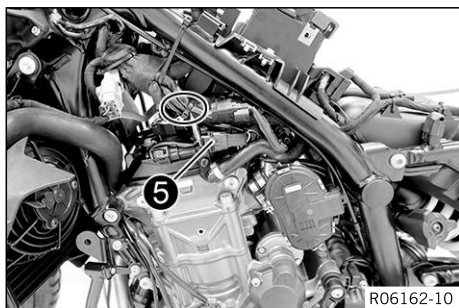
Spark plug wrench with link (77229172000) (📖 p. 473)



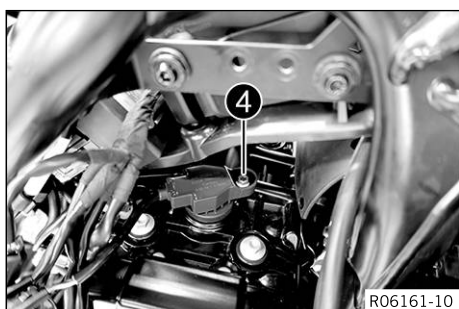
- Mount the ignition coil.
- Mount and tighten screw 6.

Guideline

Screw, ignition coil	M6	8 Nm (5.9 lbf ft)
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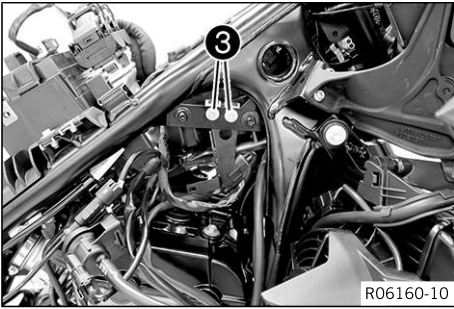
- Join plug-in connector 5.
- Route the cable without tension and secure with the cable ties.



- Mount the ignition coil.
- Mount and tighten screw 4.

Guideline

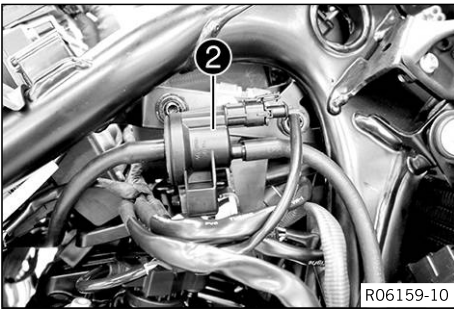
Screw, ignition coil	M6	8 Nm (5.9 lbf ft)
----------------------	----	-------------------



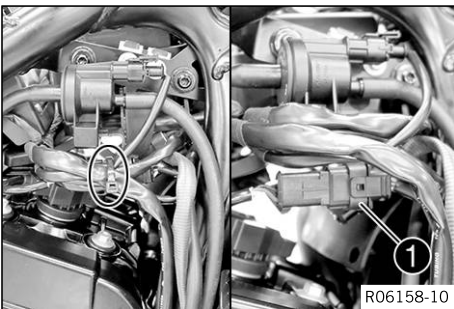
- Position the holder.
- Mount and tighten screws ③.

Guideline

Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
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- Position fuel vapor valve ② on the holder.



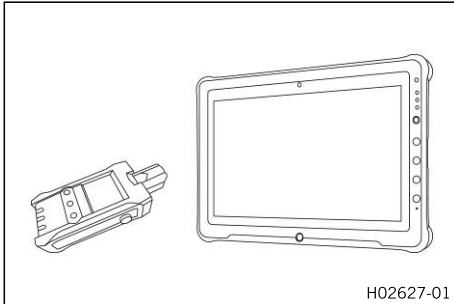
- Join plug-in connector ① and position it on the holder.
- Route the cable without tension and secure with the cable ties.

Finishing work

- Install the fuel tank. (📖 p. 123)
- Install the engine guard. (📖 p. 143)
- Install the right fuel tank spoiler. (📖 p. 142)
- Install the right side cover. (📖 p. 138)
- Install the left fuel tank spoiler. (📖 p. 140)
- Install the battery cover. (📖 p. 139)
- Install the left side cover. (📖 p. 137)
- Mount the seat. (📖 p. 120)



27.1 Performing the initialization run



Condition

The diagnostics tool is connected and running.
Software version is up to date. All model-specific variant codes are correct.
The engine is cold.

- Execute "**Engine control unit**" > "**Functions**" > "**Clear specific adaptation values**".

Guideline

All subfunctions must be executed.

- ✓ All adaptation values are deleted.

- Switch on the ignition by turning the ignition key to the position 0.
- Do not operate the throttle grip and observe the waiting time.

Guideline

Waiting time without operating the throttle grip	20 s
--	------

- Program the gear position sensor. (📖 p. 379)
- Switch off the ignition for 20 seconds.
- Program the shift shaft sensor. (📖 p. 381)
- Program the cruise control system (if available).



Danger

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

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

- Start the engine without operating the throttle grip.
- Allow the engine to run at idle speed.

Guideline

Duration	5 fan cycles
----------	--------------

Do not operate the throttle grip during the initialization process.



Info

If initialization is not completed or if the initialization process was interrupted, the entire process must be restarted.

- Check adaptation values for plausibility and error memory for entries using the diagnostics tool.
- Switch off the ignition for 20 seconds.

27.2 Adjusting the service display with the KTM diagnostics tool



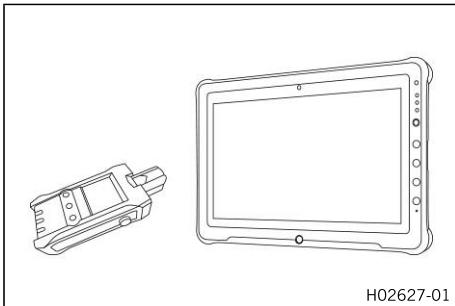
Info

The steps for adjusting the service display are the same for kilometers and miles as units.

Condition

The diagnostics tool is connected and running.

- Select "**Combination instrument**" > "**Functions**" > "**Service interval**".
- Enter the distance until the next service is due.
- End the process using "**Execute**".



28.1 engine

Design	2-cylinder 4-stroke in-line engine, water-cooled
Displacement	890 cm ³ (54.31 cu in)
Stroke	68.8 mm (2.709 in)
Bore	90.7 mm (3.571 in)
Compression ratio	13.5:1
Control	DOHC, 4 valves per cylinder controlled via cam lever, chain drive
Valve diameter, intake	37 mm (1.46 in)
Valve diameter, exhaust	30 mm (1.18 in)
Valve play, cold	
Intake at: 20 °C (68 °F)	0.10 ... 0.15 mm (0.0039 ... 0.0059 in)
Exhaust at: 20 °C (68 °F)	0.15 ... 0.20 mm (0.0059 ... 0.0079 in)
Crankshaft bearing	Slide bearing
Conrod bearing	Slide bearing
Piston pin bearing	Piston pin with bronze coating
Pistons	Forged light alloy
Piston rings	1 compression ring, 1 lower compression ring, 1 oil ring with spring expander
Engine lubrication	Pressure circulation lubrication with 2 trochoidal pumps
Primary transmission	39:75
Clutch	Slipper clutch in oil bath/mechanically operated
Transmission	6-gear transmission, claw shifted
Transmission ratio	
First gear	13:37
Second gear	17:34
Third gear	20:31
Fourth gear	22:28
Fifth gear	24:26
Sixth gear	23:22
Mixture preparation	Electronic fuel injection
Ignition	Contactless controlled fully electronic ignition with digital ignition adjustment
Alternator	12 V, 400 W
Spark plug	NGK LMAR9AI-10
Spark plug electrode gap	1.0 mm (0.039 in)
Cooling	Water cooling, permanent circulation of coolant by water pump
Idle speed	1,400 ± 50 rpm
Starting aid	Starter motor

28.2 Tolerance, engine wear limits

Camshafts - pivot point diameter	21.980 ... 22.041 mm (0.86535 ... 0.86775 in)
Valve spring	
Minimum length (without valve spring seat)	44.0 mm (1.732 in)
Valve spring cap - thickness	1.15 ... 1.35 mm (0.0453 ... 0.0531 in)
Valve - valve stem diameter	
Exhaust	4.95 ... 4.97 mm (0.1949 ... 0.1957 in)
Intake	4.97 ... 4.99 mm (0.1957 ... 0.1965 in)
Valve guide - diameter	
New condition	5.004 ... 5.016 mm (0.19701 ... 0.19748 in)
Wear limit	5.050 mm (0.19882 in)
Valve - sealing seat width	
Intake	2.80 mm (0.1102 in)
Exhaust	3.00 mm (0.1181 in)
Valve - run-out	
On the valve plate	≤ 0.05 mm (≤ 0.002 in)
On the valve stem	≤ 0.05 mm (≤ 0.002 in)
Cylinder/cylinder head - sealing area distortion	≤ 0.05 mm (≤ 0.002 in)
Cylinder - bore diameter	
Size	90.700 ... 90.712 mm (3.57086 ... 3.57133 in)
Piston - diameter	
Size	90.200 ... 90.450 mm (3.55117 ... 3.56102 in)
Piston/cylinder - mounting clearance	
New condition	0.035 ... 0.070 mm (0.00138 ... 0.00276 in)
Wear limit	0.10 mm (0.0039 in)
Piston ring - groove clearance	≤ 0.08 mm (≤ 0.0031 in)
Piston ring end gap	
Compression rings	≤ 0.80 mm (≤ 0.0315 in)
Oil scraper ring	≤ 0.10 mm (≤ 0.0039 in)
Piston - piston pin hole diameter	20.010 ... 20.014 mm (0.78779 ... 0.78795 in)
Piston pin - diameter	19.995 ... 20.000 mm (0.7872 ... 0.7874 in)
Connecting rod - axial clearance of lower conrod bearing	0.15 ... 0.30 mm (0.0059 ... 0.0118 in)
Connecting rod - radial clearance of lower conrod bearing	
New condition	0.030 ... 0.060 mm (0.00118 ... 0.00236 in)
Wear limit	0.080 mm (0.00315 in)
Crankshaft bearing	
New condition	0.030 ... 0.060 mm (0.00118 ... 0.00236 in)
Wear limit	0.080 mm (0.00315 in)
Crankshaft - axial play	0.15 ... 0.25 mm (0.0059 ... 0.0098 in)
Crankshaft run-out at bearing pin	≤ 0.10 mm (≤ 0.0039 in)
Balancer shaft axial play	0.05 ... 0.20 mm (0.002 ... 0.0079 in)
Clutch disc pack - thickness	
New condition	35.60 ... 36.40 mm (1.4016 ... 1.4331 in)
Wear limit	34.80 mm (1.3701 in)

Clutch spring - length	≥ 43.0 mm (≥ 1.693 in)
Oil pressure regulator valve - minimum length spring	42.0 mm (1.654 in)
Oil pump	
Play between external rotor and oil pump housing	≤ 0.15 mm (≤ 0.0059 in)
Clearance, external rotor/internal rotor	≤ 0.20 mm (≤ 0.0079 in)
Axial play	0.03 ... 0.08 mm (0.0012 ... 0.0031 in)
Oil pressure	
Coolant temperature: ≥ 70 °C (≥ 158 °F) Engine speed: Idle speed	≥ 1.4 bar (≥ 20 psi)
Coolant temperature: ≥ 70 °C (≥ 158 °F) Engine speed: 6,000 rpm	≥ 2.4 bar (≥ 35 psi)
Main shaft axial clearance	0.10 ... 0.40 mm (0.0039 ... 0.0157 in)
Transmission shaft run-out	≤ 0.025 mm (≤ 0.00098 in)
Shift shaft - play in sliding plate/shift quadrant	0.40 ... 0.80 mm (0.0157 ... 0.0315 in)
Fuel pressure	
When the fuel pump is active	3.8 ... 4.2 bar (55 ... 61 psi)

28.3 Engine tightening torques

Screw plug, water pump drain hole	EJOTALtracs®Plus 60x14	8 Nm (5.9 lbf ft)	Loctite®243™
Screw, bleeder flange	EJOTALtracs® M6x12	8 Nm (5.9 lbf ft)	Loctite®243™
Hose clamp, intake flange	M4	2.5 Nm (1.84 lbf ft)	
Nozzle, engine vent	M5	2 Nm (1.5 lbf ft)	
Oil nozzle for piston cooling	M5	2 Nm (1.5 lbf ft)	
Oil nozzle in cylinder head	M5	2 Nm (1.5 lbf ft)	
Remaining screws, engine	M5	6 Nm (4.4 lbf ft)	
Screw, cam lever axial lock	M5	6 Nm (4.4 lbf ft)	Loctite®243™
Screw, crankshaft speed sensor	M5	6 Nm (4.4 lbf ft)	Loctite®243™
Screw, gear position sensor	M5	6 Nm (4.4 lbf ft)	Loctite®243™
Screw, oil filter cover	M5	6 Nm (4.4 lbf ft)	
Screw, pressure plate	M5	3 Nm (2.2 lbf ft)	Loctite®243™
Screw, shift drum retaining bracket	M5	6 Nm (4.4 lbf ft)	Loctite®243™
Screw, shift shaft sensor	M5	6 Nm (4.4 lbf ft)	Loctite®243™
Screw, thermostat case	M5	6 Nm (4.4 lbf ft)	Loctite®243™
Securing screw, balancer shaft	M5	5 Nm (3.7 lbf ft)	Loctite®243™
Swing angle sensor screw	M5	6 Nm (4.4 lbf ft)	Loctite®243™
Nut, starter motor cable	M6	5 Nm (3.7 lbf ft)	

Remaining screws, engine	M6	10 Nm (7.4 lbf ft)	
Screw, alternator cover	M6x30	10 Nm (7.4 lbf ft)	
Screw, alternator cover	M6x35	10 Nm (7.4 lbf ft)	
Screw, camshaft bearing bridge	M6	10 Nm (7.4 lbf ft)	
Screw, clutch cable retaining bracket	M6	10 Nm (7.4 lbf ft)	Loctite®243™
Screw, clutch cover	M6	10 Nm (7.4 lbf ft)	
Screw, clutch release lever	M6	10 Nm (7.4 lbf ft)	Loctite®243™
Screw, clutch spring	M6	8 Nm (5.9 lbf ft)	
Screw, cylinder head	M6	10 Nm (7.4 lbf ft)	
Screw, engine case	M6x30	12 Nm (8.9 lbf ft)	
Screw, engine case	M6x60	12 Nm (8.9 lbf ft)	
Screw, freewheel ring	M6	14 Nm (10.3 lbf ft)	Loctite®243™
Screw, ignition coil	M6	8 Nm (5.9 lbf ft)	
Screw, locking lever	M6	10 Nm (7.4 lbf ft)	Loctite®243™
Screw, main shaft bearing support	M6	10 Nm (7.4 lbf ft)	Loctite®243™
Screw, oil pan	M6x30	10 Nm (7.4 lbf ft)	
Screw, oil pan	M6x35	10 Nm (7.4 lbf ft)	
Screw, oil pump cover	M6	10 Nm (7.4 lbf ft)	Loctite®243™
Screw, oil pump unit	M6	10 Nm (7.4 lbf ft)	
Screw, oil/water heat exchanger	M6	10 Nm (7.4 lbf ft)	Loctite®243™
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, shift shaft retaining bracket	M6	10 Nm (7.4 lbf ft)	Loctite®243™
Screw, starter motor	M6	10 Nm (7.4 lbf ft)	
Screw, stator	M6	10 Nm (7.4 lbf ft)	Loctite®243™
Screw, stator	M6	10 Nm (7.4 lbf ft)	
Screw, timing chain shaft	M6	10 Nm (7.4 lbf ft)	
Screw, upper guide rail	M6	8 Nm (5.9 lbf ft)	Loctite®243™
Screw, valve cover	M6	10 Nm (7.4 lbf ft)	
Screw, water pump cover	M6	10 Nm (7.4 lbf ft)	Loctite®243™
Screw, water pump wheel	M6	10 Nm (7.4 lbf ft)	Loctite®243™
Nut, exhaust flange	M8	15 Nm (11.1 lbf ft)	Copper paste

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Oil nozzle for clutch lubrication	M8	5 Nm (3.7 lbf ft) Loctite®243™
Remaining screws for engine	M8	20 Nm (14.8 lbf ft)
Screw plug, locking screw	M8	15 Nm (11.1 lbf ft)
Screw, engine case	M8x45	25 Nm (18.4 lbf ft) Screw support greased
Screw, engine case	M8x55	25 Nm (18.4 lbf ft) Screw support greased
Screw, engine case	M8x65	25 Nm (18.4 lbf ft) Screw support greased
Screw, engine case	M8x90	25 Nm (18.4 lbf ft) Screw support greased
Screw, knock sensor	M8	20 Nm (14.8 lbf ft)
Screw, oil pump idler gear	M8	15 Nm (11.1 lbf ft) Loctite®243™
Screw, tensioning rail	M8	15 Nm (11.1 lbf ft) Loctite®243™
Stud, exhaust flange	M8	15 Nm (11.1 lbf ft) Loctite®243™
Screw, conrod bearing	M8x0.75	1st stage 5 Nm (3.7 lbf ft) 2nd stage 20 Nm (14.8 lbf ft) 3rd stage 90° Screw support and thread oiled
Spark plug	M10	11 Nm (8.1 lbf ft)
Oil pressure sensor	M10x1	10 Nm (7.4 lbf ft)
Screw plug, bearing support	M10x1	12 Nm (8.9 lbf ft) Loctite®243™
Screw plug, cam lever axis	M10x1	8 Nm (5.9 lbf ft)
Screw, unlocking of timing chain tensioner	M10x1	8 Nm (5.9 lbf ft)
Coolant temperature sensor	M10x1.25	10 Nm (7.4 lbf ft)
Screw, cylinder head	M10x1.25	Tightening sequence: Observe tightening sequence. 1st stage 5 Nm (3.7 lbf ft) 2nd stage 15 Nm (11.1 lbf ft) 3rd stage 90° 4th stage 90° Screw support greased/thread oiled
Screw plug, cylinder head oil drain	M12x1.5	15 Nm (11.1 lbf ft)
Screw, rotor	M12x1.5	90 Nm (66.4 lbf ft) Thread greased
Screw plug, water jacket	M16x1.5	20 Nm (14.8 lbf ft) Loctite®243™

Nut, engine sprocket	M20x1.5	100 Nm (73.8 lbf ft) Loctite®243™
Nut, inner clutch hub	M20x1.5	135 Nm (99.6 lbf ft)
Plug, oil screen	M20x1.5	20 Nm (14.8 lbf ft)
Plug, timing chain tensioner	M24x1.5	25 Nm (18.4 lbf ft)
Screw plug, alternator cover	M24x1.5	8 Nm (5.9 lbf ft)

28.4 Capacities

28.4.1 Engine oil

Engine oil	2.8 l (3 qt.)	Engine oil (SAE 10W/50) (📖 p. 458)
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28.4.2 Coolant

Coolant	1.60 l (1.69 qt.)	Coolant (📖 p. 458)
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28.4.3 Fuel

Total fuel tank capacity, approx.	20 l (5.3 US gal)	Super unleaded (ROZ 95) (📖 p. 459)
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Fuel reserve, approx.	3 l (3 qt.)
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28.5 Chassis

Frame	Lattice frame made of chrome molybdenum steel tubing, powder-coated	
Fork	WP Suspension Open Cartridge	
Shock absorber	WP Suspension PDS	
Suspension travel		
front	240 mm (9.45 in)	
rear	240 mm (9.45 in)	
Brake system		
front	Double disc brake with radially mounted four-piston brake calipers, floating brake discs	
rear	Single disc brake with dual-piston brake caliper, floating brake disc	
Brake discs - diameter		
front	320 mm (12.6 in)	
rear	260 mm (10.24 in)	
Brake discs - wear limit		
front	4.5 mm (0.177 in)	
rear	4.5 mm (0.177 in)	
Tire pressure solo / with passenger		
front	2.4 bar (35 psi)	
rear	2.4 bar (35 psi)	
Offroad tire pressure		
front	1.8 bar (26 psi)	

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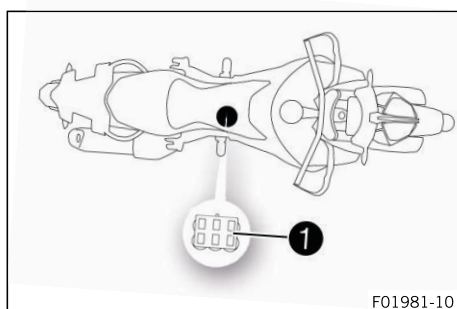
rear	1.8 bar (26 psi)
Tire pressure full payload	
front	2.6 bar (38 psi)
rear	2.9 bar (42 psi)
Secondary drive ratio	16:45
Chain	5/8 x 1/4" (520) X-ring
Steering head angle	63.7°
Wheelbase	1,528 mm (60.16 in)
Seat height, unloaded	880 mm (34.65 in)
Ground clearance, unloaded	263 mm (10.35 in)
Weight without fuel, approx.	200 kg (441 lb.)
Maximum permissible front axle load	175 kg (386 lb.)
Maximum permissible rear axle load	275 kg (606 lb.)
Maximum permissible total weight	450 kg (992 lb.)

28.6 Electrical system

12-V battery	HTZ12A-BS	Battery voltage: 12 V Nominal capacity: 10 Ah Maintenance-free
Fuse	75011088010	10 A
Fuse	75011088015	15 A
Fuse	75011088025	25 A
Fuse	58011109130	30 A

Low beam/high beam	LED
Daytime running light/position light	LED
Combination instrument lighting and indicator lamps	LED
Turn signal	LED
Brake/tail light	LED
License plate lamp	LED

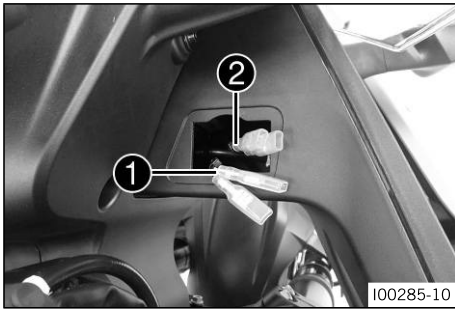
28.6.1 Diagnostics connector



F01981-10

Diagnostics connector ① is located under the battery cover.

28.6.2 Front ACC1 and ACC2



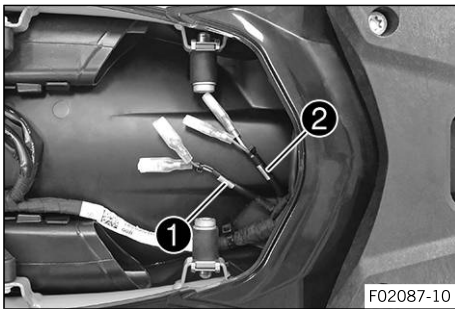
Installation location

- The front power supplies ACC1 **1** and ACC2 **2** are located in the right mask support.

i Info

The front power supplies ACC1 and ACC2 can be accessed behind the cover of the right mask support.

28.6.3 ACC1 and ACC2 rear



Installation location

- Power supplies ACC1 **1** and ACC2 **2** rear are located under the seat.

28.7 Tires

Validity	Front tire	Rear tire
(EU/ASEAN/CN)	90/90 - 21 M/C 54T M+S TL Mitas Enduro Trail+	150/70 B 18 M/C 70T M+S TL Mitas Enduro Trail+
(US)	90/90 - 21 M/C 54T M+S TL Continental TKC80 Twinduro	150/70 - 18 M/C 70Q TL Continental TKC80 Twinduro

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

28.8 Fork

Fork article number	A610C154W401000
Fork	WP Suspension Open Cartridge
Compression damping	
Comfort	20 clicks
Standard	15 clicks
Sport	10 clicks
Full payload	15 clicks
Rebound damping	
Comfort	18 clicks
Standard	15 clicks
Sport	10 clicks
Full payload	15 clicks

Spring preload - Preload Adjuster		
Comfort		+0
Standard		+0
Sport		+0
Full payload		+3
Spring length with preload spacer(s)	464 mm (18.27 in)	
Spring rate		
Weight of rider: 75 ... 85 kg (165 ... 187 lb.)	6.7 N/mm (38.3 lb/in)	
Fork length	912 mm (35.91 in)	
Fork oil per fork leg	630 ± 5 ml (21.3 ± 0.17 fl. oz.)	Fork oil (SAE 4) (48601166S1) (📖 p. 459)

28.9 Shock absorber

Shock absorber article number	A610C454W305000	
Shock absorber	WP Suspension PDS	
Low-speed compression damping		
Comfort	20 clicks	
Standard	15 clicks	
Sport	10 clicks	
Full payload	7 clicks	
High-speed compression damping		
Comfort	2 turns	
Standard	1.5 turns	
Sport	1 turn	
Full payload	0.5 turns	
Rebound damping		
Comfort	23 clicks	
Standard	15 clicks	
Sport	12 clicks	
Full payload	5 clicks	
Spring preload - Preload Adjuster		
Comfort	4 turns	
Standard	4 turns	
Sport	4 turns	
Full payload	10 turns	
Fitted length	380 mm (14.96 in)	
Spring length	201.3 mm (7.925 in)	
Spring rate		
Weight of rider: 75 ... 85 kg (165 ... 187 lb.)	95 N/mm (542 lb/in)	
Gas pressure	16 bar (232 psi)	
Damper oil	Shock absorber fluid (SAE 2.5) (50180751S1) (📖 p. 459)	

28.10 Chassis tightening torques

Brake fluid reservoir cover, front	-	2 Nm (1.5 lbf ft)
Brake fluid reservoir cover, rear	-	1.5 Nm (1.11 lbf ft)
Compensating tank cover	-	1.1 Nm (0.81 lbf ft)
Nut, valve	ISO 10V2	12 Nm (8.9 lbf ft) Loctite®2701™
Remaining screws, chassis	EJOTPT® K45x12	1 Nm (0.7 lbf ft)
Remaining screws, chassis	EJOTPT® K50x12	1 Nm (0.7 lbf ft)
Remaining screws, chassis	EJOTPT® K50x14	1 Nm (0.7 lbf ft)
Remaining screws, chassis	EJOTPT® K50x16	2 Nm (1.5 lbf ft)
Remaining screws, chassis	EJOTPT® K50x18	2 Nm (1.5 lbf ft)
Screw, inside cover on radiator	EJOT PT® K50x18	4.5 Nm (3.32 lbf ft)
Screw, tail light	EJOT DELTA PT® 45x12-Z	1.5 Nm (1.11 lbf ft)
Socket for electrical accessories	-	4 Nm (3 lbf ft)
Throttle valve body hose clamp	-	2.8 Nm (2.07 lbf ft)
Remaining nuts, chassis	M4	3 Nm (2.2 lbf ft)
Remaining screws, chassis	M4	3 Nm (2.2 lbf ft)
Screw, fixed grip, left	M4	3 Nm (2.2 lbf ft)
Remaining nuts, chassis	M5	5 Nm (3.7 lbf ft)
Remaining screws, chassis	M5	5 Nm (3.7 lbf ft)
Screw for throttle grip	M5	3.5 Nm (2.58 lbf ft)
Screw, air filter box	M5	3 Nm (2.2 lbf ft)
Screw, brake fluid reservoir for rear brake	M5	5 Nm (3.7 lbf ft) Loctite®243™
Screw, brake line holder on link fork	M5	1 Nm (0.7 lbf ft)
Screw, combination instrument	M5	1 Nm (0.7 lbf ft)
Screw, combination switch, left	M5	2 Nm (1.5 lbf ft)
Screw, combination switch, right	M5	5 Nm (3.7 lbf ft)
Screw, engine sprocket cover	M5	5 Nm (3.7 lbf ft) Loctite®243™
Screw, foot brake lever stub	M5	10 Nm (7.4 lbf ft) Loctite®243™
Screw, fork protector	M5x12	5 Nm (3.7 lbf ft)
Screw, fork protector	M5x17	5 Nm (3.7 lbf ft)
Screw, fuel level sensor	M5	3 Nm (2.2 lbf ft)
Screw, fuel tank insert	M5	3 Nm (2.2 lbf ft)
Screw, headlight mask	M5	3.5 Nm (2.58 lbf ft)
Screw, headlight mask intermediate part	M5	3.5 Nm (2.58 lbf ft)
Screw, heat guard	M5	5 Nm (3.7 lbf ft) Loctite®243™
Screw, instrument support on mask support, front	M5	5 Nm (3.7 lbf ft)
Screw, instrument support on mask support, rear	M5	5 Nm (3.7 lbf ft)

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Screw, license plate holder	M5	5 Nm (3.7 lbf ft)	Loctite®243™
Screw, lower rear panel	M5	3 Nm (2.2 lbf ft)	
Screw, mask support	M5	5 Nm (3.7 lbf ft)	
Screw, mask support cover	M5	3.5 Nm (2.58 lbf ft)	
Screw, side stand sensor	M5	2 Nm (1.5 lbf ft)	Loctite®243™
Screw, splash protector	M5	2.8 Nm (2.07 lbf ft)	
Screw, trim	M5	3 Nm (2.2 lbf ft)	
Spoke nipple	M5	6 Nm (4.4 lbf ft)	
Hand guard fitting	M6	6 Nm (4.4 lbf ft)	
Nut, foot brake lever adjustment	M6	6 Nm (4.4 lbf ft)	
Nut, hand brake lever	M6	Attach torque to nut. 10 Nm (7.4 lbf ft)	
Nut, push rod, foot brake lever	M6	6 Nm (4.4 lbf ft)	
Nut, shift rod	M6	6 Nm (4.4 lbf ft)	
Nut, shift rod	M6LH	6 Nm (4.4 lbf ft)	
Remaining nuts, chassis	M6	10 Nm (7.4 lbf ft)	
Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)	
Screw activated carbon filter on retaining bracket	M6	8 Nm (5.9 lbf ft)	
Screw cap, fuel tank cover	M6	8 Nm (5.9 lbf ft)	
Screw, 6-D sensor	M6	5 Nm (3.7 lbf ft)	
Screw, ABS module	M6	8 Nm (5.9 lbf ft)	
Screw, ball joint of push rod on foot brake cylinder	M6	6 Nm (4.4 lbf ft)	Loctite®243™
Screw, battery cover attachment	M6	5 Nm (3.7 lbf ft)	
Screw, battery holding bracket	M6	4.5 Nm (3.32 lbf ft)	
Screw, battery terminal	M6	4.5 Nm (3.32 lbf ft)	
Screw, brace for mask support center part	M6	3 Nm (2.2 lbf ft)	Loctite®243™
Screw, brake assembly	M6	5 Nm (3.7 lbf ft)	
Screw, cable on starter motor	M6	5 Nm (3.7 lbf ft)	
Screw, cable on starter relay	M6	4.5 Nm (3.32 lbf ft)	
Screw, clutch assembly	M6	5 Nm (3.7 lbf ft)	
Screw, cross member in rear	M6x13	10 Nm (7.4 lbf ft)	Loctite®243™
Screw, cross member in rear	M6x12	6 Nm (4.4 lbf ft)	Loctite®243™
Screw, engine guard	M6x8	8 Nm (5.9 lbf ft)	
Screw, engine guard	M6x10	10 Nm (7.4 lbf ft)	Loctite®243™
Screw, engine guard retaining bracket	M6	10 Nm (7.4 lbf ft)	Loctite®243™
Screw, exhaust clamp on main silencer	M6	8 Nm (5.9 lbf ft)	
Screw, foot brake cylinder	M6	10 Nm (7.4 lbf ft)	Loctite®243™

Screw, footrest bracket, rear	M6	9 Nm (6.6 lbf ft) Loctite®243™
Screw, front brake disc	M6	14 Nm (10.3 lbf ft) Loctite®243™
Screw, front wheel speed sensor	M6	6 Nm (4.4 lbf ft)
Screw, fuel pump	M6	6 Nm (4.4 lbf ft)
Screw, fuel tank clamp	M6	3 Nm (2.2 lbf ft)
Screw, fuel tank cover	M6x12	8 Nm (5.9 lbf ft)
Screw, fuel tank cover	M6x22	8 Nm (5.9 lbf ft)
Screw, fuel tank spoiler attachment	M6	4 Nm (3 lbf ft)
Screw, fuel tap	M6	6 Nm (4.4 lbf ft)
Screw, ground wire on frame	M6	6 Nm (4.4 lbf ft)
Screw, ground wire to starter motor	M6	10 Nm (7.4 lbf ft)
Screw, ignition lock (tamper-proof screw)	M6	Tighten until the head tears off. Loctite®243™
Screw, magnetic holder on side stand	M6	2 Nm (1.5 lbf ft) Loctite®243™
Screw, mask support on frame	M6	10 Nm (7.4 lbf ft) Loctite®243™
Screw, mask support on steering head	M6	10 Nm (7.4 lbf ft) Loctite®243™
Screw, presilencer exhaust clamp	M6	8 Nm (5.9 lbf ft) Copper paste
Screw, radiator bracket, bottom	M6	5 Nm (3.7 lbf ft)
Screw, rear brake disc	M6	14 Nm (10.3 lbf ft) Loctite®243™
Screw, rear wheel speed sensor	M6	6 Nm (4.4 lbf ft)
Screw, seat fixing	M6	6 Nm (4.4 lbf ft)
Screw, seat lock	M6	10 Nm (7.4 lbf ft) Loctite®243™
Screw, shift rod	M6	10 Nm (7.4 lbf ft) Loctite®243™
Screw, shift shaft deflector on shift shaft	M6	10 Nm (7.4 lbf ft) Loctite®243™
Screw, voltage regulator	M6	6 Nm (4.4 lbf ft)
Foot brake lever, fitting	M8	25 Nm (18.4 lbf ft) Loctite®2701™
Hand guard screw	M8	25 Nm (18.4 lbf ft)
Nut, rear sprocket screw	M8	35 Nm (25.8 lbf ft) Loctite®2701™
Pin, rear brake caliper	M8	22 Nm (16.2 lbf ft) Loctite®243™
Remaining nuts, chassis	M8	25 Nm (18.4 lbf ft)
Remaining screws, chassis	M8	25 Nm (18.4 lbf ft)
Screw, bottom triple clamp	M8	12 Nm (8.9 lbf ft)
Screw, engine fixing arm linkage bracket	M8	25 Nm (18.4 lbf ft) Loctite®243™

28 TECHNICAL SPECIFICATIONS

Screw, engine guard frame	M8	25 Nm (18.4 lbf ft) Loctite®243™
Screw, foot brake lever return spring pin	M8	12 Nm (8.9 lbf ft) Loctite®2701™
Screw, fork stub	M8	15 Nm (11.1 lbf ft)
Screw, front brake caliper	M8	25 Nm (18.4 lbf ft)
Screw, grab handle	M8	25 Nm (18.4 lbf ft) Loctite®243™
Screw, handlebar clamp	M8	20 Nm (14.8 lbf ft)
Screw, main silencer fastening	M8	15 Nm (11.1 lbf ft)
Screw, main silencer holder	M8	25 Nm (18.4 lbf ft)
Screw, presilencer on frame	M8	15 Nm (11.1 lbf ft) Loctite®243™
Screw, rear footrest bracket	M8	25 Nm (18.4 lbf ft) Loctite®243™
Screw, seat bracket	M8	25 Nm (18.4 lbf ft) Loctite®243™
Screw, shift lever	M8	25 Nm (18.4 lbf ft) Loctite®2701™
Screw, spring holder plate on side stand bracket	M8	15 Nm (11.1 lbf ft) Loctite®2701™
Screw, steering damper on holder	M8	8 Nm (5.9 lbf ft) Loctite®243™
Screw, steering damper on triple clamp	M8	8 Nm (5.9 lbf ft) Loctite®243™
Screw, steering stem	M8	20 Nm (14.8 lbf ft) Loctite®243™
Screw, subframe	M8	25 Nm (18.4 lbf ft) Loctite®243™
Screw, top triple clamp	M8	15 Nm (11.1 lbf ft)
Securing bolt for brake linings	M8	10 Nm (7.4 lbf ft)
Remaining nuts, chassis	M10	45 Nm (33.2 lbf ft)
Remaining screws, chassis	M10	45 Nm (33.2 lbf ft)
Screw, engine bracket	M10	45 Nm (33.2 lbf ft) Loctite®243™
Screw, front footrest bracket	M10x30	45 Nm (33.2 lbf ft) Loctite®243™
Screw, front footrest bracket	M10x40	45 Nm (33.2 lbf ft) Loctite®243™
Screw, front footrest bracket	M10x65	45 Nm (33.2 lbf ft) Loctite®243™
Screw, handlebar support	M10	45 Nm (33.2 lbf ft) Loctite®243™
Screw, side stand	M10	40 Nm (29.5 lbf ft) Loctite®243™
Screw, subframe	M10	50 Nm (36.9 lbf ft) Loctite®243™
Banjo bolt, brake line	M10x1	25 Nm (18.4 lbf ft)
Nut, turn signal	M10x1.25	4 Nm (3 lbf ft)

Screw, front brake caliper	M10x1.25	45 Nm (33.2 lbf ft) Loctite®243™
Screw, bottom shock absorber	M12	80 Nm (59 lbf ft) Loctite®2701™
Screw, swingarm pivot	M12	100 Nm (73.8 lbf ft)
Screw, top shock absorber	M12	80 Nm (59 lbf ft) Loctite®2701™
Lambda sensor	M18x1.5	50 Nm (36.9 lbf ft)
Bushing, shock absorber support	M20LHx1.5	10 Nm (7.4 lbf ft) Thread and fitting greased
Screw, steering head	M20x1.5	18 Nm (13.3 lbf ft)
Nut, rear wheel spindle	M25x1.5	90 Nm (66.4 lbf ft) Thread and contact area of wheel spindle greased
Screw, front wheel spindle	M25x1.5	45 Nm (33.2 lbf ft) Thread greased

29.1 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

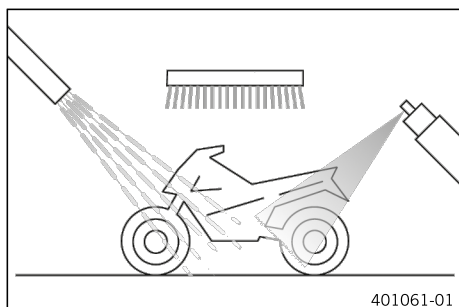
Environmental hazard Hazardous substances cause environmental damage.

- 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 loose dirt first with a soft jet of water.
- Spray the heavily soiled parts with a normal commercial motorcycle cleaner and clean using a brush.

Motorcycle cleaner (📖 p. 460)



Info

Use warm water containing normal motorcycle cleaner and a soft sponge.

Never apply motorcycle cleaner to a dry vehicle; always rinse the vehicle with water first.

If the vehicle was operated in road salt, clean it with cold water. Warm water would enhance the corrosive effects of salt.

- After rinsing the motorcycle with a gentle spray of water, allow it to dry thoroughly.
- Remove the closure of the exhaust system.



Warning

Danger of accidents Moisture and dirt impair the brake system.

- Brake carefully several times to dry out and remove dirt from the brake linings and the brake discs.

- After cleaning, ride the vehicle a short distance until the engine warms up.



Info

The heat produced causes water at inaccessible locations in the engine and on the brake system to evaporate.

- After the motorcycle has cooled down, lubricate all moving parts and pivot points.
- Clean the chain. (📖 p. 179)
- Treat bare metal (except for brake discs and the exhaust system) with a corrosion inhibitor.

Preserving materials for paints, metal and rubber (📖 p. 461)

- Treat the painted parts with a mild paint polish.

Perfect finish and high gloss polish for paints (📖 p. 461)



Info

Do not polish parts that were matte when delivered as this would strongly impair the material quality.

- Treat the plastic parts and powder-coated parts with a mild cleaning and care product.

Special cleaner for glossy and matte paint finishes, metal and plastic surfaces (📖 p. 461)

- Oil the ignition and steering lock, tank lock, and seat lock.

Universal oil spray (📖 p. 461)



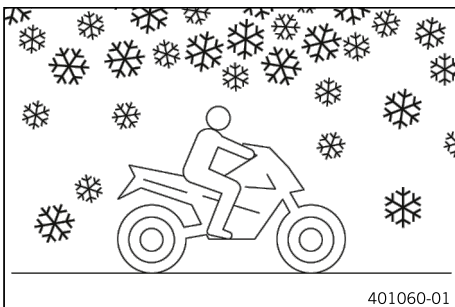
29.2 Checks and maintenance steps for winter operation



Info

If you use the motorcycle in winter, salt can be expected on the roads. You should therefore take precautions against aggressive road salt.

After riding on salted roads, thoroughly clean the vehicle with cold water and dry it well. Warm water enhances the corrosive effects of salt.



- Clean the motorcycle. (📖 p. 430)
- Clean brake system.



Info

After **EVERY** trip on salted roads, thoroughly clean the brake calipers and brake linings, after they have cooled down and without removing them, with cold water and dry them carefully.

After riding on salted roads, thoroughly clean the motorcycle with cold water and dry it well.

- Treat engine, link fork, and all other bare or zinc-plated parts (except the brake discs) with a wax-based corrosion inhibitor.



Info

Corrosion inhibitor must not come in contact with the brake discs as this would greatly reduce the braking force.

- Clean the chain. (📖 p. 179)

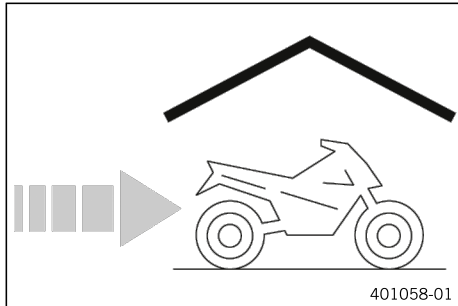


30.1 Storage

i Info

If you plan to garage the motorcycle for a longer period, perform the following steps or have them performed.

Before storing the motorcycle, check all parts for function and wear. If service, repairs, or replacements are necessary, you should do this during the storage period (less workshop overload). In this way, you can avoid long workshop waiting times at the start of the new season.



- When refueling for the last time before taking the motorcycle out of service, add fuel additive.

Fuel additive (📖 p. 460)

- Refuel. (📖 p. 136)

i Tip

Fill the fuel tank completely as specified, using fuel with the lowest possible ethanol content.

- Clean the motorcycle. (📖 p. 430)
- Change the engine oil and the oil filter, clean the oil screens. (📖 p. 400)
- Check the coolant fill level and antifreeze. (📖 p. 382)
- Check tire pressure. (📖 p. 146)
- Remove the 12-V battery. (📖 p. 186)

Guideline

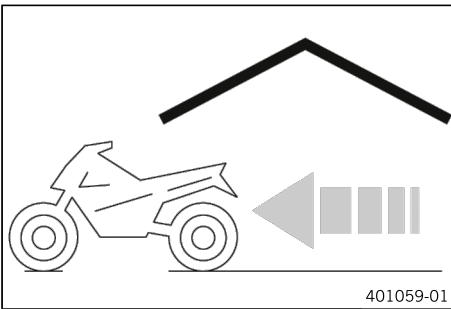
Storage temperature of the 12-V battery without direct sunlight	0 ... 35 °C (32 ... 95 °F)
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- Charge the 12-V battery.
- Store the vehicle in a dry location that is not subject to large fluctuations in temperature.
- Cover the motorcycle with a tarp or cover that is permeable to air.

i Info

Do not use non-porous materials since they prevent humidity from escaping, thus causing corrosion. Avoid running the engine for a short time only. Since the engine cannot warm up properly, the water vapor produced during combustion condenses and causes valves and the exhaust system to rust.

30.2 Preparing for use after storage

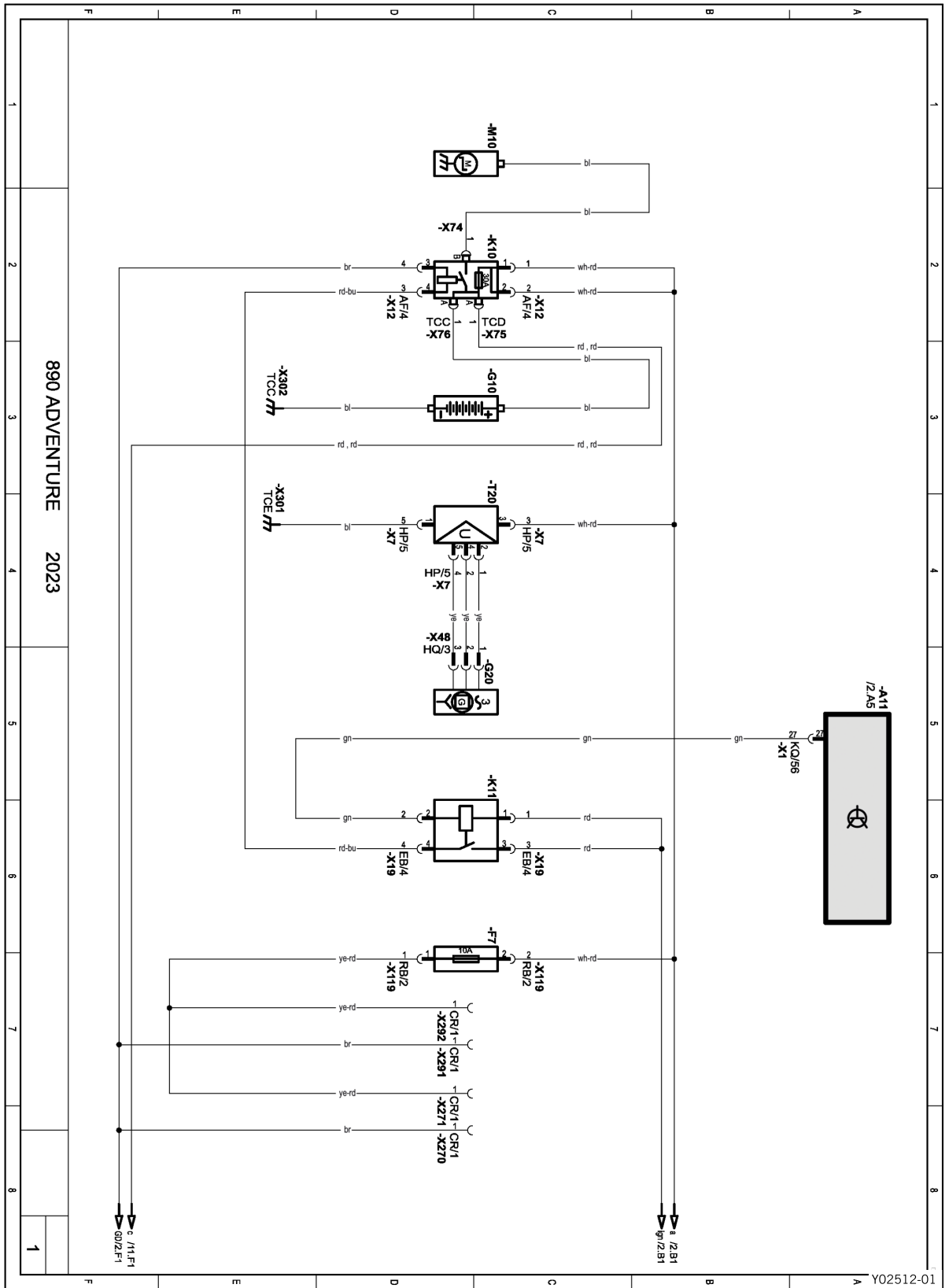


- Take the motorcycle off the front lifting gear. (📖 p. 15)
- Remove the rear of the motorcycle from the lifting gear. (📖 p. 16)
- Install the 12-V battery. (📖 p. 187)
- Set the time and date.
- Perform checks and maintenance measures when preparing for use.
- Take a test ride.



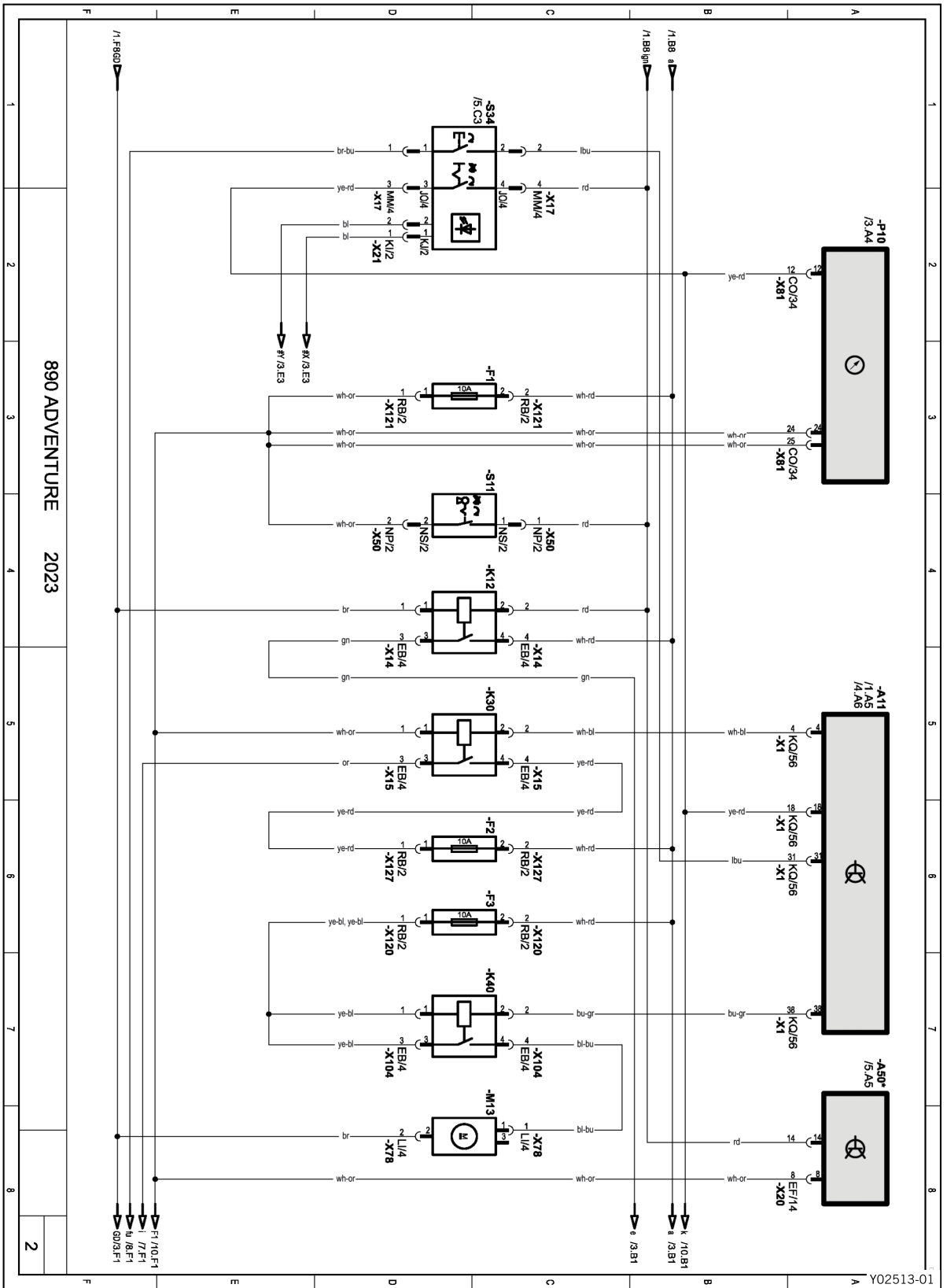
		every 48 months					
		every 24 months			every 12 months		
		every 30,000 km (18,600 mi)		every 15,000 km (9,300 mi)		after 1,000 km (620 mi)	
Check the chain tension. (📖 p. 175)	○	●	●	●	●	●	●
Grease all moving parts (e.g. side stand, hand lever, chain, etc.) and check for smooth operation.	○	●	●	●	●	●	●
Change the spark plugs. (📖 p. 410)			●				
Check the valve clearance. (📖 p. 389)			●				
Change the air filter, clean the air filter box. (📖 p. 117)		●	●				
Check the fuel pressure. (📖 p. 126)		●	●	●	●	●	●
Check the headlight setting. (📖 p. 223)	○	●	●				
Check the tightness of the safety-relevant screws and nuts which are easily accessible.	○	●	●	●	●	●	●
Clean the dust boots of the fork legs. (📖 p. 22)		●	●				
Check the coolant fill level and antifreeze. (📖 p. 382)	○	●	●	●	●		
Change the coolant. (📖 p. 385)							●
Check that the radiator fan is functioning properly.	○	●	●	●	●	●	●
Final check: Check the vehicle is roadworthy and take a test ride.	○	●	●	●	●	●	●
Read out the error memory after the test ride using the KTM diagnostics tool.	○	●	●	●	●	●	●
Set the service interval display. (📖 p. 237)	○	●	●	●	●	●	●
Make a service entry in KTM Dealer.net .	○	●	●	●	●	●	●

- One-time interval
- Periodic interval



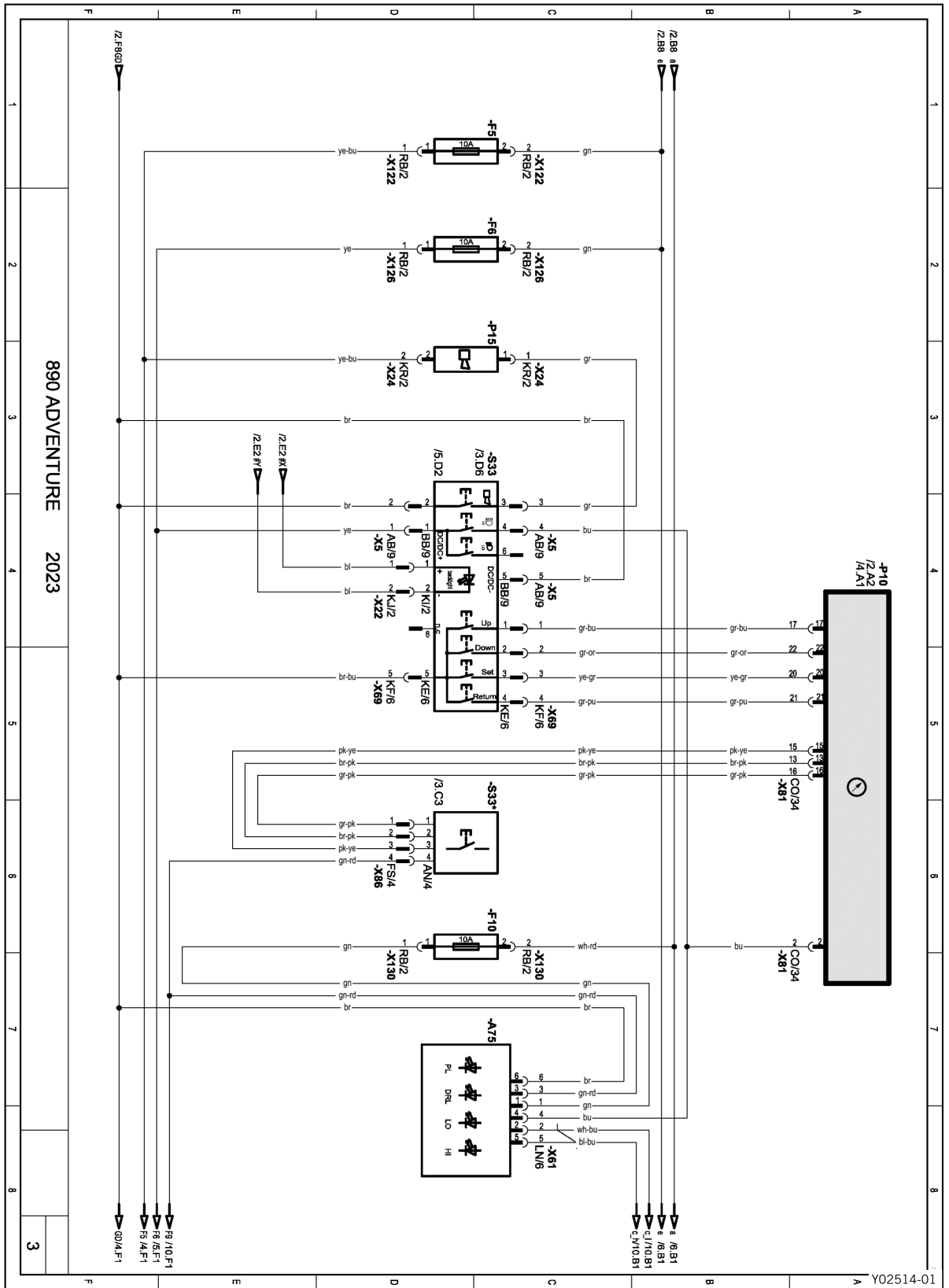
Components:

A11	Engine control unit
F7	Fuse
G10	Battery
G20	Alternator
K10	Starter relay with main fuse
K11	Start auxiliary relay
M10	Starter motor
T20	Voltage regulator
X270	Connector for accessories circuit, ground ACC 1
X271	Connector for accessories circuit, plus ACC 1
X291	Connector for accessories circuit, ground ACC 1
X292	Connector for accessories circuit, plus ACC 1



Components:

A11	Engine control unit
A50	Alarm system (if fitted)
F1	Fuse
F2	Fuse
F3	Fuse
K12	Light relay
K30	Power relay
K40	Fuel pump relay
M13	Fuel pump
P10	Combination instrument
S11	Ignition and steering lock
S34	Combination switch, right

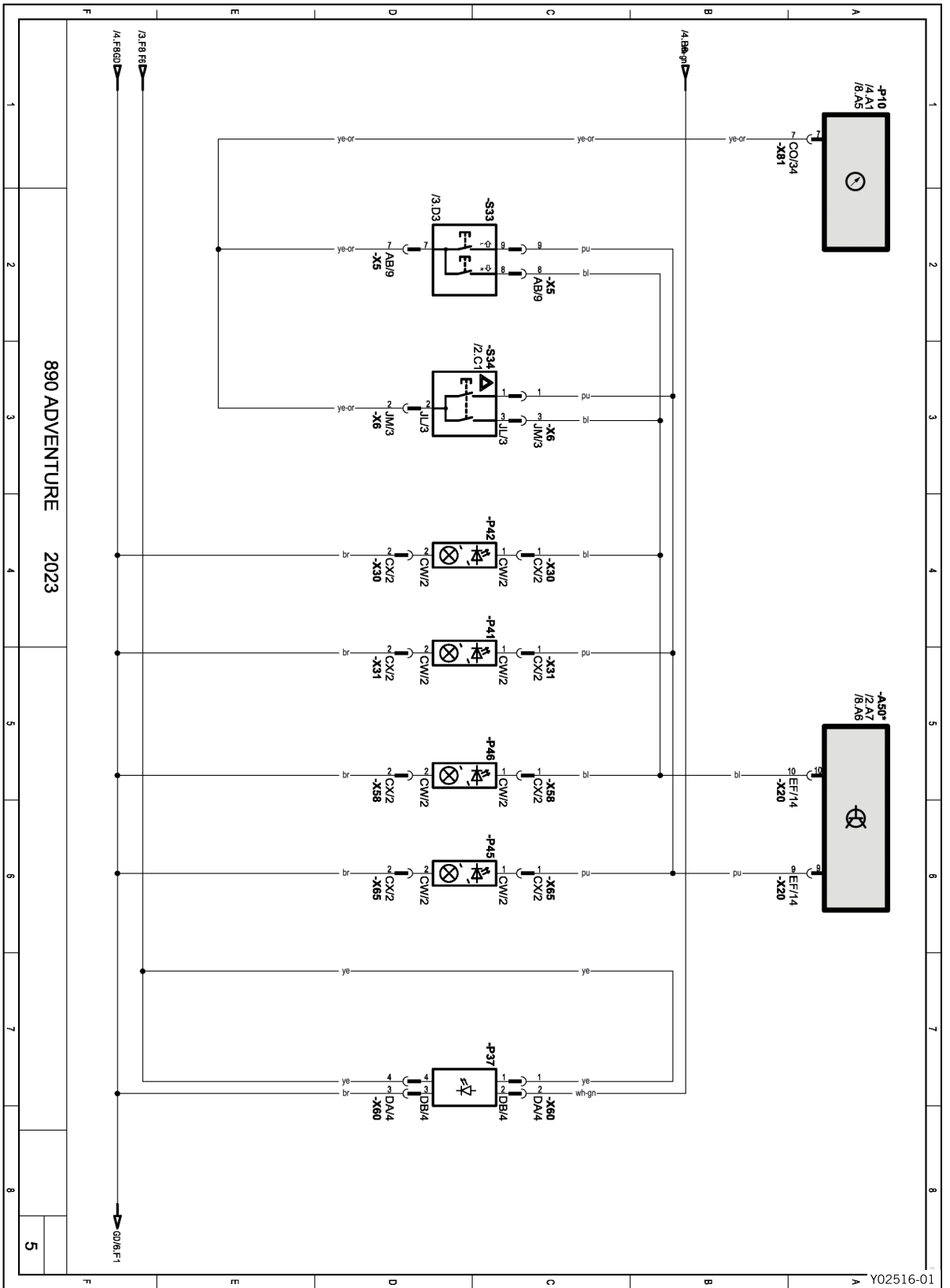


Components:

A75	Headlight unit
F5	Fuse
F6	Fuse
F10	Fuse
P10	Combination instrument
P15	Horn
S33	Left combination switch
S33*	Left combination switch cruise control system (if fitted)

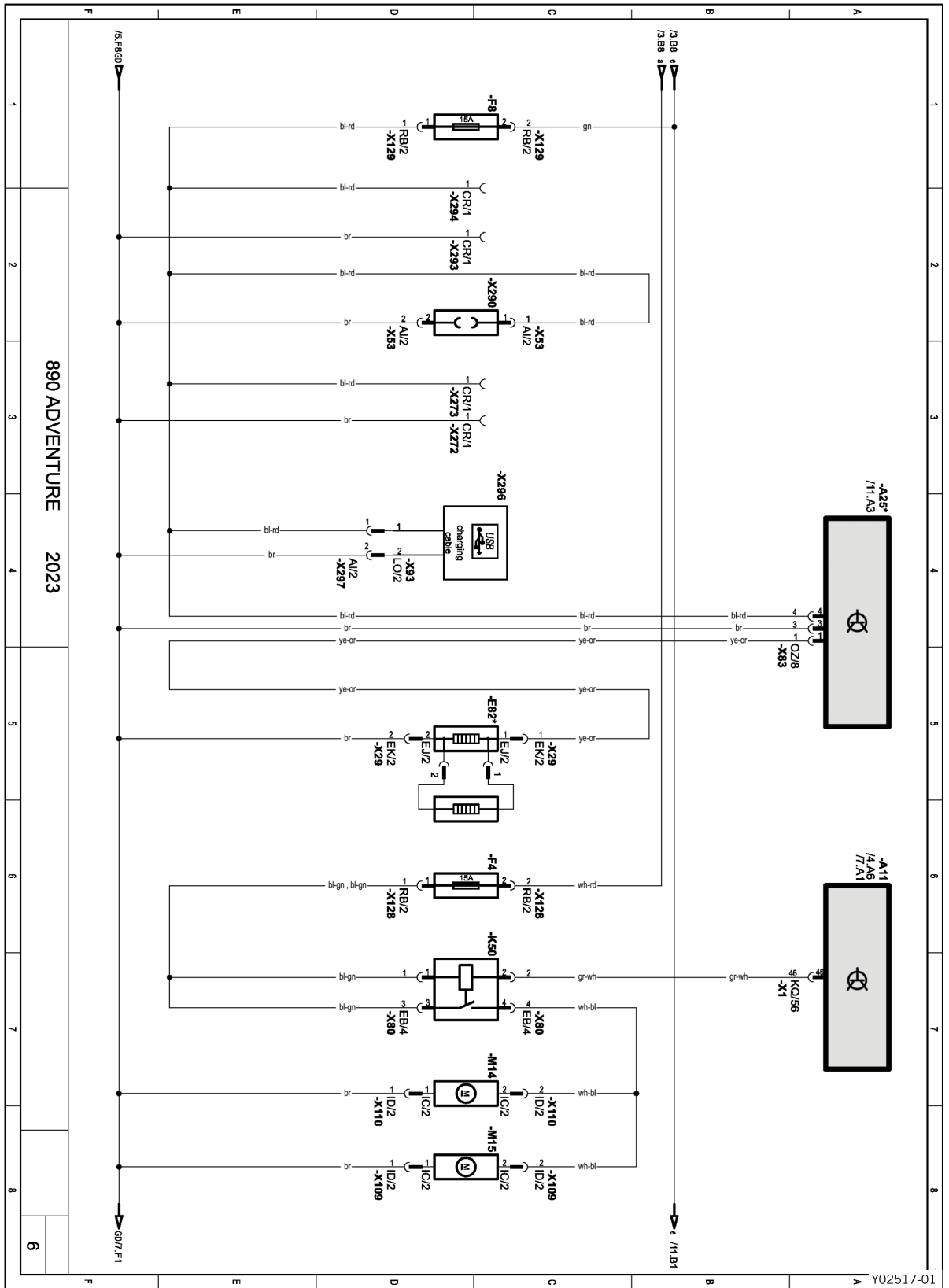
Components:

A11	Engine control unit
B25	Ambient air temperature sensor
B32	Fuel level sensor
B76	Front brake light switch
B77	Rear brake light switch
P10	Combination instrument



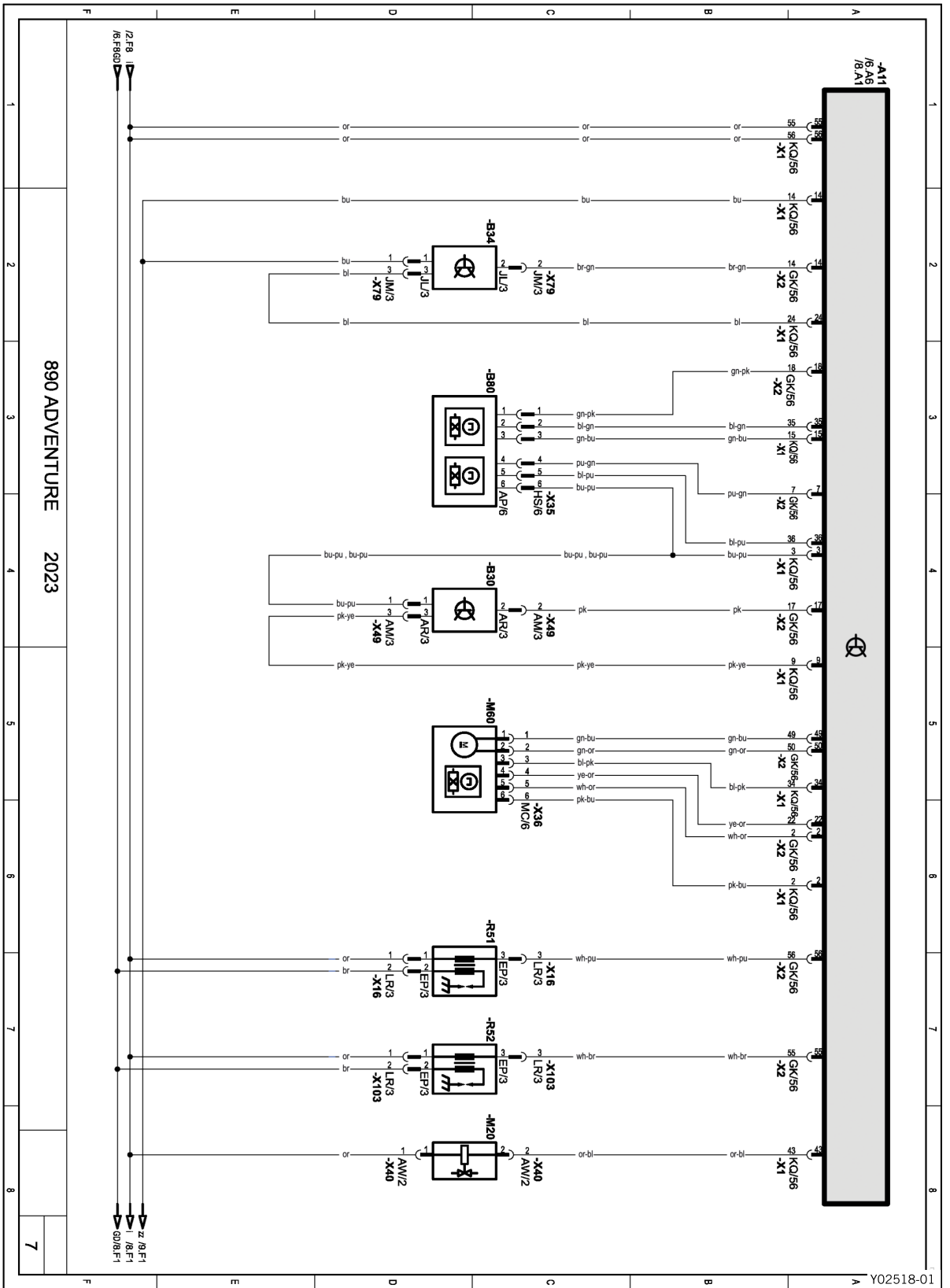
Components:

A50	Alarm system (if fitted)
P10	Combination instrument
P37	Tail light
P41	Turn signal, front left
P42	Turn signal, front right
P45	Turn signal, rear left
P46	Turn signal, rear right
S33	Combination switch, left
S34	Combination switch, right



Components:

A11	Engine control unit
A25	Heater control unit (if fitted)
E82	Heated grip (if fitted)
F4	Fuse
F8	Fuse
K50	Radiator fan relay
M14	Radiator fan 1
M15	Radiator fan 2
X272	Connector for accessories circuit, ground ACC 2
X273	Connector for accessories circuit, plus ACC 2
X290	Socket
X293	Connector for accessories circuit, ground ACC 2
X294	Connector for accessories circuit, plus ACC 2
X296	USB-A charging socket



Components:

A11	Engine control unit
B30	Side stand sensor
B34	Gear position sensor
B80	Throttle grip
M20	Fuel vapor valve
M60	Throttle valve actuator
R51	Ignition coil, cylinder 1
R52	Ignition coil cylinder 2

Components:

A11	Engine control unit
A50	Alarm system (if fitted)
B27	Shift shaft sensor
B36	Alarm system switch (if fitted)
B38	Clutch switch
B51	Lambda sensor, cylinder 1
B52	Lambda sensor, cylinder 2
P10	Combination instrument

Components:

A11	Engine control unit
B12	Intake air temperature sensor
B21	Coolant temperature sensor
B35	Oil pressure sensor
B50	Induction manifold pressure sensor, cylinder1 and cylinder2
B91	Knock sensor
M51	Injection valve, cylinder 1
M52	Injection valve, cylinder 2
P10	Combination instrument

Components:

A11	Engine control unit
A21	Immobilizer control unit
A41	Connectivity Unit (if installed)
B37	Crankshaft speed sensor
P10	Combination instrument
T30	Antenna of the immobilizer control unit

Components:

A11	Engine control unit
A25	Heater control unit (if fitted)
A30	ABS control unit
A85	Tire pressure monitoring system (if fitted)
B70	Front wheel speed sensor
B71	Rear wheel speed sensor
B86	Inertial measurement unit
F9	Fuse
F21	ABS return pump fuse
F22	ABS hydraulic unit fuse
X295	Diagnostics connector

Cable colors:

bl	Black
br	Brown
bu	Blue
gn	Green
gr	Gray
lbu	Light blue
or	Orange
pk	Pink
pu	Violet
rd	Red
wh	White
ye	Yellow

Brake fluid DOT 4 / DOT 5.1

Standard/classification

- DOT

Guideline

- Use only brake fluid that complies with the specified standard (see specifications on the container) and that exhibits the corresponding properties.

Recommended supplier

Castrol

- REACT PERFORMANCE DOT 4

MOTOREX®

- Brake Fluid DOT 5.1

Coolant

Guideline

- Only use high-grade, silicate-free coolant with corrosion inhibitor additive for aluminum motors. Low grade and unsuitable antifreeze causes corrosion, deposits and frothing.
- Do not use pure water as only coolant is able to meet the requirements needed in terms of corrosion protection and lubrication properties.
- Only use coolant that complies with the requirements stated (see specifications on the container) and that has the relevant properties.

Antifreeze protection to at least	-25 °C (-13 °F)
-----------------------------------	-----------------

The mixture ratio must be adjusted to the necessary antifreeze protection. Use distilled water if the coolant needs to be diluted.

The use of premixed coolant is recommended.

Observe the coolant manufacturer specifications for antifreeze protection, dilution and miscibility (compatibility) with other coolants.

Recommended supplier

MOTOREX®

- COOLANT M3.0

Engine oil (SAE 10W/50)

Standard/classification

- JASO T903 MA2 (📖 p. 482)
- SAE (📖 p. 482) (SAE 10W/50)

Guideline

- Use only engine oils that comply with the specified standards (see specifications on the container) and that possess the corresponding properties.

Fully synthetic engine oil

Recommended supplier

MOTOREX®

- Power Synt 4T

Fork oil (SAE 4) (48601166S1)**Standard/classification**

- SAE (📖 p. 482) (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. 482) (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).

Chain cleaner

Recommended supplier

MOTOREX®

- Chain Clean

Fuel additive

Recommended supplier

MOTOREX®

- Fuel Stabilizer

High viscosity grease

Recommended supplier

SKF®

- LGHB 2

Long-life grease

Recommended supplier

MOTOREX®

- Bike Grease 2000

Lubricant (T158)

Recommended supplier

Lubcon®

- Turmogrease® PP 300

Lubricant (T14034)

Recommended supplier

WP Performance Systems

- WP Racing Grease IPR 2

Lubricant (T159)

Recommended supplier

Bel-Ray®

- MC-11®

Lubricant (T625)

Recommended supplier

Molykote®

- 33 Medium

Motorcycle cleaner

Recommended supplier

MOTOREX®

- Moto Clean

Perfect finish and high gloss polish for paints

Recommended supplier

MOTOREX®

- Moto Shine

Preserving materials for paints, metal and rubber

Recommended supplier

MOTOREX®

- Moto Protect

Silicone spray

Recommended supplier

MOTOREX®

- Silicone Spray

Special cleaner for glossy and matte paint finishes, metal and plastic surfaces

Recommended supplier

MOTOREX®

- Quick Cleaner

Street chain spray

Guideline

Recommended supplier

MOTOREX®

- Chainlube Road Strong

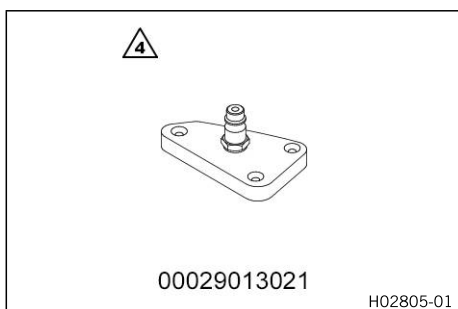
Universal oil spray

Recommended supplier

MOTOREX®

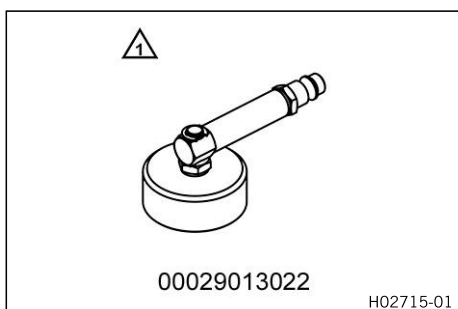
- Joker 440 Synthetic

Bleeder cover



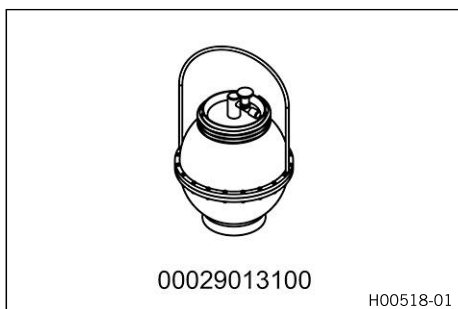
Art. no.: 00029013021

Bleeder cover



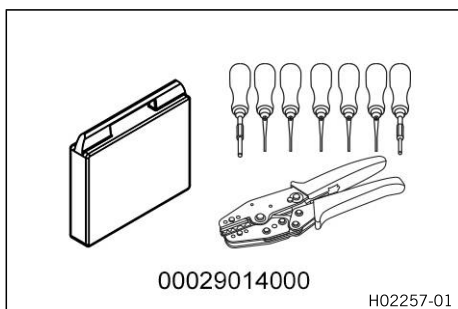
Art. no.: 00029013022

Bleeding device



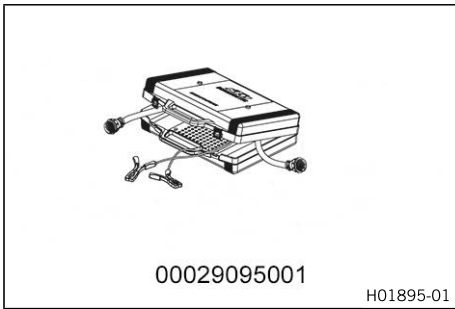
Art. no.: 00029013100

Cable connector unlocking kit



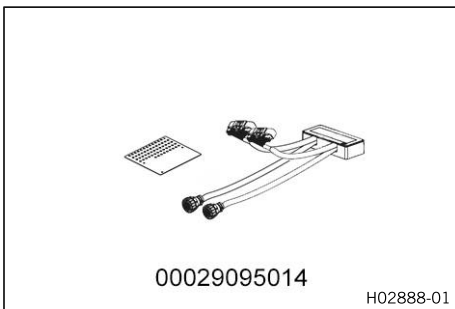
Art. no.: 00029014000

Break out box



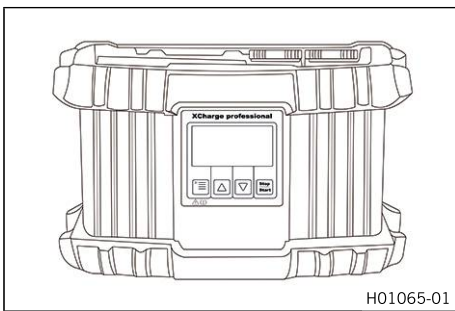
Art. no.: 00029095001

Adapter and template ME 17



Art. no.: 00029095014

EU battery charger XCharge-professional

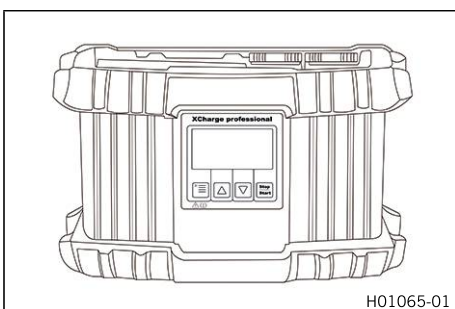


Art. no.: 00029095050

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

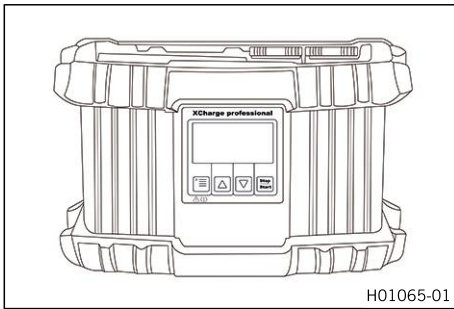


Art. no.: 00029095051

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

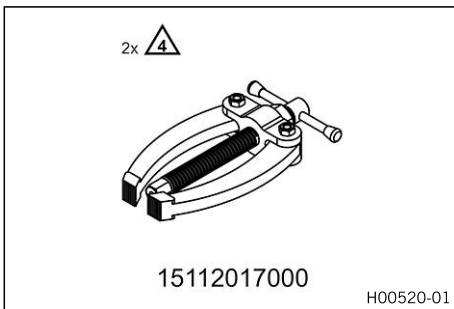


Art. no.: 00029095052

Feature

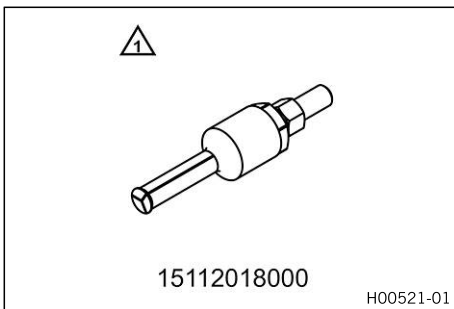
UK safety plug	
Nominal voltage	230 V
Mains fuse	16 A
Power cable length approx.	5 m (16 ft)
Charger cable length approx.	5 m (16 ft)

Bearing puller



Art. no.: 15112017000

Internal bearing puller

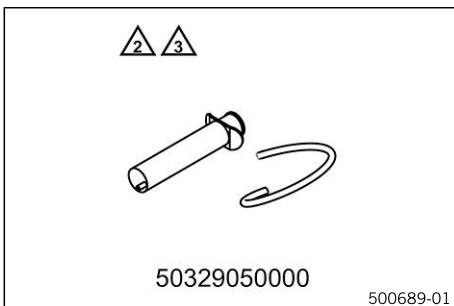


Art. no.: 15112018000

Feature

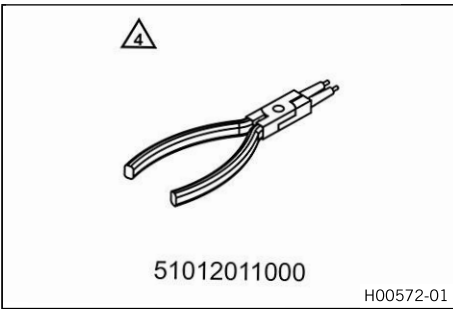
12 ... 16 mm (0.47 ... 0.63 in)

Syringe



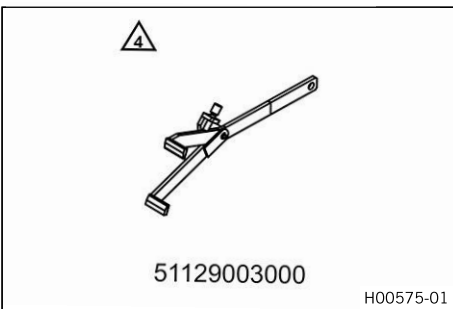
Art. no.: 50329050000

Lock ring plier



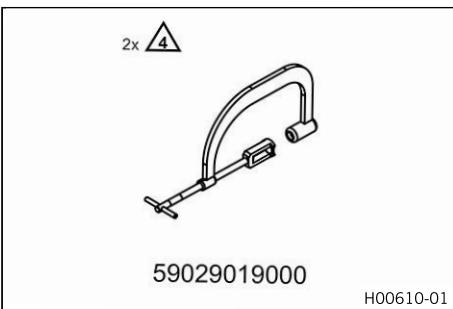
Art. no.: 51012011000

Holding wrench



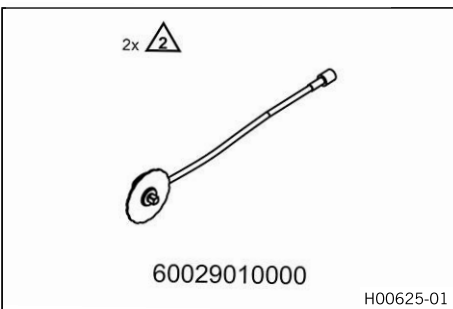
Art. no.: 51129003000

Valve spring mounter



Art. no.: 59029019000

Angle disc

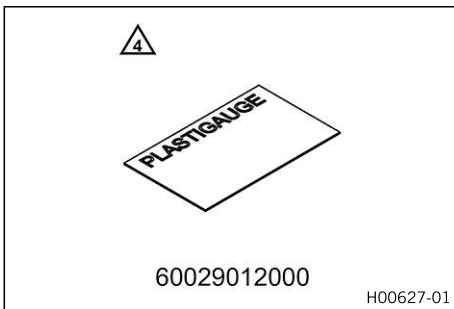


Art. no.: 60029010000

Feature

Driver system / tip	1/2 in
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Plastigauge clearance gauge

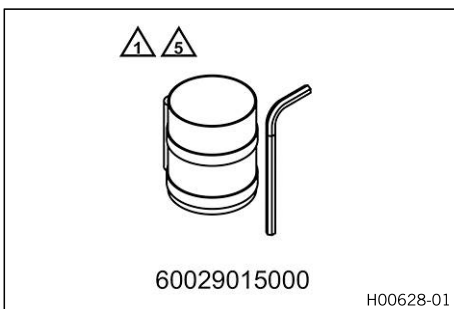


Art. no.: 60029012000

Feature

0.025 ... 0.175 mm (0.00098 ... 0.00689 in)

Piston ring compressor

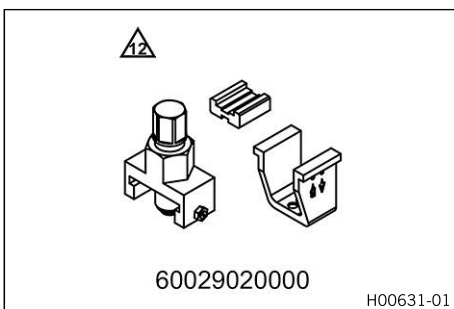


Art. no.: 60029015000

Feature

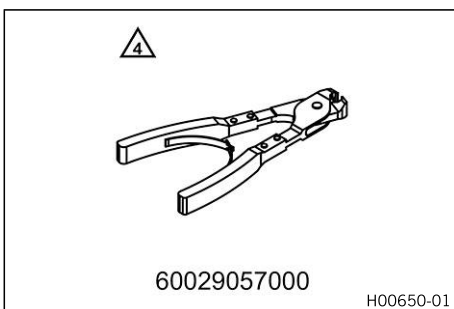
Height	80 mm (3.15 in)
Diameter	57 ... 125 mm (2.24 ... 4.92 in)

Chain rivet tool



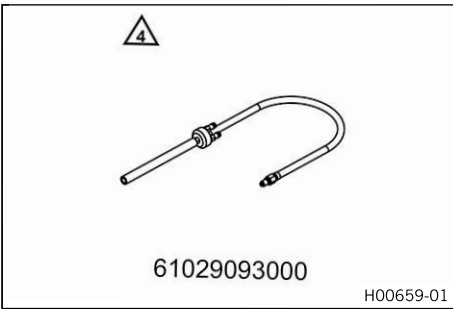
Art. no.: 60029020000

Hose clamp pliers



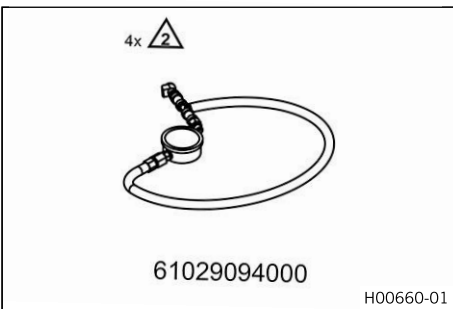
Art. no.: 60029057000

Testing hose



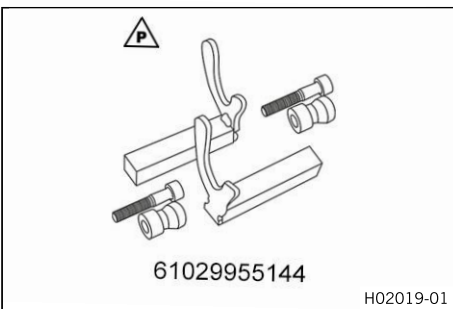
Art. no.: 61029093000

Pressure testing tool



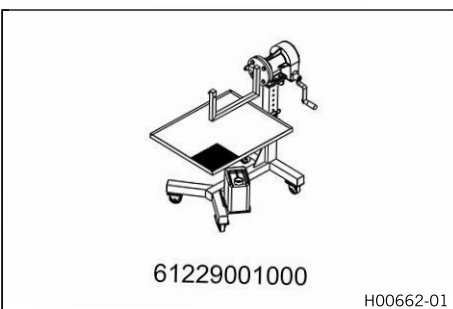
Art. no.: 61029094000

Retaining adapter



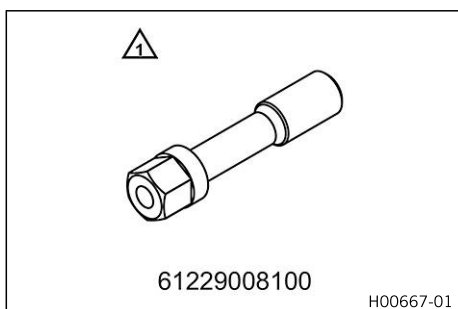
Art. no.: 61029955144

Engine work stand



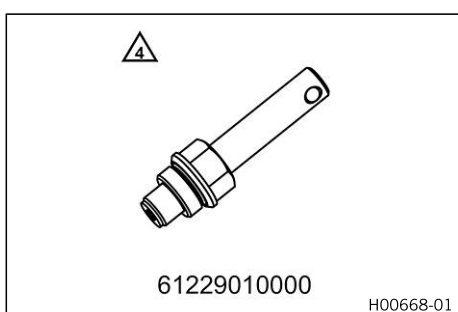
Art. no.: 61229001000

Pressing tool



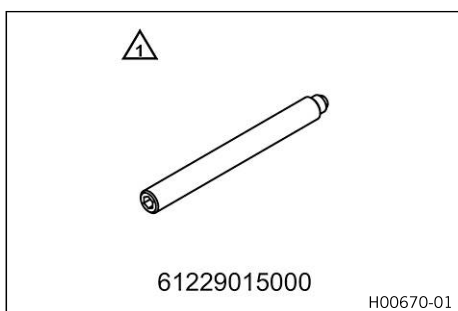
Art. no.: 61229008100

Puller



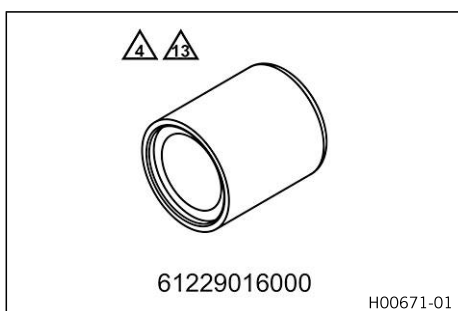
Art. no.: 61229010000

Locking screw



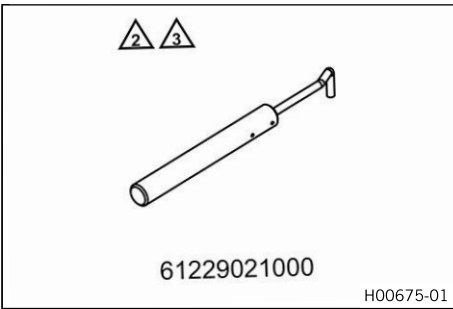
Art. no.: 61229015000

Pressing tool



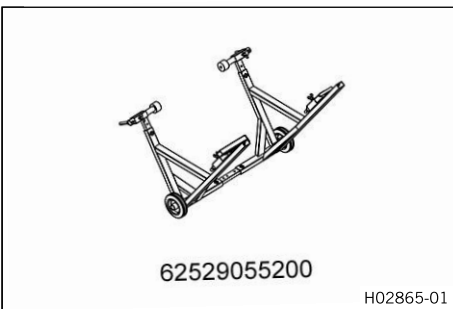
Art. no.: 61229016000

Release device for timing chain tensioner



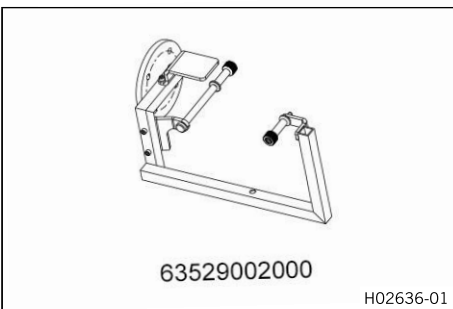
Art. no.: 61229021000

Work stand



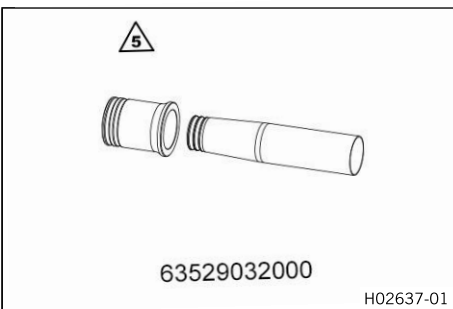
Art. no.: 62529055200

Engine bracket for engine work stand



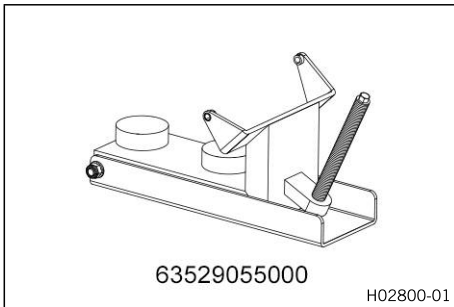
Art. no.: 63529002000

Mounting tool for lock ring



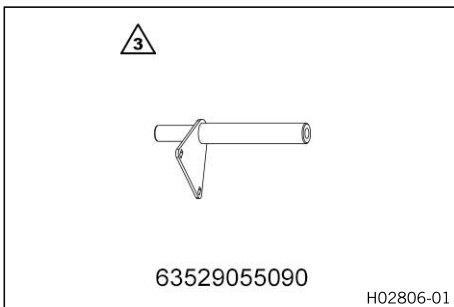
Art. no.: 63529032000

Floor jack attachment



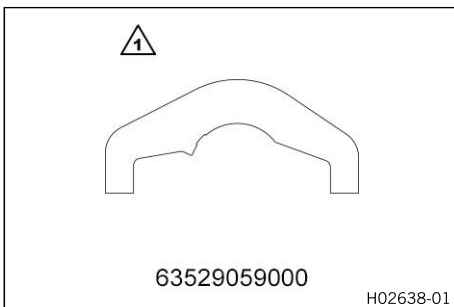
Art. no.: 63529055000

Socket pin



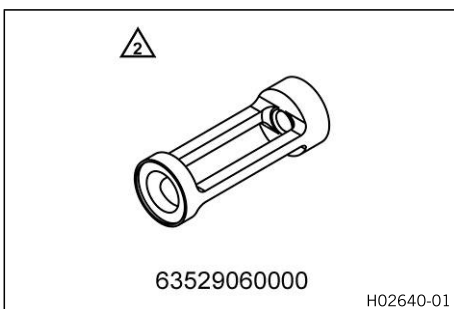
Art. no.: 63529055090

Setting gauge



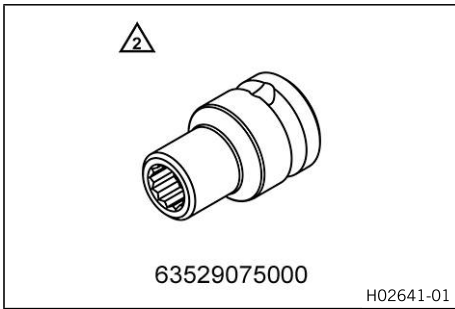
Art. no.: 63529059000

Insert for valve spring lever



Art. no.: 63529060000

Multi-tooth wrench socket

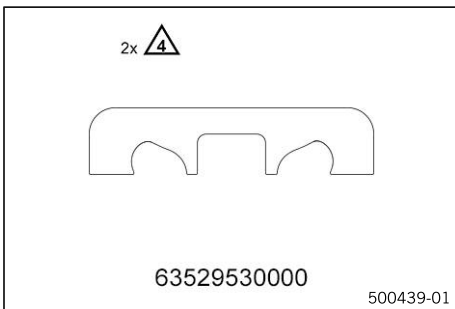


Art. no.: 63529075000

Feature

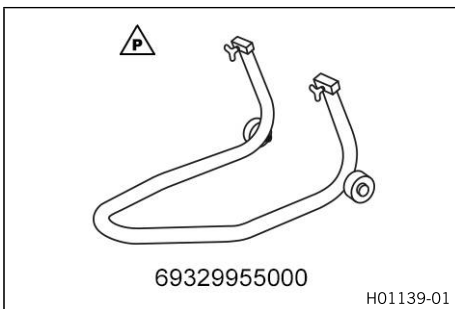
Drive	1/2 in
Diameter	9 mm (0.35 in)

Setting gauge



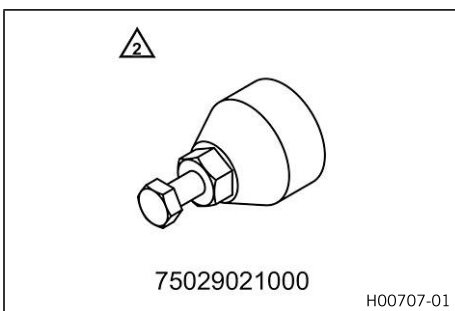
Art. no.: 63529530000

Rear wheel work stand



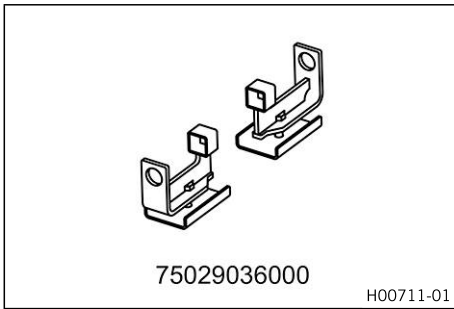
Art. no.: 69329955000

Puller



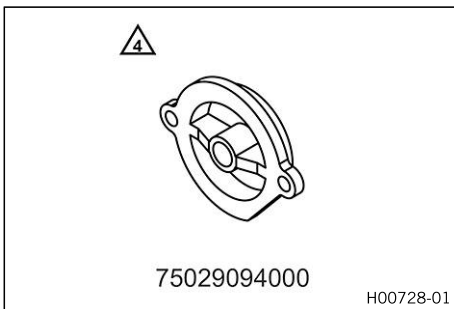
Art. no.: 75029021000

Work stand attachments



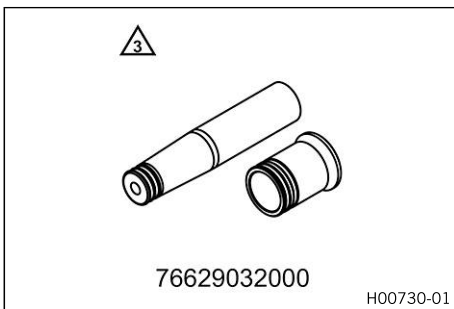
Art. no.: 75029036000

Oil pressure adapter



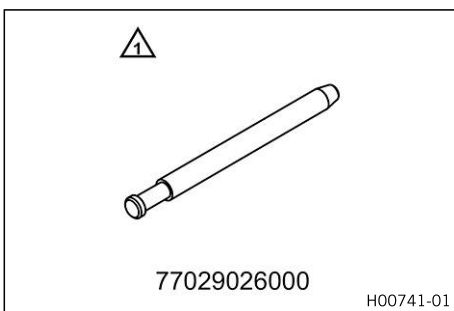
Art. no.: 75029094000

Mounting tool for lock ring



Art. no.: 76629032000

Limit plug gauge

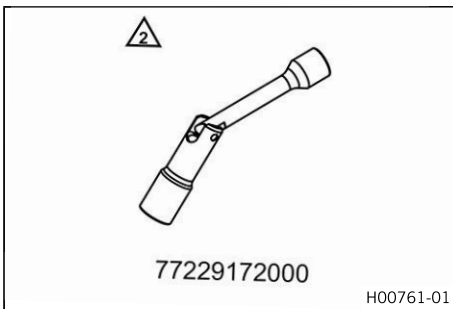


Art. no.: 77029026000

Feature

Diameter	5.05 mm (0.1988 in)
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Spark plug wrench with link

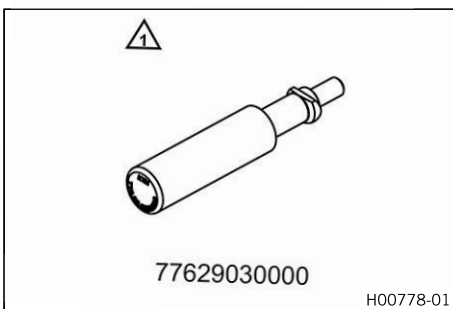


Art. no.: 77229172000

Feature

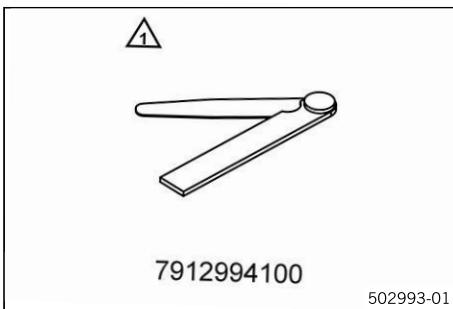
Drive	3/8 in
Hexagonal part	14 mm (0.55 in)
Length	130 mm (5.12 in)

Insertion for piston ring lock



Art. no.: 77629030000

Feeler gauge

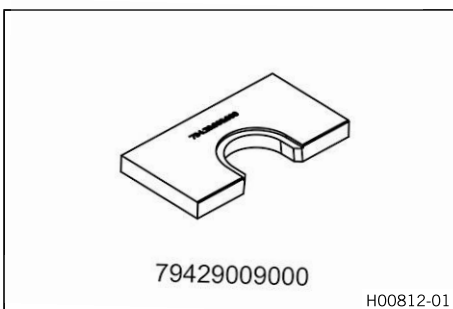


Art. no.: 79129941000

Feature

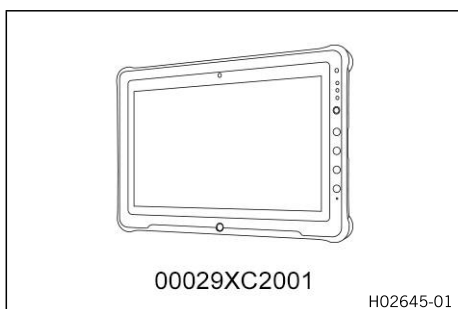
20 pieces	0.05 ... 1.00 mm (0.002 ... 0.0394 in)
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Separator plate



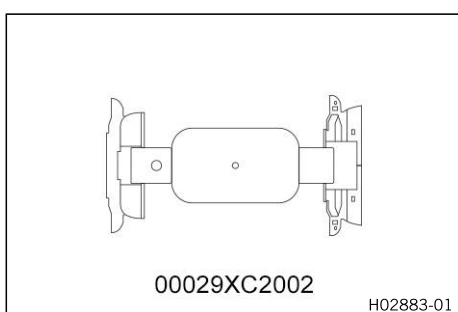
Art. no.: 79429009000

Diagnostics tablet



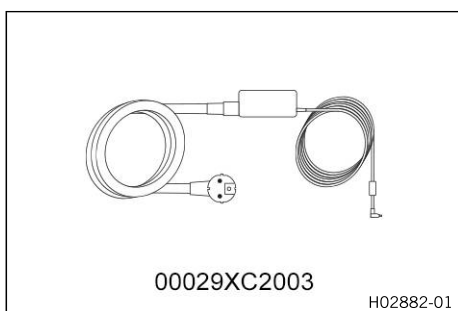
Art. no.: 00029XC2001

Hand strap



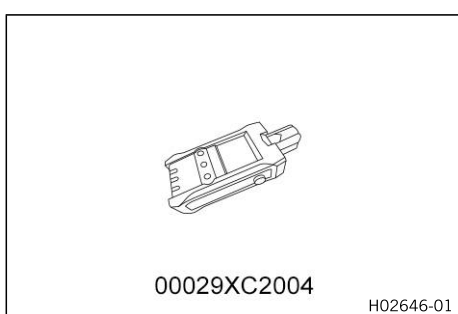
Art. no.: 00029XC2002

Battery charger



Art. no.: 00029XC2003

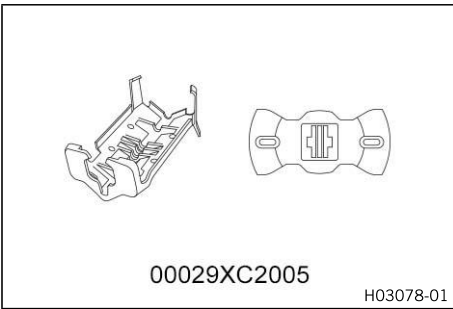
VCI



Art. no.: 00029XC2004

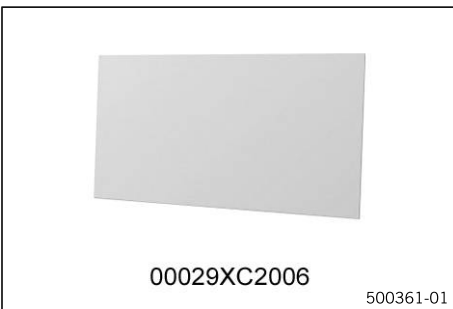
VCI attachment

Art. no.: 00029XC2005



Protective film

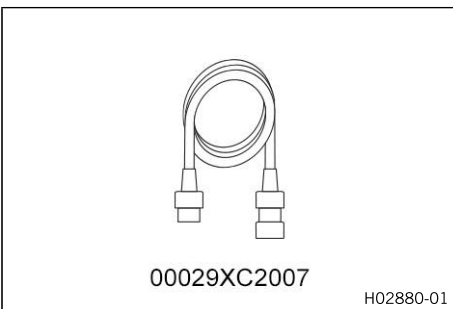
Art. no.: 00029XC2006



Diagnostics cable extension

Art. no.: 00029XC2007

Feature



Length approx.	1.15 m (3.77 ft)
----------------	------------------

USB cable

Art. no.: 00029XC2008

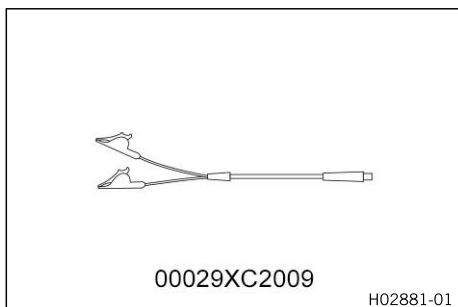
Feature



Length approx.	5 m (16 ft)
----------------	-------------

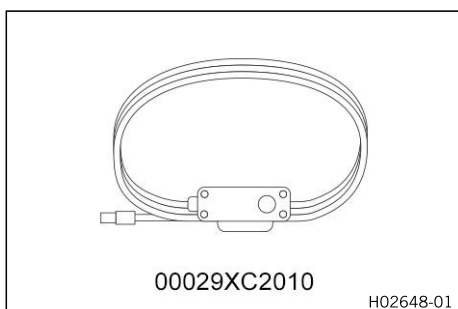
12-V power supply cable

Art. no.: 00029XC2009



RideRecorder trigger

Art. no.: 00029XC2010



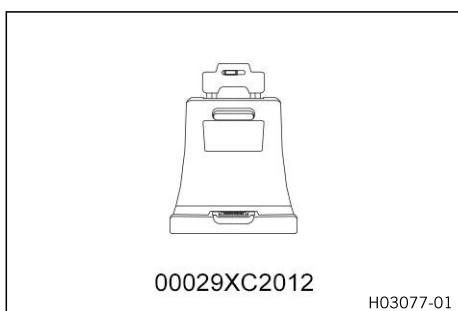
Case

Art. no.: 00029XC2011



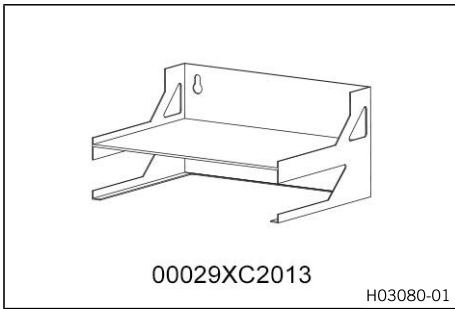
Docking station

Art. no.: 00029XC2012



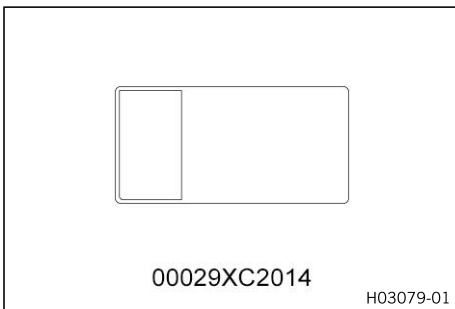
Wall attachment

Art. no.: 00029XC2013



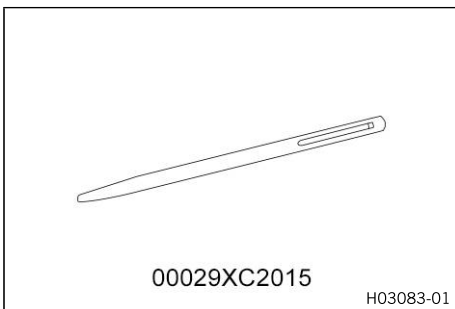
Battery

Art. no.: 00029XC2014



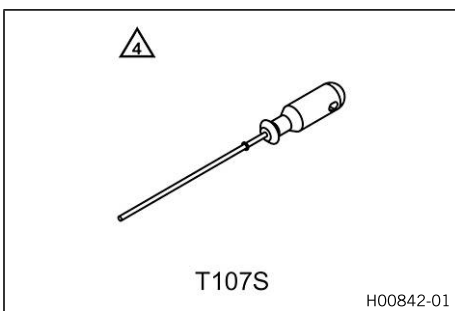
Input stylus

Art. no.: 00029XC2015

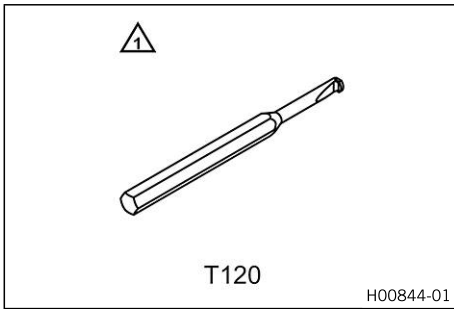


Depth micrometer

Art. no.: T107S



Drift

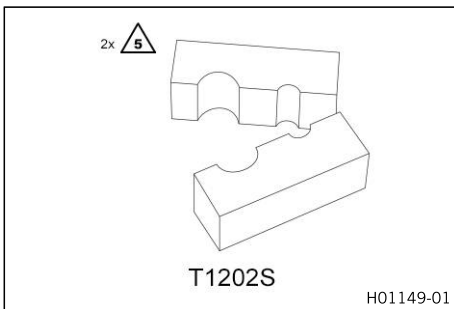


Art. no.: T120

Feature

Diameter	8 mm (0.31 in)
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Clamping stand

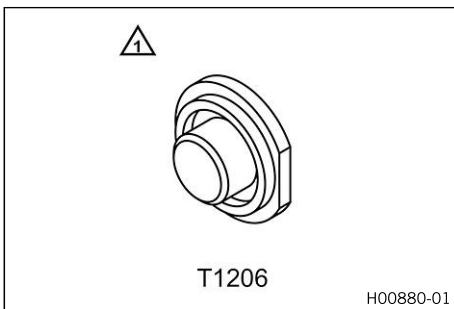


Art. no.: T1202S

Feature

Diameter	10 mm (0.39 in)
Diameter	18 mm (0.71 in)

Pressing tool

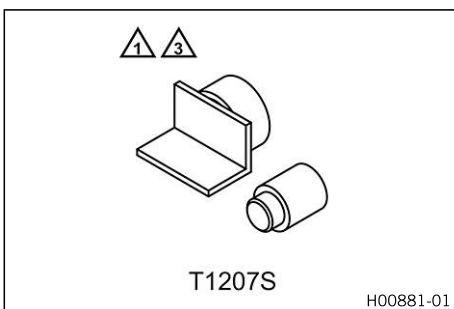


Art. no.: T1206

Feature

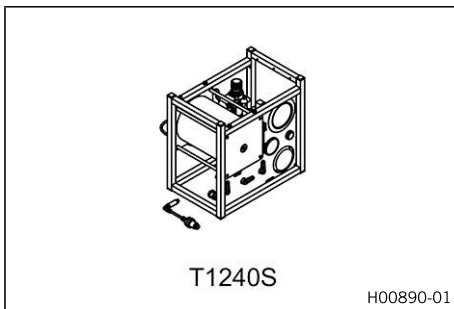
Diameter	15 ... 30 mm (0.59 ... 1.18 in)
----------	---------------------------------

Pressing tool



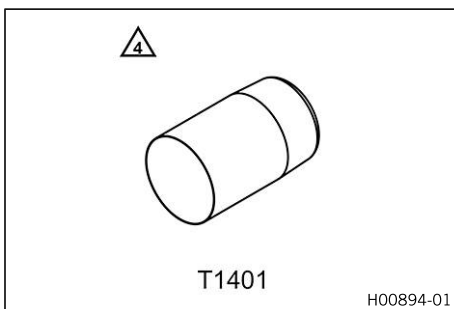
Art. no.: T1207S

Vacuum pump



Art. no.: T1240S

Protecting sleeve

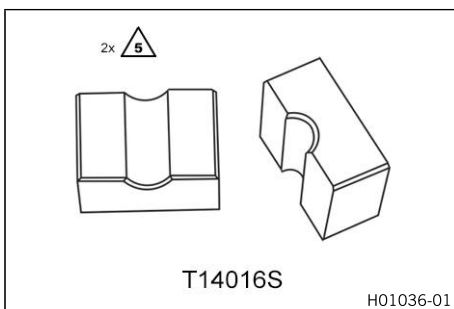


Art. no.: T1401

Feature

Diameter	48 mm (1.89 in)
----------	-----------------

Clamping stand

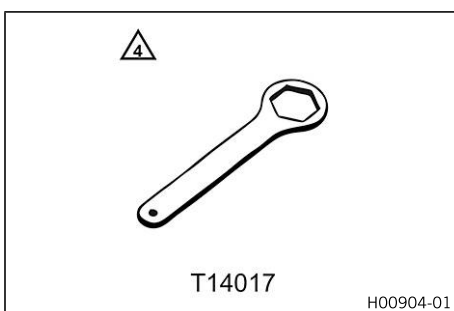


Art. no.: T14016S

Feature

Diameter	12 mm (0.47 in)
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Ring wrench

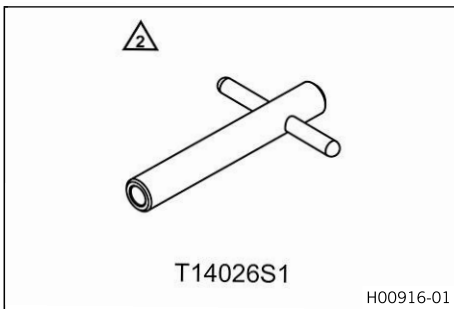


Art. no.: T14017

Feature

Hexagonal part	50 mm (1.97 in)
----------------	-----------------

Support tool

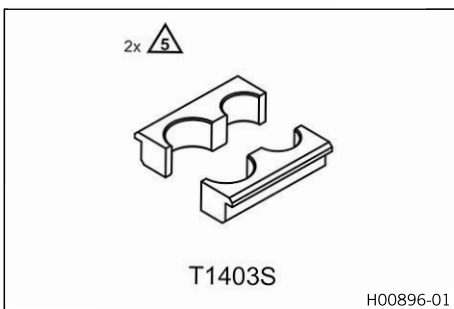


Art. no.: T14026S1

Feature

M12	
Diameter	17 mm (0.67 in)

Clamping stand

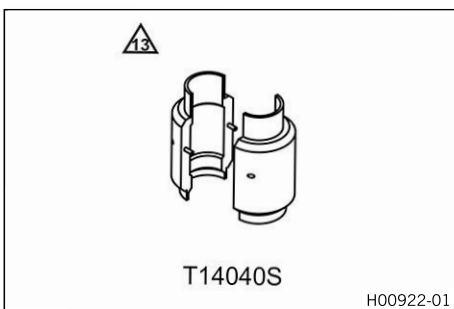


Art. no.: T1403S

Feature

Diameter	48 mm (1.89 in)
Diameter	60 mm (2.36 in)

Mounting tool

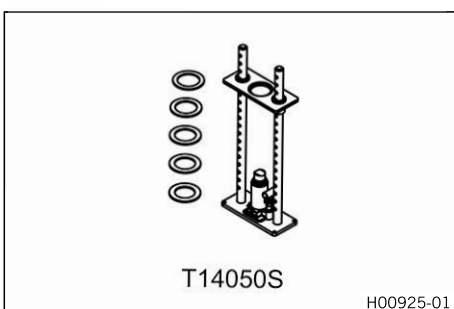


Art. no.: T14040S

Feature

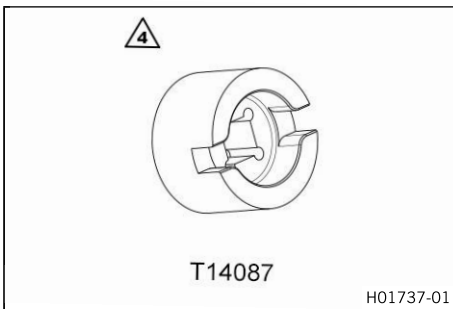
Diameter	48 mm (1.89 in)
----------	-----------------

Spring tensioner



Art. no.: T14050S

Special socket

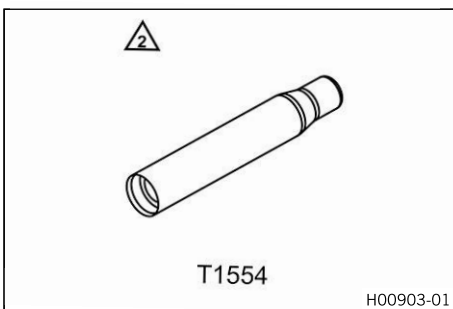


Art. no.: T14087

Feature

Drive	1/2 in
External diameter	44 mm (1.73 in)
Internal diameter	29.5 mm (1.161 in)

Mounting sleeve

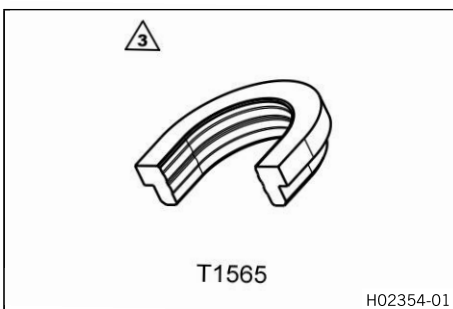


Art. no.: T1554

Feature

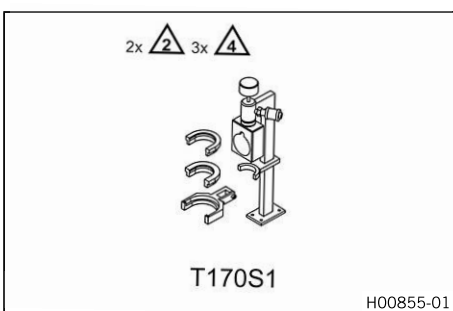
Diameter	18 mm (0.71 in)
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Filling adapter



Art. no.: T1565

Filling tool



Art. no.: T170S1

JASO T903 MA2

Different technical development directions required a separate specification for motorcycles – the **JASO T903 MA2** standard.

Earlier, engine oils from the automobile industry were used for motorcycles because there was no separate motorcycle specification.

Whereas long service intervals are demanded for automobile engines, the focus for motorcycle engines is on high performance at high engine speeds.

In most motorcycle engines, the transmission and clutch are lubricated with the same oil.

The **JASO T903 MA2** standard meets these special requirements.

SAE

The SAE viscosity classes were defined by the Society of Automotive Engineers and are used for classifying oils according to their viscosity. The viscosity describes only one property of oil and says nothing about quality.


ABS	Anti-lock braking system	Safety system that prevents locking of the wheels when driving straight ahead without the influence of lateral forces
ETTC	Engine traction torque control	Auxiliary function of the engine control, which prevents rear wheel locking with excessive engine braking effect, by lightly opening the throttle valve
-	KTMconnect	System for wireless communication with suitable cell-phones and headsets for telephony and audio
OBD	On-board diagnosis	Vehicle system, which monitors the specified parameters of the vehicle electronics
PA	Preload adjuster	Device on the suspension components that enables the adjustment of the spring preload
-	Quickshifter +	Engine electronics function for shifting up and down without clutch actuation

38 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








39.1 Red symbols

Red symbols indicate an error condition that requires immediate intervention.

	The oil pressure warning lamp lights up red – The oil pressure is too low. Stop immediately, taking care not to endanger yourself or other road users in the process, and switch off the engine.
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39.2 Yellow and orange symbols

Yellow and orange symbols indicate an error condition that requires prompt intervention. Active driving aids are also represented by yellow or orange symbols.

	The malfunction indicator lamp lights up yellow – The OBD has detected a malfunction in the vehicle electronics. Come safely to a halt, and contact an authorized KTM workshop.
	ABS warning lamp lights up yellow – Status or error messages relating to ABS.
	The ABS rear warning lamp lights up yellow – ABS is deactivated on the rear wheel.
	TC indicator lamp lights up/flashes yellow – MTC is not enabled or is currently intervening. The TC indicator lamp also lights up if a malfunction is detected. Contact an authorized KTM workshop. The TC indicator lamp flashes, if MTC or MSR (optional) actively engage.
	The cruise control system indicator lamp (optional) lights up yellow – The cruise control system function is switched on, but cruise control is not activated.
	The general warning lamp lights up yellow – A note/warning note on operating safety has been detected. This is also shown in the display.
	Hazard warning flasher indicator lamps – The hazard warning flasher is switched on.

39.3 Green and blue symbols

Green and blue symbols reflect information.

	The turn signal indicator lamp flashes green simultaneously with the turn signal – The turn signal is switched on.
	The idle indicator lamp lights up green – The transmission is in neutral.
	The cruise control system indicator lamp (optional) lights up green – The cruise control system function is switched on and cruise control is activated.
	The high beam indicator lamp lights up blue – The high beam is switched on.

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