

1290 Super Adventure S

Art. no. 3206329en



KTM

Read this repair manual carefully and thoroughly before beginning work.

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

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

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KTM Sportmotorcycle GmbH
Stallhofnerstraße 3
5230 Mattighofen, Austria

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1290 Super Adventure S US (F9975R4, F9975R5)

1290 Super Adventure S JP (F9986R4)

1290 Super Adventure S CN (F9987R4)



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1.1 Symbols used

The meaning of specific symbols is described below.

	Indicates an expected reaction (e.g. of a work step or a function).
	Indicates an unexpected reaction (e.g. of a work step or a function).
	Indicates a page reference (more information is provided on the specified page).
	Indicates information with more details or tips.
	Indicates the result of a testing step.
	Indicates a voltage measurement.
	Indicates a current measurement.
	Indicates a resistance measurement.
	Indicates the end of an activity including potential rework.

1.2 Formats used

The typographical formats used in this document are explained below.

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

2.1 Repair Manual

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

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

2.2 Safety advice

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



Info

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

2.3 Degrees of risk and symbols



Danger

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



Warning

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



Caution

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

Note

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



Note

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

2.4 Work rules

Special tools are necessary for certain tasks. The tools are not a component of the vehicle, but can be ordered using the number in parentheses. Example: valve spring mounter (59029019000)

During assembly, non-reusable parts (e.g. self-locking screws and nuts, seals and seal rings, O-rings, pins, lock washers) must be replaced by new parts.

Where thread lockers are used on screw connections (e.g. **Loctite**®), follow the instructions for use from the manufacturer.

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

After repairs or servicing, the vehicle must be checked to ensure that it is roadworthy.

3.1 Manufacturer and implied warranty

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

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

3.2 Fuel, auxiliary substances



Note

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

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

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

3.3 Spare parts, accessories

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

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

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

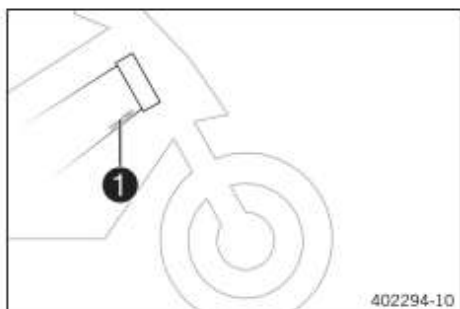
3.4 Figures

The figures contained in the manual may depict special equipment.

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

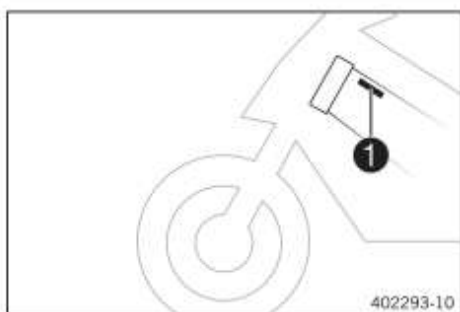
4 SERIAL NUMBERS

4.1 Vehicle identification number



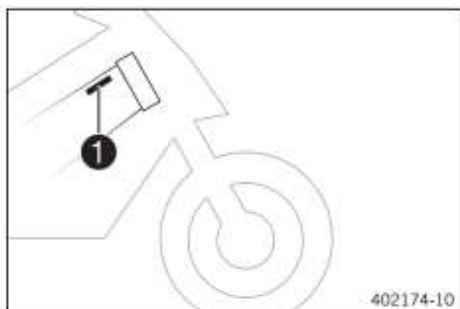
The vehicle identification number **1** is stamped on the bottom right of the frame behind the steering head.
The vehicle identification number is also shown on the type label.

4.2 Type label



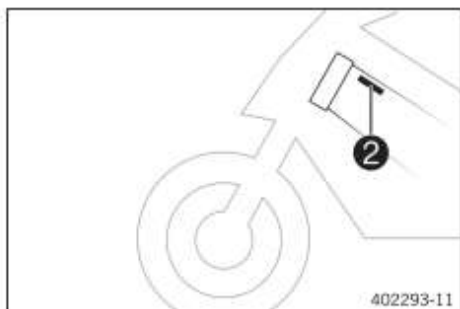
(EU/JP/CN)

Type label **1** is affixed to the top left of the frame behind the steering head.



(US)

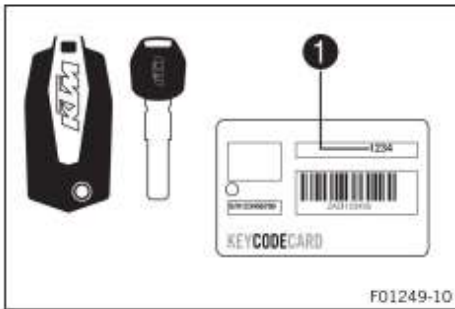
Type label USA **1** is affixed to the frame behind the steering head at the top right.



(US)

Type label Canada **2** is affixed to the frame behind the steering head at the top left.

4.3 Key number



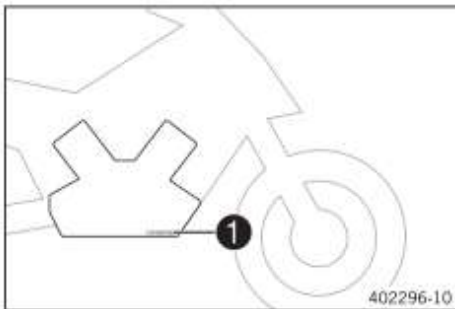
The key number **Code number 1** can be found on the **KEYCODECARD**.



Info

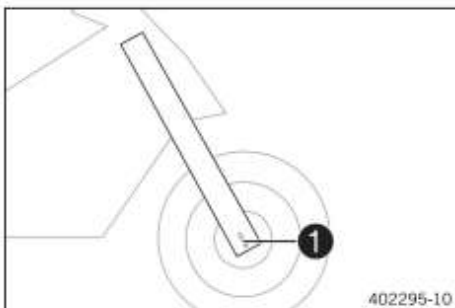
You need the key number to order a spare key. Keep the **KEYCODECARD** in a safe place.

4.4 Engine number



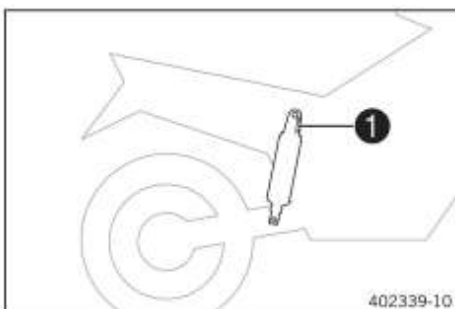
The engine number **1** is stamped on the right side of the engine.

4.5 Fork part number



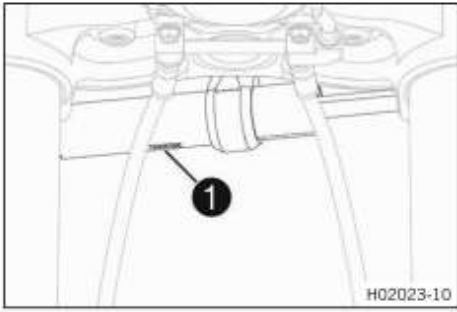
The fork part number **1** is stamped on the inner side of the fork stub.

4.6 Shock absorber article number



The shock absorber article number **1** is stamped on the top of the shock absorber.

4.7 Steering damper article number



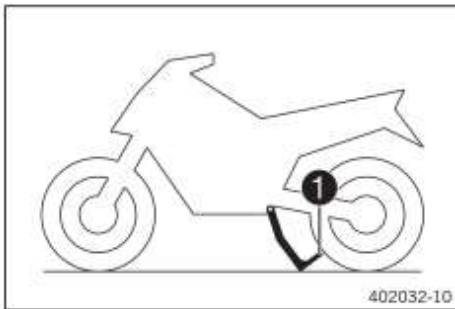
Steering damper article number **1** is embossed on the underside of the steering damper.

5.1 Raising the vehicle with the center stand

Note

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

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



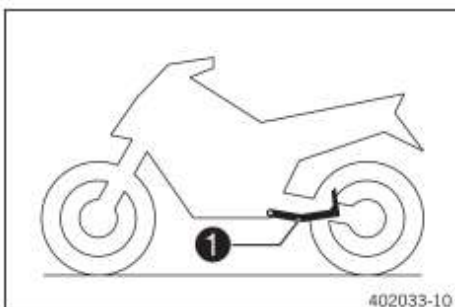
- Stand to the left of the vehicle.
- Hold the handlebar with your left hand and push the center stand onto the ground with your right foot.
- Put your entire weight on arm ❶ of the center stand while pulling the vehicle up at the left grab handle.
- ✓ The center stand is folded out to the stop.

5.2 Removing the vehicle from the center stand

Note

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

- Park the vehicle on a firm and level surface.



- Make sure that the steering is unlocked.
- Move the vehicle forward with both hands on the handlebar.
- While the vehicle tips off the center stand, actuate the front brake to stop the vehicle from rolling away.
- Check that the center stand ❶ is folded all the way up.

5.3 Starting



Danger

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

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



Caution

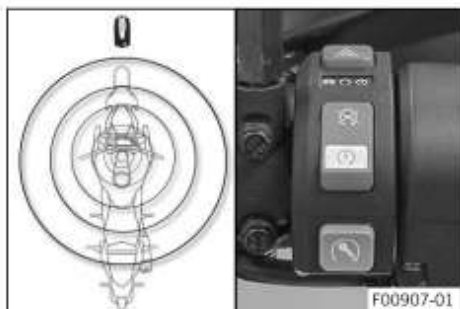
Danger of accidents Electronic components and safety devices will be damaged if the 12-V battery is discharged or missing.

- Never operate the vehicle with a discharged 12-V battery or without a 12-V battery.

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.
- Bring the Race-on key within range of the antenna.
- Ensure that the Race-on key stays in range while riding.

Guideline

Maximum range of the Race-on key around the antenna	1.5 m (4.9 ft)
---	----------------

i Info

The range may be reduced by decreases in battery voltage of the Race-on key and interfering radio waves. If the battery voltage of the Race-on key is too low, one of the ignition keys must be held in the area of the antenna (p. 18) and must be safely stored again after starting.

- Make sure that the emergency OFF switch/electric starter button is in the middle position ○.
- Switch on ignition; to do this, briefly press the Race-on tip switch (maximum of 1 second).
 - ✓ The steering is unlocked.
 - ✓ The function check of the combination instrument is run.
 - ✓ The ABS warning lamp goes out when starting off.

i Info

If the handlebar does not unlock, move the handlebar slightly.

- Shift the transmission into neutral N.
 - ✓ The green idle indicator lamp N lights up.
- Turn the emergency OFF switch/electric starter button to the lower position ⊕.

i Info

Do not press the emergency off switch/electric starter button into the lower position ⊕ until 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. Press the emergency OFF switch/electric starter button into the lower position ⊕ for a maximum of 5 seconds. Wait for a least 5 seconds before trying again. 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, the engine stops.



5.4 Starting the motorcycle to check the function



Danger

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

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



Info

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



- Ensure that the Race-on key stays in range.

Guideline

Maximum range of the Race-on key around the fuel tank	1.5 m (4.9 ft)
---	----------------



Info

The range may be reduced by decreases in battery voltage of the Race-on key and interfering radio waves. If the battery voltage of the Race-on key is too low, one of the ignition keys must be placed in the area of the steering lock (p. 18) and must be safely stored again after starting.

- Turn the emergency OFF switch/electric starter button to the middle position ○.
- Press the Race-on tip switch Ⓢ briefly (for a maximum of 1 second).
 - ✓ The steering is unlocked.
 - ✓ The ABS warning lamp lights up and goes back out after starting off.



Info

If the handlebar does not unlock, move the handlebar slightly.

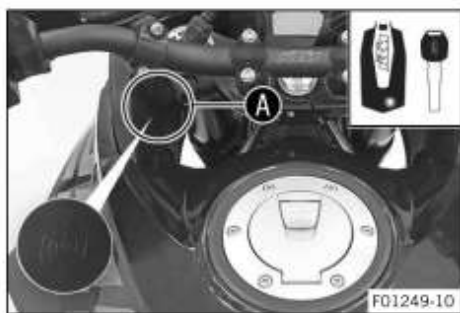
- Shift the transmission into neutral Ⓜ.
 - ✓ The green idle indicator lamp Ⓜ lights up.
- Turn the emergency OFF switch/electric starter button to the lower position ⊖.

i Info

Do not press the emergency off switch until 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.

Press the emergency OFF switch into the position **START** (Ⓢ) for a maximum of 5 seconds. Wait for a least 5 seconds before trying again.

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, the engine stops.

5.5 Steering lock (antenna)

On this vehicle, the ignition/steering lock is replaced by a remote key with transponder (Race-on key).

In order to activate the steering lock, the handlebar must be turned fully to the left.

The steering is locked and unlocked electromechanically via the Race-on tip switch (Ⓢ).

If the battery voltage of the Race-on key is too low, hold the Race-on key or the black ignition key in area **A** on the motorcycle and repeat starting.

i Info

As soon as the engine has been started, safely stow away the Race-on key or the black ignition key again.

Possible states

- Ignition off, steering locked – In this operating mode, the ignition circuit is interrupted and the steering locked.
- Ignition off, steering unlocked – In this operating mode, the ignition circuit is interrupted and the steering unlocked.
- Ignition on, steering unlocked – In this operating mode, the ignition circuit is closed and the steering unlocked.

6.1 Cleaning the dust boots of the fork legs

Preparatory work

- Raise the vehicle with the center stand. (☞ p. 15)
- Remove front fender. (☞ p. 103)



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 inner fork tubes of both fork legs.

Universal oil spray (☞ p. 491)

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

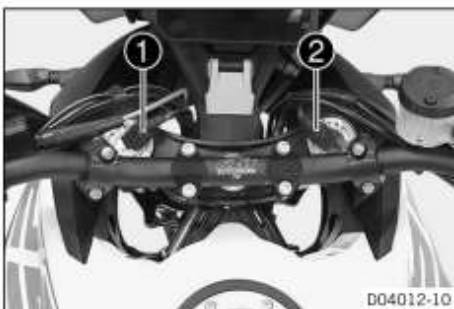
Finishing work

- Install front fender. (☞ p. 104)
- Remove the vehicle from the center stand. (☞ p. 15)

6.2 Removing the fork legs

Preparatory work

- Raise the vehicle with the center stand. (☞ p. 15)
- Clamp down the rear of the vehicle.
- Remove front fender. (☞ p. 103)
- Remove the front wheel. (☞ p. 109)
- Remove the bottom triple clamp cover. (☞ p. 102)



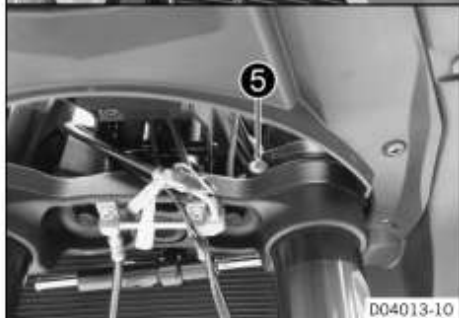
Main work

- Detach connectors ❶ and ❷.

6 FORK, TRIPLE CLAMP



- Loosen screws ③ of the lower triple clamp.
- Remove screw ④ of the steering damper.
- Loosen screw ⑤ of the steering damper clamp.

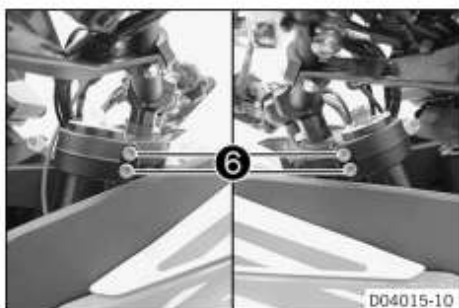


D04013-10



D04014-10

- Loosen screws ③ of the lower triple clamp.



D04015-10

- Loosen screws ⑥ of the upper triple clamp.
- Remove the fork legs from the bottom.

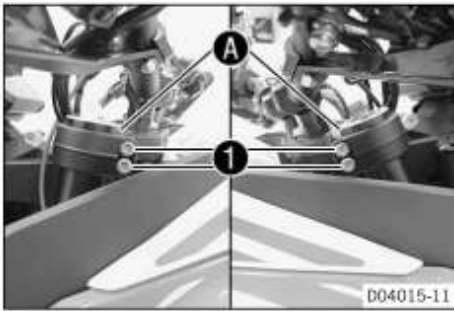
6.3 Installing the fork legs



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

- Slide the left-hand fork leg into the triple clamps and the steering damper clamp.
 - ✓ The left-hand fork leg has a white connector; the right-hand fork leg has a red connector.
 - ✓ The connector faces forward at an angle toward the center of the vehicle.
- Push the right fork leg into the triple clamps.
 - ✓ The left-hand fork leg has a white connector; the right-hand fork leg has a red connector.
 - ✓ The connector faces forward at an angle toward the center of the vehicle.
- Align the fork legs in the specified position by means of fork rings **A**.

Guideline

Upper triple clamp flush with 2nd ring of fork legs.
--

- Tighten screws **1** of the upper triple clamp.

Guideline

Screw, top triple clamp	M8	20 Nm (14.8 lbf ft)
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- Tighten screws **2** of the lower triple clamp.

Guideline

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



- Tighten screws **2** of the lower triple clamp.

Guideline

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

- Align the steering damper clamp to the lower triple clamp.

Guideline

The clamp is aligned with the contour of the lower triple clamp and lies on top of the lower triple clamp.
--

- Tighten screw **3**.

Guideline

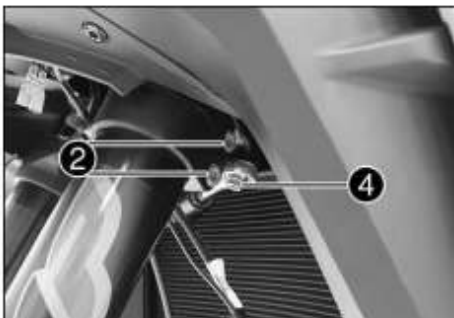
Screw, steering damper clamp	M8	12 Nm (8.9 lbf ft)
------------------------------	----	--------------------

- Position the steering damper.

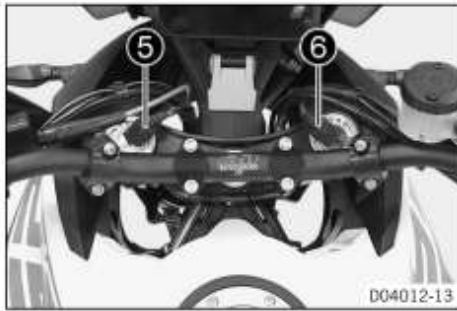
- Mount and tighten screw **4**.

Guideline

Screw, steering damper	M8	25 Nm (18.4 lbf ft) Loctite®243™
------------------------	----	--



6 FORK, TRIPLE CLAMP



- Plug in connectors **5** and **6**.

Finishing work

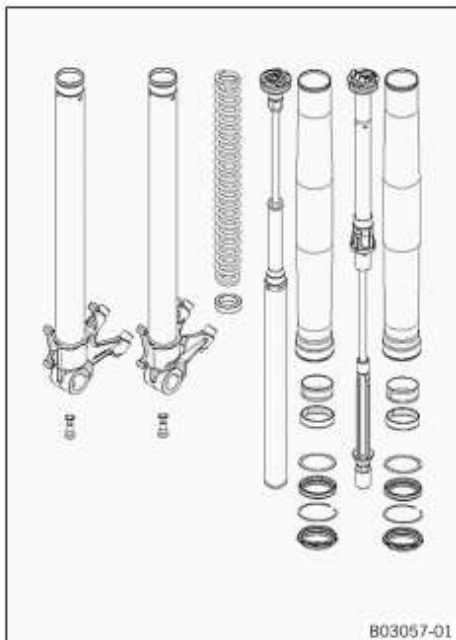
- Install the bottom triple clamp cover. (☞ p. 103)
- Install the front wheel. (☞ p. 110)
- Install front fender. (☞ p. 104)

6.4 Performing a fork service

Condition

The fork legs have been removed.

- Disassemble the fork legs. (☞ p. 22)
- Remove the spring. (☞ p. 24)
- Check the fork legs. (☞ p. 26)
- Install the spring. (☞ p. 25)
- Assemble the fork legs. (☞ p. 27)



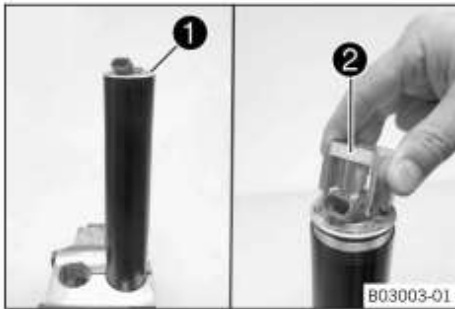
6.5 Disassembling the fork legs

i Info

The operations are the same on both fork legs.

Condition

The fork legs have been removed.



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

Clamping stand (T1403S) (見 p. 508)

- Release screw cover ① with special tool ②.

Groove nut wrench (T14071) (見 p. 509)

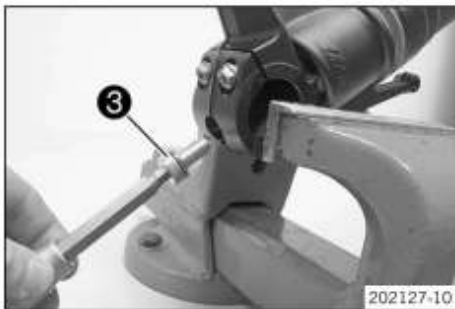


Info

The screw cover cannot be removed.



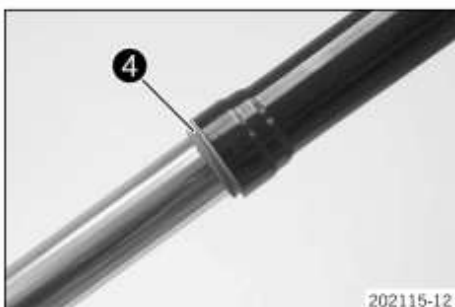
- Unclamp the fork leg.
- Drain the fork oil.



- Remove cartridge screw ③ with the washer.



- Remove the cartridge.



- Remove dust boot ④.

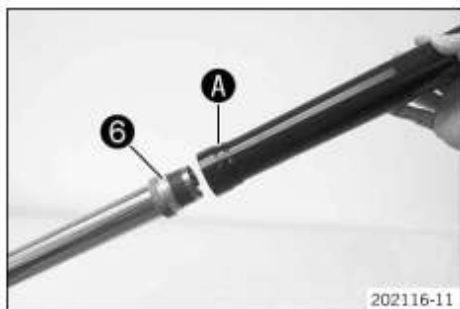
6 FORK, TRIPLE CLAMP



- Remove lock ring **5**.

i **Info**

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



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

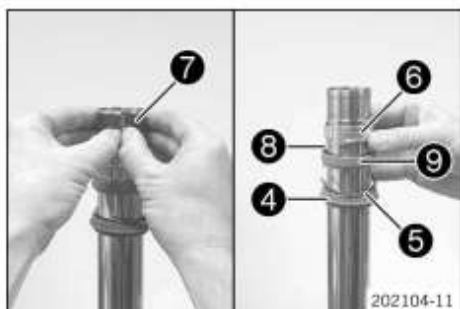
Guideline

50 °C (122 °F)

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

i **Info**

Lower sliding bushing **6** must be drawn from its bearing seat.



- Remove upper sliding bushing **7**.

i **Info**

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

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

6.6 Removing the spring

i **Info**

These operations only apply to the left fork leg.

Preparatory work

- Disassemble the fork legs. (☞ p. 22)

Main work

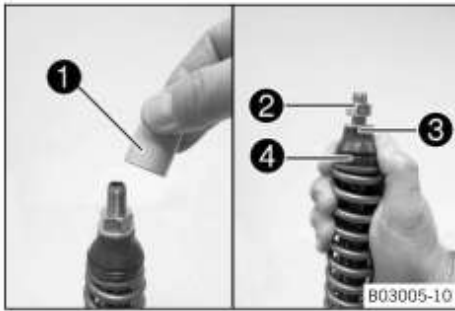
- Clamp the cartridge into a vise.

Clamping stand (T14015S) (☞ p. 508)

- Hold nut securely and loosen threaded bushing **1** with special tool.

Pin wrench (T103) (☞ p. 507)





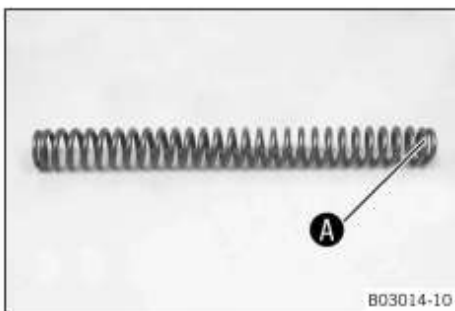
- Remove threaded bushing ①.
- Pull the spring down and remove nut ② with the washer.
- Remove spring guide ③ with preload spacer ④.
- Remove the spring. Unclamp the cartridge.

6.7 Installing the spring

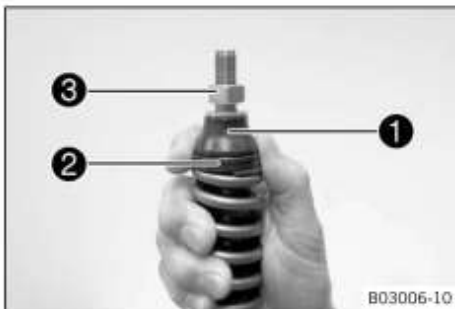


Info

These work steps only apply to the left fork leg.



- Observe the installation position of the springs.
- ✓ Tight coil A points toward the spring guide.



- Clamp the cartridge into a vise.

Clamping stand (T14015S) (p. 508)

- Position the spring.
- Position spring guide ① with preload spacer ②.
- Pull the spring down and mount nut ③ with the washer. Screw the nut all the way down.

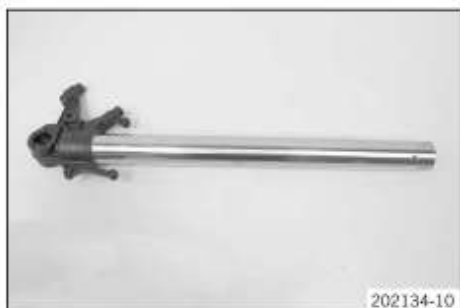


- Screw on threaded bushing ④ all the way.
- Hold threaded bushing ④ and tighten nut ③.

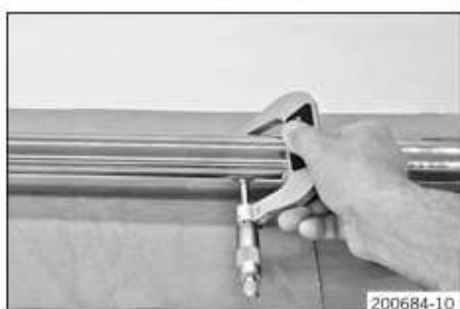
6.8 Checking the fork legs

Condition

The fork is disassembled.



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



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

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

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



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

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

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



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



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



- Check the spring length.

Guideline

Spring length with preload spacer(s)	443 mm (17.44 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.

6.9 Assembling the fork legs

i Info

The operations are the same on both fork legs.

Preparatory work

- Check the fork legs. (☞ p. 26)
- Install the spring. (☞ p. 25)

Main work

- Clamp the inside fork tube using an axle clamp.

Guideline

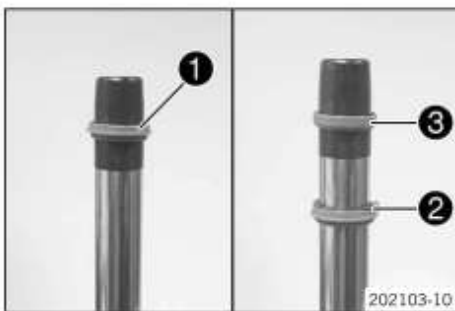
Use soft jaws.

- Mount the special tool.

Protecting sleeve (T1401) (☞ p. 507)

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

Lubricant (T14034) (☞ p. 490)



i Info

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

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

Lubricant (T14034) (☞ p. 490)

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

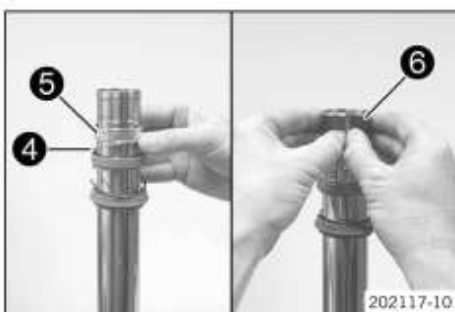
- Remove the special tool.

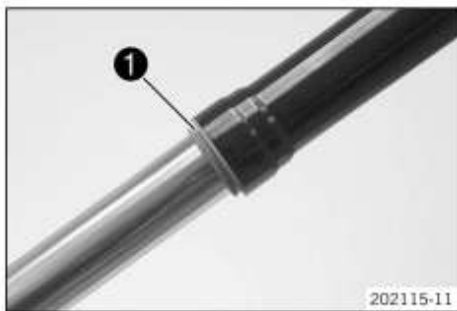
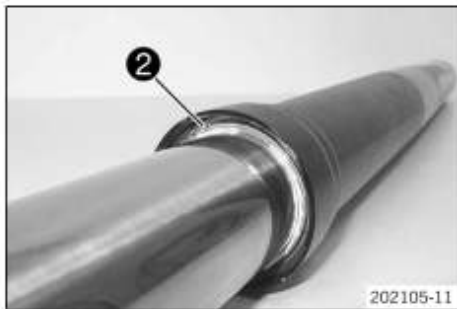
- Push on support ring **4**.

- Sand edges of the sliding bushings with 600 grit sandpaper; then clean and grease bushings.

Fork oil (SAE 4) (48601166S1) (☞ p. 489)

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





i Info

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

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

Guideline

50 °C (122 °F)

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

Mounting tool (T14040S) (見 p. 508)

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

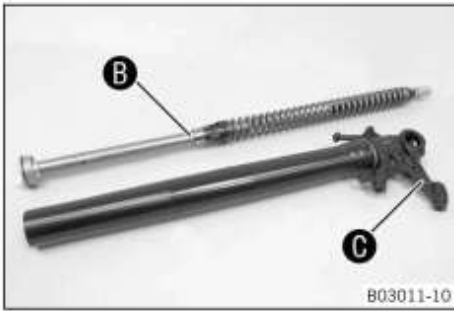
- Position the support ring.
- Hold the seal ring with shorter side of the special tool.

Mounting tool (T14040S) (見 p. 508)

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

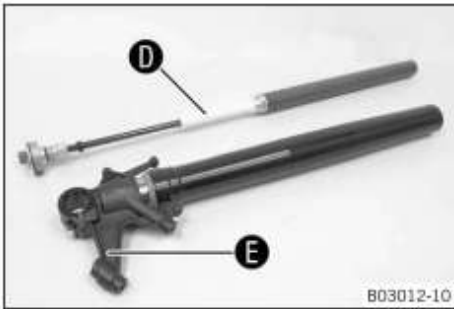
- Mount lock ring **2**.
✓ The lock ring engages audibly.

- Mount dust boot **1**.



- Assemble the individual components that belong together.

i Info
Sensor side (left fork leg): cartridge with spring and white plug **B**, axle clamp with label **L C**.

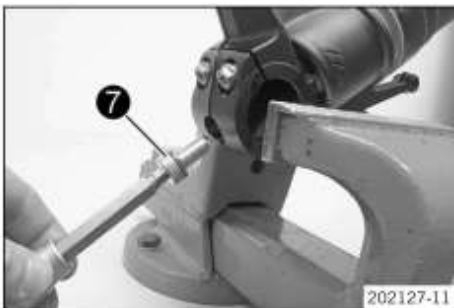


- Assemble the individual components that belong together.

i Info
Actuator side (right fork leg): cartridge without spring, red plug **D**, axle clamp with label **R E**.



- Slide the cartridge into the inside fork tube.



- Mount and tighten cartridge screw **7** with washer.

Guideline

Screw, cartridge	M12x1	25 Nm (18.4 lbf ft)
------------------	-------	---------------------



- Clamp the right fork leg vertically.

Guideline

Use soft jaws.

- Fill with fork oil.

Fork oil per fork leg	430 ml (14.54 fl. oz.)	Fork oil (SAE 4) (48601166S1) (R&R p. 489)
-----------------------	---------------------------	---

6 FORK, TRIPLE CLAMP



- Clamp the left fork leg vertically.

Guideline

Use soft jaws.

- Fill with fork oil.

Fork oil per fork leg	680 ml (22.99 fl. oz.)	Fork oil (SAE 4) (48601166S1) (☞ p. 489)
-----------------------	---------------------------	--

- Push the outside fork tube upwards.

i Info

The following work steps apply to both fork legs.

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

Clamping stand (T1403S) (☞ p. 508)

- Grease the O-ring of the screw cover.

Lubricant (T158) (☞ p. 490)

- Screw on and tighten screw cap **8**.

Guideline

Screw cap on the outside fork tube	M47x1.5	40 Nm (29.5 lbf ft)
------------------------------------	---------	---------------------

Groove nut wrench (T14071) (☞ p. 509)

6.10 Checking steering head bearing play



Warning

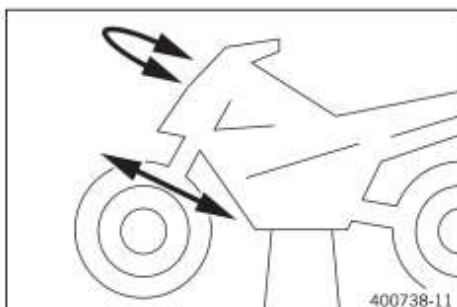
Danger of accidents Incorrect steering head bearing play impairs the handling characteristic and damages components.

- Correct incorrect steering head bearing play immediately.



Info

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



Preparatory work

- Raise the vehicle with the center stand. (☞ p. 15)

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 steering head bearing play. (☞ p. 31)

- 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 steering head bearing play. (📖 p. 31)
 - Check the steering head bearing and adjust if necessary.

Finishing work

- Remove the vehicle from the center stand. (📖 p. 15)



6.11 Adjusting steering head bearing play

Preparatory work

- Raise the vehicle with the center stand. (📖 p. 15)

Main work

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

Guideline

Screw, steering head, top	M22x1.5	15 Nm (11.1 lbf ft) Only applies when using: Holding wrench (45229050000) (📖 p. 494)
---------------------------	---------	---

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

- Tighten screws ❶.

Guideline

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

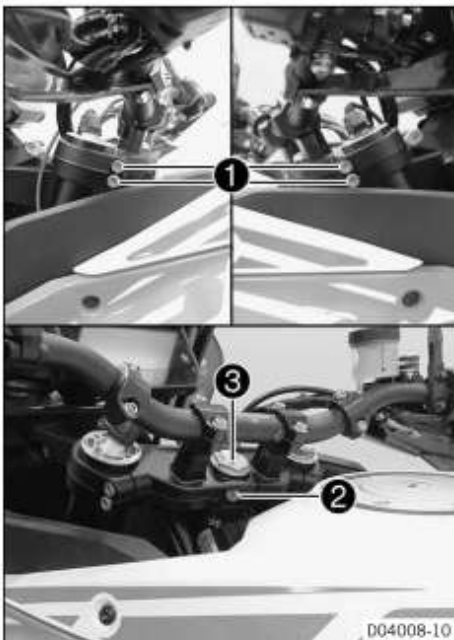
- Tighten screw ❷.

Guideline

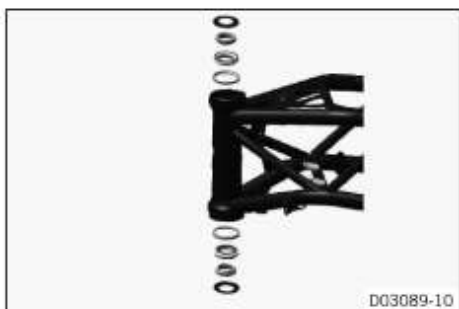
Screw, steering stem	M8	20 Nm (14.8 lbf ft)
----------------------	----	---------------------

Finishing work

- Check steering head bearing play. (📖 p. 30)
- Remove the vehicle from the center stand. (📖 p. 15)



6.12 Lubricating the steering head bearing



- Remove the lower triple clamp. (☞ p. 32)
- Install the lower triple clamp. (☞ p. 33)

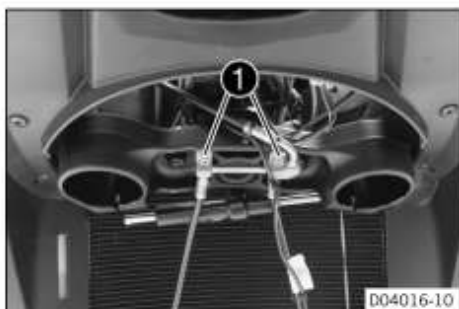
6.13 Removing the lower triple clamp

Preparatory work

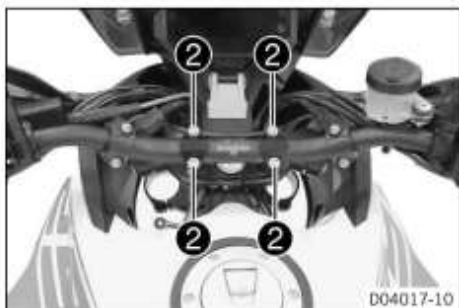
- Raise the vehicle with the center stand. (☞ p. 15)
- Clamp down the rear of the vehicle.
- Remove front fender. (☞ p. 103)
- Remove the front wheel. (☞ p. 109)
- Remove the bottom triple clamp cover. (☞ p. 102)
- Remove the fork legs. (☞ p. 19)

Main work

- Remove screws ❶. Take off the brake line and hang it to the side.



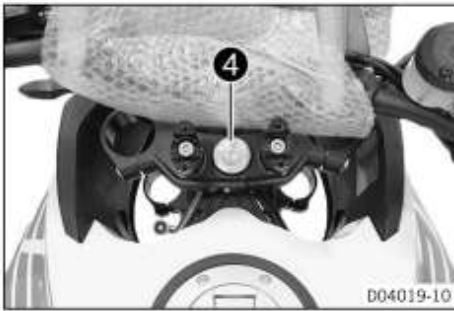
- Remove screws ❷ with handlebar clamps.
- Remove the handlebar and lay it to one side.



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

- Loosen screw ❸.



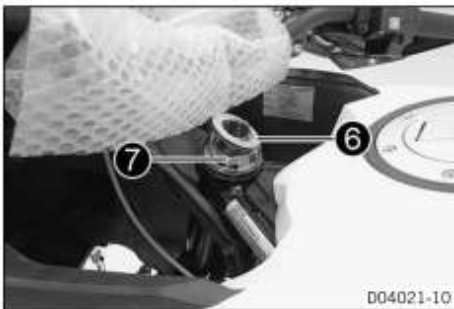


- Remove screw 4 with washer.
- Remove the upper triple clamp.

i Info
Hold lower triple clamp.

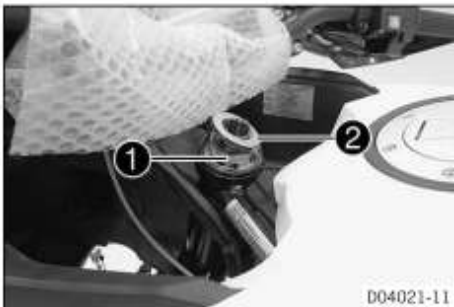


- Remove protective ring 5.



- Remove the lower triple clamp with steering stem.
- Remove seal ring retainer 6.
- Remove upper steering head bearing 7.

6.14 Installing the lower triple clamp



Main work

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

High viscosity grease (see p. 490)

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



- Mount protective ring 3.

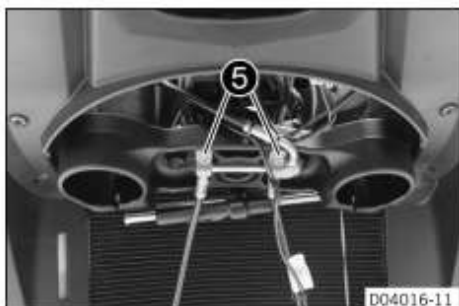
6 FORK, TRIPLE CLAMP



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

Guideline

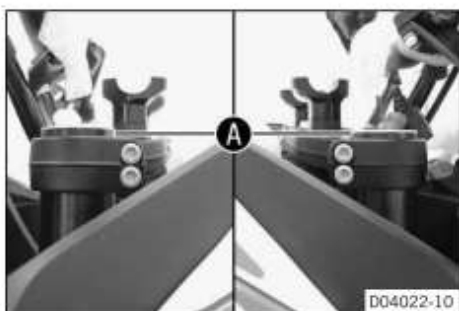
Screw, steering head, top	M22x1.5	18 Nm (13.3 lbf ft)
---------------------------	---------	---------------------



- Position the brake lines.
- Mount and tighten screws 5.

Guideline

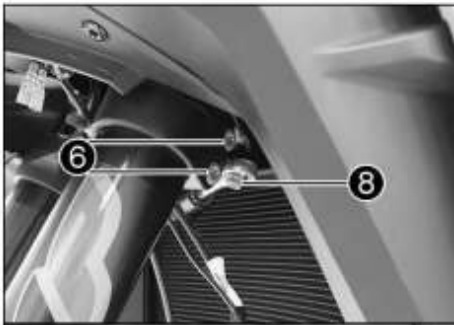
Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
---------------------------	----	--------------------



- Slide the left-hand fork leg into the triple clamps and the steering damper clamp.
 - ✓ The left-hand fork leg has a white connector; the right-hand fork leg has a red connector.
 - ✓ The connector faces forward at an angle toward the center of the vehicle.
- Push the right fork leg into the triple clamps.
 - ✓ The left-hand fork leg has a white connector; the right-hand fork leg has a red connector.
 - ✓ The connector faces forward at an angle toward the center of the vehicle.
- Align the fork legs in the specified position by means of fork rings A.

Guideline

Upper triple clamp flush with 2nd ring of fork legs.
--



- Tighten screws **6** of the lower triple clamp.

Guideline

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

- Align the steering damper clamp to the lower triple clamp.

Guideline

The clamp is aligned with the contour of the lower triple clamp and lies on top of the lower triple clamp.		
--	--	--

- Tighten screw **7**.

Guideline

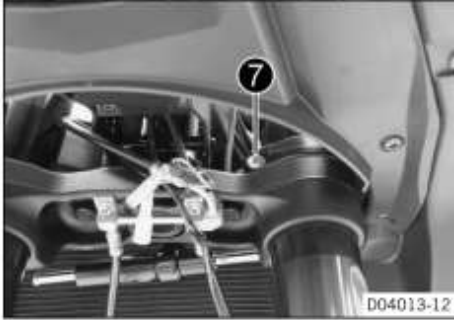
Screw, steering damper clamp	M8	12 Nm (8.9 lbf ft)
------------------------------	----	--------------------

- Position the steering damper.

- Mount and tighten screw **8**.

Guideline

Screw, steering damper	M8	25 Nm (18.4 lbf ft) Loctite®243™
------------------------	----	--



D04013-12



D04024-10

- Tighten screw **4**.

Guideline

Screw, steering head, top	M22x1.5	18 Nm (13.3 lbf ft)
---------------------------	---------	---------------------

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

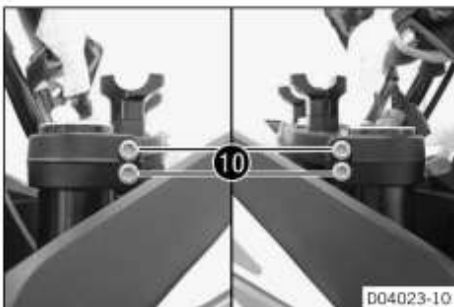


D04025-10

- Tighten screw **9**.

Guideline

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



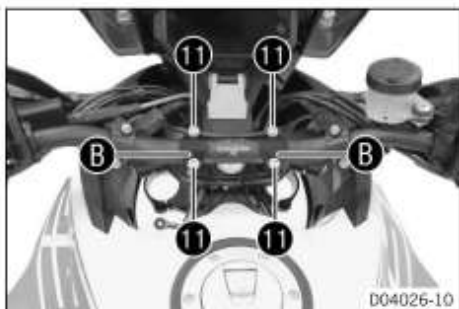
D04023-10

- Tighten screws **10** of the upper triple clamp.

Guideline

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

6 FORK, TRIPLE CLAMP

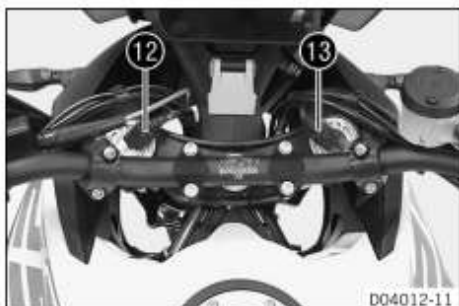


- Position the handlebar.
- Position the handlebar clamps. Mount and tighten screws 11.

Guideline

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

- ✓ Markings B face backwards.



- Plug in connectors 12 and 13.

Finishing work

- Install the bottom triple clamp cover. (see p. 103)
- Install the front wheel. (see p. 110)
- Install front fender. (see p. 104)
- Check steering head bearing play. (see p. 30)
- Remove the vehicle from the center stand. (see p. 15)

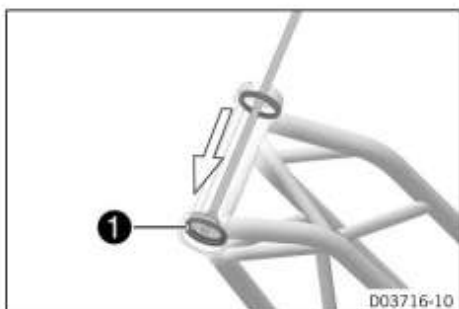
6.15 Changing the steering head bearing

Preparatory work

- Raise the vehicle with the center stand. (see p. 15)
- Clamp down the rear of the vehicle.
- Remove front fender. (see p. 103)
- Remove the front wheel. (see p. 109)
- Remove the bottom triple clamp cover. (see p. 102)
- Remove the fork legs. (see p. 19)
- Remove the lower triple clamp. (see p. 32)

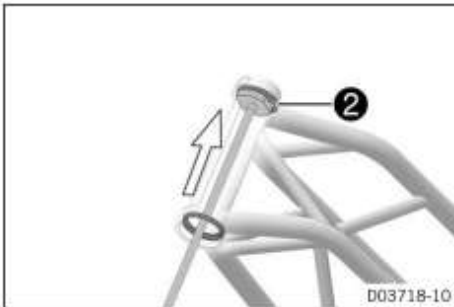
Main work

- Remove the lower bearing race 1 using a suitable tool.





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



- Remove the upper bearing race 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 retainer.
- Grease and mount the new seal ring retainer.
- Mount new bearing.

Finishing work

- Install the lower triple clamp. (☞ p. 33)
- Install the bottom triple clamp cover. (☞ p. 103)
- Install the front wheel. (☞ p. 110)
- Install front fender. (☞ p. 104)
- Check steering head bearing play. (☞ p. 30)
- Remove the vehicle from the center stand. (☞ p. 15)

6.16 Changing the steering damper

Preparatory work

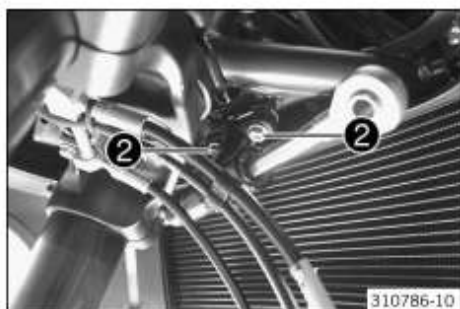
- Remove the bottom triple clamp cover. (p. 102)

Main work

- Remove screw ❶.



- Remove screws ❷.
- Remove the steering damper.
- Position the new steering damper.
- Mount and tighten screws ❷.



Guideline

Screw, steering damper	M6	10 Nm (7.4 lbf ft) Loctite®243™
------------------------	----	---

- Check that the clamp is seated correctly.

Info

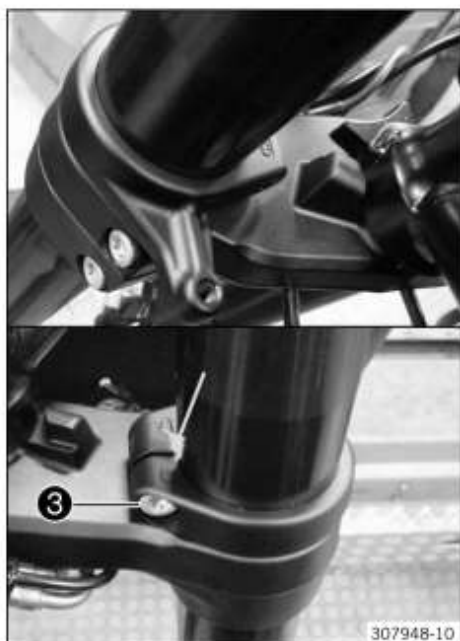
For purposes of illustration, the following operations are shown with the headlight mask deinstalled.

The clamp is aligned with the contour of the lower triple clamp and lies on top of the lower triple clamp.

- If the clamp is not aligned with the contour of the lower triple clamp or does not lie on top of the lower triple clamp:
 - Loosen screw ❸ and the position clamp.
 - Mount and tighten screw ❸.

Guideline

Screw, steering damper clamp	M8	12 Nm (8.9 lbf ft)
------------------------------	----	-----------------------



- Mount and tighten screw ❶.

Guideline

Screw, steering damper	M8	25 Nm (18.4 lbf ft) Loctite®243™
------------------------	----	--



Finishing work

- Install the bottom triple clamp cover. (📖 p. 103)



7.1 Adjusting the basic position of the clutch lever



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



Info

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 Adjusting the handlebar position

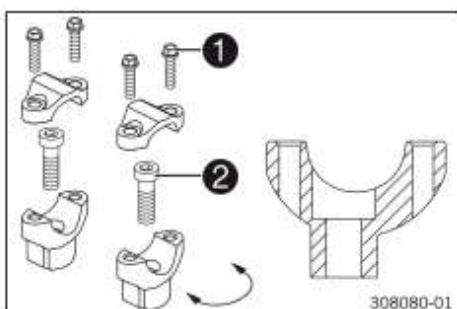


Warning

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**. Remove the handlebar clamps. Remove the handlebar and lay it to one side.



Info

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

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

Guideline

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

Position the left and right handlebar supports evenly.

- Position the handlebar.



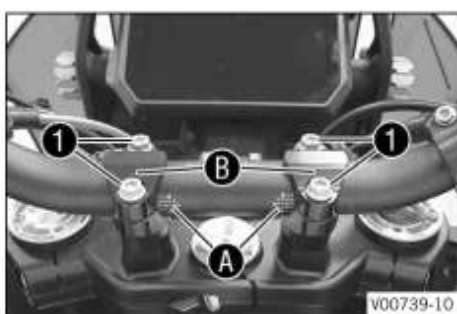
Info

Make sure the cables and wiring are positioned correctly.

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

Guideline

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



- ✓ The markings **A** of the handlebar scale are located centrally between the handlebar clamps.
- ✓ Markings **B** face backwards.

**Info**

Make sure the gap widths are even.

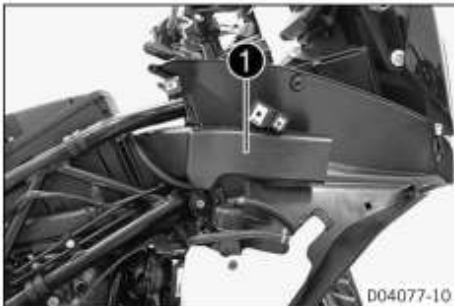
7.3 Changing the throttle grip

Preparatory work

- Remove the passenger seat. (p. 80)
- Remove the front rider's seat. (p. 79)
- Remove the front side cover. (p. 97)
- Remove the fuel tank cover. (p. 98)
- Remove the mask spoiler. (p. 100)
- Remove the fuel tank. (p. 80)

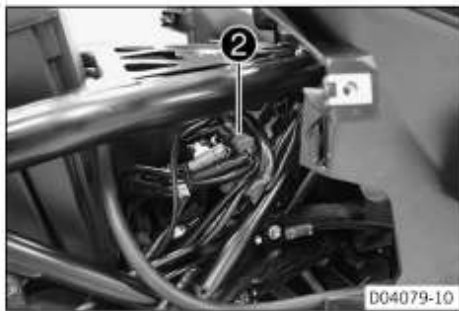
Main work

- Remove intake snorkel **1**.

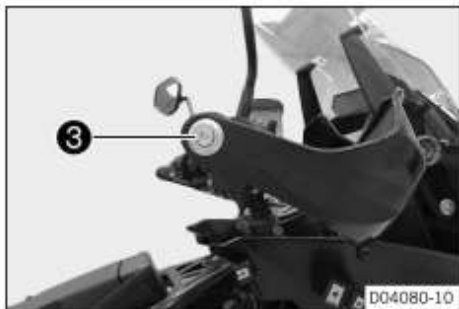


- Remove the cable ties and cable holders.

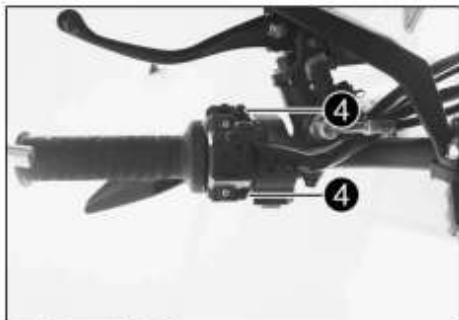
7 HANDLEBAR, CONTROLS



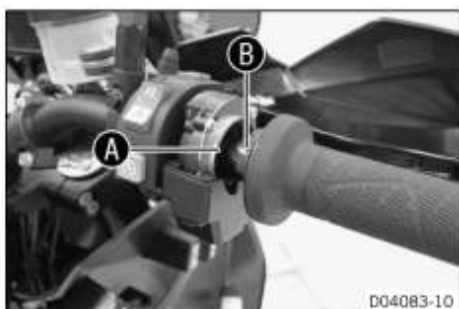
- Remove plug-in connector **2** from the holder and disconnect.



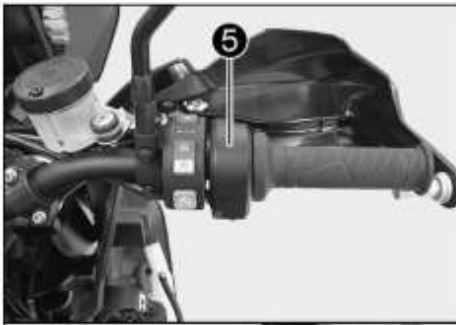
- Loosen screw **3**.
- Push the hand guard slightly to the side.



- Remove screws **4**.
- Take off cover **5**.
- Remove the throttle grip with the sensor unit.



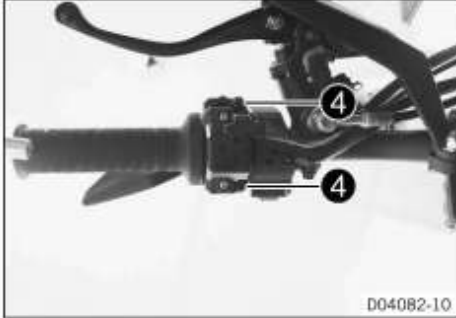
- Position a new throttle grip with a sensor unit.
 - ✓ Holding lug **A** engages in recess **B**.



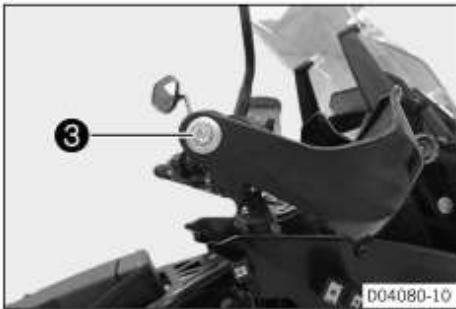
- Position cover 5.
- Mount and tighten screws 4.

Guideline

Remaining screws, chassis	M5	5 Nm (3.7 lbf ft)
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D04082-10

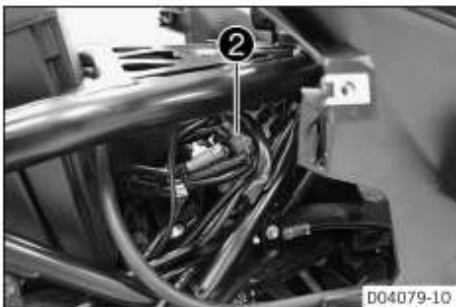


- Position hand guard.
- Tighten screw 3.

Guideline

Screw, handle bar end hand guard	M8	25 Nm (18.4 lbf ft)
----------------------------------	----	---------------------

D04080-10



D04079-10

- Join plug-in connector 2 and position in the holder.



D04078-10



D04077-10

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

- Mount intake snorkel ①.



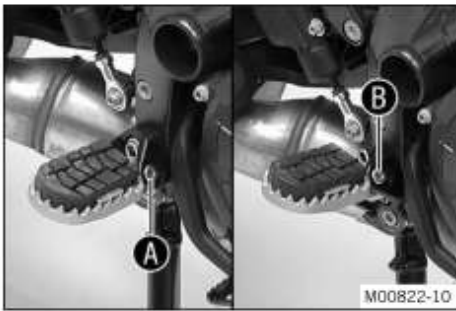
Info

Ensure the gasket is correctly seated.

Finishing work

- Install the fuel tank. (☞ p. 83)
- Install the mask spoiler. (☞ p. 101)
- Install the fuel tank cover. (☞ p. 99)
- Install the front side cover. (☞ p. 97)
- Mount the front rider's seat. (☞ p. 79)
- Mount the passenger seat. (☞ p. 80)

8.1 Rider footrests



The rider footrests can be mounted in one of two positions.

Possible states

- Rider footrests, low **A**
- Rider footrests, high **B**

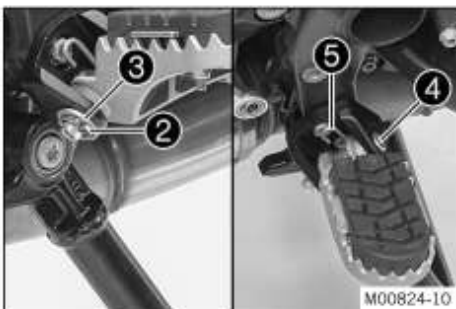
8.2 Adjusting the footrests

i Info

The operations on the footrest brackets are the same for the left and right sides.



- Remove screw **1**.
- ✓ The foot brake lever swings up to the stop.



- Remove pin **2** with washer **3**.
- Carefully remove the pin **4** of the rider footrest.

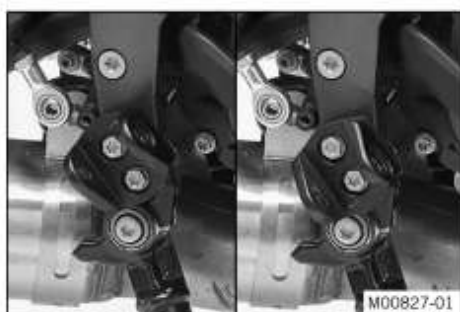
i Info

The spring is under high tension and can pop out when the pin is removed.

- Take off the rider footrest **5** with the spring.



- Remove screws **6**.



- Adjust the footrest bracket to the desired position.



- Mount and tighten screws **6**.

Guideline

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



- Mount the rider footrest with spring **5** and pin **4**.

Footrest spring plier (58429083000) (☞ p. 495)

- Mount the washer **3** and pin **2**.

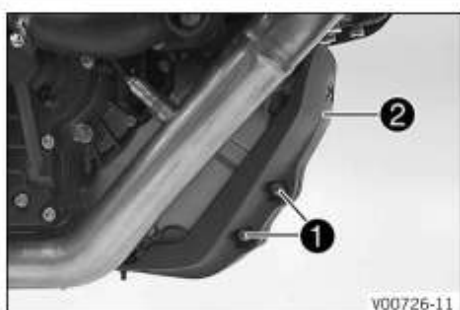


- Position the foot brake lever.
- Mount and tighten screw **1**.

Guideline

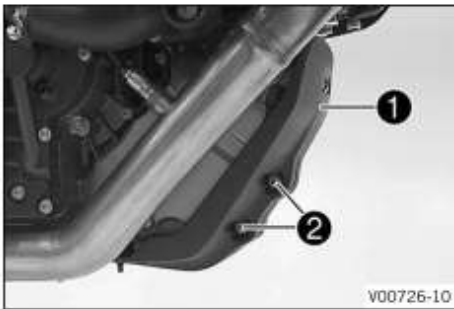
Screw, ball joint of push rod on foot brake cylinder	M6	10 Nm (7.4 lbf ft) Loctite®243™
--	----	---

8.3 Removing the engine guard



- Remove screws **1** with bushings and engine guard **2**.

8.4 Installing the engine guard



- Position engine guard ①, mount screws ② with bushings and tighten.

Guideline

Screw, engine guard	M6	10 Nm (7.4 lbf ft)
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8.5 Checking the frame



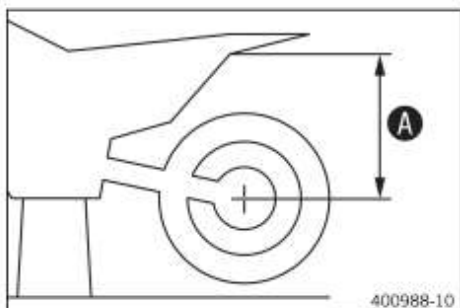
- Check the frame for cracks and deformation.
 - » If the frame exhibits cracks or deformation due to a mechanical impact:
 - Change the frame.



Info

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

9.1 Measuring the rear wheel dimension unloaded



Preparatory work

- Raise the vehicle with the center stand. (p. 15)

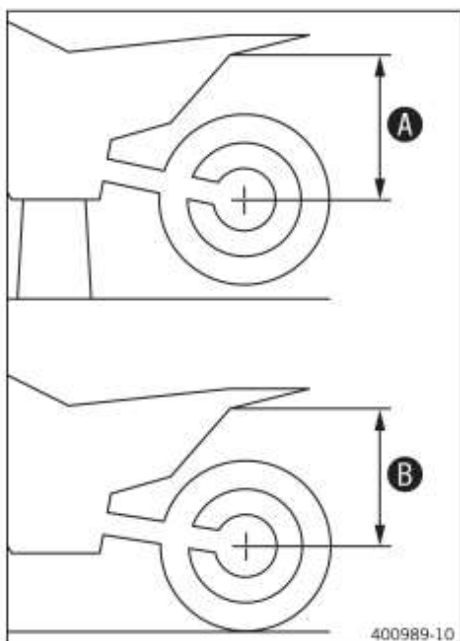
Main work

- Measure distance – as vertical as possible – between rear axle and fixed point, for example, a mark on the rear fairing.
- Note the down value as dimension **A**.

Finishing work

- Remove the vehicle from the center stand. (p. 15)

9.2 Checking the static sag of the shock absorber



- Measure dimension **A** of rear wheel unloaded. (p. 48)
- Hold the motorcycle upright with aid of an assistant.
- Measure the distance between rear axle and fixed point again.
- Note the down value as dimension **B**.

Info

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

- Check the static sag.

Full fuel tank	25 mm (0.98 in)
Empty fuel tank	20 mm (0.79 in)

- » If the static sag is less or more than the specified value:
 - Adjust the spring preload of the shock absorber. (p. 48)

9.3 Adjusting the spring preload of the shock absorber



Condition

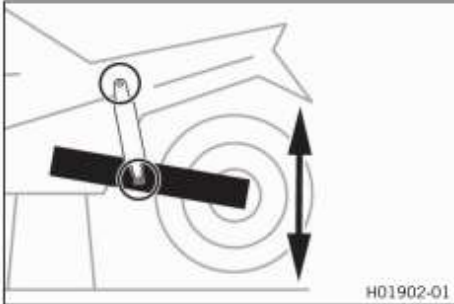
The diagnostic tool is connected and running.

- Execute "Damping system – SCU" > "Functions" > "Adjusting offset for sag".
- Following the instructions in KTM diagnostics tool exactly.

9.4 Checking the heim joint for play

Preparatory work

- Raise the vehicle with the center stand. (☞ p. 15)
- Place a load on the front of the vehicle.
- ✓ The rear wheel is not in contact with the ground.



Main work

- Check the top and bottom heim joints.
- Move the link fork up and down.
 - > If there is detectable play:
 - Change the heim joint. (☞ p. 53)

Finishing work

- Remove the vehicle from the center stand. (☞ p. 15)

9.5 Removing the shock absorber

Preparatory work

- Raise the vehicle with the center stand. (☞ p. 15)
- Remove the passenger seat. (☞ p. 80)
- Remove the front rider's seat. (☞ p. 79)



Main work

- Remove screws ①. Remove the splash protector.



- Remove screw ②.
- Lower the link fork.

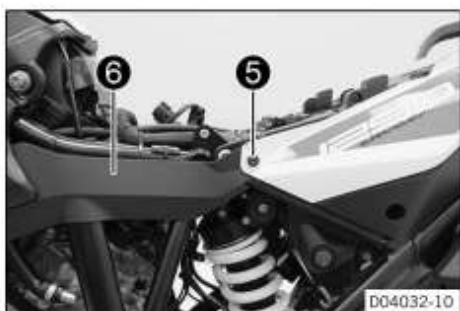
9 SHOCK ABSORBER, LINK FORK



- Disconnect plug-in connector ③.
- Maneuver the wiring harness out.



- Unplug connector ④.



- Remove screw ⑤.
- Lift up heat protector ⑥.

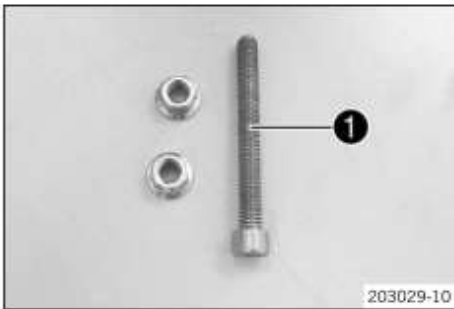


- Remove screw ⑦.
- Lower the shock absorber.



- Remove the shock absorber.

9.6 Installing the shock absorber



Procure tool (screw):

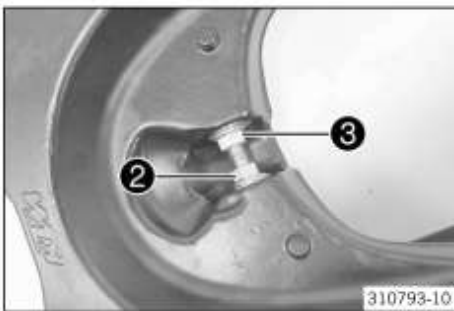
- Procure screw **1** and 2 collar nuts.

Guideline

Screw	M10
Length	≥ 60 mm (≥ 2.36 in)



- Position screw **1** in the drill hole of the link fork.



- Mount both collar nuts **2** and **3** with the collar facing out.
- Hold screw **1**. Tighten collar nut **2** until it is in contact with the link fork.
 - ✓ Screw **1** rests against the link fork at collar nut **3**.
 - ✓ The centering bushing of the shock absorber is pressed into the link fork.
- Remove the screw and the nuts.



- Position the shock absorber.

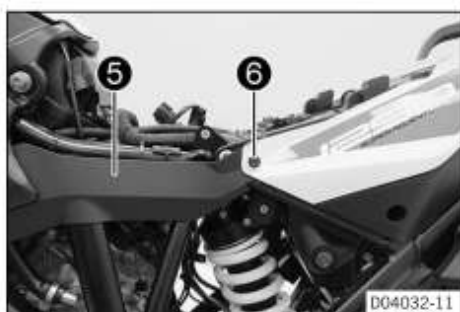


- Mount and tighten screw **4**.

Guideline

Screw, top shock absorber	M14x1.5	80 Nm (59 lbf ft) Thread greased
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9 SHOCK ABSORBER, LINK FORK



- Position heat protector **5**.
- Mount and tighten screw **6**.

Guideline

Screw, cover part	M5	3.5 Nm (2.58 lbf ft)
-------------------	----	-------------------------



- Lift the link fork and position the shock absorber.
- Mount and tighten screw **7**.

Guideline

Screw, bottom shock absorber	M14x1.5	80 Nm (59 lbf ft) Thread greased
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- Position the wiring harness.
- Plug in connector **8**.



- Position the wiring harness.
- Join plug-in connector **9**.



- Position the splash protector.
- Mount and tighten screws **10**.

Guideline

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

Finishing work

- Program the shock absorber control motor. (📖 p. 65)
- Mount the front rider's seat. (📖 p. 79)
- Mount the passenger seat. (📖 p. 80)

- Remove the vehicle from the center stand. (☞ p. 15)

9.7 Changing the heim joint



Info

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

Preparatory work

- Raise the vehicle with the center stand. (☞ p. 15)
- Remove the passenger seat. (☞ p. 80)
- Remove the front rider's seat. (☞ p. 79)
- Remove the shock absorber. (☞ p. 49)

Main work

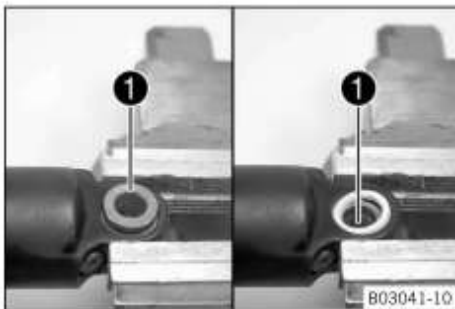
- Clamp the shock absorber into the vise.

Guideline

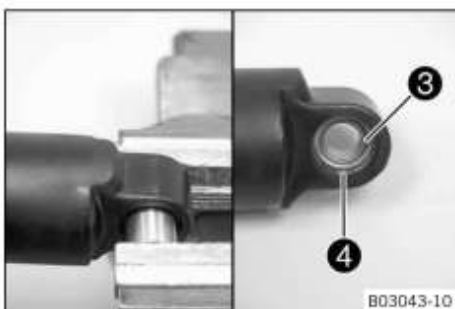
Use soft jaws.

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

Drift (T120) (☞ p. 507)



- Remove seal rings ② on both sides.

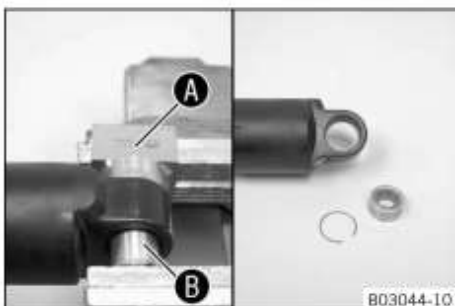


- Press heim joint ③ to the side.

Pressing tool (T1207S) (☞ p. 507)

✓ The heim joint rests against a lock ring.

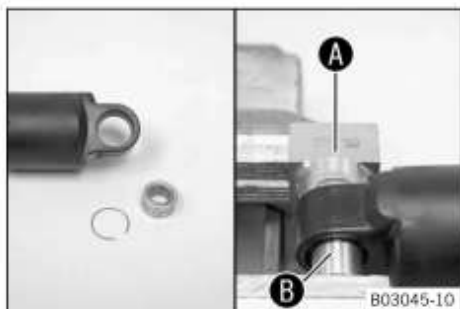
- Remove second lock ring ④.



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

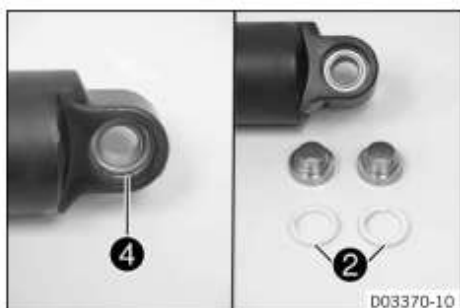
Pressing tool (T1207S) (☞ p. 507)

9 SHOCK ABSORBER, LINK FORK



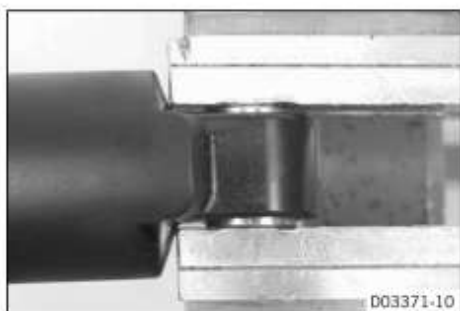
- Place special tool **A** underneath and, using a special tool **B**, press the new heim joint up to the lock ring.

Pressing tool (T1207S) (☞ p. 507)



- Mount second lock ring **4**.
- Mount and grease seal rings **2** on both sides.

Lubricant (T158) (☞ p. 490)



- Press in both collar bushings of the heim joint.

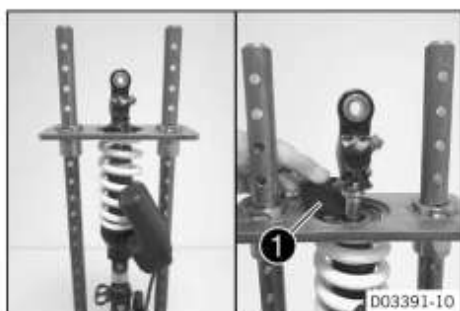
Finishing work

- Install the shock absorber. (☞ p. 51)
- Program the shock absorber control motor. (☞ p. 65)
- Mount the front rider's seat. (☞ p. 79)
- Mount the passenger seat. (☞ p. 80)
- Remove the vehicle from the center stand. (☞ p. 15)

9.8 Removing the spring

Condition

The shock absorber has been removed.



- Clamp the shock absorber into the special tool.

Spring compressor (T14050S) (☞ p. 508)

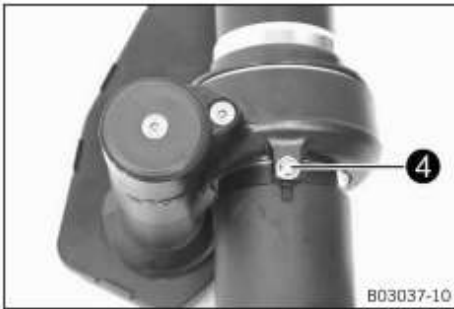
Info

Use a fitting washer of the special tool as a spring pad.

- Compress the spring. Remove spring retainer **1**.



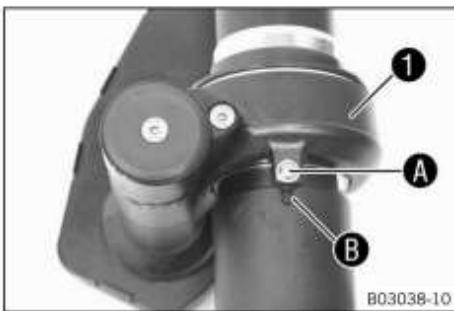
- Release the spring. Unclamp the shock absorber.
- Remove washer **2** and the spring.
- Remove washer **3**.



- Remove the preload adjuster.

i Info
Screw **4** does not need to be loosened.

9.9 Installing the spring



- Mount the preload adjuster **1**.
- ✓ Screw **A** is aligned with recess **B**.



- Mount washer **2**.
- Position spring and washer **3**.



- Clamp the shock absorber into the special tool.

Spring compressor (T14050S) (☞ p. 508)

i Info
Use a fitting washer of the special tool as a spring pad.

- Compress the spring. Mount spring retainer **4**.
- Release the spring. Unclamp the shock absorber.

9.10 Removing the heim joint



Info

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

Condition

The shock absorber has been removed.

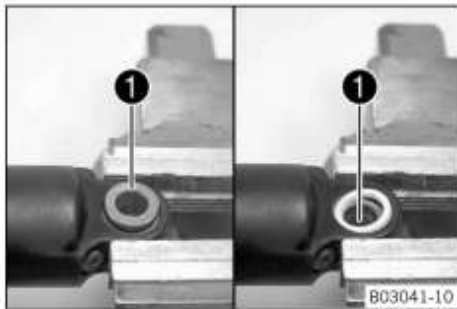
- Clamp the shock absorber into the vise.

Guideline

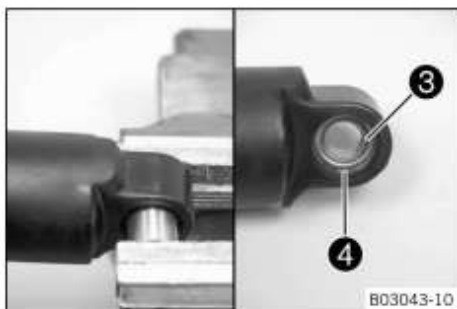
Use soft jaws.

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

Drift (T120) (p. 507)



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

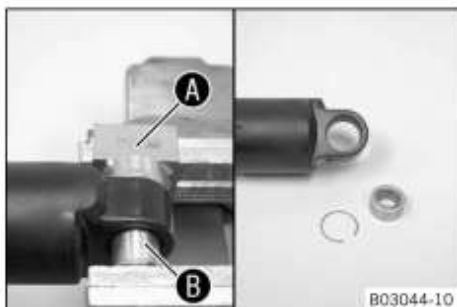


- Press heim joint **3** to the side.

Pressing tool (T1207S) (p. 507)

- ✓ The heim joint rests against a lock ring.

- Remove other lock ring **4**.



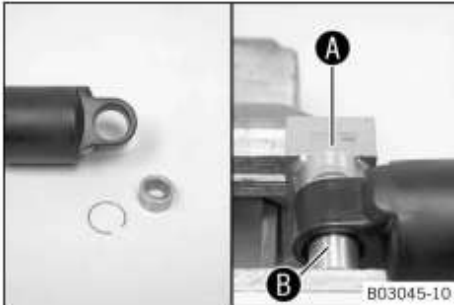
- Place special tool **A** underneath and press out the heim joint with a special tool **B**.

Pressing tool (T1207S) (p. 507)

9.11 Installing the heim joint

i Info

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



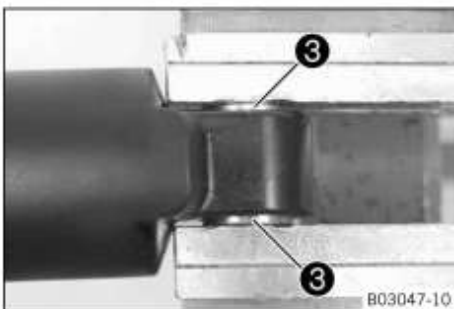
- Place special tool **A** underneath and press out the heim joint up to the lock ring with special tool **B**.

Pressing tool (T1207S) (📖 p. 507)



- Mount a second lock ring **1**.
- Mount seal rings **2** on both sides and grease.

Lubricant (T158) (📖 p. 490)



- Press in both collar bushings **3** of the heim joint.

9.12 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.

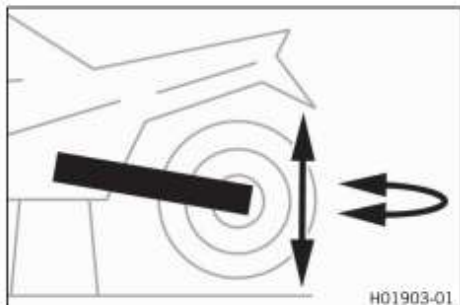
i Info

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

9.13 Checking the fork bearing for play

Preparatory work

- Raise the vehicle with the center stand. (📖 p. 15)
- Place a load on the front of the vehicle.
 - ✓ The rear wheel is not in contact with the ground.



Main work

- Move the link fork up and down.
 - » If there is detectable play:
 - Change the fork bearing. (📖 p. 62)
- Move the link fork from one side to the other.
 - » If there is detectable play:
 - Change the fork bearing. (📖 p. 62)

9.14 Removing the link fork

Preparatory work

- Raise the vehicle with the center stand. (📖 p. 15)
- Remove the rear wheel. (📖 p. 115)

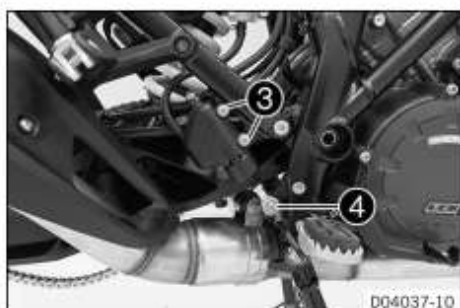


Main work

- Remove screws ❶. Remove the splash protector.



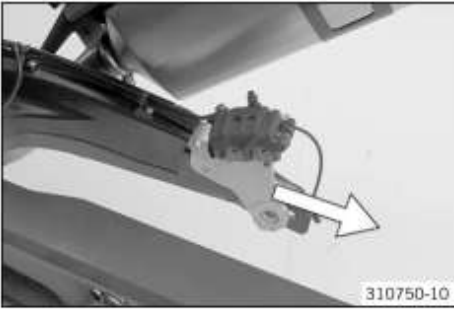
- Remove screw ❷.
- Take off the cable holder.



- Remove screws ❸ with the washers.
- Remove screw ❹.
- Hang the foot brake cylinder to the side.



- Take the brake line out of the holders.



- Pull the brake caliper back and hang it to the side.



- Take the cable out of holders.
- Unplug connector **5**.



- Remove screw **6**.
- Push the link fork down and away from the shock absorber.



- Remove nut **7**.
- Remove the fork pivot.
- Take off the link fork.

9.15 Installing the link fork



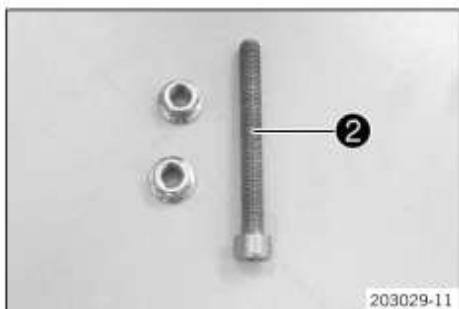
D04041-11

Main work

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

Guideline

Nut, fork pivot	M19x1.5	130 Nm (95.9 lbf ft) Thread greased
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203029-11

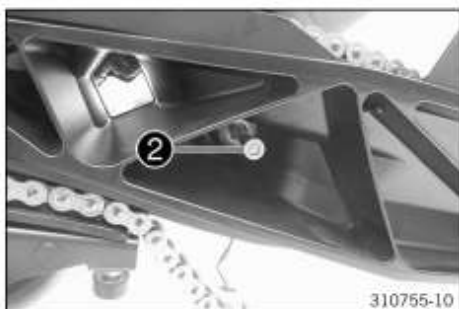
Procure tool (screw):

- Procure screw ② and 2 collar nuts.

Guideline

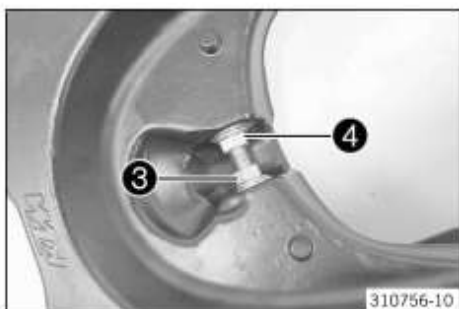
Screw	M10
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Length	≥ 60 mm (≥ 2.36 in)
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310755-10

- Position screw ② in the drill hole of the link fork.



310756-10

- Mount both collar nuts ③ and ④ with the collar facing out.
- Hold screw ②. Tighten collar nut ③ until it is in contact with the link fork.
- ✓ Screw ② rests against the link fork at collar nut ④.
- ✓ The centering bushing of the shock absorber is pressed into the link fork.
- Remove the screw and the nuts.

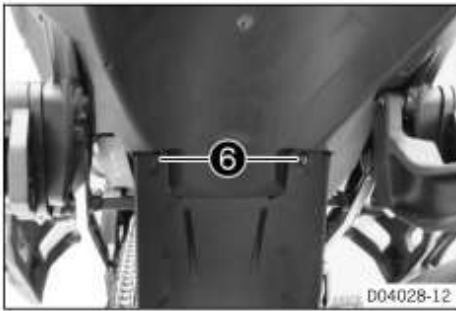


D04040-11

- Lift the link fork and position the shock absorber.
- Mount and tighten screw ⑤.

Guideline

Screw, bottom shock absorber	M14x1.5	80 Nm (59 lbf ft) Thread greased
------------------------------	---------	-------------------------------------



- Position the splash protector.
- Mount and tighten screws ⑥.

Guideline

Remaining screws, chassis	M5	5 Nm (3.7 lbf ft)
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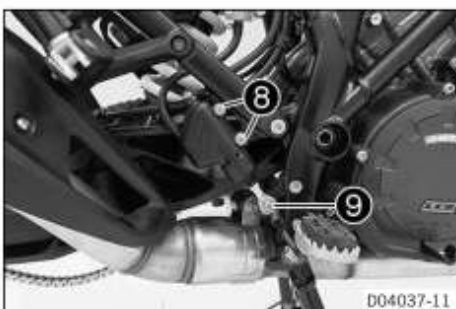
- Plug in connector ⑦.
- Secure the cable in the holders.



- Position the brake caliper.



- Secure the brake line in the holders.



- Position the foot brake cylinder.
- Mount and tighten screws ⑧ with the washers.

Guideline

Screw, foot brake cylinder	M6	10 Nm (7.4 lbf ft) Loctite®243™
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- Mount and tighten screw ⑨.

Guideline

Screw, ball joint of push rod on foot brake cylinder	M6	10 Nm (7.4 lbf ft) Loctite®243™
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9 SHOCK ABSORBER, LINK FORK



- Position the cable holder.
- Mount and tighten screw **10**.

Guideline

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

Finishing work

- Install the rear wheel. (☞ p. 116)
- Adjust the chain tension. (☞ p. 121)
- Remove the vehicle from the center stand. (☞ p. 15)
- Program the link fork position sensor. (☞ p. 66)

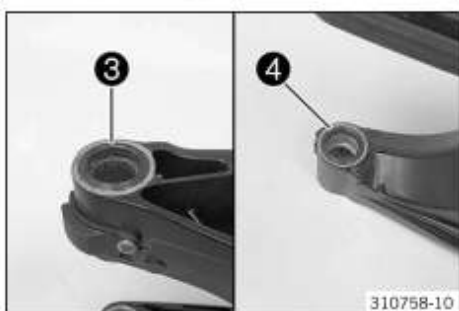
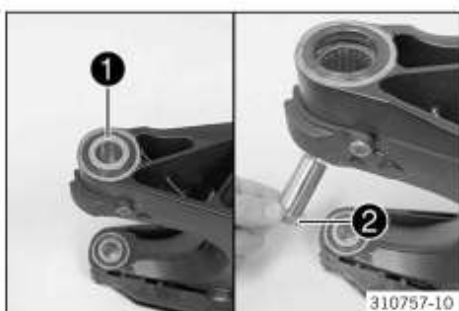
9.16 Changing the fork bearing

Preparatory work

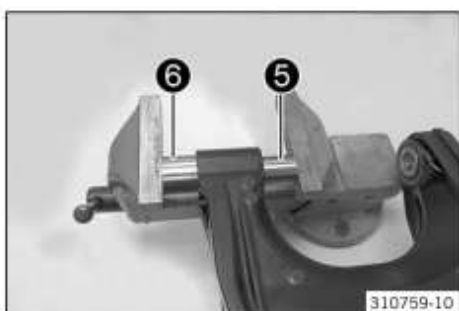
- Raise the vehicle with the center stand. (☞ p. 15)
- Remove the rear wheel. (☞ p. 115)
- Remove the link fork. (☞ p. 58)

Right fork bearing

- Remove outer collar bushing **1**.
- Remove inner collar bushing **2** together with bushing.



- Remove shaft seal rings **3** and **4**.



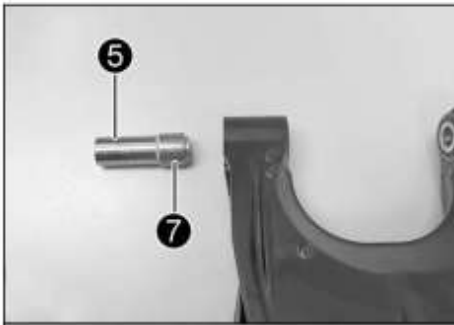
- Position special tool **5** in the needle bearing from the inside.

Pressing tool (61329004100) (☞ p. 502)

- Position special tool **6** on the link fork from the outside.

Pressing tool (61329004200) (☞ p. 502)

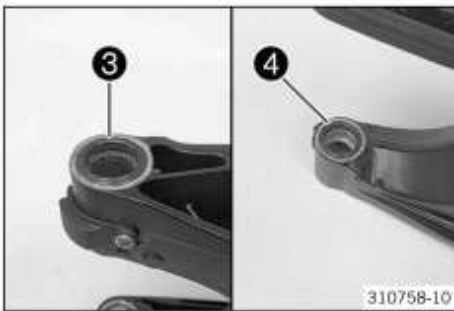
- Push out the needle bearing.



- Position new needle bearing **7** on the special tool **5**.

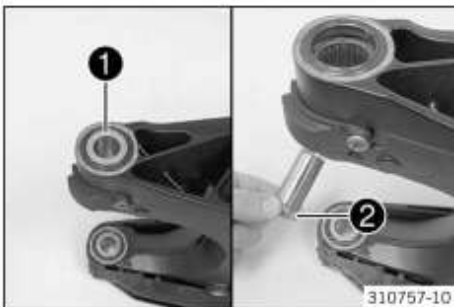
Pressing tool (61329004100) (p. 502)

- Position the special tool with the bearing on the link fork from outside.
- Push in the needle bearing until it is flush.



- Grease new shaft seal rings **3** and **4** and press in until they are flush.

Long-life grease (p. 490)

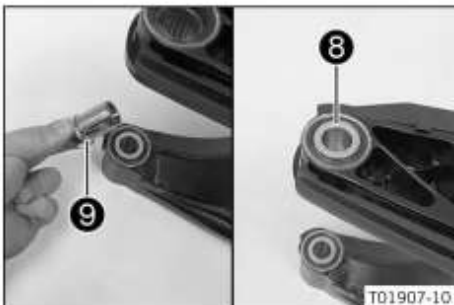


- Grease the needle bearing.

Long-life grease (p. 490)

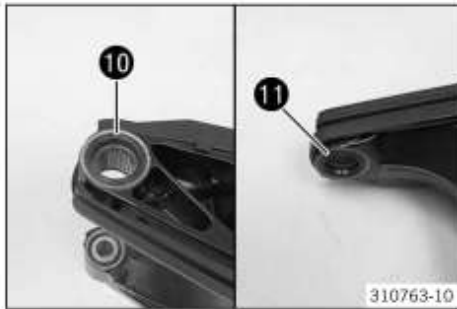
- Mount inner collar bushing **2** together with the bushing.
- Mount outer collar bushing **1**.

Left fork bearing

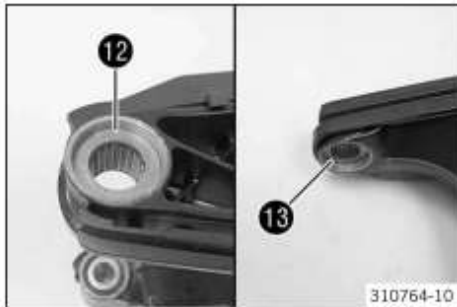


- Remove outer collar bushing **8**.
- Remove inner collar bushing **9** together with bushing.

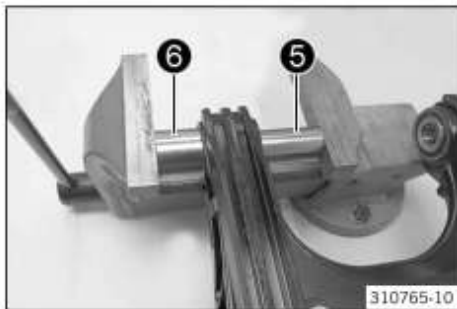
9 SHOCK ABSORBER, LINK FORK



- Remove shaft seal rings **10** and **11**.



- Remove stop disks **12** and **13**.



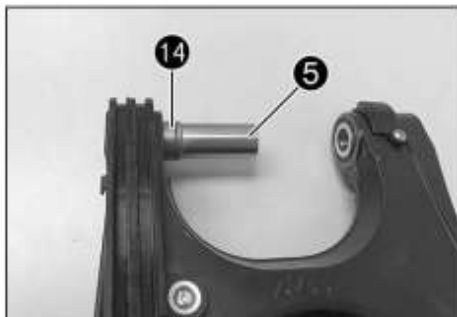
- Position special tool **5** in the needle bearing.

Pressing tool (61329004100) (p. 502)

- Position special tool **6** in the link fork.

Pressing tool (61329004200) (p. 502)

- Push out the needle bearing.



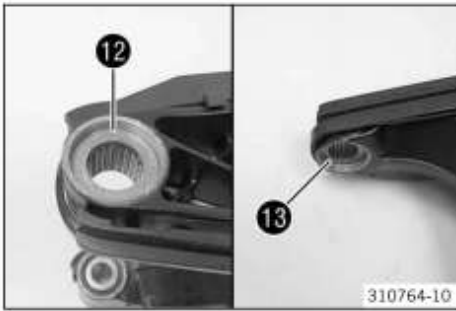
- Position new needle bearing **14** on the special tool **5**.

Pressing tool (61329004100) (p. 502)

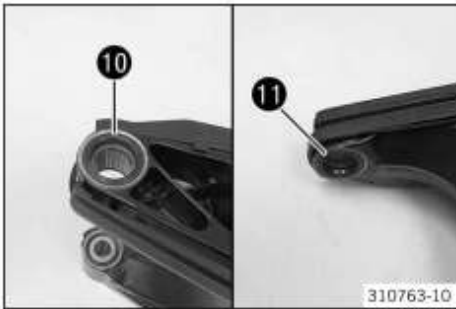
- Position the special tool with bearing on the link fork.

- Push in the needle bearing until it is flush.



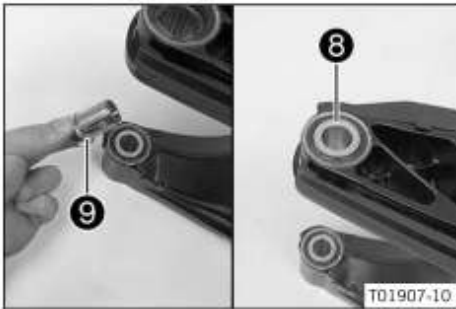


- Position stop disks 12 and 13.



- Grease new shaft seal rings 10 and 11 and press in until they are flush.

Long-life grease (see p. 490)



- Grease the needle bearing.
- Mount inner collar bushing 9 together with the bushing.
- Mount outer collar bushing 8.

Long-life grease (see p. 490)

Finishing work

- Install the link fork. (see p. 60)
- Install the rear wheel. (see p. 116)
- Adjust the chain tension. (see p. 121)
- Remove the vehicle from the center stand. (see p. 15)
- Program the link fork position sensor. (see p. 66)

9.17 Programming the shock absorber control motor

Condition

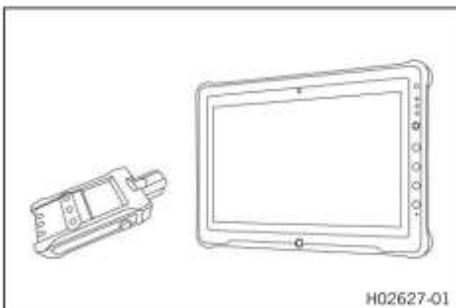
The diagnostic tool is connected and running.

- Execute "Damping system" > "Functions" > "Factory calibration".

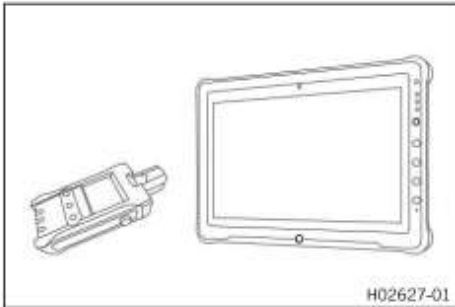
Info

The instructions must be followed precisely.

- Clear the fault memory using the KTM diagnostics tool.
 - » Take a test ride.
 - Read out the trouble code memory using the KTM diagnostics tool.



9.18 Programming the link fork position sensor



Condition

The diagnostic tool is connected and running.

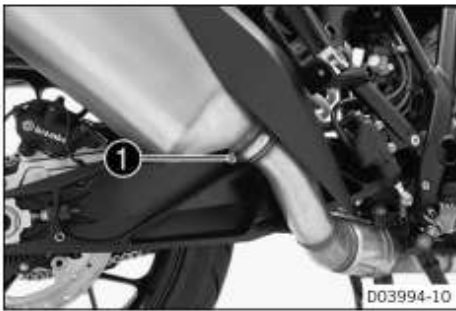
- Execute "**Damping system**" > "**Functions**" > "**Rear suspension travel sensor calibration**".

Info

The instructions must be followed precisely.

- Clear the fault memory using the KTM diagnostics tool.
 - » Take a test ride.
 - Read out the trouble code memory using the KTM diagnostics tool.

10.1 Removing main silencer



- Remove screw **1**.
- Take off the exhaust clamp.



- Remove screw **2** with the washer.
- Take off the main silencer with the main silencer clamp.

10.2 Installing the main silencer



- Position the main silencer with the main silencer clamp.
- Mount screw **1** with the washer, but do not tighten yet.

Guideline

Screw, exhaust clamp	M8	25 Nm (18.4 lbf ft)
----------------------	----	---------------------



- Position the exhaust clamp.
- Mount and tighten screw **2**.

Guideline

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



- Tighten screw **1**.

Guideline

Screw, exhaust clamp	M8	25 Nm (18.4 lbf ft)
----------------------	----	---------------------

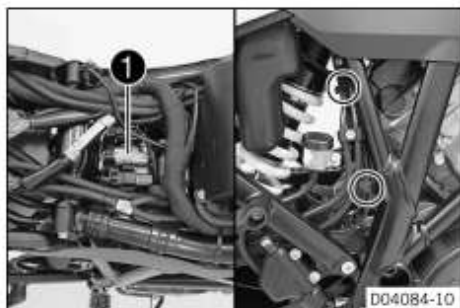
10.3 Removing the manifold

Preparatory work

- Remove main silencer. (p. 67)
- Remove the passenger seat. (p. 80)
- Remove the front rider's seat. (p. 79)
- Remove the front side cover. (p. 97)
- Remove the fuel tank cover. (p. 98)
- Remove the mask spoiler. (p. 100)
- Remove the fuel tank. (p. 80)

Main work

- Pull off plug-in connector **1** from plug holder and disconnect.
- Remove the cable ties and expose the cable.



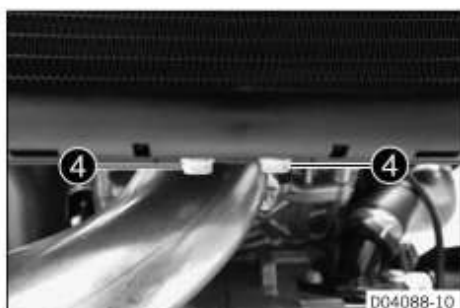
- Disconnect plug-in connector **2**.
- Expose the cable.

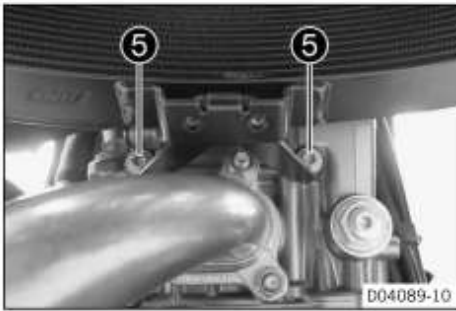


- Remove screw **3**.
- Take off the exhaust clamp.

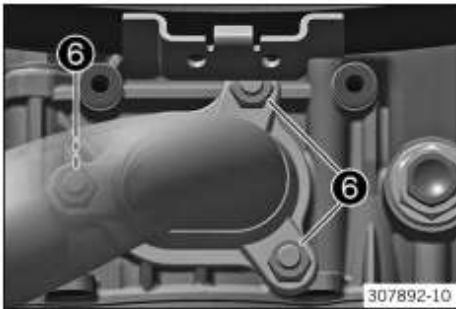


- Remove screws **4**.
- Remove the fuel line with the guide.





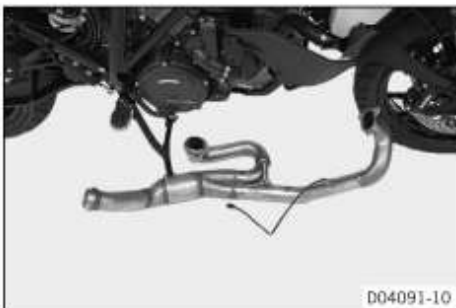
- Remove screws **5**.
- Take off the retaining bracket.



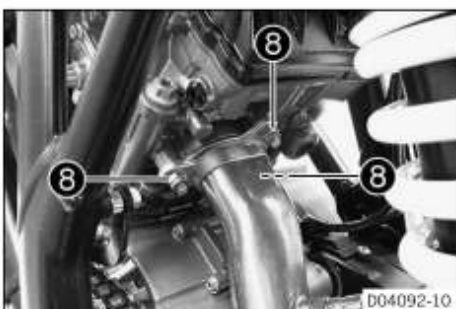
- Remove nuts **6**.



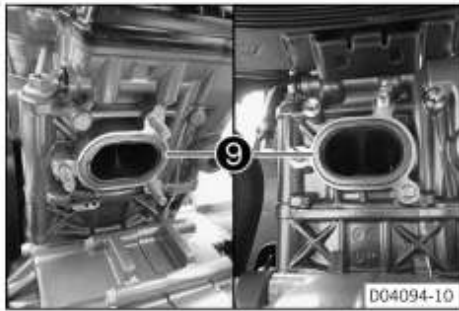
- Remove screw **7**.



- Lower manifold and take off in a forward direction.

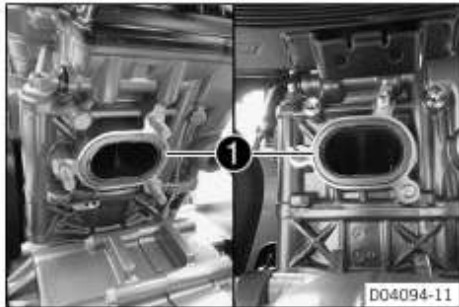


- Remove nuts **8**.
- Remove the manifold in a downward direction.



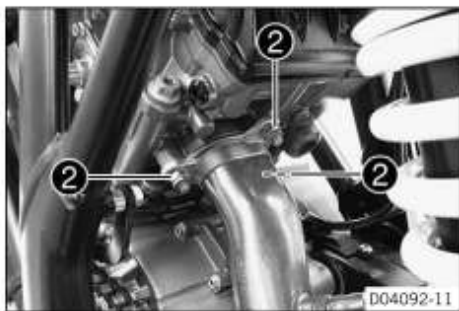
- Remove exhaust gaskets **9**.

10.4 Installing the manifold



Main work

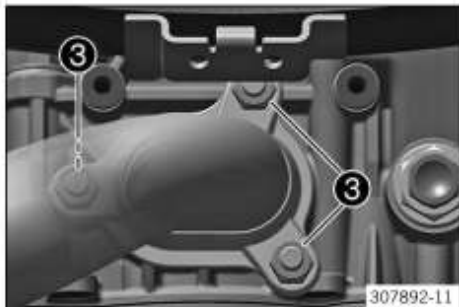
- Position exhaust gaskets **1**.



- Position the manifold from below.
- Mount nuts **2** but do not tighten yet.

Guideline

Nut, manifold on cylinder head	M8	Tightening sequence: Tighten the nuts evenly. Do not bend the metal. 25 Nm (18.4 lbf ft)
--------------------------------	----	--



- Position manifold to the front.
- Mount nuts **3** but do not tighten yet.

Guideline

Nut, manifold on cylinder head	M8	Tightening sequence: Tighten the nuts evenly. Do not bend the metal. 25 Nm (18.4 lbf ft)
--------------------------------	----	--



- Mount and tighten screw **4**.

Guideline

Screw, exhaust clamp	M8	25 Nm (18.4 lbf ft)
----------------------	----	---------------------



- Position the exhaust clamp.
- Mount and tighten screw **5**.

Guideline

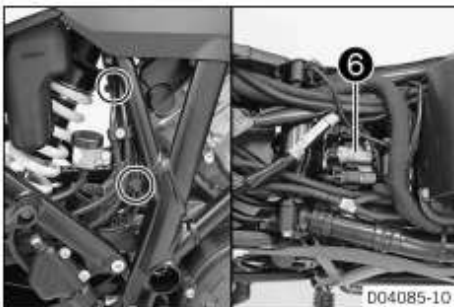
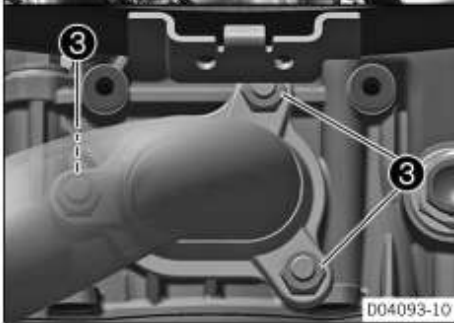
Screw, exhaust clamp	M6	8 Nm (5.9 lbf ft)
----------------------	----	-------------------



- Tighten nuts **2** and **3**.

Guideline

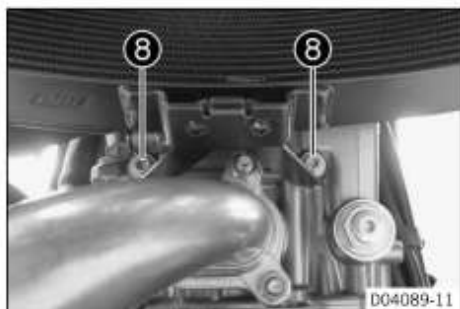
Nut, manifold on cylinder head	M8	Tightening sequence: Tighten the nuts evenly. Do not bend the metal. 25 Nm (18.4 lbf ft)
--------------------------------	----	--



- Route the cable without tension and secure with cable ties.
- Join the plug-in connector **6** and position in the plug holder.



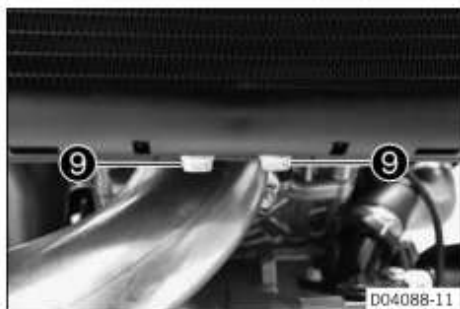
- Route the cable without tension.
- Join plug-in connector **7**.



- Position the retaining bracket.
- Mount and tighten screws **8**.

Guideline

Screw, cooler retaining bracket	M6	7 Nm (5.2 lbf ft)
---------------------------------	----	-------------------



- Position the fuel hose with the guide.
- Mount and tighten screws **9**.

Guideline

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

Finishing work

- Install the fuel tank. (📖 p. 83)
- Install the mask spoiler. (📖 p. 101)
- Install the fuel tank cover. (📖 p. 99)
- Install the front side cover. (📖 p. 97)
- Mount the front rider's seat. (📖 p. 79)
- Mount the passenger seat. (📖 p. 80)
- Install the main silencer. (📖 p. 67)

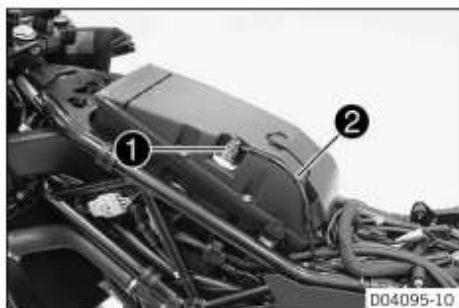
11.1 Removing the upper part of the air filter box

Preparatory work

- Remove the passenger seat. (p. 80)
- Remove the front rider's seat. (p. 79)
- Remove the front side cover. (p. 97)
- Remove the fuel tank cover. (p. 98)
- Remove the mask spoiler. (p. 100)
- Remove the fuel tank. (p. 80)

Main work

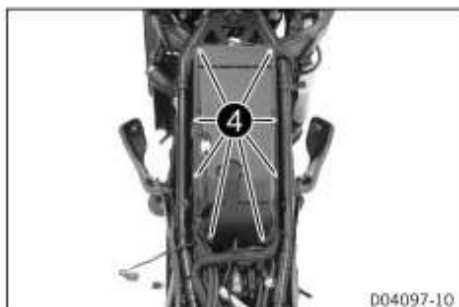
- Detach connector ①.
- Expose cable ②.



- Push back hose clip ③.
- Pull off the vent hose.



- Remove screws ④.
- Remove the upper part of the air filter box.



11.2 Changing the air filter, cleaning the air filter box

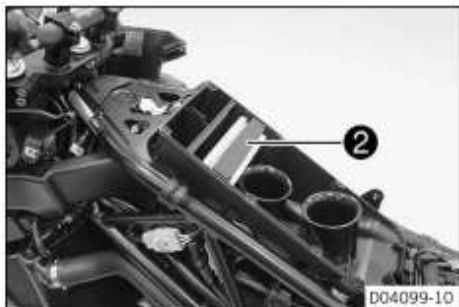
Preparatory work

- Remove the passenger seat. (p. 80)
- Remove the front rider's seat. (p. 79)
- Remove the front side cover. (p. 97)
- Remove the fuel tank cover. (p. 98)
- Remove the mask spoiler. (p. 100)
- Remove the fuel tank. (p. 80)
- Remove the upper part of the air filter box. (p. 73)

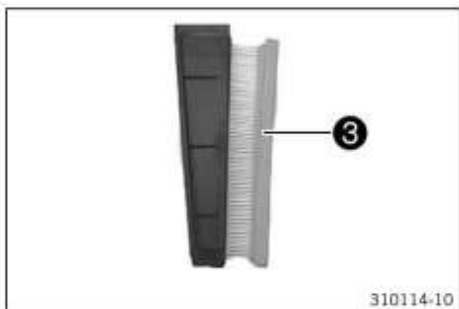


Main work

- Remove air filter clamping wedge **1** toward the top.



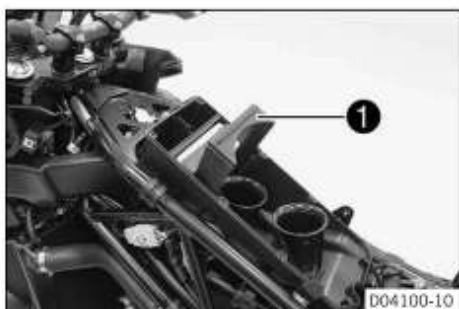
- Remove air filter frame **2** with the air filter.



- Clean the air filter box.
- Position the new air filter **3** in the air filter frame.



- Position air filter frame **2** in the lower section of the air filter box together with the air filter.
 - ✓ The broad side of the air filter frame faces the engine.



- Mount air filter clamping wedge **1**.
 - ✓ The narrow side of the air filter clamping wedge faces the engine.

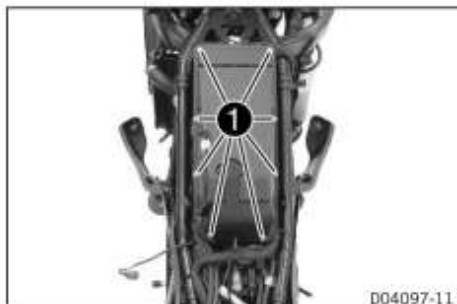
Finishing work

- Install the upper part of the air filter box. (☞ p. 75)
- Install the fuel tank. (☞ p. 83)
- Install the mask spoiler. (☞ p. 101)
- Install the fuel tank cover. (☞ p. 99)

- Install the front side cover. (p. 97)
- Mount the front rider's seat. (p. 79)
- Mount the passenger seat. (p. 80)



11.3 Installing the upper part of the air filter box

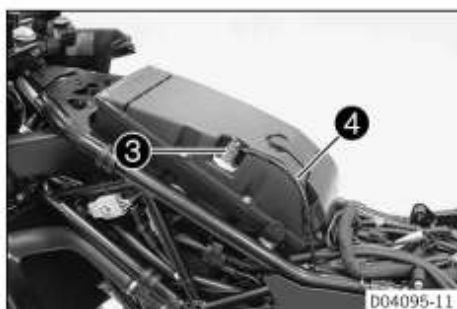


Main work

- Position the upper part of the air filter box.
- Mount and tighten screws ①.



- Mount the vent hose.
- Position hose clip ②.



- Plug in connector ③.
- Position cable ④.

Finishing work

- Install the fuel tank. (p. 83)
- Install the mask spoiler. (p. 101)
- Install the fuel tank cover. (p. 99)
- Install the front side cover. (p. 97)
- Mount the front rider's seat. (p. 79)
- Mount the passenger seat. (p. 80)



11.4 Removing the air filter box

Preparatory work

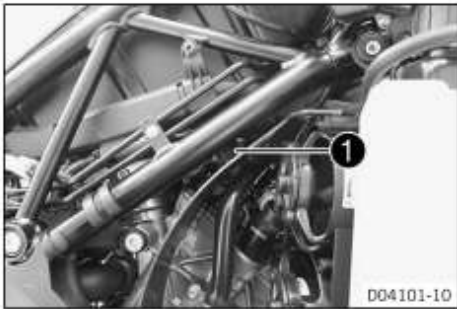
- Remove the passenger seat. (p. 80)
- Remove the front rider's seat. (p. 79)
- Remove the front side cover. (p. 97)
- Remove the fuel tank cover. (p. 98)
- Remove the mask spoiler. (p. 100)
- Remove the fuel tank. (p. 80)
- Remove the upper part of the air filter box. (p. 73)

Main work

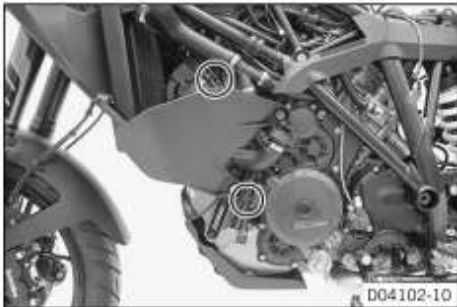
- Remove spring band clamp **1**.

Spring band clamps plier (60029057100) (p. 497)

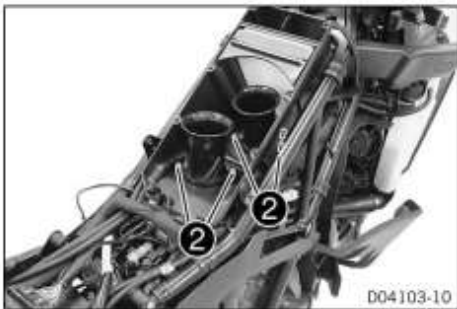
- Pull off the air release hose.



- Remove the cable ties.



- Remove screws **2** with bushings.
- Take off the intake trumpets.

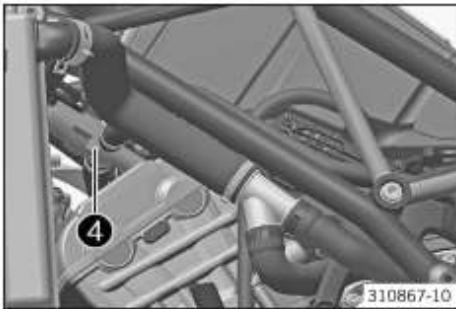


- Press intake snorkel **3** forwards out of the air filter box.





- Raise the lower part of the air filter box and pull it back gently.

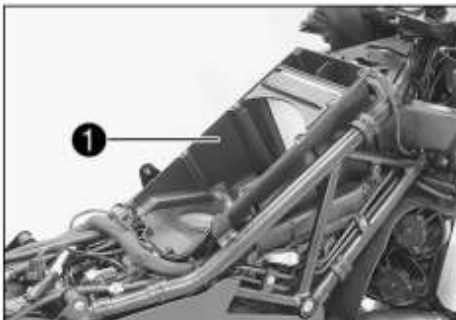


- Remove SAS valve 4 from the holder.



- Take off the lower part of the air filter box.

11.5 Installing the lower part of the air filter box



Main work

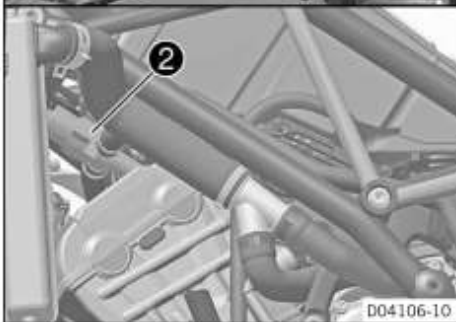
- Position the lower part of air filter box 1 in the frame.

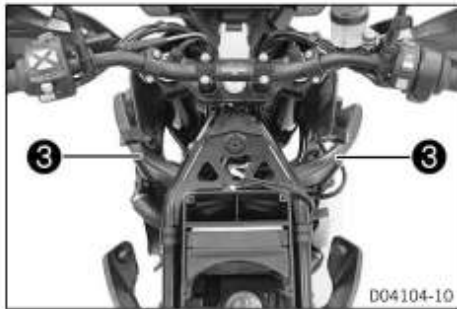


Info

Ensure that the O-rings are seated correctly.

- Mount SAS valve 2 on the holder.



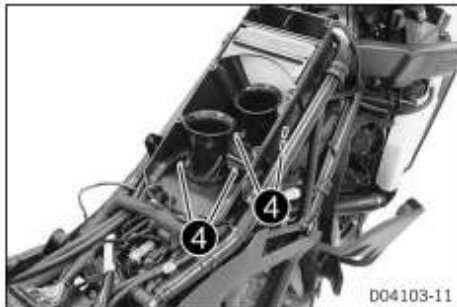


- Position intake snorkel **3**.



Info

Ensure that the seals are seated correctly.



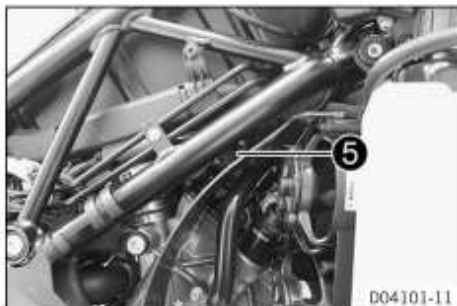
- Position the intake trumpets and mount and tighten screws **4** with the bushings.

Guideline

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



- Route the hose without kinks and secure it with cable ties.



- Mount the vent hose.
- Position spring band clamp **5** with special tool.

Spring band clamps plier (60029057100) (p. 497)

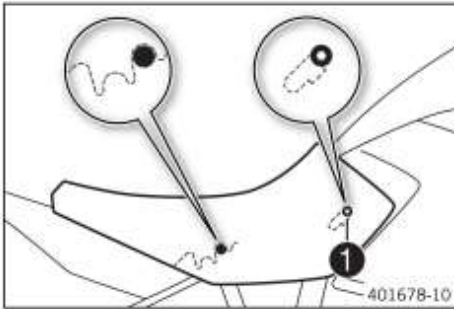
Finishing work

- Install the upper part of the air filter box. (p. 75)
- Install the fuel tank. (p. 83)
- Install the mask spoiler. (p. 101)
- Install the fuel tank cover. (p. 99)
- Install the front side cover. (p. 97)
- Mount the front rider's seat. (p. 79)
- Mount the passenger seat. (p. 80)

12.1 Setting the front rider's seat

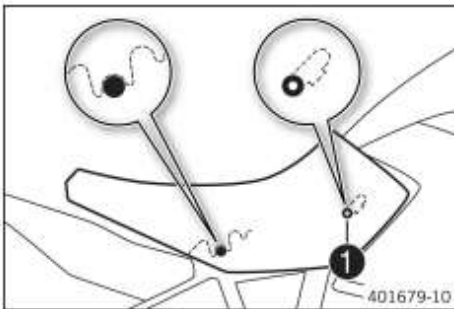
Preparatory work

- Remove the passenger seat. (p. 80)



Lower the front rider's seat:

- Attach the front rider's seat to the fuel tank at the recesses ①, and push the front rider's seat down and forward at the same time.



Raise the front rider's seat:

- Attach the front rider's seat to the fuel tank at the recesses ①, and push the rider's seat up and forward at the same time.
- Finally, check that the front rider's seat is correctly mounted.

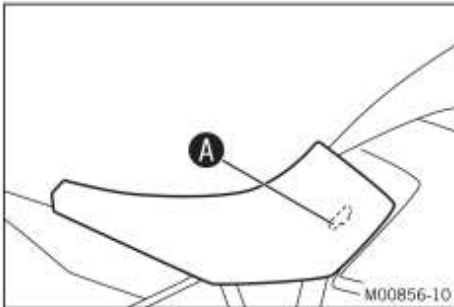
Finishing work

- Mount the passenger seat. (p. 80)

12.2 Removing the front rider's seat

Preparatory work

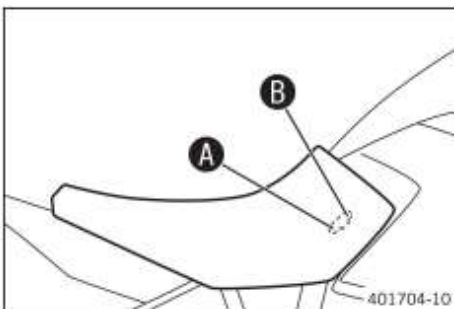
- Remove the passenger seat. (p. 80)



Main work

- Lift the rider's seat back and unhook in the A area.

12.3 Mounting the front rider's seat



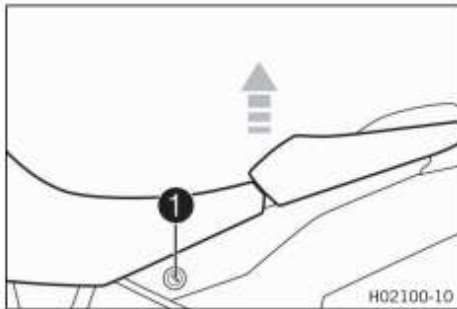
Main work

- Attach the recesses on the front rider's seat to the fuel tank at the desired seat position A or B, and push the front rider's seat forward while lowering it at the rear.
- Finally, check that the front rider's seat is correctly mounted.

Finishing work

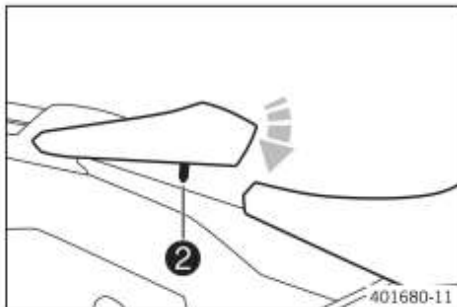
- Mount the passenger seat. (📖 p. 80)

12.4 Removing the passenger seat



- Insert the Race-on key or the black ignition key into the seat lock ❶ and turn clockwise.
- Raise the front of the passenger seat, pull toward the fuel tank, and take off from above.
- Remove the ignition key.

12.5 Mounting the passenger seat



- Attach the hooks on the passenger seat ❶ to the hanger on the subframe.

i Info

Ensure that the seat heating cable is correctly routed.

- Lower the front of the passenger seat and push it toward the rear at the same time.
- Position locking pin ❷ in the lock housing and press the passenger seat forward until the locking pin engages with an audible click.
- Check that the passenger seat is mounted correctly.

12.6 Removing the fuel tank



Danger

Fire hazard Fuel is highly flammable.

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

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



Warning

Danger of poisoning Fuel is poisonous and a health hazard.

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

Preparatory work

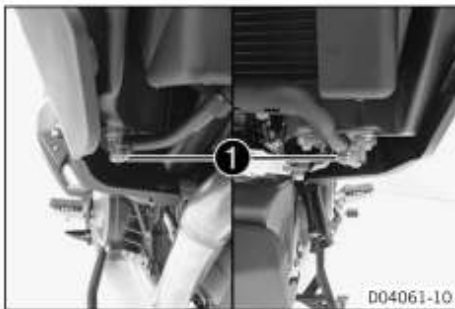
- Remove the passenger seat. (see p. 80)
- Remove the front rider's seat. (see p. 79)
- Remove the front side cover. (see p. 97)
- Remove the fuel tank cover. (see p. 98)
- Remove the mask spoiler. (see p. 100)

Main work

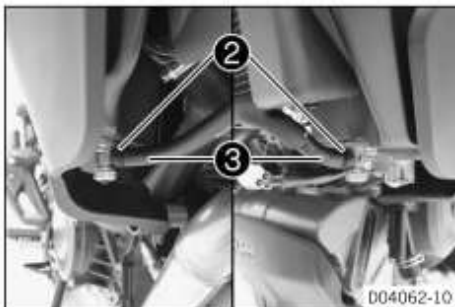
- Remove the cable tie(s).



- Close fuel cocks ①.



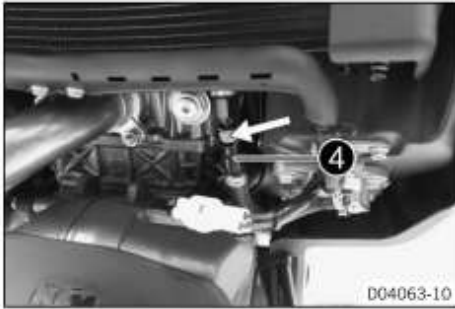
- Push back hose clips ② and remove fuel hose ③.



Info

Remaining fuel may flow out of the fuel hose.

12 FUEL TANK, SEAT, TRIM



- Thoroughly clean the plug-in connection of the fuel line using compressed air.



Info

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

- Press on the small metal plate and disconnect fuel hose connection 4.



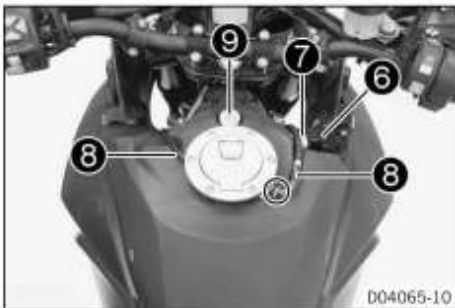
Info

Remaining fuel may flow out of the fuel hose.

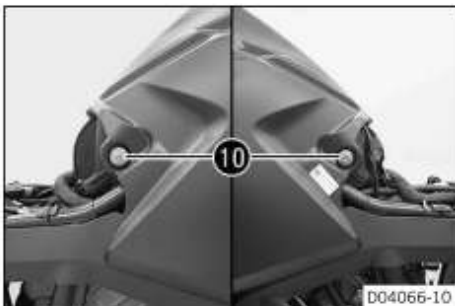
- Assemble the wash cap set.

Wash cap set (81212016000)

- Disconnect plug-in connector 5.



- Remove the cable tie(s).
- Unplug connector 6.
- Disconnect plug-in connector 7.
- Detach vent hose 8.
- Remove screw 9 with bearing sleeve and rubber bushings.



- Remove screws 10 with the bushings on both sides.



- Remove screws 11 on both sides.
- Take off the fuel tank.

i Info
Pay attention to the inside cover.

12.7 Installing the fuel tank



Danger

Fire hazard Fuel is highly flammable.

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

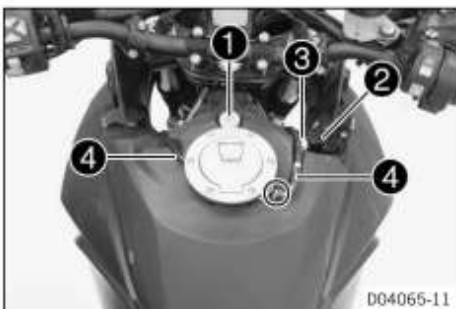
- Do not refuel the vehicle in the vicinity of open flames or lit cigarettes.
- Switch off the engine for refueling.
- Make sure that no fuel is spilled; particularly not on hot parts of the vehicle.
- If any fuel is spilled, wipe it off immediately.
- Observe the specifications for refueling.



Warning

Danger of poisoning Fuel is poisonous and a health hazard.

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



Main work

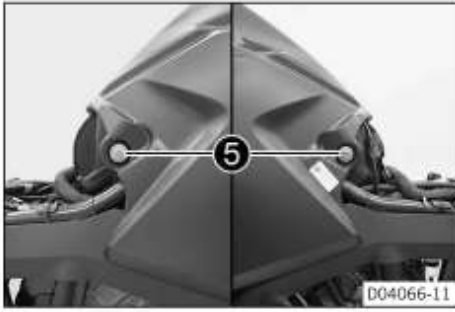
- Position the fuel tank.
- Mount and tighten screw 1 with bearing sleeve and rubber bushings.

Guideline

Screw, fuel tank	M8	15 Nm (11.1 lbf ft)
------------------	----	---------------------

- Plug in connector 2.
- Join plug-in connector 3.
- Mount vent hoses 4.
- Mount the cable ties.

12 FUEL TANK, SEAT, TRIM



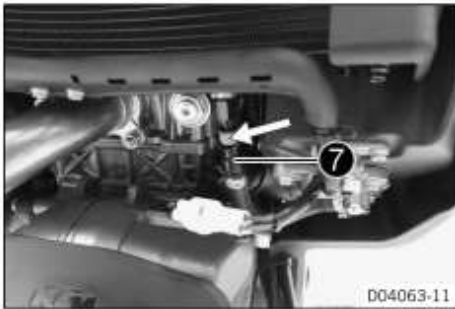
- Mount and tighten screws **5** with bushings.

Guideline

Screw, fuel tank	M6	10 Nm (7.4 lbf ft)
------------------	----	--------------------



- Join plug-in connector **6**.

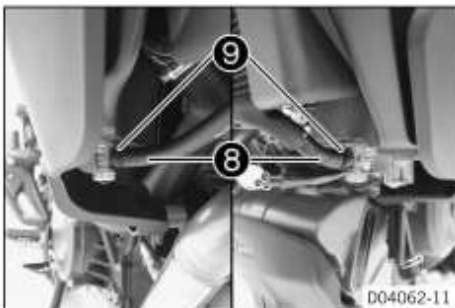


- Remove the wash cap set.
- Thoroughly clean the plug-in connection of the fuel line using compressed air.

i Info

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

- Join fuel hose connection **7**.



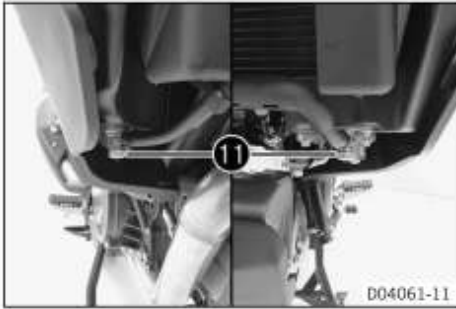
- Mount fuel hose **8**.
- Position hose clips **9**.



- Mount and tighten screws **10** on both sides.

Guideline

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



- Open fuel cocks 11.



- Mount the cable ties.

Finishing work

- Install the mask spoiler. (p. 101)
- Install the fuel tank cover. (p. 99)
- Install the front side cover. (p. 97)
- Mount the front rider's seat. (p. 79)
- Mount the passenger seat. (p. 80)

12.8 Checking the fuel pressure



Danger

Fire hazard Fuel is highly flammable.

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

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



Warning

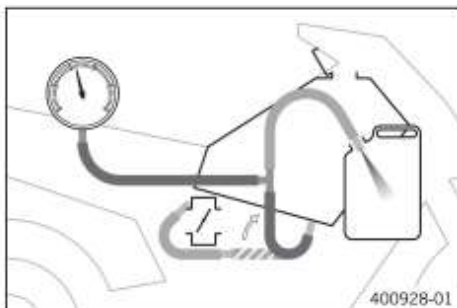
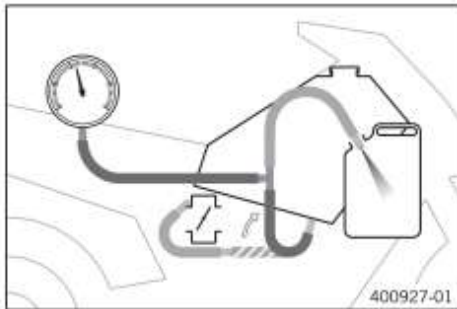
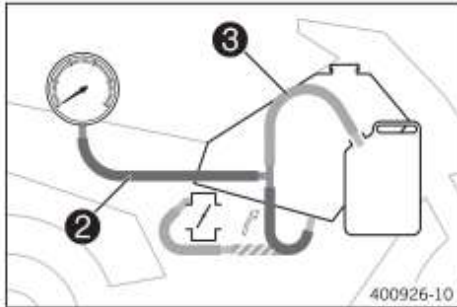
Danger of poisoning Fuel is poisonous and a health hazard.

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

Condition

The fuel tank is completely full.

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



The ignition is off.
The diagnostic tool is connected.

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



Info

Remaining fuel may flow out of the fuel hose.

- Mount special tool **2**.

Pressure testing tool (61029094000) (see p. 498)
--

- Mount special tool **3** with nozzle code **1,05**.

Testing hose (61029093000) (see p. 498)

- Position the hose end in a fuel can.

Guideline

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

- Connect the diagnostic tool and start it.
- Execute **"Engine Electronics" > "Actuator Test" > "Function test 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. (see p. 89)
 - Change the fuel pump. (see p. 87)

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



- Thoroughly clean the plug-in connection of the fuel line using compressed air.

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

- Join fuel hose connection ①.

12.9 Changing the fuel pump



Danger

Fire hazard Fuel is highly flammable.

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

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



Warning

Danger of poisoning Fuel is poisonous and a health hazard.

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

Preparatory work

- Drain the fuel from the fuel tank into a suitable container.

Main work

- Thoroughly clean the plug-in connection of the fuel line using compressed air.

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

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

i Info
Remaining fuel may flow out of the fuel hose.

- Assemble the wash cap set.

Wash cap set (81212016000)

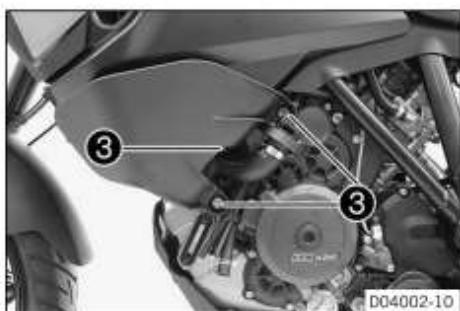




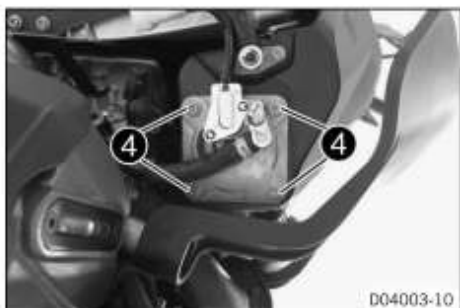
- Remove the cable ties.



- Disconnect plug-in connector 2.



- Remove screws 3.
- Hang the tank guard to one side.



- Remove screws 4.
- Pull out the fuel pump.



Info

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

- Position a new fuel pump with O-ring in the fuel tank.
- Mount and tighten screws 4.

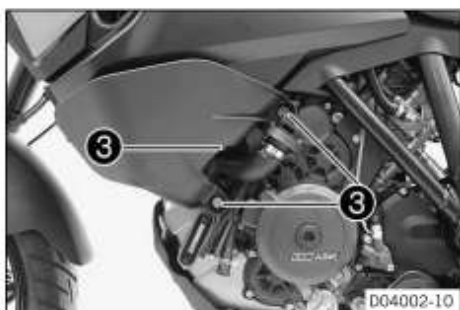
Guideline

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

- Position the tank guard.
- Mount and tighten screws 3.

Guideline

Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
Remaining screws, chassis	M10	45 Nm (33.2 lbf ft)





- Join plug-in connector ②.



- Mount the cable ties.



- Remove the wash cap set.
- Thoroughly clean the plug-in connection of the fuel line using compressed air.

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

- Join fuel hose connection ①.

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.

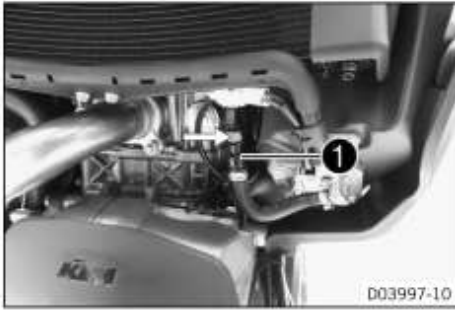
- Do not refuel the vehicle in the vicinity of open flames or lit cigarettes.
- Switch off the engine for refueling.
- Make sure that no fuel is spilled; particularly not on hot parts of the vehicle.
- If any fuel is spilled, wipe it off immediately.
- Observe the specifications for refueling.



Warning

Danger of poisoning Fuel is poisonous and a health hazard.

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



Preparatory work

- Drain the fuel from the fuel tank into a suitable container.

Main work

- Thoroughly clean the plug-in connection of the fuel line using compressed air.



Info

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

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



Info

Remaining fuel may flow out of the fuel hose.

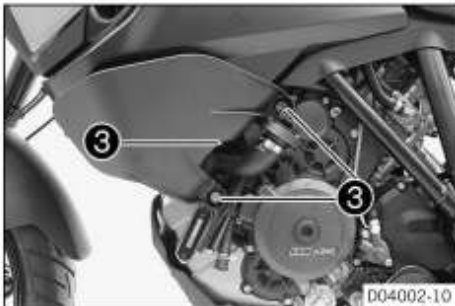
- Assemble the wash cap set.

Wash cap set (81212016000)

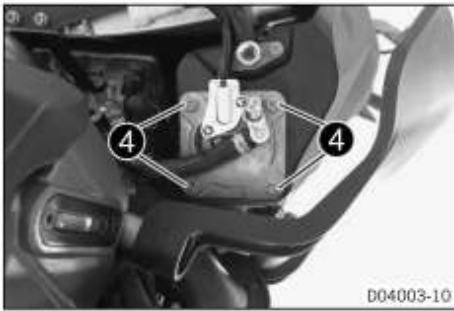
- Remove the cable ties.



- Disconnect plug-in connector **2**.



- Remove screws **3**.
- Hang the tank guard to one side.

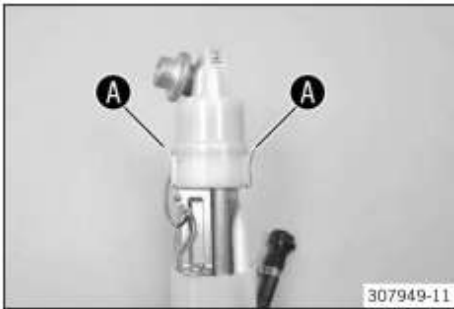


- Remove screws **4**.
- Pull out the fuel pump.

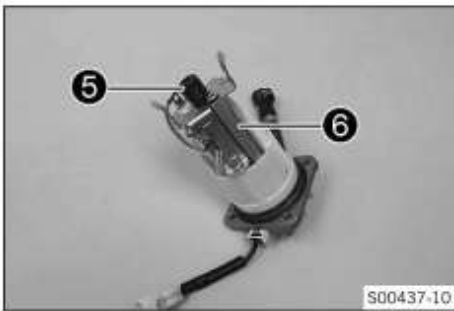


Info

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



- Push clamps **A** outward.
- Take off the fuel filter housing.



- Remove gasket **5**.
- Take off fuel pipe **6**.

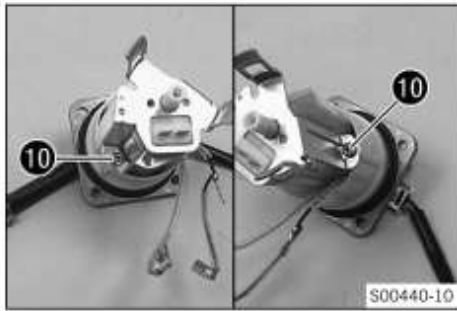


- Detach connectors **7** and **8**.

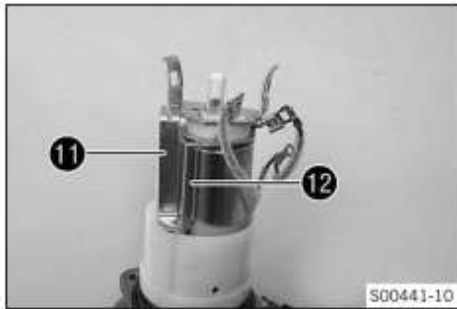


- Remove screw **9** with washer.

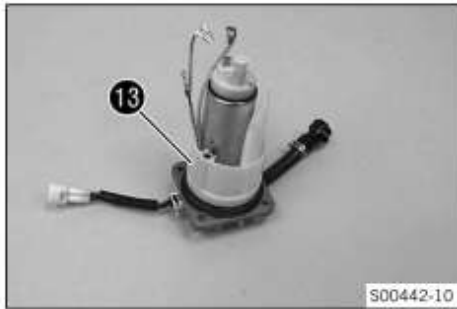
12 FUEL TANK, SEAT, TRIM



- Remove screws 10.



- Remove retaining brackets 11 and 12.



- Remove plastic housing 13 with distance sleeves.



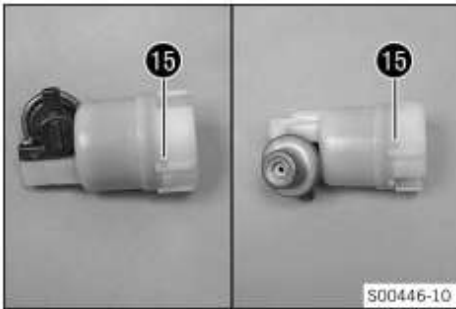
- Take the fuel pump out of the fuel pump cover.



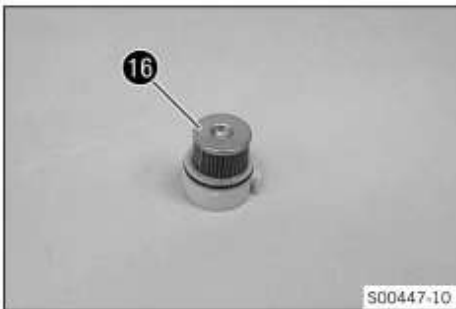
- Take off sealing element 14.



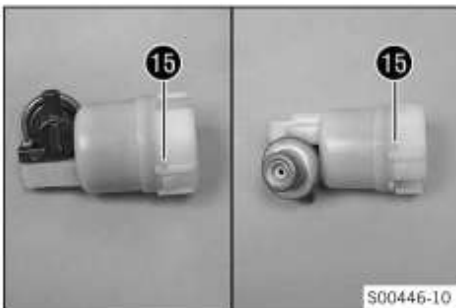
- Remove the fuel filter.
- Mount a new fuel filter.



- Release latch 15.
- Pull off the outer fuel filter housing.



- Take off the fuel filter 16.
- Mount a new fuel filter.



- Mount the outer fuel filter housing.
- ✓ Locking mechanism 15 engages in the fuel filter housing.

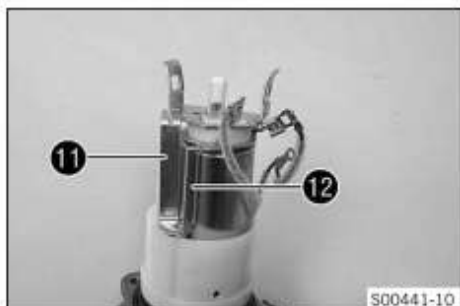


- Mount sealing element 14.
- Position the fuel pump in the fuel pump cover.

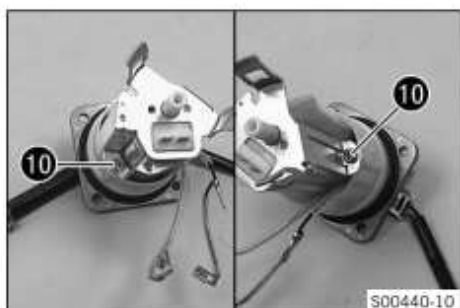
12 FUEL TANK, SEAT, TRIM



- Mount plastic housing **13** with distance sleeves.
- ✓ The holding lugs of the plastic housing engage in the holes of the fuel pump cover.



- Mount retaining brackets **11** and **12**.



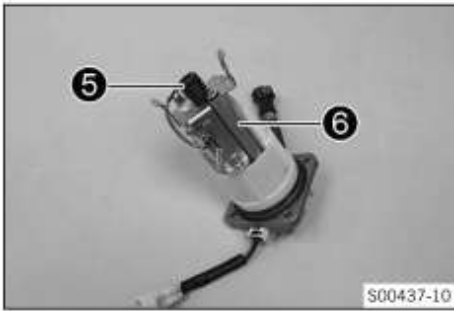
- Mount and tighten screws **10**.



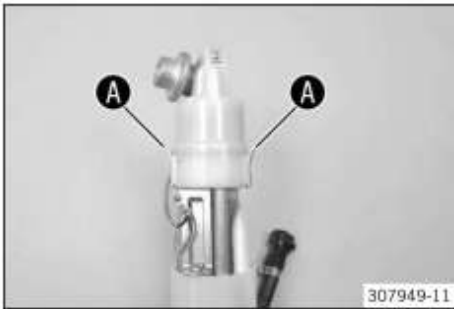
- Mount and tighten screw **9** with washer.



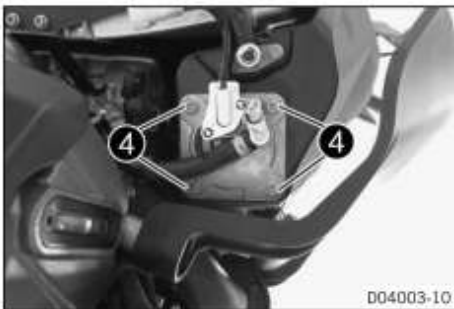
- Plug in connectors **7** and **8**.



- Mount fuel pipe ⑥.
- Mount gasket ⑤.



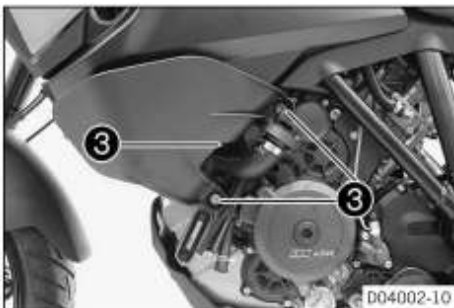
- Mount the fuel filter housing.
- ✓ Clamps A must engage.



- Grease the O-ring.
- Position the fuel pump with O-ring in the fuel tank.
- Mount and tighten screws ④.

Guideline

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



- Position the tank guard.
- Mount and tighten screws ③.

Guideline

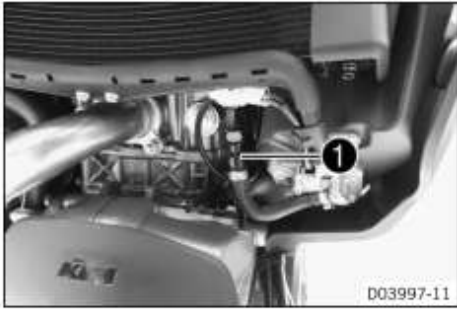
Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
Remaining screws, chassis	M10	45 Nm (33.2 lbf ft)



- Join plug-in connector ②.



- Mount the cable ties.



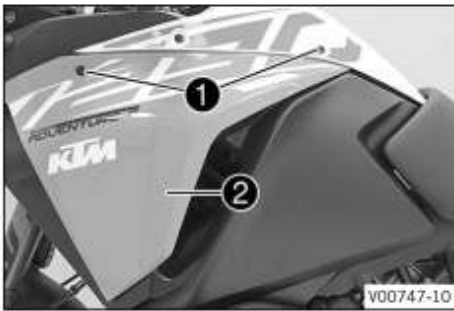
- Remove the wash cap set.
- Thoroughly clean the plug-in connection of the fuel line using compressed air.

i **Info**

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

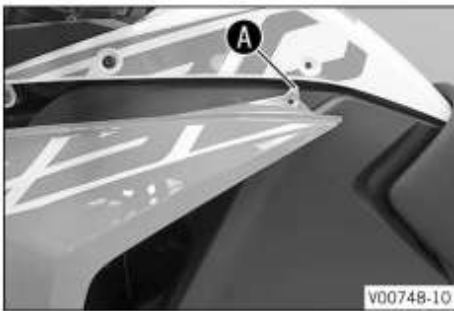
- Join fuel hose connection ❶.

13.1 Removing the front side cover

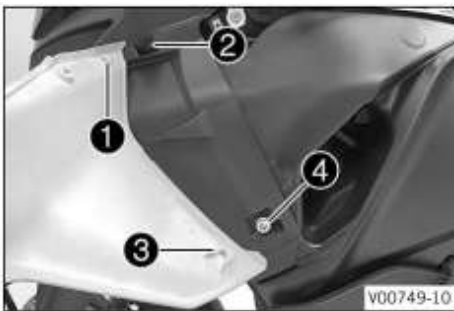


- Remove screws **1**.
- Remove side cover **2**.
- Repeat these steps on the opposite side.

13.2 Installing the front side cover



- Position the side cover in area **A** under the fuel tank cover.



- Attach side cover to bracket **2** using holding lug **1**.
- Attach side cover to bracket **3** using holding lug **4** and position on the fuel tank.



- Mount and tighten screws **5**.

Guideline

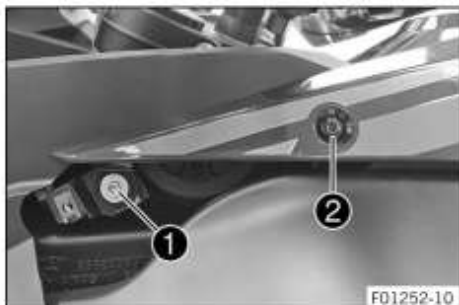
Screw, cover part	M5x12	3.5 Nm (2.58 lbf ft)
-------------------	-------	-------------------------

- Repeat these steps on the opposite side.

13.3 Removing the fuel tank cover

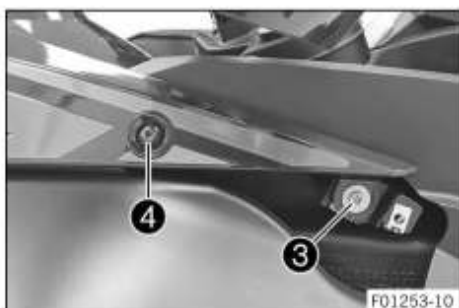
Preparatory work

- Remove the passenger seat. (📖 p. 80)
- Remove the front rider's seat. (📖 p. 79)
- Remove the front side cover. (📖 p. 97)

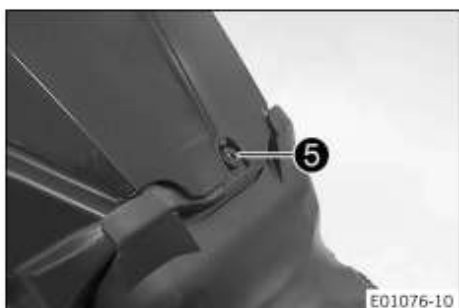


Main work

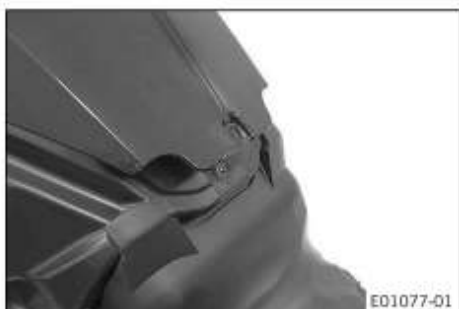
- Remove screw ①.
- Remove screw ②.



- Remove screw ③.
- Remove screw ④.

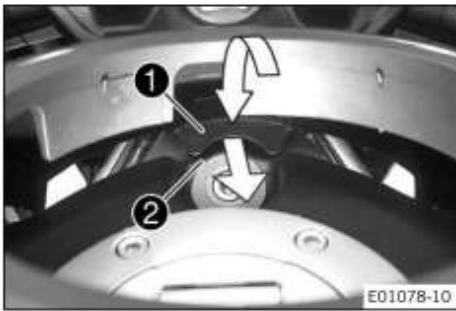


- Remove screw ⑤.



- Raise the fuel tank cover at the rear and take it off in a forward direction.

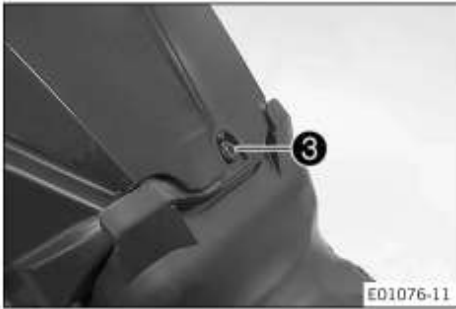
13.4 Installing the fuel tank cover



Main work

- Position the fuel tank cover.
- ✓ Holding lug **1** engages under the fuel tank **2**.

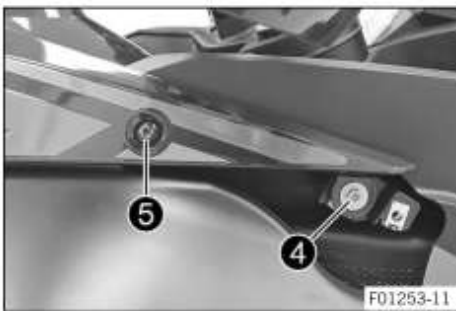
i Info
Pay attention to the sealing lip and the bleeder hose.



- Mount and tighten screw **3**.

Guideline

Screw, cover part	M5x12	3.5 Nm (2.58 lbf ft)
-------------------	-------	-------------------------



- Mount and tighten screw **4**.

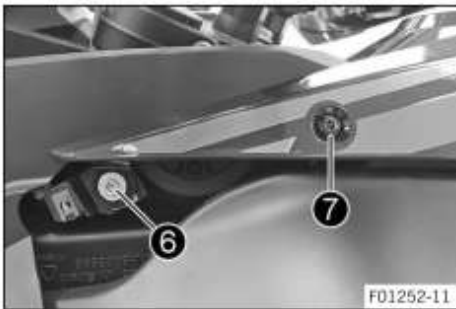
Guideline

Screw, cover part	M6	6 Nm (4.4 lbf ft)
-------------------	----	-------------------

- Mount and tighten screw **5**.

Guideline

Screw, cover part	M5x12	3.5 Nm (2.58 lbf ft)
-------------------	-------	-------------------------



- Mount and tighten screw **6**.

Guideline

Screw, cover part	M6	6 Nm (4.4 lbf ft)
-------------------	----	-------------------

- Mount and tighten screw **7**.

Guideline

Screw, cover part	M5x12	3.5 Nm (2.58 lbf ft)
-------------------	-------	-------------------------

Finishing work

- Install the front side cover. (p. 97)
- Mount the front rider's seat. (p. 79)
- Mount the passenger seat. (p. 80)

13.5 Removing the mask spoiler

Preparatory work

- Remove the passenger seat. (p. 80)
- Remove the front rider's seat. (p. 79)
- Remove the front side cover. (p. 97)
- Remove the fuel tank cover. (p. 98)

Main work

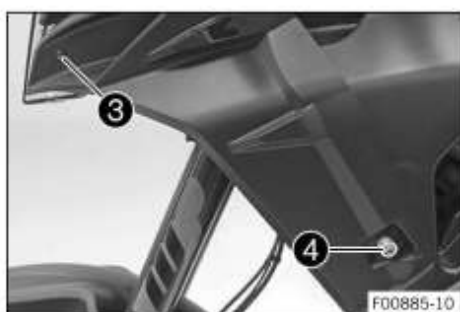
- Remove screw **1**.



- Remove screw **2**.

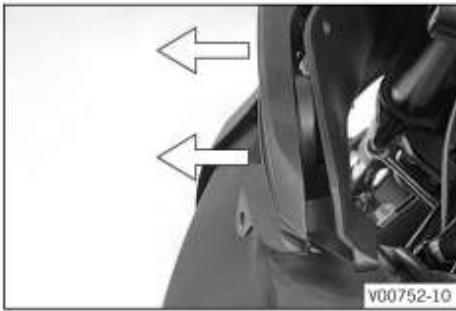


- Remove screw **3**.
- Remove screw **4** with the bushing.



- Loosen holding lug **5** from the inside cover.



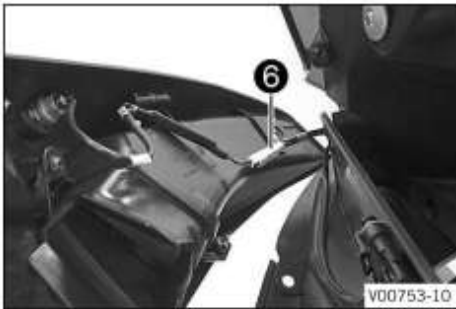


- Remove the mask spoiler laterally from the supports.



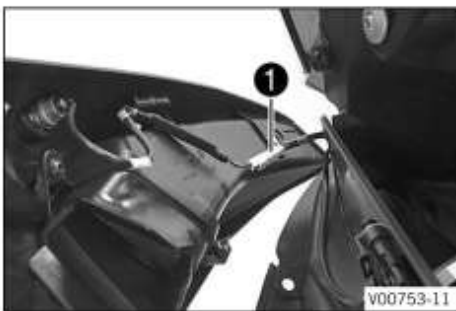
Info

Pay attention to the turn signal cable.



- Disconnect plug-in connector **6**.
- Remove the mask spoiler with the turn signal.
- Repeat these steps on the opposite side.

13.6 Installing the mask spoiler



Main work

- Join plug-in connector **1**.

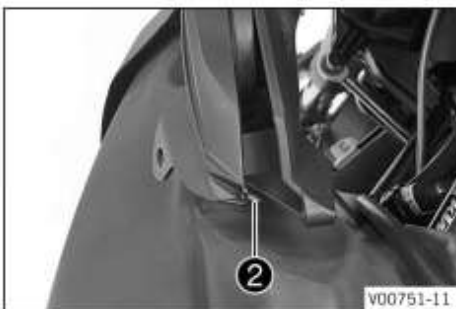


- Position the mask spoiler and press laterally into the supports.

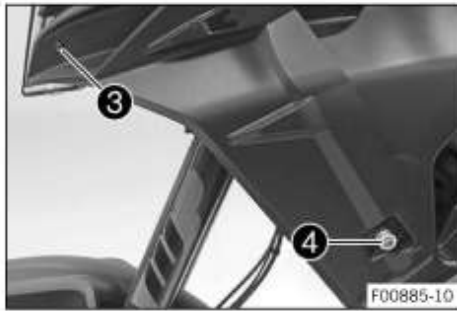


Info

Ensure that the turn signal cable is placed correctly.



- Position holding lug **2** in the drill hole.



- Mount and tighten screw ③.

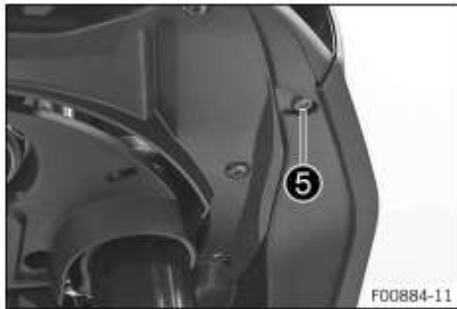
Guideline

Screw, mask spoiler	M5x12	3.5 Nm (2.58 lbf ft)
---------------------	-------	-------------------------

- Mount and tighten screw ④ with the bushing.

Guideline

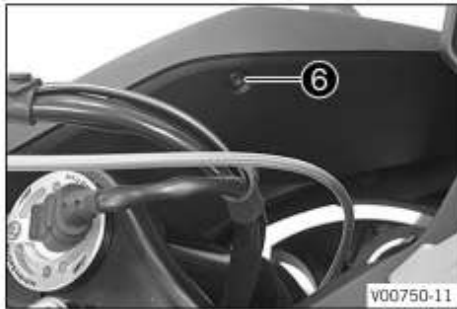
Screw, bushing	M6	4 Nm (3 lbf ft)
----------------	----	-----------------



- Mount and tighten screw ⑤.

Guideline

Screw, mask spoiler	M5x12	3.5 Nm (2.58 lbf ft)
---------------------	-------	-------------------------



- Mount and tighten screw ⑥.

Guideline

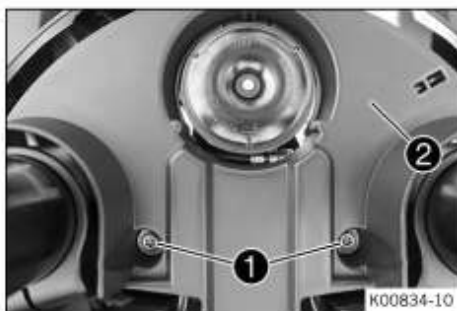
Screw, mask spoiler	M5x12	3.5 Nm (2.58 lbf ft)
---------------------	-------	-------------------------

- Repeat these steps on the opposite side.

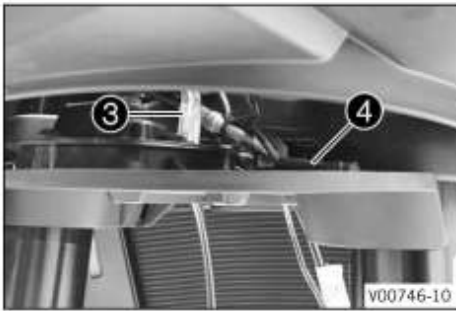
Finishing work

- Install the fuel tank cover. (p. 99)
- Install the front side cover. (p. 97)
- Mount the front rider's seat. (p. 79)
- Mount the passenger seat. (p. 80)

13.7 Removing the bottom triple clamp cover

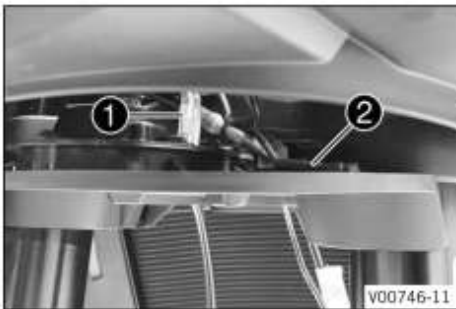


- Remove screws ①.
- Lower triple clamp cover ② slightly.

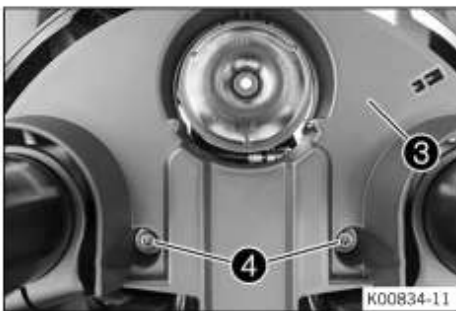


- Disconnect plugs ③ of the horn.
- Detach temperature sensor ④.
- Remove the triple clamp cover.

13.8 Installing the bottom triple clamp cover



- Plug in connectors ① of the horn.
- Attach temperature sensor ②.

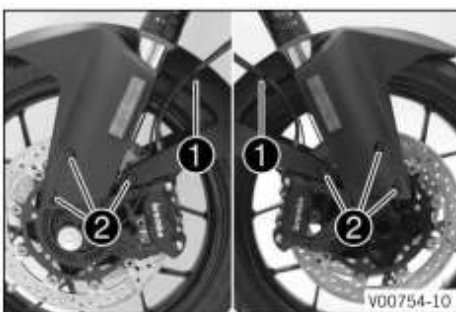


- Position the triple clamp cover ③.
- Mount and tighten screws ④.

Guideline

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

13.9 Removing front fender



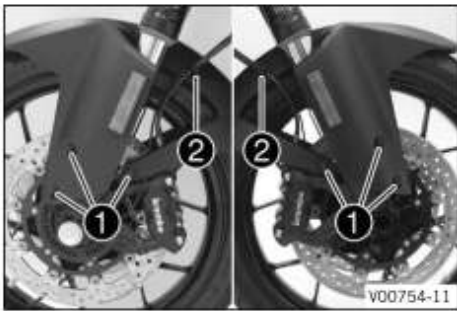
- Open holder ① and detach the brake lines and cable.
- Remove screws ②.
- Take the fender off to the front.



Info

Pay attention to the brake lines and the cable.

13.10 Installing front fender



- Position the fender.



Info

Pay attention to the routing of the brake lines and the cable.

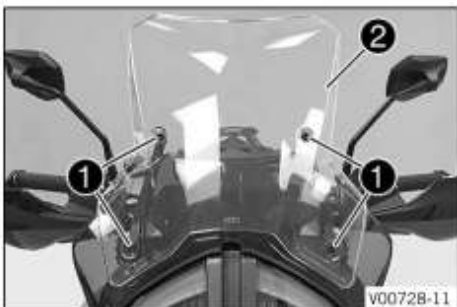
- Mount and tighten screws ①.

Guideline

Screw, fender	M5x12	3.5 Nm (2.58 lbf ft)
---------------	-------	-------------------------

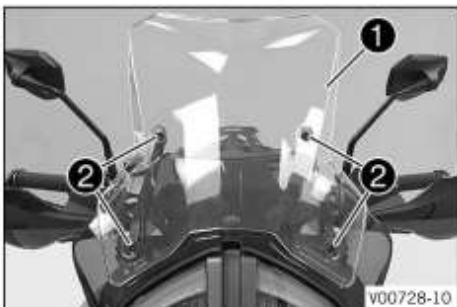
- Insert the brake lines and cable in brackets ② and close the holder.

13.11 Removing the windshield



- Remove screws ① with rubber bushing and windshield ②.

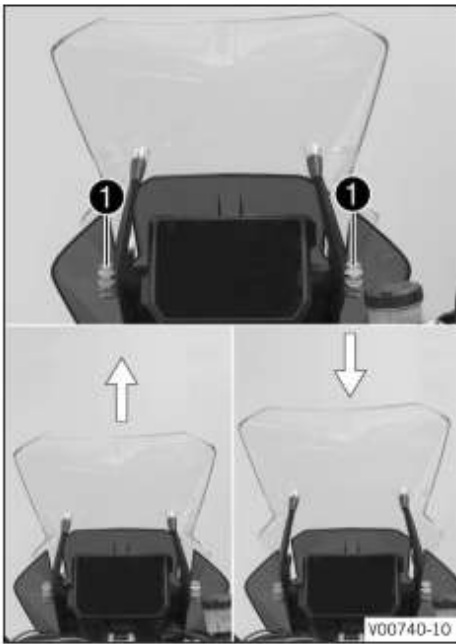
13.12 Installing the windshield



- Position windshield ①.
- Mount and tighten screws ② with the rubber bushings.

Guideline

Screw, wind shield	M5	3.5 Nm (2.58 lbf ft)
--------------------	----	-------------------------

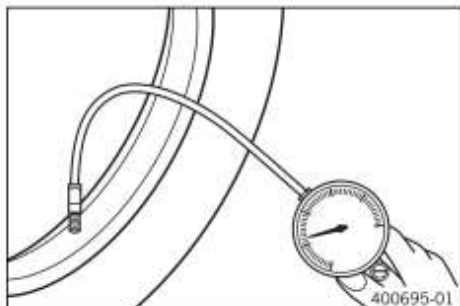
13.13 Adjusting the windshield

- Turn the adjusting wheel **1** to bring the windshield in the required position.

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

Tire pressure, solo / with passenger / full payload	
front: with cold tires	2.4 bar (35 psi)
rear: with cold tires	2.9 bar (42 psi)

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

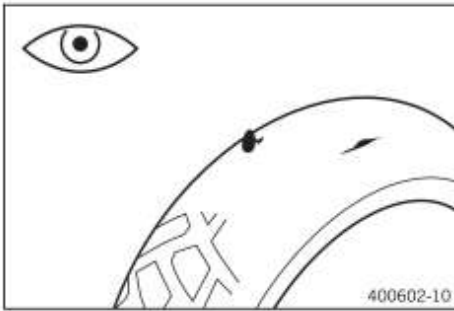
- Run in new tires with moderate riding at alternating angles.

Running-in phase 200 km (124 mi)

i Info

Tire type, tire condition, and tire pressure influence the braking and handling characteristics of the vehicle.

Worn tires are particularly unfavorable on wet surfaces.

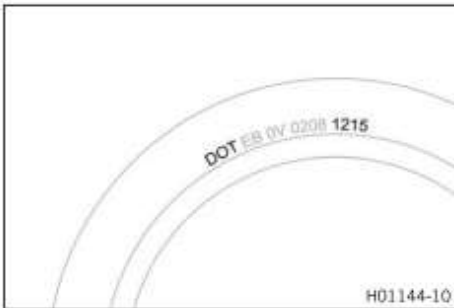


- Check the front and rear tires for cuts, run-in objects, and other damage.
 - » If the tires have cuts, run-in objects, or other damage:
 - Change the tires.
- Check the tread depth.

i Info
Adhere to the legally required minimum tread depth.

Minimum tread depth	≥ 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 wheel bearing for play

Preparatory work

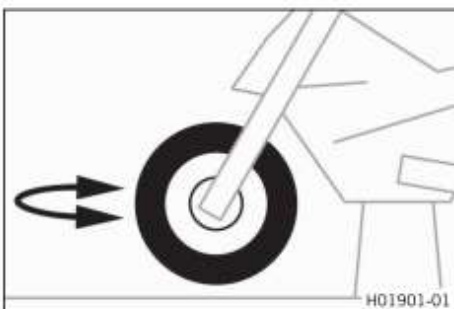
- Raise the vehicle with the center stand. (📖 p. 15)
- Place a load on the rear of the vehicle.
- ✓ The front wheel is not in contact with the ground.

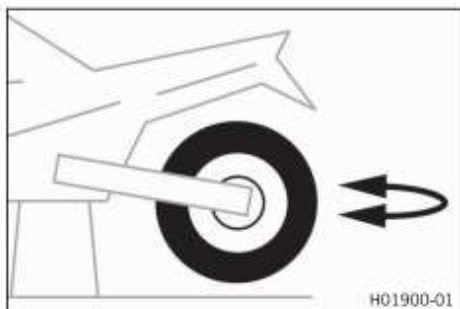
Main work

- 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. 112)





- 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. 118)

14.4 Changing the tire pressure sensor (EU/US/CN)

i Info
The following steps are the same for the front and rear wheel.

Condition
Tire has been removed.

- Main work**
- Remove nut **1**.
 - Take off valve **2** and tire pressure sensor **3**.



- Note ID number **A** of the new tire pressure sensor.

i Info
The ID number is used to program the tire pressure sensor.



- Grease O-ring **4** slightly.

Thinned tire mounting paste

- Position valve **2** in the hole on the rim,
 - ✓ The valve points towards the rim tape.
- Position new tire pressure sensor **3** with nut **1** on the valve.
 - ✓ The tire pressure sensor points to the rear in the direction of travel.
- Tighten nut **1**.

Guideline

Angled valve	M8	6 Nm (4.4 lbf ft)
--------------	----	-------------------

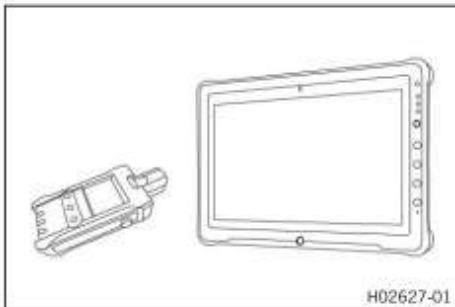
Finishing work

- Mount and balance the tires.

14.5 Programming the tire pressure sensor (EU/US/CN)

Condition

The diagnostic tool is connected and running.



- Execute "Tire air pressure monitor" > "Functions" > "Programming the tire air pressure sensor" > "Select the wheel".

Info

The instructions must be followed precisely.

- Clear the fault memory using the KTM diagnostics tool.
 - » Take a test ride.
 - Read out the trouble code memory using the KTM diagnostics tool.



14.6 Front wheel

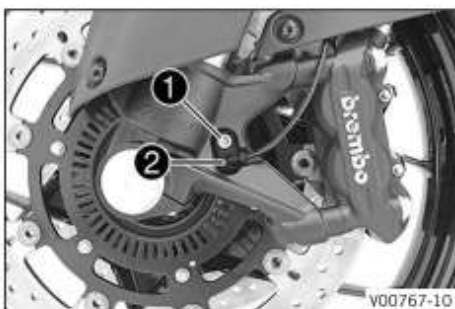
14.6.1 Removing the front wheel

Preparatory work

- Raise the vehicle with the center stand. (📖 p. 15)

Main work

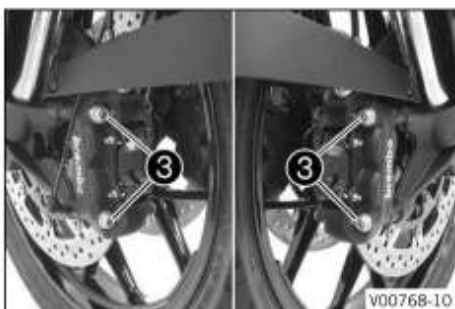
- Place a load on the rear of the vehicle.
 - ✓ The front wheel is not in contact with the ground.
- Remove screw ① and pull wheel speed sensor ② out of the hole.



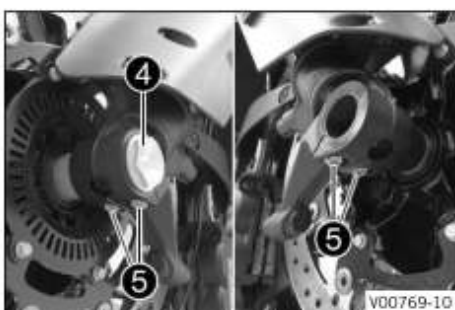
- Remove screws ③ from both brake calipers.
- Press back the brake linings by slightly tilting the brake calipers laterally on the brake disc.
- Pull the brake calipers carefully back from the brake discs and hang to the side loosely.

Info

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



- Loosen screw ④ by several rotations.
- Loosen screws ⑤.
- Press on screw ④ to push the wheel spindle out of the axle clamp.
- Remove screw ④.





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.

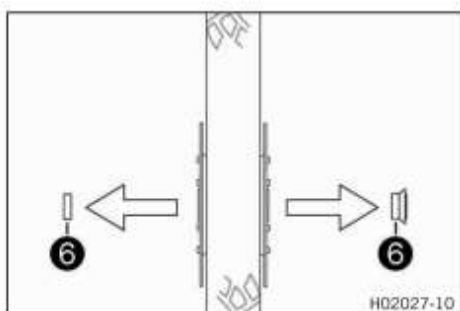
- Hold the front wheel and remove the wheel spindle. Take the front wheel out of the fork.



Info

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

- Remove spacers **6**.



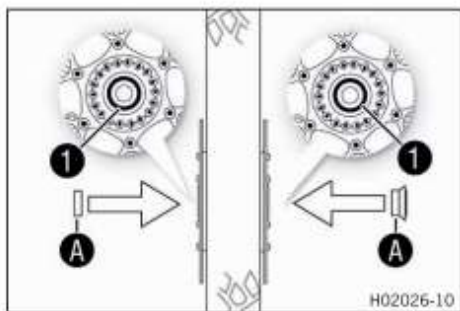
14.6.2 Installing the front wheel



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. 112)
- Clean and grease shaft seal rings **1** and contact surfaces **A** of the spacers.

Long-life grease (p. 490)

- Insert the narrow spacer **2** on the right in the direction of travel.

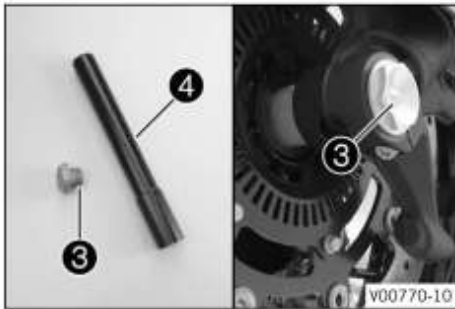


Info

Arrow **B** indicates the direction of travel of the front wheel.
The ABS sensor wheel is on the left viewed in the direction of travel.

- Insert the wide spacer on the left 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.

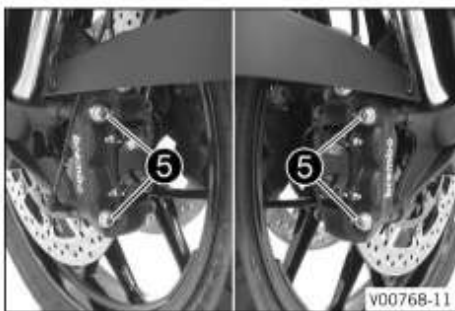
- Clean and grease screw **3** and wheel spindle **4**.

Long-life grease (☞ p. 490)

- Jack up the front wheel into the fork, position it, and insert the wheel spindle.
- Mount and tighten screw **3**.

Guideline

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



- Position the brake calipers.
 - ✓ The brake linings are correctly positioned.
- Mount screws **5** on both brake calipers but do not tighten yet.
- Operate the hand brake lever repeatedly until the brake linings are in contact with the brake disc and there is a pressure point. Fix the hand brake lever in the activated position.

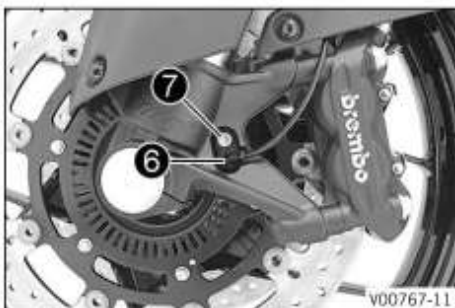
✓ The brake calipers straighten.

- Tighten screws **5** on both brake calipers.

Guideline

Screw, front brake caliper	M10	45 Nm (33.2 lbf ft) Loctite®243™
----------------------------	-----	--

- Remove the locking piece of the hand brake lever.

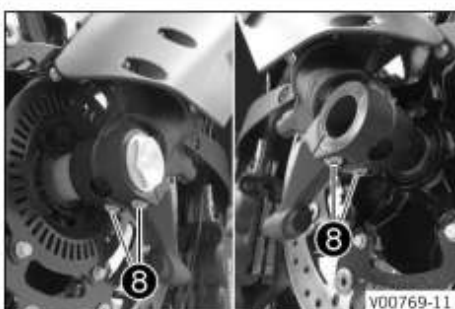


- Position wheel speed sensor **6** in the hole.
- Mount and tighten screw **7**.

Guideline

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

- Remove the vehicle from the center stand. (☞ p. 15)



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

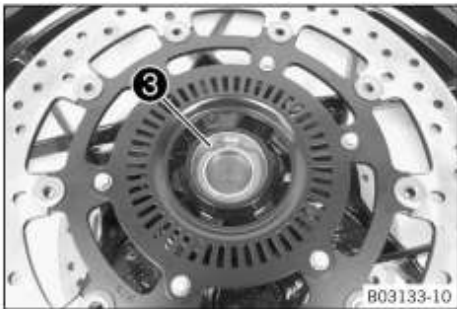
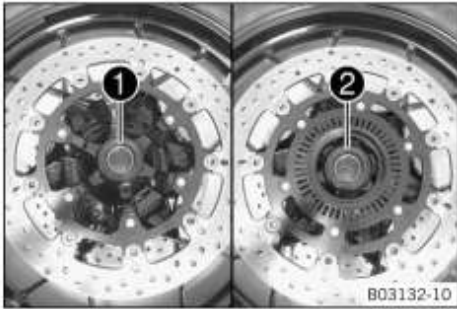
14.6.3 Changing the front wheel bearing

Preparatory work

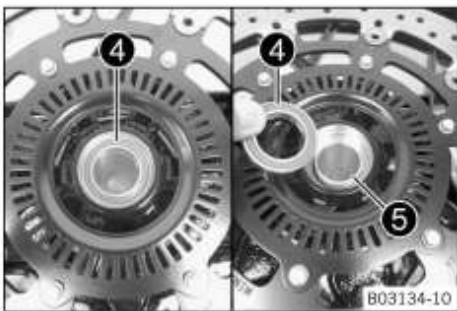
- Raise the vehicle with the center stand. (見 p. 15)
- Remove the front wheel. (見 p. 109)

Main work

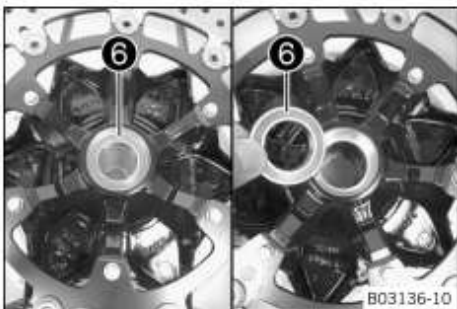
- Remove shaft seal rings ① and ②.



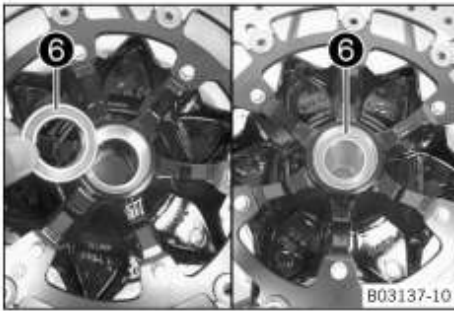
- Remove lock ring ③.



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

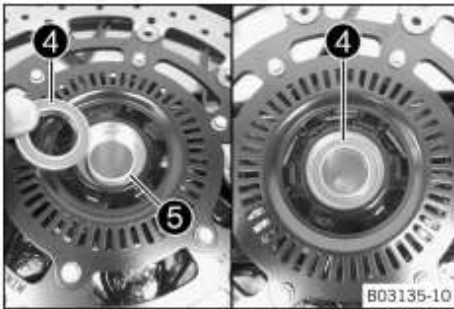


- Using a suitable tool, press bearing ⑥ out from the inside to the outside.



- Press new bearing **6** 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.

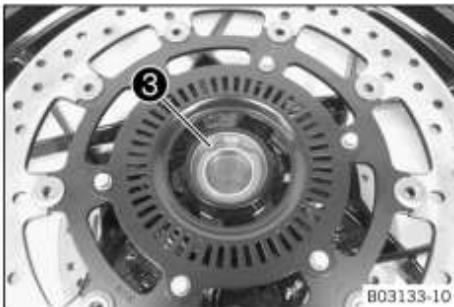


- Clean, grease, and mount spacing tube **5**.

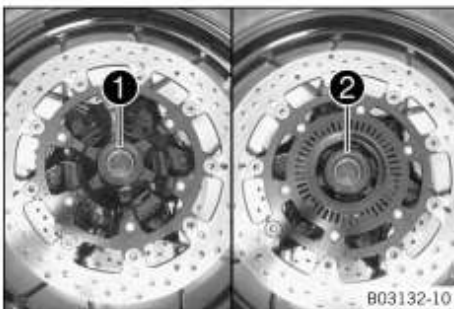
Long-life grease (see p. 490)

- Press new bearing **4** 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 **3**.
✓ The lock ring engages audibly.



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

Finishing work

- Install the front wheel. (see p. 110)

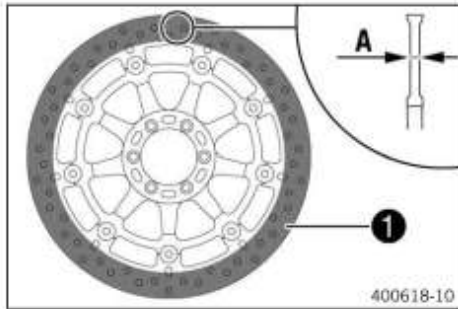
14.6.4 Checking the brake discs



Warning

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

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



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

i Info

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

Brake discs - wear limit	
front	4 mm (0.16 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. 114)
 - Change the rear brake disc. (☞ p. 120)
- Check the front and rear brake discs for damage, cracking, and deformation.
 - » If the brake disc exhibits damage, cracking, or deformation:
 - Change the front brake discs. (☞ p. 114)
 - Change the rear brake disc. (☞ p. 120)

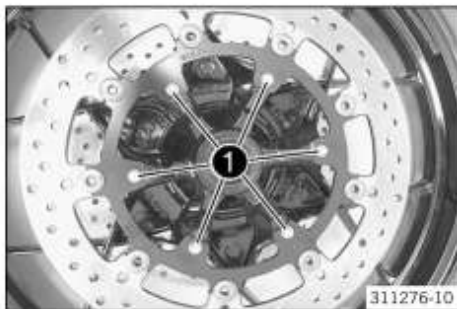
14.6.5 Changing the front brake discs

i Info

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

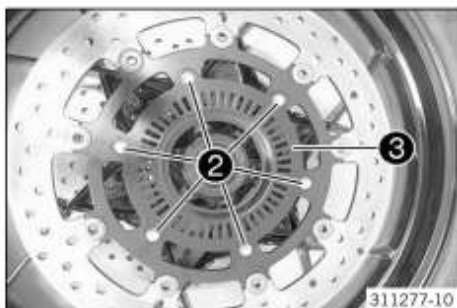
Preparatory work

- Raise the vehicle with the center stand. (☞ p. 15)
- Remove the front wheel. (☞ p. 109)

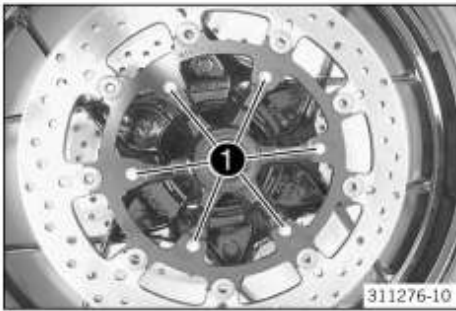


Main work

- Remove screws **1**. Take off the right-hand brake disc.



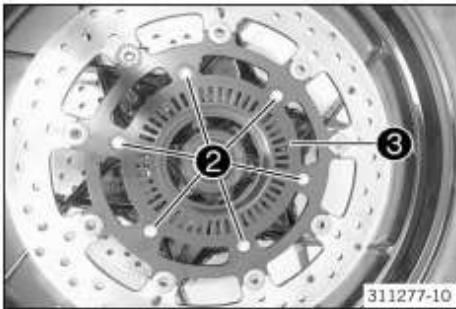
- Remove screws **2**. Take off the left-hand brake disc with ABS sensor wheel **3**.



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

Guideline

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



- Clean the contact surface of the brake disc.
- Position the new brake disc with the label facing outward. Position ABS sensor wheel ③. Mount and tighten screws ②.

Guideline

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

- ✓ The ABS sensor wheel is on the left viewed in the direction of travel.

Finishing work

- Install the front wheel. (📖 p. 110)

14.7 Rear wheel

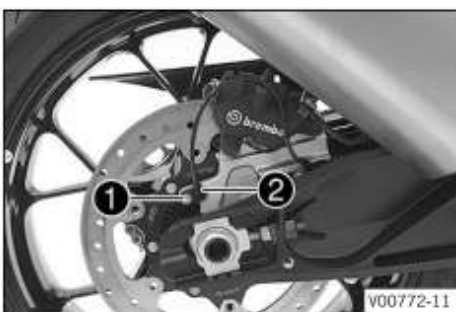
14.7.1 Removing the rear wheel

Preparatory work

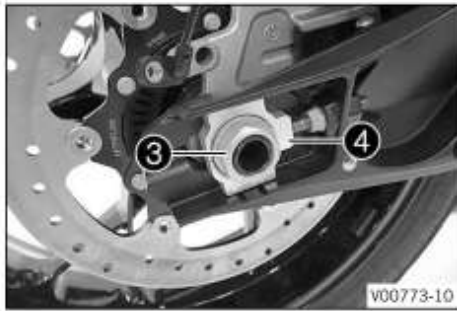
- Raise the vehicle with the center stand. (📖 p. 15)

Main work

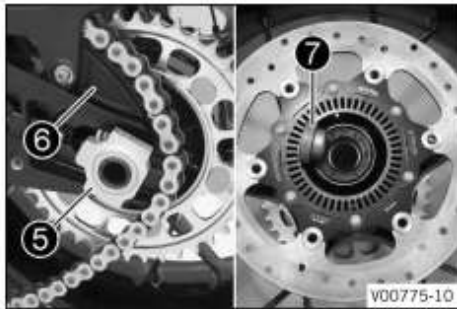
- Press the brake caliper onto the brake disc by hand in order to push back the brake pistons.



- Remove screw ① and pull wheel speed sensor ② out of the hole.



- Remove nut **3**. Remove 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**.



Warning

Danger of accidents Damaged brake discs reduce the braking effect.

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

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



Info

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

- Remove spacer **7**.

14.7.2 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.

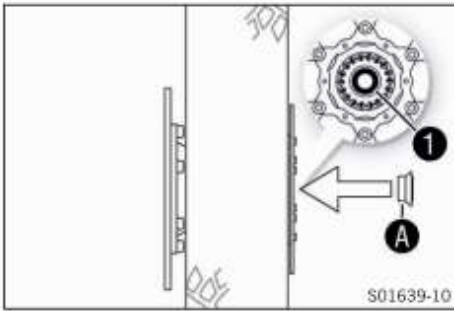


Warning

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.

- Check the rear hub damping rubber pieces. (📖 p. 124)



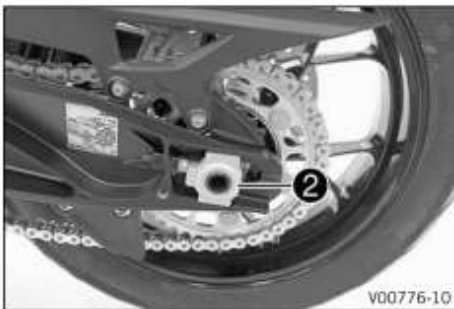
- Check the wheel bearing for damage and wear.
 - » If the wheel bearing is damaged or worn:
 - Change the rear wheel bearing. (p. 118)
- Clean and grease shaft seal ring 1 and contact surface A of the spacer.

Long-life grease (p. 490)

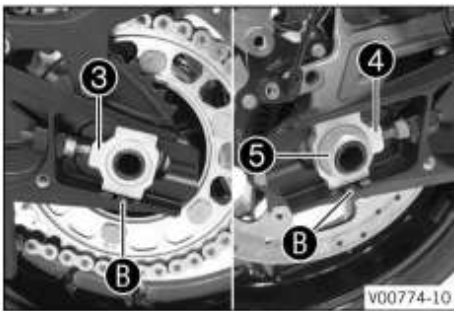
- Insert the spacer.
- Clean and grease the thread of the wheel spindle and nut.

Long-life grease (p. 490)

- Mount the damping rubber pieces and rear sprocket carrier on the rear wheel.
- Place the rear wheel in the link fork and engage the brake disc in the brake caliper.



- Mount wheel spindle 2 but do not push it in all the way.
- Push the rear wheel forward as far as possible and lay the chain on the rear sprocket.



- Push the wheel spindle in all the way and mount chain adjuster 4 and nut 5.

i Info
Mount chain adjusters 3 and 4 in the same position.

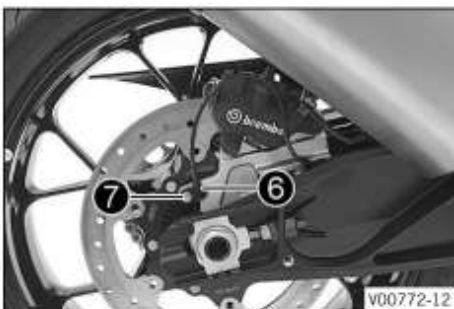
- Make sure that the chain adjusters are fitted correctly on the adjusting screws.

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 B.

- Tighten nut 5.

Guideline

Nut, rear wheel spindle	M25x1.5	90 Nm (66.4 lbf ft) Thread greased
-------------------------	---------	---------------------------------------



- Position wheel speed sensor 6 in the hole.
- Mount and tighten screw 7.

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.

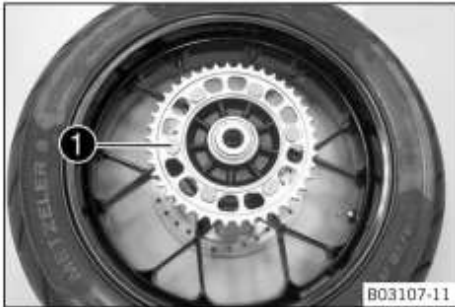
14.7.3 Changing the rear wheel bearing

Preparatory work

- Raise the vehicle with the center stand. (📖 p. 15)
- Remove the rear wheel. (📖 p. 115)

Main work

- Remove rear sprocket carrier **1**.



B03107-11

- Check both bearings **2** for damage and wear.
 - If the bearings are damaged or worn:
 - Change the bearing of the rear sprocket carrier. (📖 p. 126)



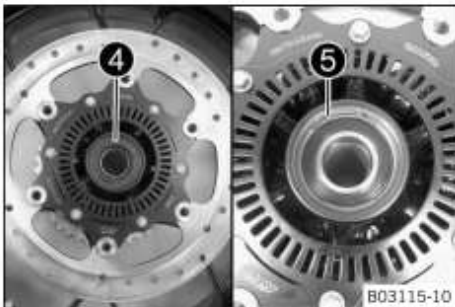
310712-10

- Remove damping rubber pieces **3**.

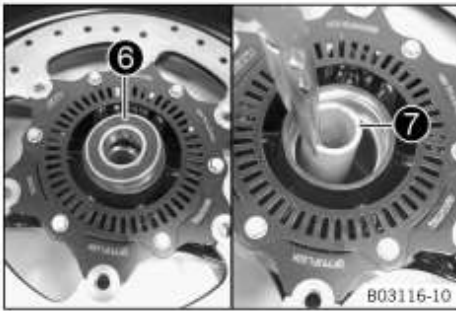


B03112-10

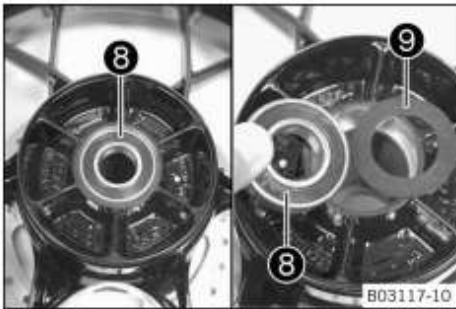
- Remove shaft seal ring **4**.
- Remove lock ring **5**.



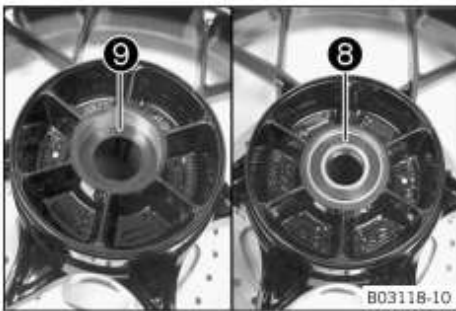
B03115-10



- Using a suitable tool, press bearing 6 out from the inside to the outside.
- Remove spacing tube 7.

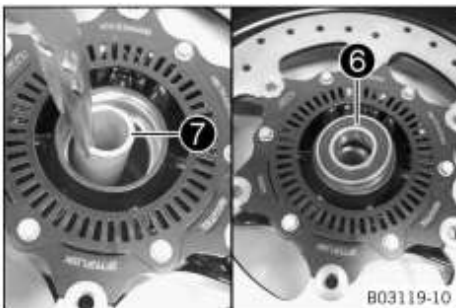


- Using a suitable tool, press bearing 8 out from the inside to the outside.
- Check spacer washer 9 for damage and wear.
 - » If the spacer washer is damaged or worn:
 - Replace the spacer washer.



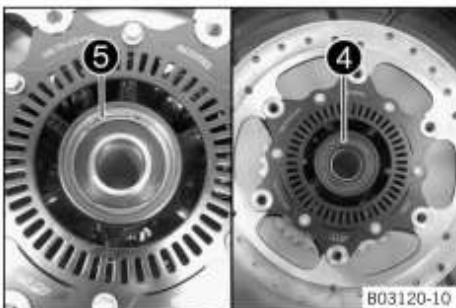
- Position spacer washer 9.
- Press new bearing 8 all the way in from the outside to the inside.

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



- Clean, grease, and mount spacing tube 7.
- Long-life grease (☞ p. 490)
- Press new bearing 6 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.



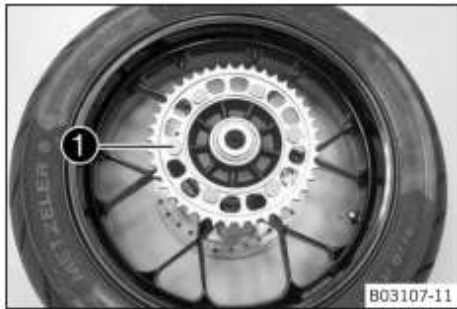
- Mount lock ring 5.
 - ✓ The lock ring engages audibly.
- Grease new shaft seal ring 4 and press it in until it is flush.

Long-life grease (☞ p. 490)



B03112-10

- Position damping rubber pieces ③.



B03107-11

- Mount rear sprocket carriers ①.

Finishing work

- Install the rear wheel. (☞ p. 116)

14.7.4 Changing the rear brake disc

i Info

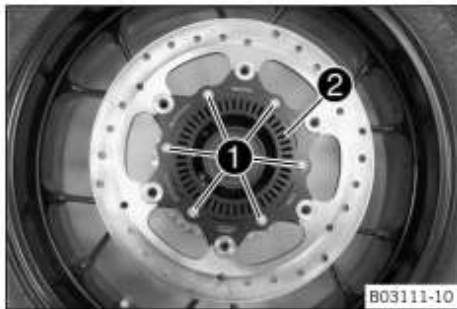
If the brake discs are changed, the brake linings must also be changed.

Preparatory work

- Raise the vehicle with the center stand. (☞ p. 15)
- Remove the rear wheel. (☞ p. 115)

Main work

- Remove screws ①.
- Remove brake disc with ABS sensor wheel ②.
- Clean the contact surface of the brake disc.
- Position the new brake disc with the label facing outward.
- Position ABS sensor wheel ②.
- Mount and tighten screws ①.



B03111-10

Guideline

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

- Install the rear wheel. (☞ p. 116)

14.7.5 Checking the chain tension



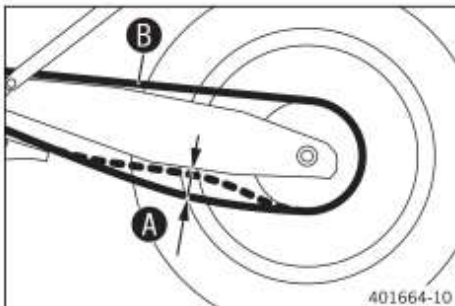
Warning

Danger of accidents Incorrect chain tension damages components and results in accidents.

If the chain is tensioned too much, the chain, engine sprocket, rear sprocket, transmission and rear wheel bearings wear more quickly. Some components may break if overloaded.

If the chain is too loose, the chain may fall off the engine sprocket or the rear sprocket. As a result, the rear wheel locks or the engine will be damaged.

- Check the chain tension regularly.
- Set the chain tension in accordance with the specification.



Preparatory work

- Raise the vehicle with the center stand. (📖 p. 15)

Main work

- Shift the transmission into neutral **N**.
- In the area in front of the chain guide, push the chain up and determine the chain tension **A**.



Info

Top chain section **B** must be taut.

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

Chain tension	40 ... 45 mm (1.57 ... 1.77 in)
---------------	------------------------------------

- » If the chain tension does not meet the specification:
 - Adjust the chain tension. (📖 p. 121)

Finishing work

- Remove the vehicle from the center stand. (📖 p. 15)

14.7.6 Adjusting the chain tension



Warning

Danger of accidents Incorrect chain tension damages components and results in accidents.

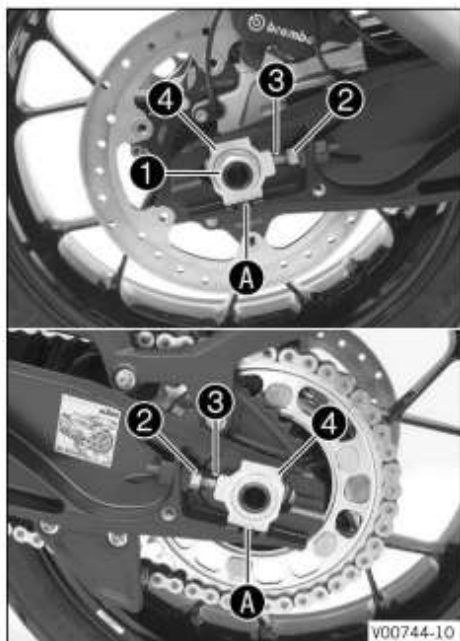
If the chain is tensioned too much, the chain, engine sprocket, rear sprocket, transmission and rear wheel bearings wear more quickly. Some components may break if overloaded.

If the chain is too loose, the chain may fall off the engine sprocket or the rear sprocket. As a result, the rear wheel locks or the engine will be damaged.

- Check the chain tension regularly.
- Set the chain tension in accordance with the specification.

Preparatory work

- Raise the vehicle with the center stand. (📖 p. 15)
- Check the chain tension. (📖 p. 121)



Main work

- Loosen nut ①.
- Loosen nuts ②.
- Adjust the chain tension by turning adjusting screws ③ left and right.

Guideline

Chain tension	40 ... 45 mm (1.57 ... 1.77 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 ⑤. The rear wheel is then correctly aligned.	

i Info

The top chain section must be taut. Chain wear is not always even, so you should check the setting 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 greased
-------------------------	---------	---------------------------------------

i Info

Chain adjusters ④ can be turned by 180°.

Finishing work

- Remove the vehicle from the center stand. (p. 15)

14.7.7 Checking the chain, rear sprocket, and engine sprocket

Preparatory work

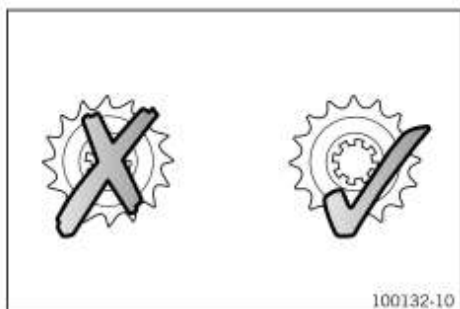
- Raise the vehicle with the center stand. (p. 15)

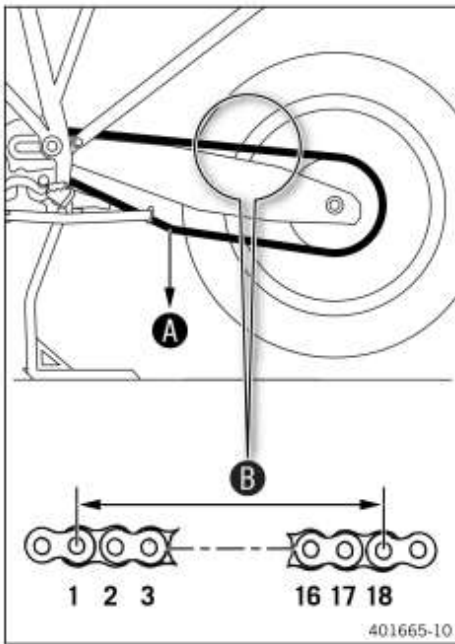
Main work

- 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. 128)

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.)
--------------------------------	----------------

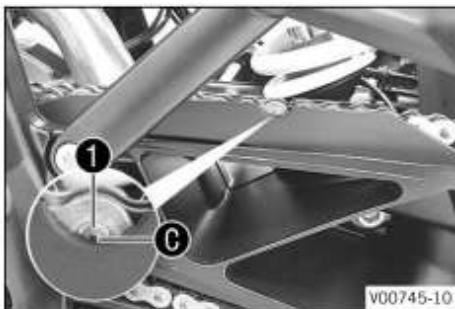
- Measure distance **B** of 18 chain rollers in the upper chain section.

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

Maximum distance B from 18 chain rollers at the longest chain section	272 mm (10.71 in)
--	-------------------

- » If distance **B** is greater than the specified measurement:
 - Change the drivetrain kit. (☞ p. 128)

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 chain sliding guard for wear at the recess.

i Info
When the chain sliding guard is new, the rivets **1** are half visible at the bottom edge **C** of the recess.

- » When the rivets of the chain are no longer visible at the bottom edge of the recess of the chain sliding guard:
 - Change the chain sliding guard.

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

Guideline

Screw, chain sliding guard	M5	5 Nm (3.7 lbf ft)
----------------------------	----	-------------------



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

Guideline

Screw, chain guide	M6	5 Nm (3.7 lbf ft)
--------------------	----	-------------------

Finishing work

- Remove the vehicle from the center stand. (☞ p. 15)

14.7.8 Cleaning the chain



Warning

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

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



Warning

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

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



Note

Environmental hazard Hazardous substances cause environmental damage.

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



Info

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



Preparatory work

- Raise the vehicle with the center stand. (☞ p. 15)

Main work

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

Chain cleaner (☞ p. 490)

- After drying, apply chain spray.

Street chain spray (☞ p. 491)

Finishing work

- Remove the vehicle from the center stand. (☞ p. 15)

14.7.9 Checking the rear hub damping rubber pieces



Info

The engine power is transmitted from the rear sprocket to the rear wheel via the 6 damping rubber pieces. The damping rubber pieces 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 the vehicle with the center stand. (☞ p. 15)
- Remove the rear wheel. (☞ p. 115)



Main work

- Check the damping rubber pieces **1** 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. (☞ p. 125)



- Lay the rear wheel on a workbench with the rear sprocket facing upward and insert the wheel spindle in the hub.
- Check the rear sprocket play **A**.



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. 125)

Finishing work

- Install the rear wheel. (☞ p. 116)

14.7.10 Changing all the damping rubber pieces of the rear hub

Preparatory work

- Raise the vehicle with the center stand. (☞ p. 15)
- Remove the rear wheel. (☞ p. 115)

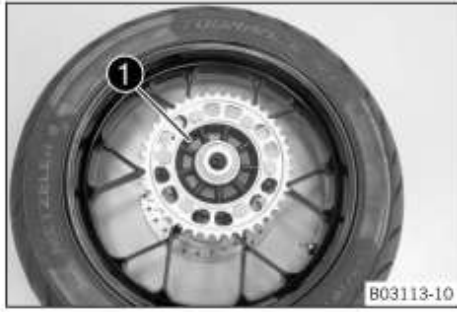


Main work

- Remove rear sprocket carrier **1**.



- Remove all damping rubber pieces **2**.
- Position new damping rubber pieces.



- Mount rear sprocket carriers ①.

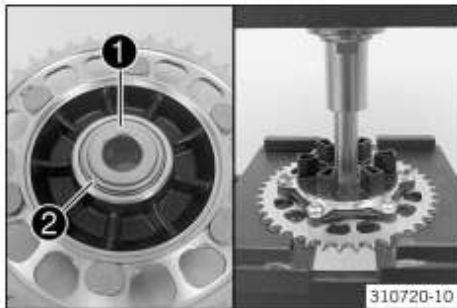
Finishing work

- Install the rear wheel. (📖 p. 116)

14.7.11 Changing the bearing of the rear sprocket carrier

Condition

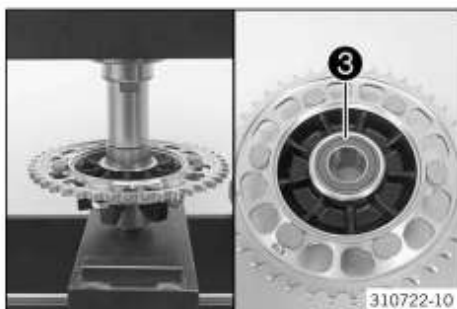
Rear sprocket carrier is removed.



- Using a shim ①, press distance sleeve ② from the inside to the outside.



- Using a suitable tool, press both bearings ③ out from the inside to the outside.



- Using a suitable tool, press in new bearings ③ from the outside to the inside until they are flush.

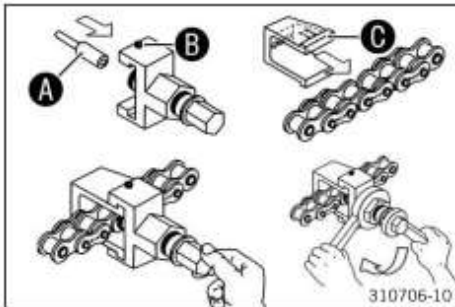
i Info

Support rear sprocket carrier in the area of the bearing to avoid damage.



- Press in the distance sleeve **1** from the outside all the way to the inside using the shim **2**.

14.7.12 Opening the chain

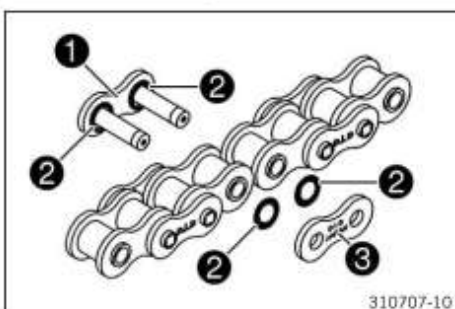


- Mount press drift **A** with the larger diameter in the spindle of the special tool. Turn the spindle counterclockwise.

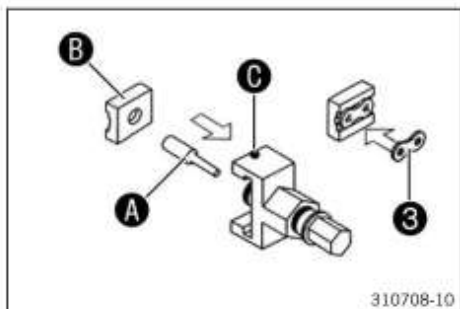
Chain rivet tool (60029020000) (註 p. 497)

- Make the connecting link of the chain accessible. Fret the riveting point.
- Position the special tool with the press drift 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.

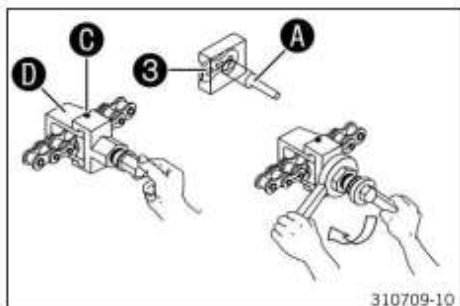
14.7.13 Riveting the chain



- 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.



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- Mount press drift **A** with the smaller diameter in the spindle of the special tool. Turn the spindle counterclockwise.

Chain rivet tool (60029020000) (p. 497)

- Position press plate **B** of the special tool on the press drift.
- 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.
 - ✓ Press drift **A** of the special tool presses against the center of the 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. 497)

14.7.14 Changing the drivetrain kit

Preparatory work

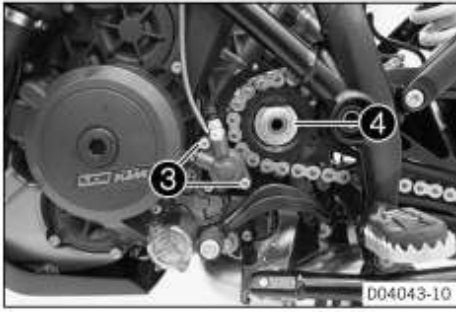
- Raise the vehicle with the center stand. (p. 15)

Main work

- Remove screws **1**.
- Take off engine sprocket cover **2**.



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- Remove screws **3**.
- Take off the slave cylinder of the clutch and hang it to one side.

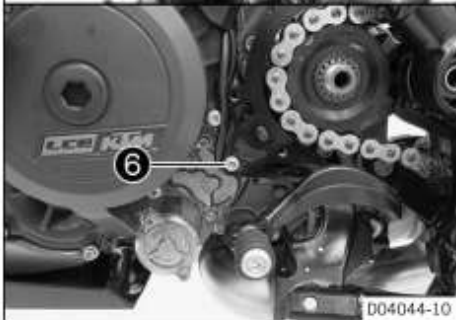
i Info
Do not activate the clutch lever while the slave cylinder of the clutch is removed.
Do not kink the clutch line.

- Remove the spacer with sleeves.
- Bend up the lock washer.
- Have an assistant operate the rear brake.
- Remove nut **4** with the lock washer.
- Remove screw **5**.

i Info
Do not misplace the spacer.



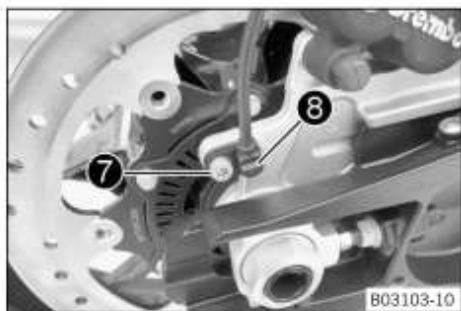
- Remove screw **6**.
- Remove the chain securing guide with the spacer.



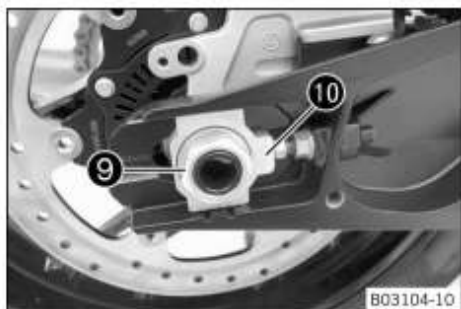
- Remove pin **A**.



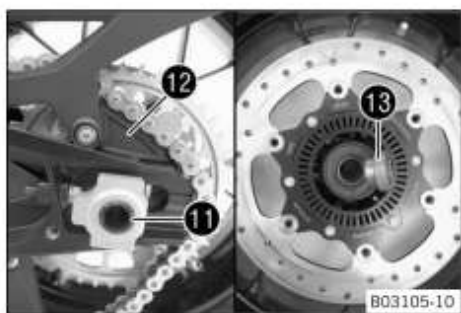
- Press the brake caliper onto the brake disc by hand in order to push back the brake pistons.



- Remove screw **7** and pull wheel speed sensor **8** out of the hole.



- Remove nut **9**. Remove chain adjuster **10**.



- Only pull out wheel spindle **11** 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 **12**.



Warning

Danger of accidents Damaged brake discs reduce the braking effect.

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

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

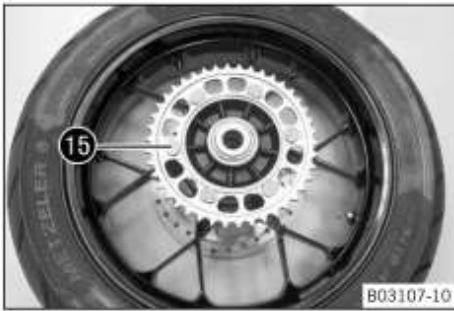


Info

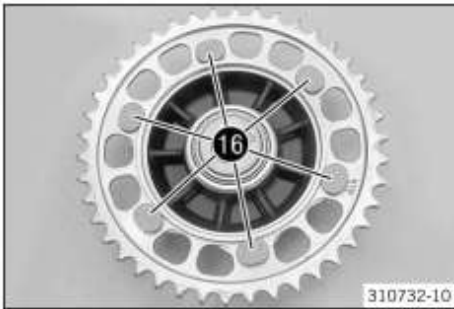
Do not operate the foot brake when the rear wheel is removed.

- Remove spacer **13**.
- Remove engine sprocket **14**.
- Open the chain. (📖 p. 127)
- Mount a new chain.
- Rivet the chain. (📖 p. 127)
- Position new engine sprocket **14** in the chain and mount on the countershaft.





- Remove rear sprocket carrier **15**.



- Fix the rear sprocket carrier in the vise.

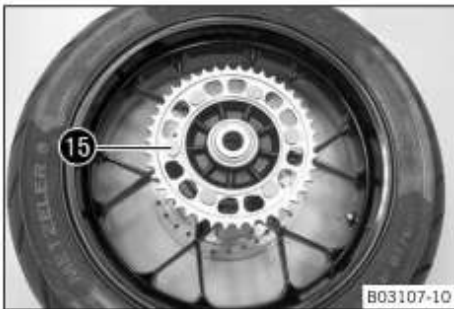
Guideline

Use soft jaws.

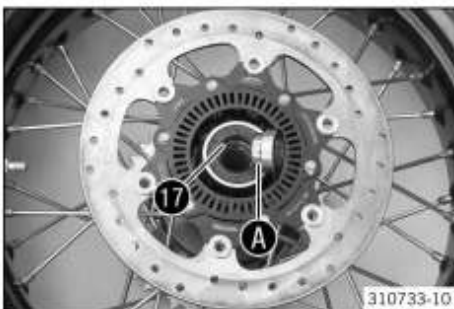
- Remove fittings **16** and take off the rear sprocket.
- Position a new rear sprocket.
- Mount and tighten fittings **16**.

Guideline

Nut, rear sprocket screw	M10x1.25	50 Nm (36.9 lbf ft) Loctite®243™
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- Mount rear sprocket carriers **15**.



- Check the wheel bearing for damage and wear.
 - > If the wheel bearing is damaged or worn:
 - Change the rear wheel bearing. (📖 p. 118)
- Clean and grease shaft seal ring **17** and contact surface **A** of the spacer.

Long-life grease (📖 p. 490)

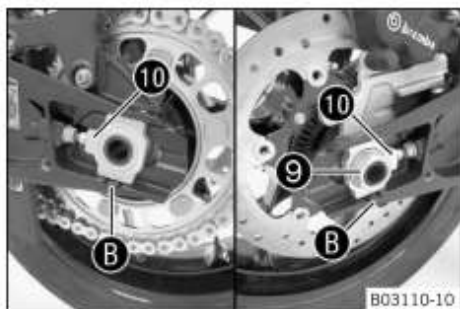
- Insert a spacer.
- Clean and grease the thread of the wheel spindle and nut.

Long-life grease (📖 p. 490)

- Mount the damping rubber pieces and rear sprocket carrier on the rear wheel.
- Place the rear wheel in the link fork and engage the brake disc in the brake caliper.



- Mount wheel spindle **11**, but do not push it in all the way.
- Push the rear wheel forward as far as possible and lay chain on the rear sprocket.



- Push the wheel spindle all the way in and mount chain adjusters **10** and nut **9**, but do not tighten yet.

Guideline

Nut, rear wheel spindle	M25x1.5	90 Nm (66.4 lbf ft) Thread greased
-------------------------	---------	---------------------------------------

i Info

Mount chain adjusters **10** in the same position.

- Make sure that the chain adjusters are fitted correctly on the adjusting screws.

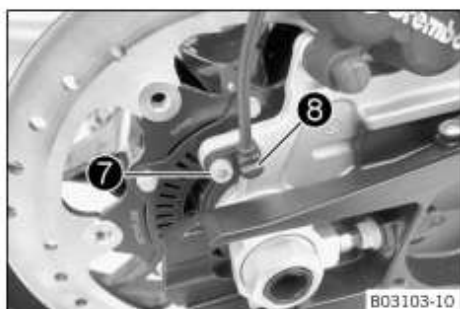
Guideline

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 **B**.

- Tighten nut **9**.

Guideline

Nut, rear wheel spindle	M25x1.5	90 Nm (66.4 lbf ft) Thread greased
-------------------------	---------	---------------------------------------



- Position wheel speed sensor **8** in the hole.
- Mount and tighten screw **7**.

Guideline

Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
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- Mount pin **A**.



- Position the chain securing guide with the spacer.
- Mount and tighten screw 5 with spacer.

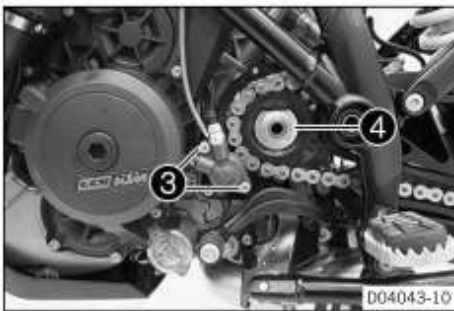
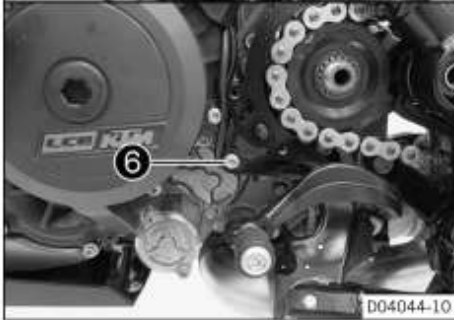
Guideline

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

- Mount and tighten screw 6.

Guideline

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



- Have an assistant operate the rear brake.
- Mount nut 4 with lock washer and tighten.

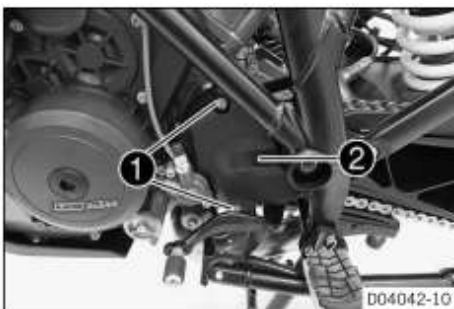
Guideline

Nut of engine sprocket	M20x1.5	100 Nm (73.8 lbf ft) Loctite®243™
------------------------	---------	---

- Secure the nut with the lock washer.
- Mount the clutch slave cylinder with the spacer and sleeves.
- Mount and tighten screws 3.

Guideline

Clutch slave cylinder screw	M6	10 Nm (7.4 lbf ft)
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- Position engine sprocket cover 2.
- Mount and tighten screws 1.

Guideline

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

Finishing work

- Check the chain tension. (p. 121)
- Remove the vehicle from the center stand. (p. 15)

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.

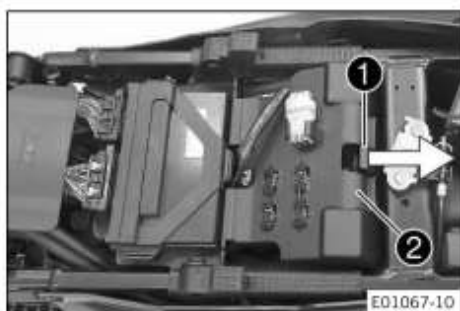
- Never operate the vehicle with a discharged 12-V battery or without a 12-V battery.

Preparatory work

- Switch off ignition - to do this briefly press the Race-on button  (maximum of 1 second) with the ignition switched on.
- Remove the passenger seat. ( p. 80)
- Remove the front rider's seat. ( p. 79)

Main work

- Pull locking mechanism **1** in the direction of the arrow.
- Fold open cover **2**.



- Disconnect both negative cables **3** from the 12-V battery.
- Disconnect both positive cables **4** from the 12-V battery.
- Take the 12-V battery and battery case **5** 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.

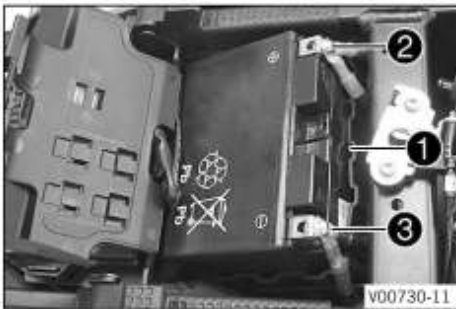
- Keep 12 V batteries out of the reach of children.
- Wear suitable protective clothing and safety glasses.
- Avoid contact with battery acid and battery gases.
- Keep sparks or open flames away from the 12 V battery.
- Only charge 12 V batteries in well-ventilated rooms.
- Rinse the affected area immediately 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.

- Never operate the vehicle with a discharged 12-V battery or without a 12-V battery.



Main work

- Position the 12-V battery in battery case ①.

Guideline

The even side of the battery case must be opposite the poles.

- Position the 12-V battery with the battery case in the battery compartment.
- Position both positive cables ② and mount and tighten the screw.

Guideline

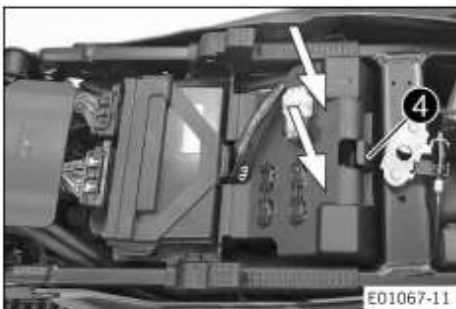
Screw, battery terminal	M6	4.5 Nm (3.32 lbf ft)
-------------------------	----	-------------------------

- Position the negative cable ③ and mount and tighten the screw.

Guideline

Screw, battery terminal	M6	4.5 Nm (3.32 lbf ft)
-------------------------	----	-------------------------

- Close cover ④ and gently push down.
- ✓ The cover engages with an audible click.



Finishing work

- Mount the front rider's seat. (p. 79)
- Mount the passenger seat. (p. 80)
- Set the 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.

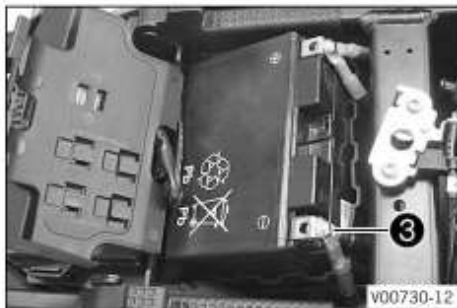
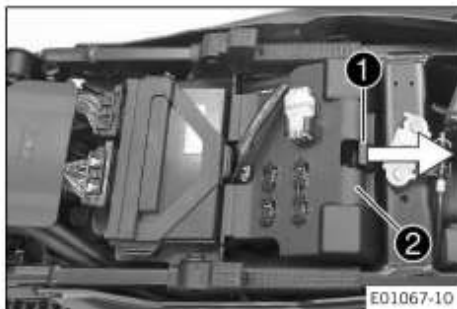
- Never operate the vehicle with a discharged 12-V battery or without a 12-V battery.

Preparatory work

- Switch off ignition - to do this briefly press the Race-on button  (maximum of 1 second) with the ignition switched on.
- Remove the passenger seat. ( p. 80)
- Remove the front rider's seat. ( p. 79)

Main work

- Pull locking mechanism **1** in the direction of the arrow.
- Fold open cover **2**.



- Disconnect negative cables **3** of 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.

- Never operate the vehicle with a discharged 12-V battery or without a 12-V battery.

**Main work**

- Position the negative cables ① and mount and tighten the screw.

Guideline

Screw, battery terminal	M6	4.5 Nm (3.32 lbf ft)
-------------------------	----	-------------------------



- Close cover ② and gently push down.
- ✓ The cover engages with an audible click.

Finishing work

- Mount the front rider's seat. (📖 p. 79)
- Mount the passenger seat. (📖 p. 80)
- 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

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 if there is no load on the 12-V battery, it discharges steadily.

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, destroying the battery.


The 12-V battery is maintenance-free, i.e. the acid level does not have to be checked.

Preparatory work


- Switch off ignition - to do this briefly press the Race-on button  (maximum of 1 second) with the ignition switched on.
- Remove the passenger seat. ( p. 80)
- Remove the front rider's seat. ( p. 79)
- Disconnect the negative cable of the 12-V battery. ( p. 136)

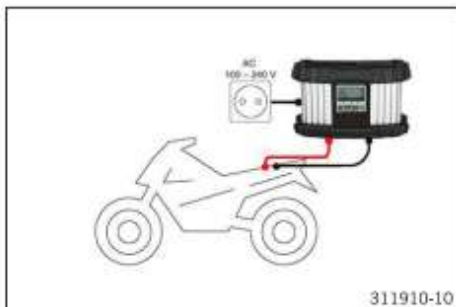
Main work

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

EU battery charger **XCharge-professional** (00029095050)
( p. 492)

Alternative 1

US battery charger **XCharge-professional**
(00029095051) ( p. 493)



Alternative 2

UK battery charger **XCharge-professional**
(00029095052) (☞ p. 493)

Alternative 3

CH battery charger **XCharge-professional**
(00029095053) (☞ p. 493)

i Info

Follow the instructions of the charger and the manual.

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

The charging current, charging voltage, and charging time must not be exceeded.	
Recharge the 12-V battery regularly when the motorcycle is not being used	3 months

Finishing work

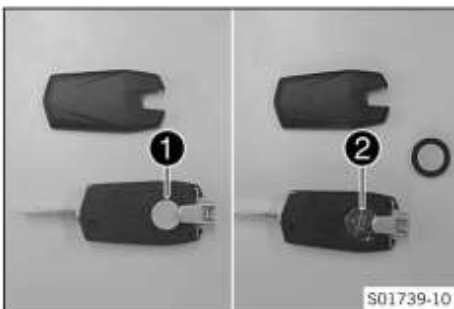
- Connect the negative cable of the 12-V battery. (☞ p. 137)
- Mount the front rider's seat. (☞ p. 79)
- Mount the passenger seat. (☞ p. 80)
- Set the time and date.



15.6 Changing the Race-on key battery



- Fold out the key bit of the Race-on key.
- Push the lower half of the Race-on key in the direction of the arrow and take off.



- Remove battery cover **1**.
- Remove the Race-on key battery **2**.
- Insert a new Race-on key battery with the label facing upward.

Race-on key battery (CR 2032) (☞ p. 399)

- Mount battery cover **1**.



S01740-11

- Fit lower half of the Race-on key and snap into place in the direction of the arrow.

15.7 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.

Preparatory work

- Switch off ignition - to do this briefly press the Race-on button (🔑) (maximum of 1 second) with the ignition switched on.
- Remove the passenger seat. (📖 p. 80)
- Remove the front rider's seat. (📖 p. 79)

Main work

- Remove screw ① and screw ②.
- Carefully raise rear fairing ③ slightly.



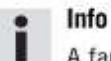
E01069-10

- Take off protection caps ④.



E01070-10

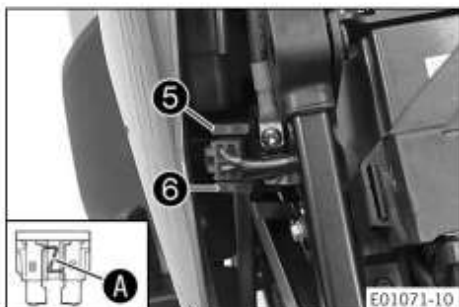
- Remove faulty main fuse ⑤.



Info

A faulty fuse has a burned-out fuse wire **A**.
A spare fuse ⑥ is located in the starter relay.
The main fuse protects all power consumers of the vehicle.

- Insert a new main fuse.



E01071-10

Fuse (58011109130) (📖 p. 399)

- Check that the electrical system is functioning properly.
- Mount the protection caps.



Tip

Insert a new spare fuse into the starter relay to have it available when needed.



- Position rear fairing ③.
- Mount and tighten screw ②.

Guideline

Screw, cover part	M5x17	3.5 Nm (2.58 lbf ft)
-------------------	-------	-------------------------

- Mount and tighten screw ①.

Guideline

Screw, cover part	M5x12	3.5 Nm (2.58 lbf ft)
-------------------	-------	-------------------------

Finishing work

- Mount the front rider's seat. (📖 p. 79)
- Mount the passenger seat. (📖 p. 80)
- Set the time and date.

15.8 Changing the fuses in the fuse box



Warning

Fire hazard Incorrect fuses overload the electrical system.

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



Info

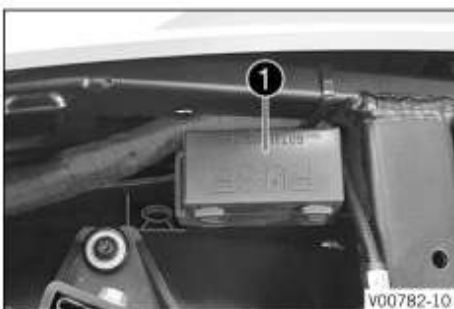
The fuse box containing the fuses of individual power consumers is located under the seat.

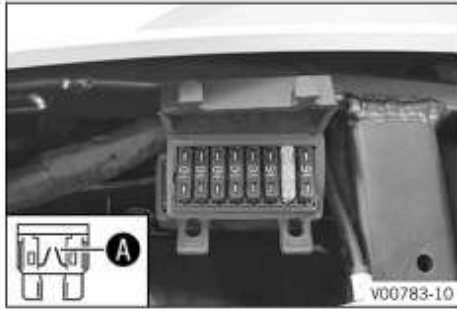
Preparatory work

- Switch off ignition - to do this briefly press the Race-on button (📖) (maximum of 1 second) with the ignition switched on.
- Remove the passenger seat. (📖 p. 80)
- Remove the front rider's seat. (📖 p. 79)

Main work

- Open fuse box cover ①.





- Check the fuses.



Info

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

- Remove the faulty fuse.

Guideline

Fuse 1 - 10 A - power supply for control units and components
Fuse 2 - 10 A - permanent positive for auxiliary equipment (ACC1), ignition positive for auxiliary equipment (ACC2)
Fuse 3 - 10 A - headlight control unit
Fuse 4 - 10 A - headlight control unit
Fuse 5 - 10 A - engine electronics control unit
Fuse 6 - 15 A - suspension control unit
Fuse 7 - 25 A - ABS return pump
Fuse 8 - 15 A - ABS hydraulic unit

- Insert a spare fuse with the correct rating.

Fuse (58011109110) (see p. 399)
Fuse (58011109115) (see p. 399)
Fuse (58011109125) (see p. 399)



Tip

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

- Check that the power consumer is functioning properly.
- Close the fuse box cover.

Finishing work

- Mount the front rider's seat. (see p. 79)
- Mount the passenger seat. (see p. 80)

15.9 Checking the charging voltage

Condition

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

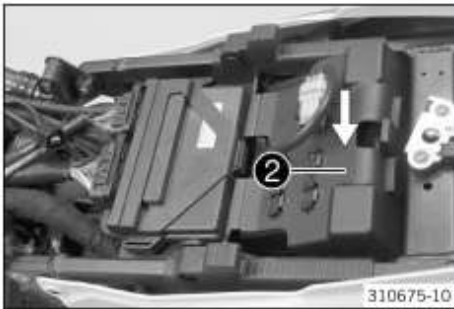
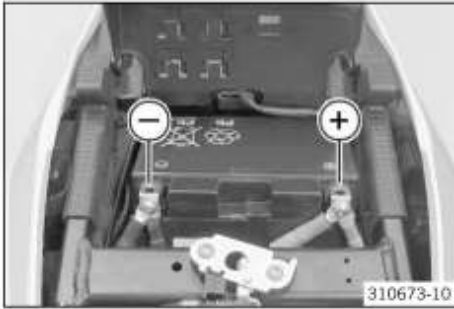
Preparatory work

- Remove the passenger seat. (see p. 80)
- Remove the front rider's seat. (see p. 79)

Main work

- Pull locking mechanism **1** in the direction of the arrow.
- Fold open cover **2**.
- Start the motorcycle to check the function. (see p. 17)





- **V** Measure the voltage between the specified points.
Measuring point **plus (+)** – Measuring point **Ground (-)**

Charging voltage	
5,000 rpm	13.5 ... 15.0 V

- » If the displayed value is greater than the specified value:
 - Change the voltage regulator.
- Close cover **2** and gently push down.
 - ✓ The cover engages with an audible click.

Finishing work

- Mount the front rider's seat. (p. 79)
- Mount the passenger seat. (p. 80)

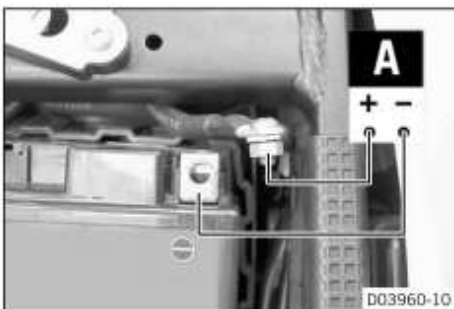
15.10 Checking the open-circuit current

Preparatory work

- Switch off ignition - to do this briefly press the Race-on button (p. 80) (maximum of 1 second) with the ignition switched on.
- Remove the passenger seat. (p. 80)
- Remove the front rider's seat. (p. 79)
- Disconnect the negative cable of the 12-V battery. (p. 136)

Main work

- Connect the negative cable of the 12-V battery using an appropriate fitting.
- Measure the current between the 12-V battery ground (-) and the negative cable.



- i Info**
The value of the open-circuit current only applies to vehicles in their original state without additional power consumers.
After switching off the ignition, wait 1 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. 137)
- Mount the front rider's seat. (p. 79)

- Mount the passenger seat. (📄 p. 80)
- Set the time and date.

16.1 Checking the front brake linings



Warning

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

- Ensure that worn-out brake linings are replaced immediately.

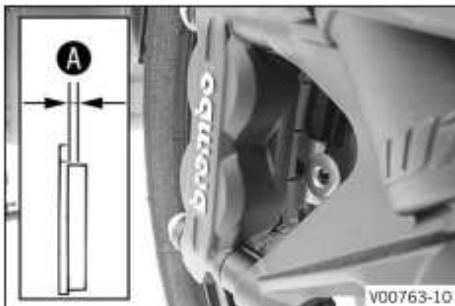


Warning

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 front brake linings. (p. 145)
- Check all brake linings on both brake calipers for damage and cracking.
 - › If there is damage or cracking:
 - Change the front brake linings. (p. 145)

16.2 Changing the front brake linings



Warning

Skin irritation Brake fluid causes skin irritation.

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



Warning

Danger of accidents Old brake fluid reduces the braking effect.

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



Warning

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

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



Warning

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

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

- Only use brake linings approved and recommended by KTM.



Note

Environmental hazard Hazardous substances cause environmental damage.

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



Info

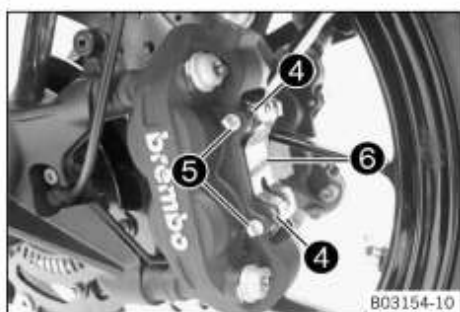
Never use DOT 5 brake fluid! It is silicone-based and purple in color. Oil seals and brake lines are not designed for DOT 5 brake fluid.

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

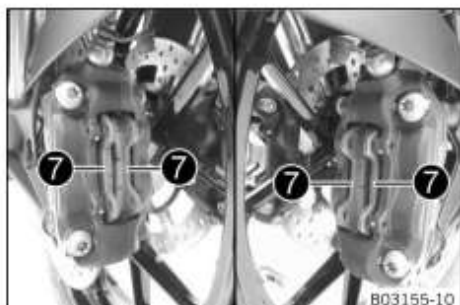
Only use clean brake fluid from a sealed container.



- Move the brake reservoir mounted on the handlebar into a horizontal position.
- Remove screws ①.
- Take off cover ② with membrane ③.



- Press the brake piston back into the basic position and ensure that brake fluid does not flow out of the brake fluid reservoir; extract some if necessary.
- Remove cotter pins ④ and pull out pins ⑤.
- Remove retaining bracket ⑥.

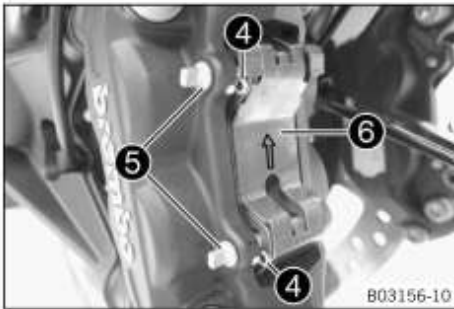


- Remove brake linings ⑦.
- Clean the brake caliper.
- Mount new brake linings ⑦.

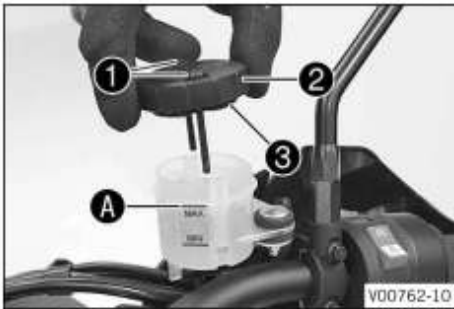


Info

Always change the brake linings in sets and on both sides.



- Position retaining bracket ⑥.
- ✓ The arrow on the retaining bracket points in the direction of travel.
- Mount pins ⑤ and cotter pins ④.
- 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 ①.
- Brake fluid DOT 4 / DOT 5.1 (📖 p. 488)
- Position cover ② with membrane ③.

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

- Mount and tighten screws ①.

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 **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.



- Move the brake 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 ①:
 - Add front brake fluid. (📖 p. 148)

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 **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 attacks paint.

Only use clean brake fluid from a sealed container.



Preparatory work

- Check the front brake linings. (☞ p. 145)

Main work

- Move the brake reservoir mounted on the handlebar to a horizontal position.
- Remove screws ①.
- Take off cover ② with membrane ③.
- Add brake fluid up to **MAX** marking A.

Brake fluid DOT 4 / DOT 5.1 (☞ p. 488)

- Position cover ② with membrane ③.
- Mount and tighten screws ①.

**Info**

Clean up overflowed or spilled brake fluid immediately with water.

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.

**Info**

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

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

Only use clean brake fluid from a sealed container.



- Move the brake reservoir mounted on the handlebar into 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. 494)

Brake fluid DOT 4 / DOT 5.1 (📖 p. 488)

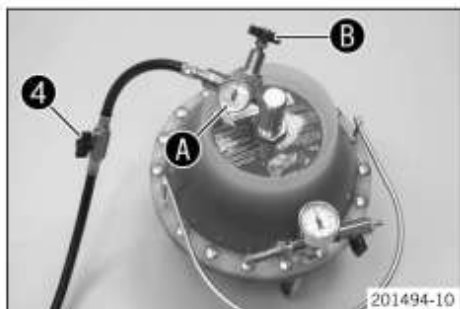


- Mount corresponding bleeder cover ③ from special tool set.

Bleeder cover (00029013002) (📖 p. 492)

- Connect the bleeding device.

Bleeding device (00029013100) (📖 p. 492)



- 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. 492)
--

- 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. Attach 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. 492)
--

- Open bleeder screw **8** by approx. one half turn.

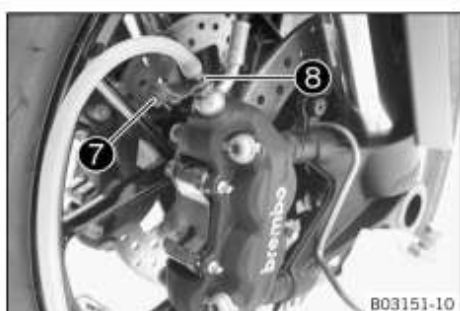
i Info

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. Attach the protection cap.
- Disconnect the bleeding device. Remove the bleeder cover.

- Remove the protection cap of the hand brake cylinder bleeder screw. Connect the bleeder bottle hose.

- Open bleeder screw **9** by approx. one half turn. Operate the hand brake lever repeatedly until fresh brake fluid emerges from the hose of the bleeder bottle without bubbles. Tighten the bleeder screw.
- Remove the bleeder bottle hose. Attach the protection cap.





- Correct the brake fluid to the **MAX** marking.

Brake fluid DOT 4 / DOT 5.1 (☞ p. 488)
--

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

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

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

16.6 Adjusting the basic position of the hand brake lever



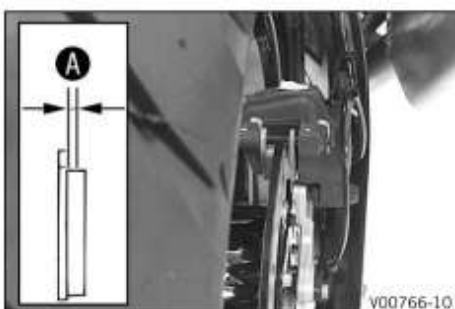
- Adjust the basic position of the hand brake lever to your hand size by turning adjusting wheel **1**.

i Info
Push the hand brake lever forward and turn the adjusting wheel.
Do not make any adjustments while riding.

16.7 Checking the rear brake linings

! 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	≥ 1 mm (≥ 0.04 in)
----------------------------	--------------------

- > If the minimum thickness is less than specified:
 - Change the rear brake linings. (☞ p. 152)
- Check the brake linings for damage and cracking.
 - > If there is wear or tearing:
 - Change the rear brake linings. (☞ p. 152)

16.8 Changing the rear brake linings



Warning

Skin irritation Brake fluid causes skin irritation.

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



Warning

Danger of accidents Old brake fluid reduces the braking effect.

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



Warning

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

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



Warning

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

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

- Only use brake linings approved and recommended by KTM.



Note

Environmental hazard Hazardous substances cause environmental damage.

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

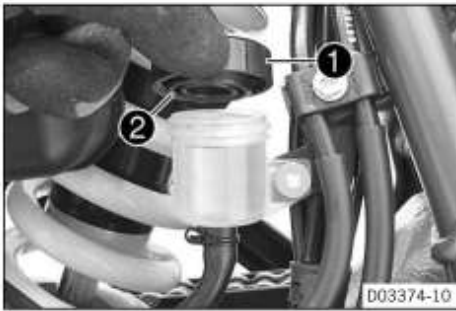


Info

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

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

Only use clean brake fluid from a sealed container.

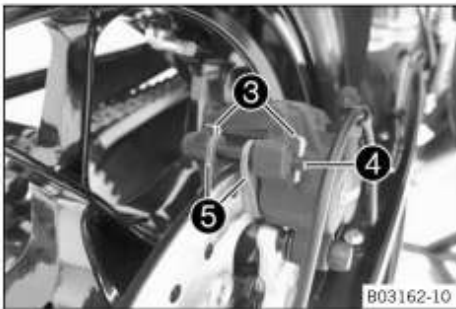


- Stand the vehicle upright.
- Remove screw cap ① with membrane ②.
- Press the brake caliper onto the brake disc by hand in order to push back the brake pistons. Ensure that brake fluid does not flow out of the brake fluid reservoir; extract some if necessary.

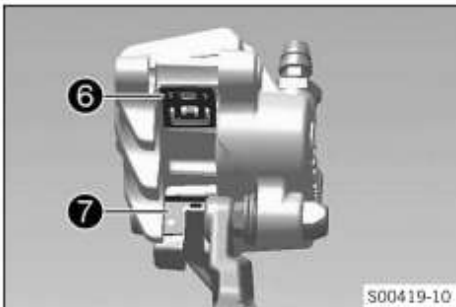


Info

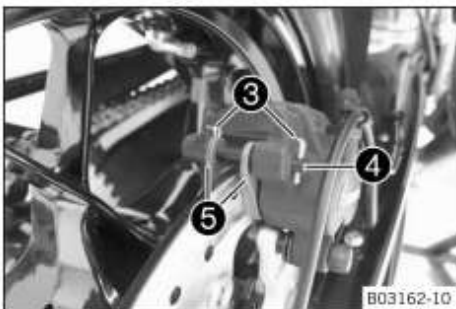
Make sure that you do not press the brake caliper against the spokes when pushing back the brake pistons.



- Remove cotter pins ③.
- Remove pin ④ and brake linings ⑤.
- Clean the brake caliper and brake caliper bracket.



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



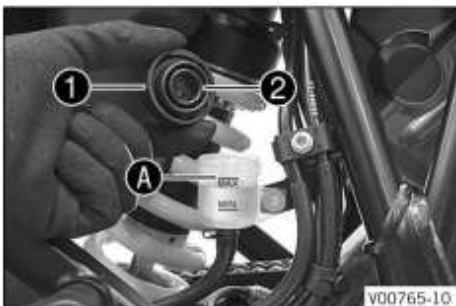
- Position new brake linings ⑤.



Info

Always change the brake linings in pairs.

- Mount pins ④ and cotter pins 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. 488)

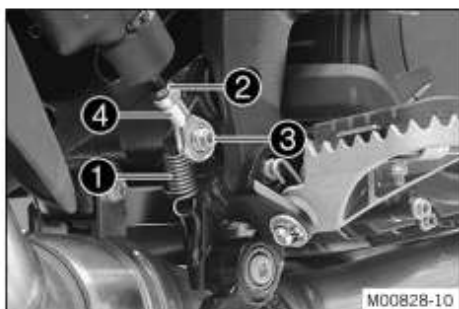
- Mount and tighten screw cap ① with membrane ②.



Info

Clean up the overflowed or spilled brake fluid immediately with water.

16.9 Adjusting the basic position of the foot brake lever



- Detach spring ①.
- Loosen nut ②.
- Remove screw ③.
- To adjust the basic position of the foot brake lever to individual requirements, turn ball joint ④ accordingly.

i Info

The range of adjustment is limited.
The screw must be screwed into the ball joint by at least 5 turns.

- Hold ball joint ④ and tighten nut ②.

Guideline

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

- Mount and tighten screw ③.

Guideline

Screw, ball joint of push rod on foot brake cylinder	M6	10 Nm (7.4 lbf ft) Loctite®243™
--	----	---

- Attach spring ①.

16.10 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.

Preparatory work

- Raise the vehicle with the center stand. (p. 15)

Main work

- Check the brake fluid level in brake fluid reservoir ①.
 - * If the fluid level reaches the **MIN** marking **A**:
 - Add rear brake fluid. (p. 155)



16.11 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 attacks paint.

Only use clean brake fluid from a sealed container.

Preparatory work

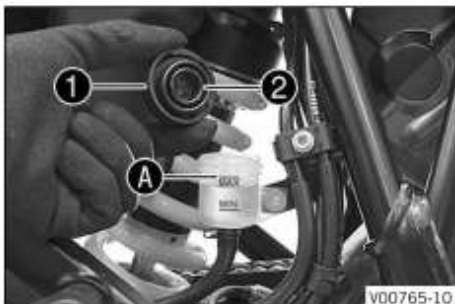
- Raise the vehicle with the center stand. (📖 p. 15)
- Check the rear brake linings. (📖 p. 151)

Main work

- Remove screw cap ① with membrane ②.
- Add brake fluid up to **MAX** marking A.

Brake fluid DOT 4 / DOT 5.1 (📖 p. 488)

- Mount and tighten screw cap ① with membrane ②.

**Info**

Clean up overflowed or spilled brake fluid immediately with water.

16.12 Changing the rear brake fluid



Warning

Skin irritation Brake fluid causes skin irritation.

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



Note

Environmental hazard Hazardous substances cause environmental damage.

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



Info

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

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

Only use clean brake fluid from a sealed container.



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

Syringe (50329050000) (☞ p. 494)

Brake fluid DOT 4 / DOT 5.1 (☞ p. 488)
--

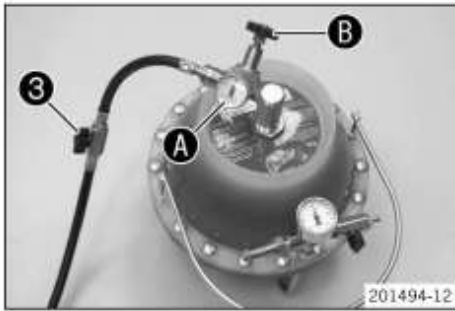


- Mount bleeder cover **2**.

Bleeder cover (00029013004) (☞ p. 492)
--

- Connect the bleeding device.

Bleeding device (00029013100) (☞ p. 492)
--



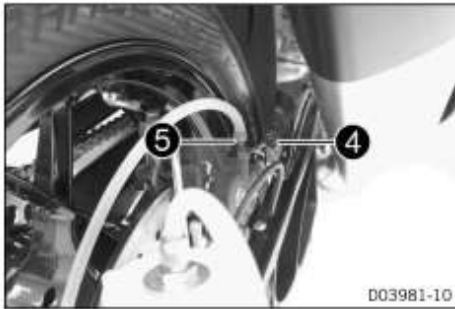
- Open shut-off valve **3**.

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

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

Guideline:

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



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

Bleeding device (00029013100) (p. 492)
--

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

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


- Tighten the bleeder screw.
 - Close shut-off valve **3**.
 - Open the bleeder screw again until brake fluid stops emerging.
✓ Overfilling the brake fluid reservoir is prevented.
 - Tighten the bleeder screw. Remove the bleeder bottle hose. Attach the protection cap.
 - Disconnect the bleeding device. Remove the bleeder cover.
 - Correct the brake fluid to the **MAX** marking.
- | |
|--------------------------------------|
| Brake fluid DOT 4 / DOT 5.1 (p. 488) |
|--------------------------------------|
- Mount and tighten the screw cap with the membrane.



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

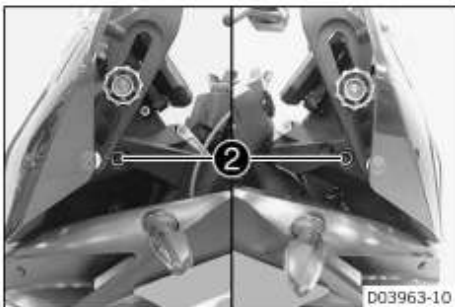
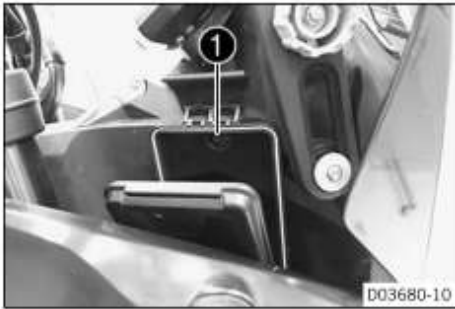
17.1 Removing the headlight

Preparatory work

- Switch off ignition - to do this briefly press the Race-on button  (maximum of 1 second) with the ignition switched on.

Main work

- Open the storage compartment and remove screw **1**.
- Hang the storage compartment to the side.



- Remove screws **2**.



- Turn the adjusting wheel counterclockwise until the headlight unlocks.
- Swing the headlight toward the front.



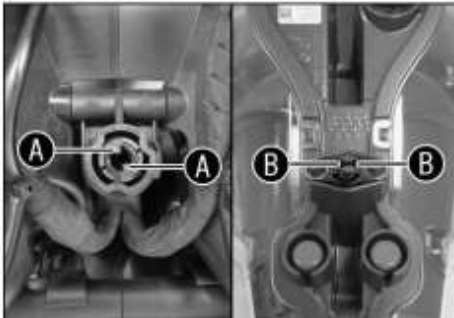
- Unplug connector **3**.
- Take off the headlight and put down on a soft cloth.

17.2 Installing the headlight



Main work

- Plug in connector 1 for the headlight.
- Check that the lighting is functioning properly.



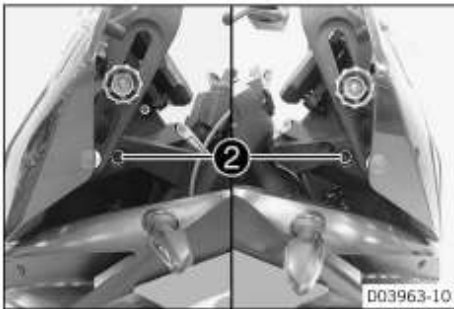
- Position the headlight.
- Align the adjusting screw on the headlight with the adjustment mounting.
 - ✓ The holding lugs A on the adjustment mounting engage in the cut-outs B on the adjusting screw.
- Turn the adjusting wheel clockwise until the adjusting screw engages in the thread.



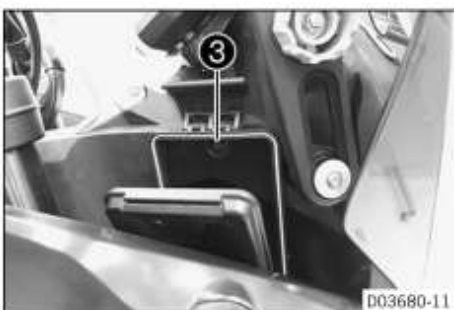
- Mount and tighten screws 2.

Guideline

Screw, headlight	EJOT ALtracs® 60x20	8 Nm (5.9 lbf ft)
------------------	------------------------	-------------------



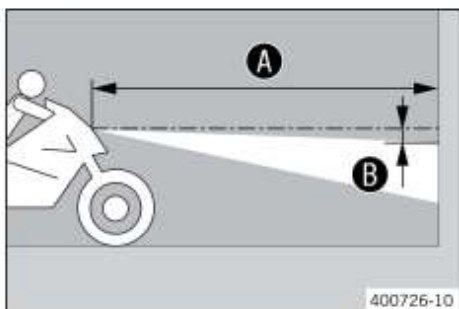
- Position the storage compartment.
- Mount and tighten screw 3.
- Close the storage compartment.



Finishing work

- Check the headlight setting. (p. 160)

17.3 Checking the headlight setting



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

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

- Position the vehicle perpendicular to the wall at a distance **A** from the wall and switch on the low beam.

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 the headlight range. (p. 160)

17.4 Adjusting the headlight range

Preparatory work

- Check the headlight setting. (p. 160)

Main work

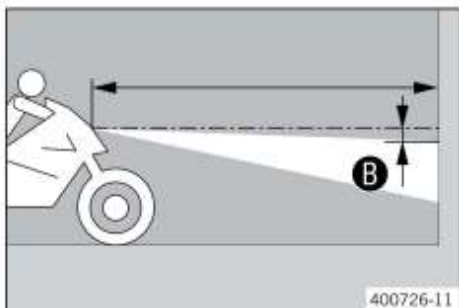
- Turn adjusting wheel **1** to adjust the headlight range.



i Info
Turn counterclockwise to increase the headlight range; turn clockwise to reduce 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.

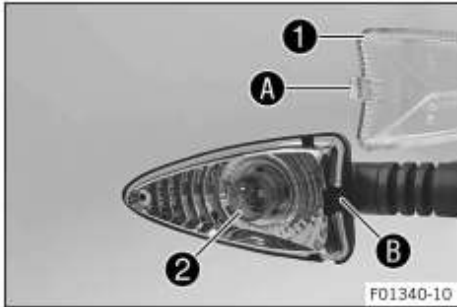


17.5 Changing the turn signal bulb (US)

Note

Damage to reflector Grease on the reflector reduces the light intensity. Grease on the bulb will evaporate due to the heat and be deposited on the reflector.

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



- Remove the screw on the front of the turn signal housing.
- Carefully remove turn signal glass 1.
- Press bulb 2 carefully into the socket, turn it counterclockwise by about 30°, and take it out of the socket.

i Info
Do not touch the reflector with your fingers and keep it free from grease.

- Push the new bulb gently into the socket and turn it clockwise all the way in.

Turn signal (RY10W / socket BAU15s) (p. 399)

- Check that the turn signal is functioning properly.
- Position the turn signal glass.

i Info
Insert holding lug A into cut-out B.

- Insert the screw and first turn counterclockwise until it engages in the thread with a small jerk. Tighten the screw lightly.

17.6 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. An enabling code is required to activate the ignition keys.



Programming additional ignition key:

Condition

The diagnostics tool is connected and running.

- Position the black KTM ignition key in the area **A**.
- Switch on ignition - to do this briefly press the Race-on button  (maximum of 1 second) with the ignition switched off.
- Select **"CU diagnostics" > "Immobilizer" > "ECU"**.
- **"Functions" > "Program key" > "Select"**.

Info

The instructions in the diagnostics tool must be followed precisely.

- **"Request enabling code"** Select.
- **"Start programming"** Select.

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 5 seconds.
- Read out the trouble code memory using the KTM diagnostics tool.
 - » If an error is still present:
 - Repeat the procedure.

If no or one Race-on key is present:

Condition

Ignition is switched off and diagnostics tool is connected to external power supply for VCI and running.

- Select **"CU diagnostics" > "Immobilizer" > "ECU"**.
- **"Functions" > "Program key" > "Select"**.

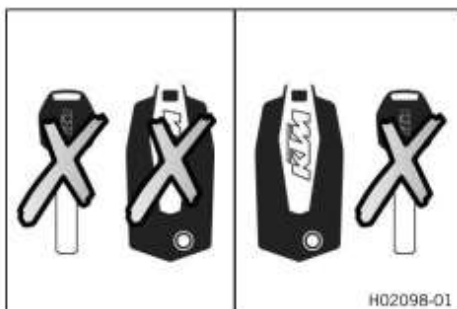
Info

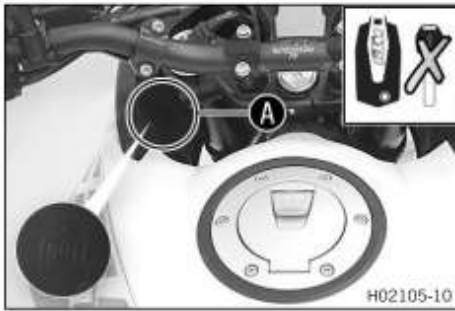
The instructions in the diagnostics tool must be followed precisely.


- **"Request enabling code"** Select.
- **"Start programming"** Select.

Info

The instructions in the diagnostics tool must be followed precisely.






- Place the Race-on key in the radio range of area **A**.
- Switch on ignition - to do this briefly press the Race-on button  (maximum of 1 second) with the ignition switched off.
- Clear the fault memory using the KTM diagnostics tool.
- Switch off the ignition for 5 seconds.
- Read out the trouble code memory using the KTM diagnostics tool.
 - » If an error is still present:
 - Repeat the procedure.



If only the black KTM ignition key is present:

Condition

The diagnostics tool is connected and running.

- Position the black KTM ignition key in the area **A**.
- Switch on ignition - to do this briefly press the Race-on button  (maximum of 1 second) with the ignition switched off.
- Select **"CU diagnostics" > "Immobilizer" > "ECU"**.
- **"Functions" > "Program key" > "Select"**.



Info

The instructions in the diagnostics tool must be followed precisely.

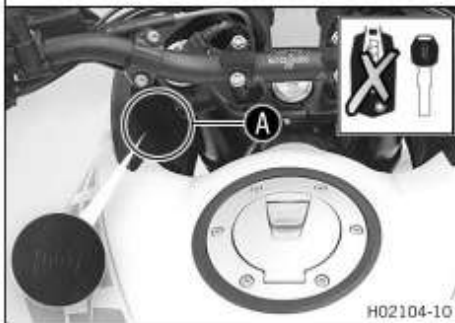
- **"Request enabling code"** Select.
- **"Start programming"** Select.



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 5 seconds.
- Read out the trouble code memory using the KTM diagnostics tool.
 - » If an error is still present:
 - Repeat the procedure.



17.7 Changing USB cable

Preparatory work

- Switch off ignition - to do this briefly press the Race-on button  (maximum of 1 second) with the ignition switched on.
- Remove the headlight. ( p. 158)



Main work

- Unplug connector **1** on the combination instrument.



- Actuate lock **2** on connector **A0** and pull off pins **18, 25, 19** and **11**.



Info

Note the assignment of the cable colors.
Ensure that no other pins are removed.

- Allow the lock **2** on the connector to snap in again.



- Remove the cable tie and cable fixings.



Info

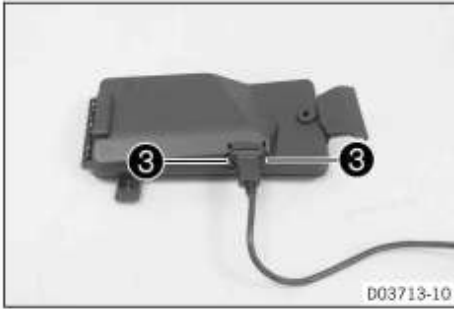
Do not remove the cable fixings with a sharp object.

- Expose the USB cable.



- Remove the USB cable with storage compartment.



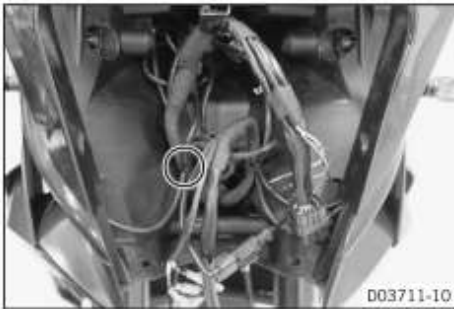


- Remove screws **3**.
- Remove the USB cable.
- Position the new USB cable.
- Mount and tighten screws **3**.



- Route the USB cable toward the front.

i Info
The storage compartment is not positioned until the headlight is installed.



- Secure the USB cable with the cable tie and cable fixings.



- Actuate lock **2** on connector **AO** and plug in pins **18, 25, 19** and **11**.

i Info
Ensure that no other pins are removed.

- Allow the lock **2** on the connector to snap in again.





- Plug connector ❶ into the combination instrument.

Finishing work

- Install the headlight. (📖 p. 159)
- Check the headlight setting. (📖 p. 160)

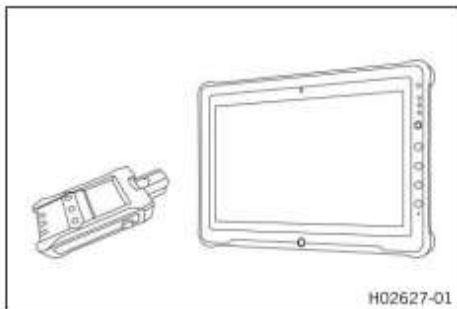
17.8 Adjusting service display with KTM diagnostics tool

i Info

The steps for adjusting the service display are the same for the **Km** and **Meilen** units.

Condition

The diagnostic tool is connected and running.



- Select "**Combination instrument**" > "**Functions**" > "**Adjust service interval**".
- Enter the distance until the next service is due.
- Select the unit for the distance.
- Quit the process using "**Execute**".

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 (see p. 169)

Display 2



Warning

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, e.g. 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 the indicator lamps are briefly activated for a function check.



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 Day-Night mode



F01268-01

Day mode is shown in a bright color.



F01268-02

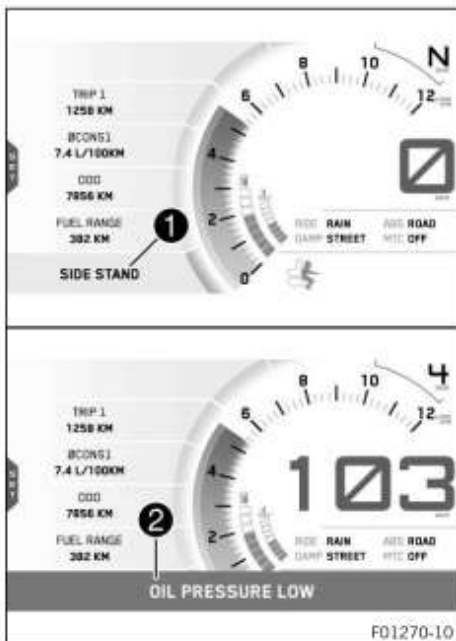
Night mode is shown in a dark color.

i Info

The ambient light sensor in the combination instrument measures the brightness of the environment and automatically switches the display to day or night mode. The display is brightened, darkened or switched to the other mode depending on the brightness measured by the ambient light sensor.

The display mode cannot be changed manually.

18.4 Warnings



F01270-10

Warnings appear on the bottom edge of the display; these are marked yellow or red depending on their relevance.

Yellow warnings **1** indicate errors or information which require prompt intervention or an adjustment to the riding style.

Red warnings **2** indicate errors or information which require immediate intervention.

i Info

Warnings can be hidden by pressing any button.

All the existing warnings are displayed in the **Warnings** 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 ❄ is shown in area ❶ of the display.

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, the warning **ICE WARNING** also appears.

18.6 Indicator lamps



F01267-01

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.













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.

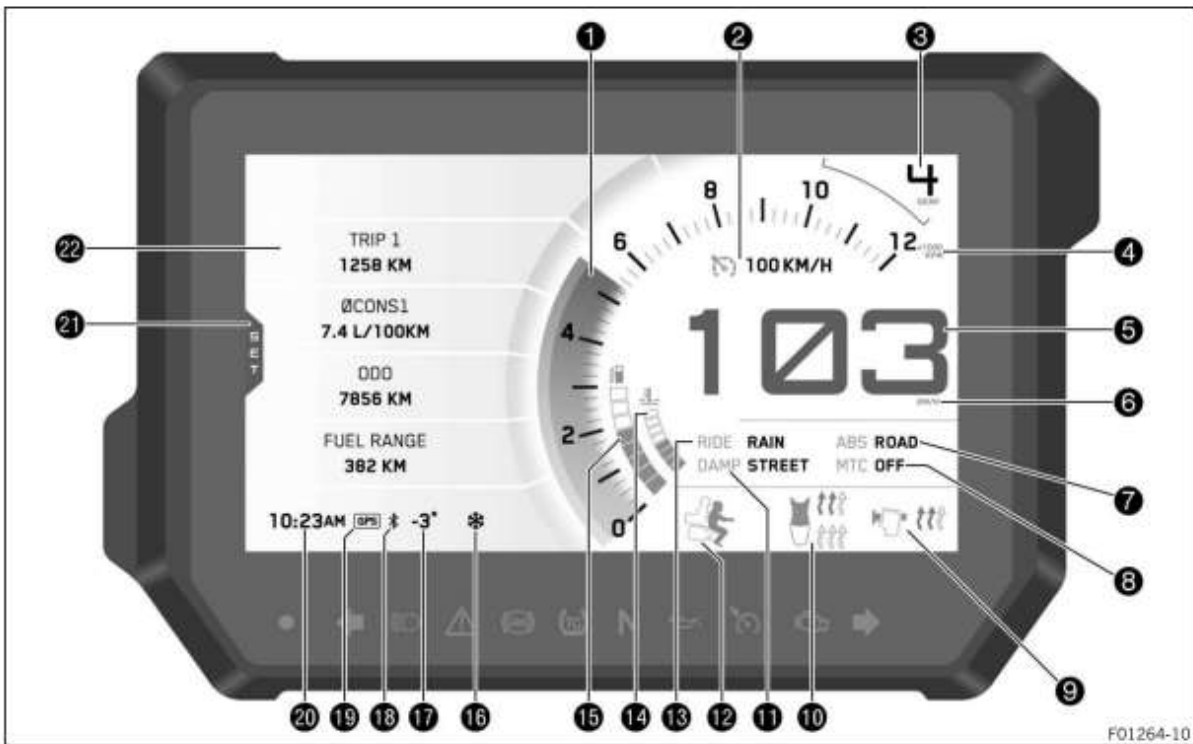
The oil pressure warning lamp always lights up as long as the engine is not running. If the engine is running and the oil pressure warning lamp lights up, stop immediately (taking care not to endanger yourself or other road users in the process) and switch off the engine.

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.

Possible states

	Race-on indicator lamp lights up/flashes yellow/orange/red – Status or error messages relating to Race-on system/alarm system.
	The left turn signal indicator lamp flashes green with a steady rhythmic flash – The left turn signal is switched on.
	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.
	The ABS warning lamp lights up yellow – Status or error messages relating to <u>ABS</u> . The ABS warning lamp flashes if the ABS mode Offroad is enabled.
	TC indicator lamp lights up/flashes yellow – The MTC is not enabled or is currently intervening. The TC indicator lamp also lights up if an error is detected. Contact an authorized KTM workshop. The TC indicator lamp flashes if TC actively engages or if the HHC (optional) is activated.
	The idle indicator lamp lights up green – The transmission is in neutral.
	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 cruise control system indicator lamp lights up yellow – The cruise control system function is switched on, but the speed control is not active.
	The cruise control system indicator lamp lights up green – The cruise control system function is switched on and the speed control is active.
	Malfunction indicator lamp lights up yellow – The <u>OBD</u> has detected an emission- or safety-critical fault.
	The right turn signal indicator lamp flashes green with a steady rhythmic flash – The right turn signal is switched on.

18.7 Display



FO1264-10

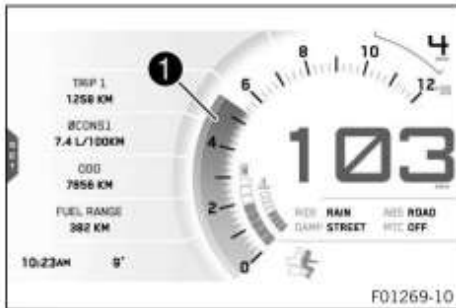
i **Info**

The figure shows the start screen of the combination instrument. If the menu is opened, the speed is still displayed.

- ① Speed (☞ p. 172)
- ① Shift warning light (☞ p. 172)
- ① The shift warning light is integrated in the tachometer display.
- ② Cruise control indicator (☞ p. 173)
- ③ Gear display
- ④ Unit for the speed display
- ⑤ Speed (☞ p. 173)
- ⑥ Unit for the speedometer
- ⑦ **ABS** display (☞ p. 173)
- ⑧ **MTC** display (☞ p. 173)
- ⑨ Heated grip (optional) (☞ p. 174)
- ⑩ Seat heater (optional) (☞ p. 174)
- ⑪ **Damp** display (☞ p. 174)
- ⑫ **Load** display (☞ p. 175)
- ⑬ **Ride** display (☞ p. 174)
- ⑭ Coolant temperature indicator (☞ p. 175)
- ⑮ Fuel level display (☞ p. 175)
- ⑯ Ice warning (☞ p. 169)
- ⑯ Only shown when there is an increased risk of ice on the roads.
- ⑰ Ambient air temperature indicator (☞ p. 176)

- 18 Bluetooth® (optional)
- 19 GPS (optional)
- 20 Time (see p. 176)
- 21 SET
Only shown where the menu overview is closed.
- 22 Favourites display (see p. 176)

18.8 Speed



The speed is shown in area 1 of the display.
The speed is measured in revolutions per minute.

18.9 Shift warning light



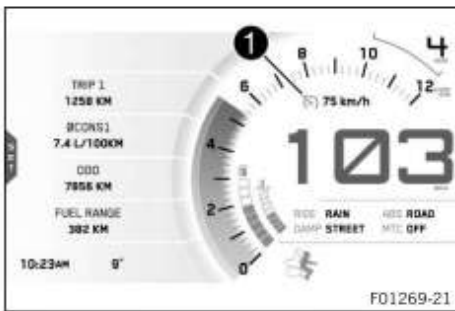
The shift warning light is integrated in the tachometer display. In the **Shift Light** menu, the engine speed for the shift warning light can be set. The shift warning light is always active during the running-in phase (up to 1,000 km / 621 mi). The shift warning light can only be deactivated, and the values for **RPM1** and **RPM2** can only be adjusted after this. The shift warning light lights up red at **RPM1** and flashes red at **RPM2**.

i Info

In sixth-gear, the shift warning light is deactivated when the engine is warm after the first service.

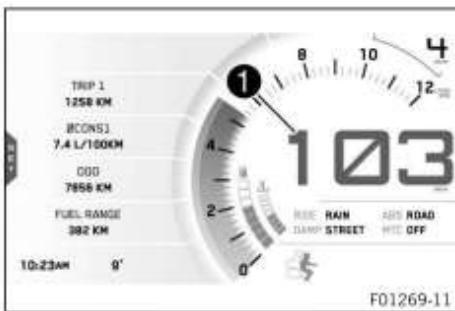
Coolant temperature	≤ 35 °C (≤ 95 °F)
ODO	< 1,000 km (< 620 mi)
The shift warning light always lights up at	6,500 rpm
Coolant temperature	> 35 °C (> 95 °F)
ODO	> 1,000 km (> 620 mi)
RPM1 shift warning light	lights up
RPM2 shift warning light	flashes

18.10 Cruise control indicator



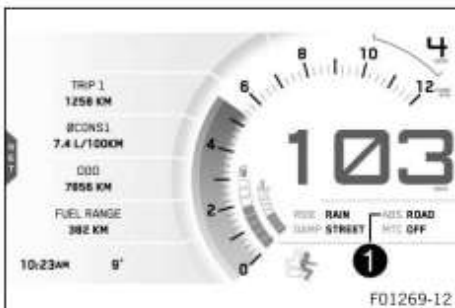
The operating state and active cruise control are shown in the **1** area of the display.
Cruise control is operated using the cruise control tip switch.

18.11 Speed



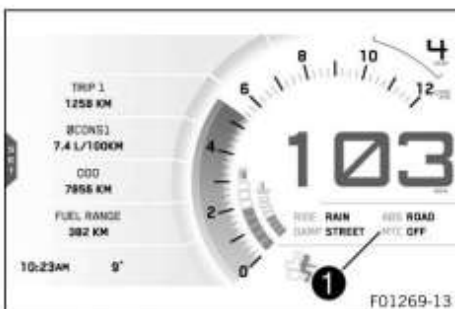
The speed is shown in area **1** of the display.
The unit of speed can be configured in the **Distance** menu.
Speed is shown in kilometers per hour **km/h** or in miles per hour **mph**.

18.12 ABS display



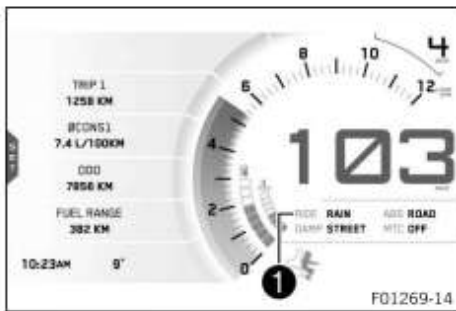
The ABS mode setting is shown in the **1** area of the display.
The **ABS** can be configured in the **ABS** menu.

18.13 MTC display



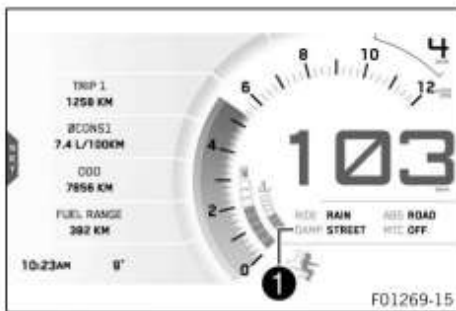
The **1** area of the display indicates whether **MTC** the system is switched on or off.
The motorcycle traction control can be switched on or off in the **MTC** menu.

18.14 Ride display



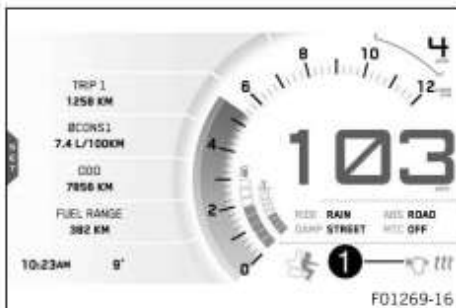
The **Ride Mode** setting is shown in area **1** of the display. The drive mode can be configured in the **Ride Mode** menu.

18.15 Damp display



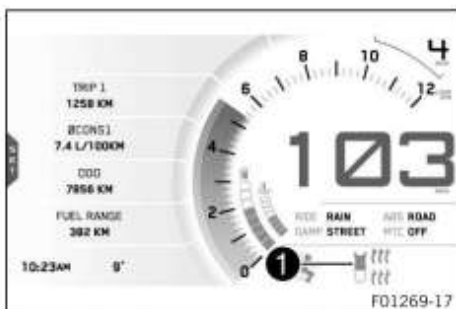
The **Damping** mode setting is shown in the **1** area of the display. The damping can be configured in the **Damping** menu.

18.16 Heated grip (optional)



When the heated grip is switched on, the **Heated Grips** symbol appears in the **1** area of the display. The heated grip can be configured in the **Heated Grips** menu.

18.17 Seat heater (optional)



When the seat heating is switched on, the **Heated Seat** symbol appears in area **1** of the display. The seat heating can be configured in the **Heated Seat** menu.

i Info

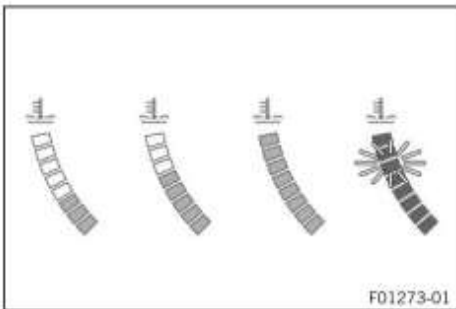
The heating level for the passenger seat heating can be controlled by a switch next to the right grab handle.

18.18 Load display



The payload setting is shown in area **1** of the display. The payload can be configured in the **Load** menu.

18.19 Coolant temperature indicator



The coolant temperature indicator consists of bars. The more bars that light up, the hotter the coolant.

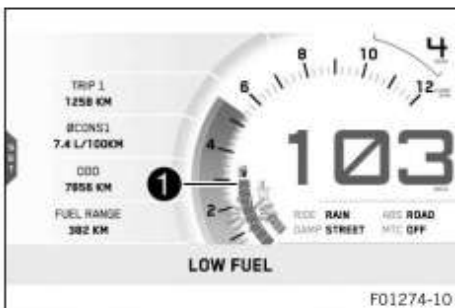
i Info

When all the bars flash, the warning **ENGINE TEMP HIGH** also appears.

Possible states

- The engine is cold – Up to three bars light up.
- Engine warm – Four bars light up.
- Engine hot – Five to eight bars light up.
- Engine very hot – all eight bars flash red.

18.20 Fuel level display

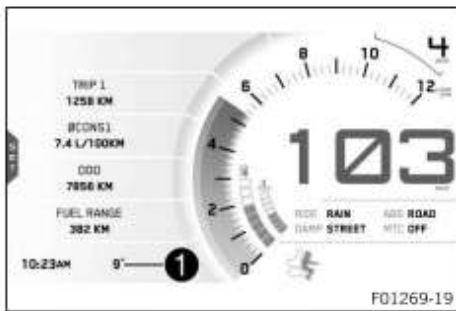


The fuel tank contents are shown in area **1** of the display. The fuel level indicator consists of bars. The more bars are lit, the more fuel is in the fuel tank.

i Info

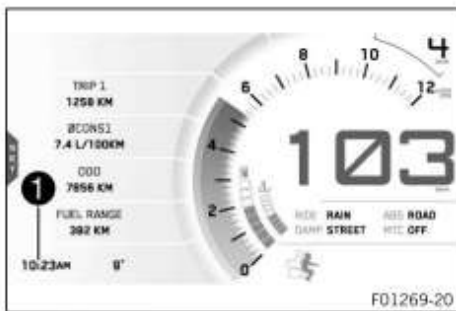
If the fuel level is getting low, all eight segments flash red and the following warning also appears **LOW FUEL**. The fuel level is displayed with a slight delay to prevent the indicator from constantly moving while riding. The fuel level display is not updated while the side stand is folded out or 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.

18.21 Ambient air temperature indicator



The ambient air temperature is displayed in the **1** area. The unit of ambient air temperature can be configured in the **Temperature** menu. The ambient air temperature is displayed in °C or °F.

18.22 Time



The time is shown in area **1** of the display. The time is displayed in 24 hour format in all languages except for EN-US. The time is displayed in 12 hour format if the language is set to EN-US. The time can be configured in the **Time/Date** menu.

i Info
The time must be reset if the 12-V battery was disconnected from the vehicle or the fuse was removed.

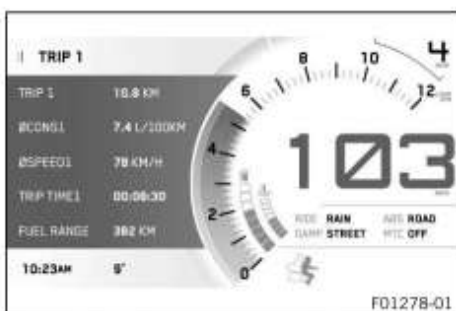
18.23 Favourites display



Up to eight items of information are shown in the **Favourites** display. The **Favourites** display can be freely configured in the **Favourites** menu.

i Info
One to four items of information selected are displayed on two lines. Five to eight items of information selected are displayed on a single line.

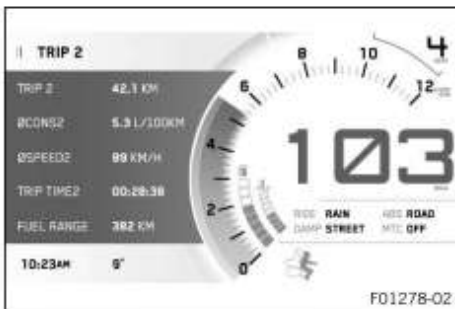
18.24 Quick Selector 1 display



When the menu is closed, the **Quick Selector 1** menu is opened by pressing the **UP** button. Press the **BACK** button to close **Quick Selector 1**.

i Info
The **Quick Selector 1** can be configured in the **Quick Selector 1** menu. Any information can be selected.

18.25 Quick Selector 2 display



When the menu is closed, the **Quick Selector 2** menu is opened by pressing the **DOWN** button.
Press the **BACK** button to close **Quick Selector 2**.



Info

The **Quick Selector 2** can be configured in the **Quick Selector 2** menu. Any information can be selected.

18.26 Navigation display (optional)



The **Navigation** display appears when the navigation function is active.

The **Navigation** display shows the direction arrow, the distance to the next waypoint, the road name as well as up to four sets of information.

The **Navigation** display can be freely configured in the **Navigation Info Screen** menu.



Info

One to two sets of information selected are displayed on two lines. Three to four sets of information selected are displayed on one line.

18.27 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 **Preferences** is marked.
- Press and hold the **UP** and **DOWN** button for approximately 2 seconds.
 - ✓ The **Service** menu 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.

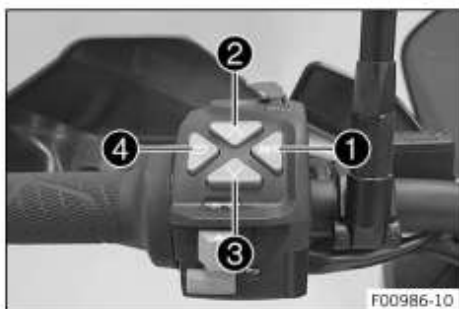
18.28 Programming cruise control system



R02776-10

- Switch on ignition; to do this, briefly press the Race-on tip switch  (maximum of 1 second).
 - ✓ 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 neutral position.
 - ✓ The cruise control system indicator lamp  goes out.
- Switch off ignition.

18.29 Menu



F00986-10

i Info

Press the **SET** button **1** in the standard display to open the menu.

Navigate through the menu using the **UP** button **2** or the **DOWN** button **3**.

Press the **BACK** button **4** to close the current menu or the menu overview.

If no button on the left combination switch is pressed when the menu is open, the menu closes automatically after about 20 seconds. Pressing the **SET** button again opens the last menu opened.

18.29.1 KTM MY RIDE (optional)



F01280-01

Condition

- The motorcycle is stationary.
- Function **KTM MY RIDE** (optional) activated.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **KTM MY RIDE** is marked. Press the **SET** button to open the menu.

In **KTM MY RIDE** an appropriate cellphone or headset can be paired with the combination instrument via **Bluetooth®** and the navigation function can be configured.

i Info

Not every cellphone and headset is suitable for pairing with the combination instrument.

The standard **Bluetooth®** 2.1 must be supported.

18.29.2 Audio (optional)



Condition

- Function **KTM MY RIDE** (optional) activated.
- Function **Wireless Interface** (optional) activated.
- The combination instrument is connected to a suitable cell-phone.
- The combination instrument is connected to a suitable head-set.
 - Press the **SET** button when the menu is closed.
 - Press the **UP** or **DOWN** button until **KTM MY RIDE** 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.

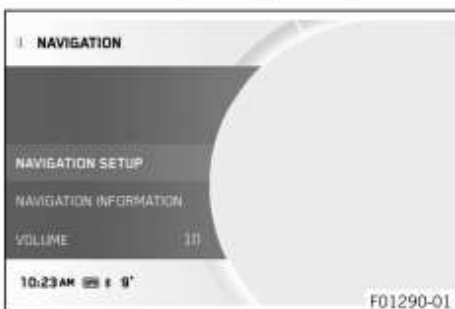
- Press the **UP** or **DOWN** button until **Audio** is marked. Press the **SET** button to open the menu.
- Press and hold the **UP** button to increase the audio volume.
- Press and hold the **DOWN** button to reduce the audio volume.
- Press the **UP** button briefly to change to the next audio track.
- Briefly pressing the **DOWN** button twice changes to the previous audio title or plays the current audio title, depending on the cellphone model.
- Press the **SET** button to play or pause the audio track.



Tip

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.

18.29.3 Navigation (optional)



Condition

- Function **KTM MY RIDE** (optional) activated.
- The **KTM MY RIDE** app (optional) is installed and opened on a suitable cellphone (**Android**® devices Version 6.0 and higher, **iOS** devices Version 10 and higher).
- The combination instrument is connected to a suitable cell-phone.
- The GPS function is activated on the connected cellphone.
- For voice navigation: The combination instrument is connected to a suitable headset and an appropriate language package has been downloaded in the **KTM MY RIDE** app.
 - Press the **SET** button when the menu is closed.
 - Press the **UP** or **DOWN** button until **KTM MY RIDE** is marked. Press the **SET** button to open the menu.

- Press the **UP** or **DOWN** button until **Navigation** is marked. Press the **SET** button to open the menu.

The **Navigation** menu allows various settings to be made and general information on the navigation to be called up.

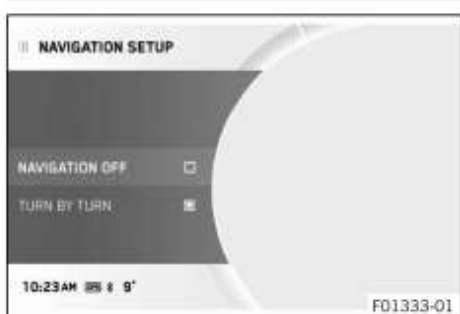
i Info

The **Audio** function can be used with the navigation function at the same time.

An incoming call is visualized in a small window at the top of the combination instrument display when the navigation function is active. You cannot navigate in the **Navigation** menu during an active phone conversation.

When the navigation function is switched on and the device is connected, the **GPS** symbol appears in the display of the combination instrument.

18.29.4 Navigation Setup (optional)



Condition

- Function **KTM MY RIDE** activated (optional).
- The **KTM MY RIDE** app (optional) is installed and opened on a suitable cellphone (**Android**® devices Version 6.0 and higher, **iOS** devices Version 10 and higher).
- The combination instrument is connected to a suitable cellphone.
- The GPS function is activated on the connected cellphone.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **KTM MY RIDE** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Navigation** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Navigation Setup** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until the desired menu item **Navigation Off** or **Turn by Turn** is marked. Press the **SET** button to switch the submenu item on or off.

i Info

The visual navigation can be switched on or off with the **Navigation Off**. An activated voice navigation remains switched on.

The visual navigation can be changed to direction arrows with **Turn by Turn**.

Navigation mode can be set in the **Navigation Setup** submenu.

18.29.5 Navigation information (optional)



Condition

- Function **KTM MY RIDE** (optional) activated.
 - The **KTM MY RIDE** app (optional) is installed and opened on a suitable cellphone (**Android**® devices Version 6.0 and higher, iOS devices Version 10 and higher).
 - The combination instrument is connected to a suitable cellphone.
 - The GPS function is activated on the connected cellphone.
- Press the **SET** button when the menu is closed.
 - Press the **UP** or **DOWN** button until **KTM MY RIDE** is marked. Press the **SET** button to open the menu.
 - Press the **UP** or **DOWN** button until **Navigation** is marked. Press the **SET** button to open the menu.
 - Press the **UP** or **DOWN** button until **Navigation Information** is marked. Press the **SET** button to open the menu.



Info

Distance to Target shows the distance to the destination.
Arrival Time shows the arrival time of the cellphone.

Information on the current navigation can be viewed in the **Navigation Information** submenu.

18.29.6 Volume (optional)



Condition

- Function **KTM MY RIDE** (optional) activated.
 - The **KTM MY RIDE** app (optional) is installed and opened on a suitable cellphone (**Android**® devices Version 6.0 and higher, iOS devices Version 10 and higher).
 - The combination instrument is connected to a suitable cellphone.
 - The GPS function is activated on the connected cellphone.
 - For voice navigation: The combination instrument is connected to a suitable headset and an appropriate language package has been downloaded in the **KTM MY RIDE** app.
- Press the **SET** button when the menu is closed.
 - Press the **UP** or **DOWN** button until **KTM MY RIDE** is marked. Press the **SET** button to open the menu.
 - Press the **UP** or **DOWN** button until **Navigation** 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 the **UP** or **DOWN** button until **Volume** is marked.



Info

Press and hold the **UP** button to increase the audio volume.
Press and hold the **DOWN** button to reduce the audio volume.

The volume of the navigation can be set in the **Volume** submenu.

18.29.7 Setup (optional)



Condition

- The motorcycle is stationary.
- Function **KTM MY RIDE** (optional) activated.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **KTM MY RIDE** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Setup** is marked. Press the **SET** button to open the menu.

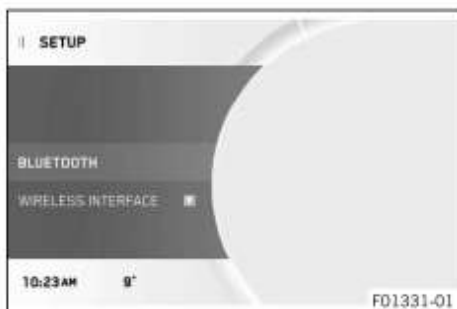
Setup allows you to configure **Wireless Interface**, via which the **Bluetooth** menu can be activated or deactivated.



Info

The **Bluetooth**® function can only be used in conjunction with **KTM MY RIDE** (optional).
When the **Bluetooth**® function is switched on and the device is connected, the **Bluetooth**® symbol appears in the display of the combination instrument.
Not every cellphone and headset is suitable for pairing with the combination instrument.

18.29.8 Bluetooth (optional)



Condition

- The motorcycle is stationary.
- Function **KTM MY RIDE** (optional) activated.
- Function **Wireless Interface** (optional) activated.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **KTM MY RIDE** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Setup** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Bluetooth** is marked. Press the **SET** button to open the menu.

In **Bluetooth**, an appropriate cellphone or headset can be paired with the combination instrument via **Bluetooth**®.

i Info

The **Bluetooth®** function can only be used in conjunction with **KTM MY RIDE** (optional). When the **Bluetooth®** function is switched on and the device is connected, the **Bluetooth®** symbol appears in the display of the combination instrument.

Not every cellphone and headset is suitable for pairing with the combination instrument.

18.29.9 Phone (optional)**Condition**

- The motorcycle is stationary.
 - Function **KTM MY RIDE** (optional) activated.
 - Function **Wireless Interface** (optional) 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 **KTM MY RIDE** is marked. Press the **SET** button to open the menu.
 - Press the **UP** or **DOWN** button until **Setup** is marked. Press the **SET** button to open the menu.
 - Press the **UP** or **DOWN** button until **Bluetooth** is marked. Press the **SET** button to open the menu.
 - Press the **UP** or **DOWN** button until the desired menu item **Phone** is marked. Press the **SET** button to open the menu.

i Info

Two cellphones can never be paired simultaneously with the combination instrument.

- Press the **SET** button again to confirm the **Pairing** submenu item.
- A message appears on the combination instrument indicating that this is now ready for pairing. The pairing is completed successfully by confirming the **Passkey** on the cellphone and on the combination instrument.

i Info

Once the pairing is completed, the registered trademark of the paired cellphone is displayed in the **Phone** menu. Press the **UP** or **DOWN** button until the paired device is marked. The paired device can be deleted by pressing the **SET** button.

Not every cellphone is suitable for pairing with the combination instrument.

- Move the device already paired into the range of the combination instrument while the **Bluetooth®** function is active.
- ✓ The device is automatically paired with the combination instrument.

- ✘ If the device is not automatically paired with the combination instrument after approx. 30 seconds:
 - Restart the combination instrument or repeat **Pairing** procedure.

A suitable cellphone can be paired with the combination instrument in the **Phone** submenu.

18.29.10 Headset Rider (optional)



Condition

- The motorcycle is stationary.
- Function **KTM MY RIDE** (optional) activated.
- Function **Wireless Interface** (optional) 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 **KTM MY RIDE** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Setup** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Bluetooth** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Headset Rider** is marked. Press the **SET** button to open the menu.
- Press the **SET** button again to confirm the **Pairing** submenu item.
- The registered trademark of the rider headset appears on the combination instrument. Press the **SET** button to select the device. Press the **SET** button again to confirm the **Confirm** submenu item. The pairing of a rider headset with the combination instrument is now completed at this point.

Info

Once the pairing is completed, the registered trademark of the paired headset is displayed in the **Headset Rider** menu. Press the **UP** or **DOWN** button until the paired device is marked. The paired device can be deleted by pressing the **SET** button. Not every headset is suitable for pairing with the combination instrument.

- Move the device already paired into the range of the combination instrument while the **Bluetooth®** function is active.
- ✓ The device is automatically paired with the combination instrument.
- ✘ If the device is not automatically paired with the combination instrument after approx. 30 seconds:
 - Restart the combination instrument or repeat **Pairing** procedure.

A suitable rider headset can be paired with the combination instrument in the **Headset Rider** submenu.

18.29.11 Headset Pass. (optional)

**Condition**

- The motorcycle is stationary.
- Function **KTM MY RIDE** (optional) activated.
- Function **Wireless Interface** (optional) 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 **KTM MY RIDE** is marked. Press the **SET** button to open the menu.
 - Press the **UP** or **DOWN** button until **Setup** is marked. Press the **SET** button to open the menu.
 - Press the **UP** or **DOWN** button until **Bluetooth** is marked. Press the **SET** button to open the menu.
 - Press the **UP** or **DOWN** button until **Headset Pass.** is marked. Press the **SET** button to open the menu.
 - Press the **SET** button again to confirm the **Pairing** submenu item.
- The registered trademark of the passenger headset appears on the combination instrument. Press the **SET** button to select the device. Press the **SET** button again to confirm the **Confirm** submenu item. The pairing of a passenger headset with the combination instrument is now successfully completed.

**Info**

Once the pairing is completed, the registered trademark of the paired headset is displayed in the **Headset Pass.** menu. Press the **UP** or **DOWN** button until the paired device is marked. The paired device can be deleted by pressing the **SET** button. Not every headset is suitable for pairing with the combination instrument.

- Move the device already paired into the range of the combination instrument while the **Bluetooth®** function is active.
 - ✓ The device is automatically paired with the combination instrument.
 - ✗ If the device is not automatically paired with the combination instrument after approx. 30 seconds:
 - Restart the combination instrument or repeat **Pairing** procedure.

A suitable passenger headset can be paired with the combination instrument in the **Headset Pass.** submenu.

18.29.12 Wireless Interface



Condition

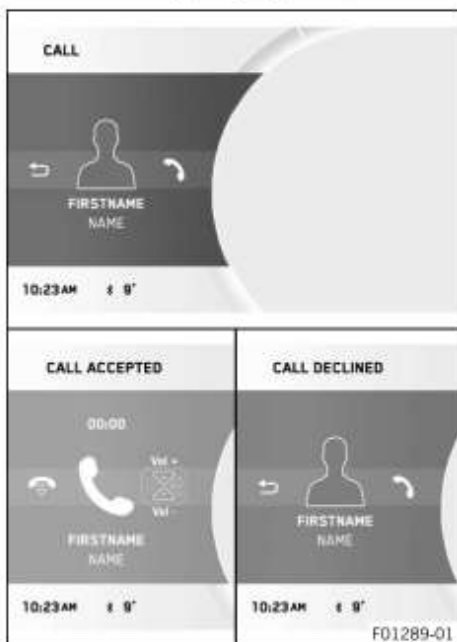
- The motorcycle is stationary.
- Function **KTM MY RIDE** (optional) activated.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **KTM MY RIDE** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Setup** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Wireless Interface** is marked. Switch the **Wireless Interface** on or off by pressing the **SET** button.

Wireless Interface allows the **Bluetooth®** menu to be activated or deactivated.

Info

The **Bluetooth®** function can only be used in conjunction with **KTM MY RIDE** (optional).
When the **Bluetooth®** function is switched on and the device is connected, the **Bluetooth®** symbol appears in the display of the combination instrument.
Not every cellphone and headset is suitable for pairing with the combination instrument.

18.29.13 Telephony (optional)



Condition

- Function **KTM MY RIDE** (optional) activated.
- Function **Wireless Interface** (optional) activated.
- The combination instrument is connected to a suitable cellphone.
- The combination instrument is connected to a suitable headset.



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 and hold down the **BACK** button to reject an incoming call.
- Press and hold the **UP** button to increase the audio volume.
- Press and hold the **DOWN** button to reduce the audio volume.



Info

The call duration and contact are displayed. Depending on the cellphone settings, the contact is displayed with a picture and a name.

An incoming call is visualized in a small window at the top of the combination instrument display when the navigation function is active.

18.29.14 Info



- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Info** is marked. Press the **SET** button to open the menu.

General information can be accessed in **Info**.

18.29.15 Trip 1



- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Info** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Trip 1** is marked. Press the **SET** button to open the menu.

Trip 1 shows the distance since the last reset, such as between two refueling stops. **Trip 1** is running and counts up to **9999**.

ØCons1 indicates the average fuel consumption based on **Trip 1**.

ØSpeed1 indicates the average speed based on **Trip 1** and **Trip Time1**.

Trip Time1 shows the journey time on the basis of **Trip 1** and runs as soon as a speed signal is received.

Fuel Range indicates the possible distance you can cover with the fuel reserve.

Press and hold the SET button for 3 - 5 seconds.	All entries in the Trip 1 menu are reset.
---	--

18.29.16 Trip 2



- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Info** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Trip 2** is marked. Press the **SET** button to open the menu.

Trip 2 shows the distance since the last reset, such as between two refueling stops. **Trip 2** is running and counts up to **9999**.

ØCons2 indicates the average fuel consumption based on **Trip 2**.

ØSpeed2 indicates the average speed based on **Trip 2** and **Trip Time2**.

Trip Time2 shows the journey time on the basis of **Trip 2** and runs as soon as a speed signal is received.

Fuel Range indicates the possible distance you can cover with the fuel reserve.

Press and hold the **SET** button for 3 - 5 seconds.

All entries in the **Trip 2** menu are reset.

18.29.17 General Info



- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Info** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **General Info** is marked. Press the **SET** button to open the menu.

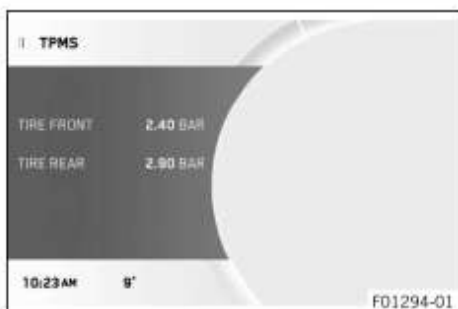
Date shows the date.

ODO shows the total distance covered.

Battery indicates the battery voltage.

Oil Temp indicates the engine oil temperature.

18.29.18 TPMS



Condition

- Model with **TPMS**.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Info** is marked. Press the **SET** button to open the menu.



Warning

Danger of accidents The tire pressure monitoring system does not eliminate the necessity to check the tires before going on a ride.

To avoid false alarms, the tire pressure values are evaluated over a period of several minutes.

- Check the tire pressure before every ride.
- Correct the tire pressure if the tire pressure deviates from the specified value.
- Even if the tire pressure values are correct, stop the vehicle immediately if its behavior indicates a loss of pressure in the tires.

- Press the **UP** or **DOWN** button until **TPMS** is marked. Press the **SET** button to open the menu.

Guideline

Tire pressure, solo / with passenger / full payload	
front: with cold tires	2.4 bar (35 psi)
rear: with cold tires	2.9 bar (42 psi)

The **TPMS** menu displays the tire pressure of the front and rear tires.

TIRE FRONT indicates the tire pressure at the front.

TIRE REAR indicates the tire pressure at the rear.

18.29.19 Warnings

**Condition**

- Message or warning is present.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Info** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Warnings** is marked. Press the **SET** button to open the menu.
- Use the **UP** or **DOWN** button to navigate through the warnings.

All the warnings that have occurred are displayed and stored in the **Warnings** menu.

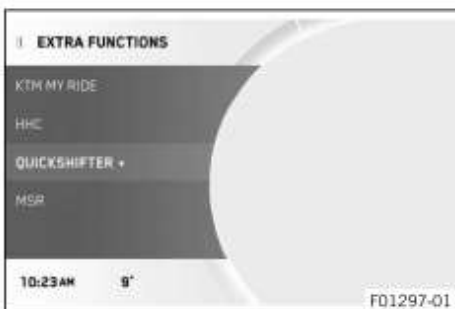
18.29.20 Service

**Condition**

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Info** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Service** is marked. Press the **SET** button to open the menu.

The next service due is shown in the **Service** menu.

18.29.21 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 **Info** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Extra Functions** is marked. Press the **SET** button to open the menu.
- Use the **UP** or **DOWN** button to navigate through the extra functions.

The optional extra functions are listed in **Extra Functions**.

i Info

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

18.29.22 Motorcycle



Condition

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Motorcycle** is marked. Press the **SET** button to open the menu.

The vehicle drive mode can be configured in **Motorcycle**.

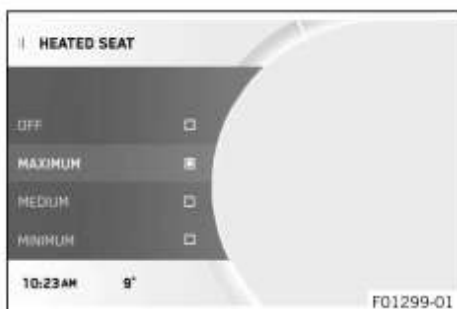
18.29.23 Heated Grips (optional)



Condition

- The motorcycle is stationary.
- Menu **Heated Grips** activated.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Motorcycle** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Heated Grips** is marked. 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.

18.29.24 Heated Seat (optional)



Condition

- The motorcycle is stationary.
- Menu **Heated Seat Ride** activated.
- Menu **Heated Seat Pas** activated.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Motorcycle** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Heated Seat** is marked. 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 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.

18.29.25 Load

**Condition**

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Motorcycle** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Load** is marked. Press the **SET** button to open the menu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to select a payload.

In the **Load** menu, you can select from four payloads. The setting of the spring preload and the rebound is adjusted for the payload.

18.29.26 Damping

**Condition**

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Motorcycle** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Damping** is marked. 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 damping setting.

The damping setting of the suspension components is shown in the **Damp** display.

In the **Damping** menu, you can select from the settings **SPORT**, **STREET**, **COMFORT**, and **OFFROAD**.

18.29.27 Ride Mode

**Condition**

- Emergency OFF switch/electric starter button on (middle position) – This position is required for operation; the ignition circuit is closed.
- Cruise control system function deactivated
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Motorcycle** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Ride Mode** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button to activate the menu item and select it with the **SET** button. Press the **SET** button to select the engine and motorcycle traction control settings that are coordinated with each other.
 - ✓ **SPORT** – homologated performance with very direct response; the motorcycle traction control allows greater slip on the rear wheel.
 - ✓ **STREET** – homologated performance with balanced response; the motorcycle traction control allows normal slip on the rear wheel.

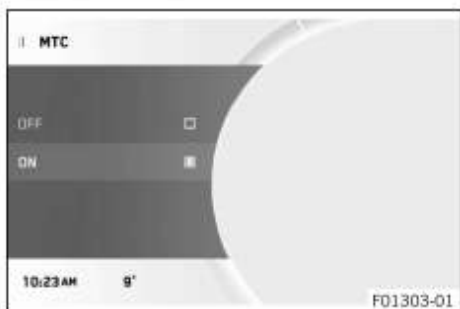
- ✓ RAIN – reduced homologated performance for better ridability; the motorcycle traction control allows normal slip on the rear wheel.
- ✓ OFFROAD – reduced homologated performance for better ridability; the motorcycle traction control allows high slip on the rear wheel.



Info

Do not open the throttle during the selection.

18.29.28 MTC



Condition

- The motorcycle is stationary.
- Cruise control system function deactivated
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Motorcycle** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **MTC** is marked. Press the **SET** button to open the menu.
- Activate the menu item using the **UP** or **DOWN** button.
- Switch the **MTC** on or off by pressing the **SET** button.



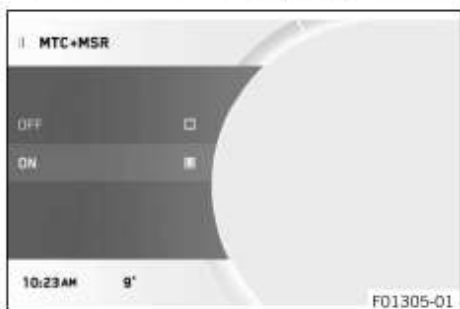
Info

Do not open the throttle when switching on or off. After the ignition is switched on, motorcycle traction control is enabled again.

Press and hold the **SET** button for 3 - 5 seconds.

Activation of the motorcycle traction control.

18.29.29 MTC+MSR (optional)



Condition

- The motorcycle is stationary.
- Cruise control system function deactivated
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Motorcycle** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **MTC+MSR** is marked. Press the **SET** button to open the menu.
- Activate the menu item using the **UP** or **DOWN** button.
- Switch the **MTC+MSR** on or off by pressing the **SET** button.



Info

Do not open the throttle when switching on or off. When the ABS is switched off or the **Offroad** ride mode 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.

Press and hold the SET button for 3 - 5 seconds.	Activation of the motorcycle traction control and the engine traction torque control.
---	---

18.29.30 ABS



Condition

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Motorcycle** is marked. Press the **SET** button to open the menu.

Note

Voiding of the government approval for road use and the insurance coverage If the ABS is switched off completely, the vehicle's approval for road use is invalidated.

- Only operate the vehicle in closed-off areas remote from public road traffic if the ABS is switched off completely.
- Press the **UP** or **DOWN** button until **ABS** is marked. Press the **SET** button to open the menu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to switch off **ABS** or to select between ABS modes.

i Info

Do not open the throttle during the selection. The ABS can only be reactivated by switching on the ignition again. When the **Road** ABS mode is enabled, ABS controls both wheels. When the **Offroad** ABS mode is enabled, ABS only controls the front wheel. The rear wheel is not controlled by ABS and may lock during braking maneuvers.

Press and hold the SET button for 3 - 5 seconds.	Activation of the different ABS modes.
---	--

18.29.31 HHC (optional)



Condition

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Motorcycle** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **HHC** is marked. Press the **SET** button to open the menu.
- Activate the menu item using the **UP** or **DOWN** button.
- Switch the **HHC** on or off by pressing the **SET** button.

18.29.32 Settings

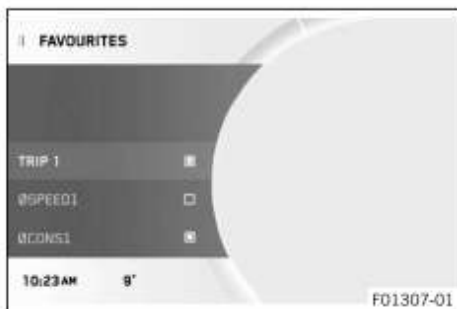


Condition

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is marked. Press the **SET** button to open the menu.

Favorites and quick selection can be configured in **Settings**.

18.29.33 Favourites



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 the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Favourites** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button to activate the menu item and select it with the **SET** button.

Up to eight items of information can be selected in the **Favourites** menu.

18.29.34 Navigation Info Screen

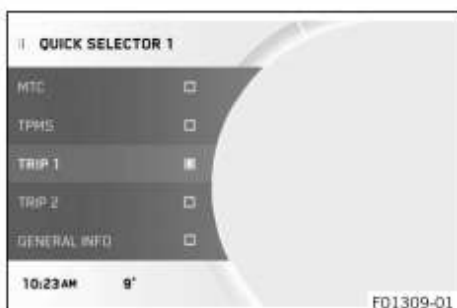


Condition

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Navigation Info Screen** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button to activate the menu item and select it with the **SET** button.

Up to four sets of information can be selected in the **Navigation Info Screen** menu.

18.29.35 Quick Selector 1



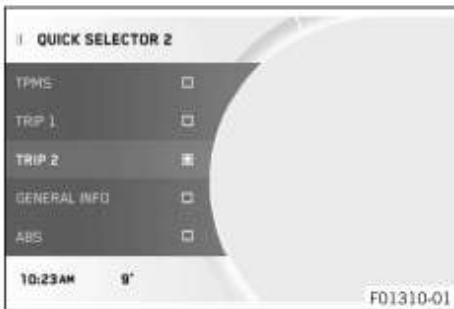
Condition

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Settings** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Quick Selector 1** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button to activate the menu item and select it with the **SET** button.

A menu can be defined for direct selection in the **Quick Selector 1** menu.

When the menu is closed, the menu defined in **Quick Selector 1** is opened by pressing the **UP** button.

18.29.36 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 marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Quick Selector 2** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button to activate the menu item and select it with the **SET** button.

A menu can be defined for direct selection in the **Quick Selector 2** menu.

When the menu is closed, the menu defined in **Quick Selector 2** is opened by pressing the **DOWN** button.

18.29.37 Preferences



Condition

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Preferences** is marked. Press the **SET** button to open the menu.

The combination instrument display can be configured in **Preferences**. Settings can be made for units or various values. Several functions can be enabled or disabled.

18.29.38 Units



Condition

- The vehicle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Preferences** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Units** is marked.
- Press the **SET** button to open the menu.

Units allows settings to be made for units or various values.

18.29.39 Distance

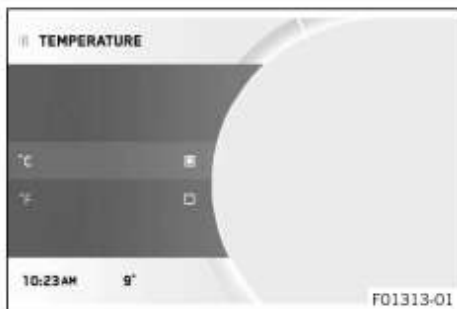


Condition

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Preferences** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Units** is marked.
- Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Distance** is marked. Press the **SET** button to open the menu.

- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to confirm the desired unit.

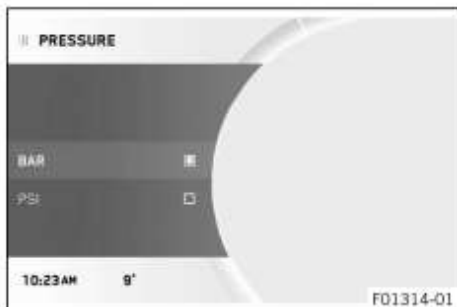
18.29.40 Temperature



Condition

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Preferences** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Units** is marked.
- Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Temperature** is marked. Press the **SET** button to open the menu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to confirm the desired unit.

18.29.41 Pressure



Condition

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Preferences** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Units** is marked.
- Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Pressure** is marked. Press the **SET** button to open the menu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to confirm the desired unit.

18.29.42 Consumption



Condition

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Preferences** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Units** is marked.
- Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Consumption** is marked. Press the **SET** button to open the menu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to confirm the desired unit.

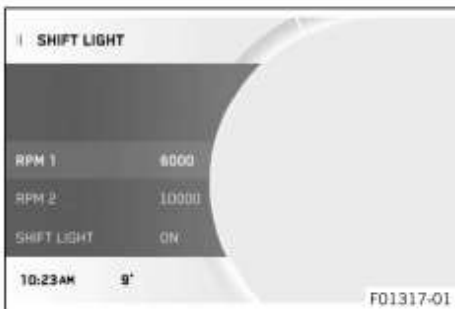
18.29.43 Language

**Condition**

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Preferences** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Language** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button to activate the menu item and select it with the **SET** button.

The menu languages are US English, UK English, German, Italian, French, and Spanish.

18.29.44 Shift Light

**Condition**

- The motorcycle is stationary.
- **ODO** > 1000 km (621 mi).
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Preferences** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Shift Light** is marked. Press the **SET** button to open the menu.
- Activate the menu item using the **UP** or **DOWN** button.
- Switch the shift warning light on or off or set the engine speed for the gear shift recommendation by pressing the **SET** button.

**Info**

When the engine speed reaches **RPM 1**, the speed display lights up red.
When the engine speed reaches **RPM 2**, the speed display flashes red.

18.29.45 Setting the time and date

**Condition**

The motorcycle is stationary.

- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Preferences** appears. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Time/Date** is marked. Press the **SET** button to open the menu.



Setting the clock

- Press the **UP** or **DOWN** button until the time is marked.
- Press the **SET** button.
 - ✓ The hour next to **Clock** flashes.
- Press the **UP** or **DOWN** button until the current hour is set.
- Press the **SET** button.
 - ✓ The minute next to **Clock** flashes.
- Press the **UP** or **DOWN** button until the current minute is set.
- Press the **SET** button.
 - ✓ The time is stored.

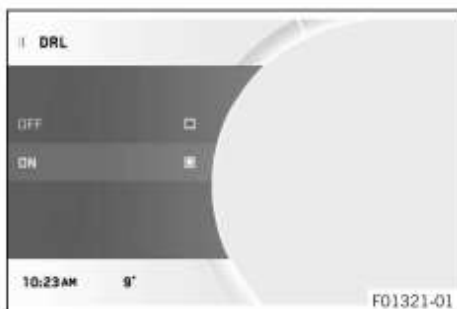


Setting the date

Info
The date format may differ depending on the language set.

- Press the **UP** or **DOWN** button until the date is marked.
- Press the **SET** button.
 - ✓ The month next to **Date** flashes.
- Press the **UP** or **DOWN** button until the current month is set.
- Press the **SET** button.
 - ✓ The day next to **Date** flashes.
- Press the **UP** or **DOWN** button until the current day is set.
- Press the **SET** button.
 - ✓ The year next to **Date** flashes.
- Press the **UP** or **DOWN** button until the current year is set.
- Press the **SET** button.
 - ✓ The date is stored.

18.29.46 DRL



Condition

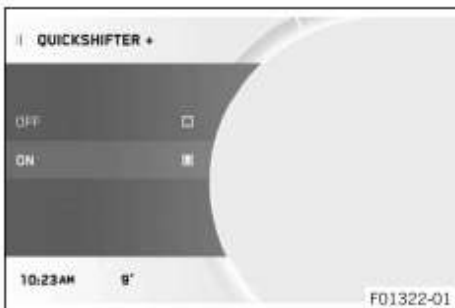
- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Preferences** is marked. Press the **SET** button to open the menu.

**Warning**

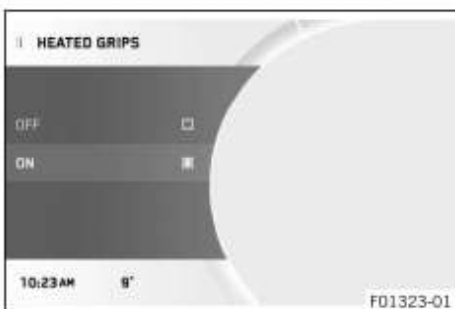
Danger of accidents When visibility is poor, the daytime running light is not a substitute for the low beam. Automatic switching between the daytime running light and low beam may only be partially available when visibility is significantly impaired due to fog, snow or rain.

- 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.
- Note the legal regulations regarding the daytime running light.

- Press the **UP** or **DOWN** button until **DRL** is marked. Press the **SET** button to open the menu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to switch the daytime running light on or off.

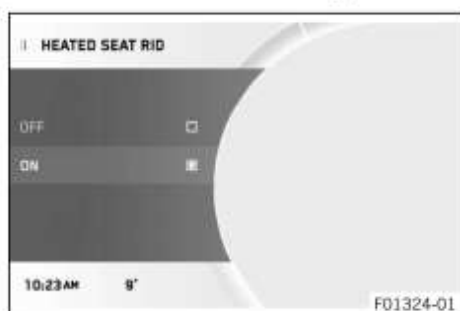
18.29.47 Quickshifter + (optional)**Condition**

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Preferences** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Quickshifter +** is marked. Press the **SET** button to open the menu.
- Activate the menu item using the **UP** or **DOWN** button.
- Press the **SET** button to switch the quickshifter + on or off.

18.29.48 Heated Grips (optional)**Condition**

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Preferences** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Heated Grips** is marked. Press the **SET** button to open the menu.
- Activate the menu item using the **UP** or **DOWN** button.
- Switch the **Heated Grips** on or off by pressing the **SET** button.

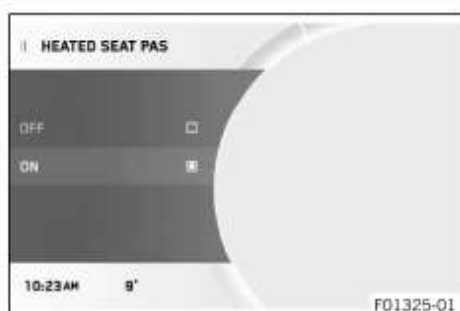
18.29.49 Heated Seat Rid (optional)



Condition

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Preferences** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Heated Seat Rid** is marked. Press the **SET** button to open the menu.
- Activate the menu item using the **UP** or **DOWN** button.
- Switch the **Heated Seat Rid** on or off by pressing the **SET** button.

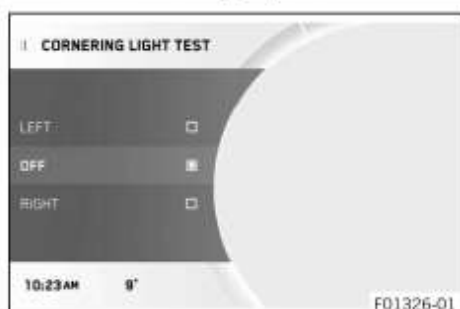
18.29.50 Heated Seat Pas (optional)



Condition

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Preferences** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Heated Seat Pas** is marked. Press the **SET** button to open the menu.
- Activate the menu item using the **UP** or **DOWN** button.
- Switch the **Heated Seat Pas** on or off by pressing the **SET** button.

18.29.51 Cornering Light Test



Condition

- The motorcycle is stationary.
- Press the **SET** button when the menu is closed.
- Press the **UP** or **DOWN** button until **Preferences** is marked. Press the **SET** button to open the menu.
- Press the **UP** or **DOWN** button until **Cornering Light Test** is marked. Press the **SET** button to open the menu.
- Activate the menu item using the **UP** or **DOWN** button.

Info

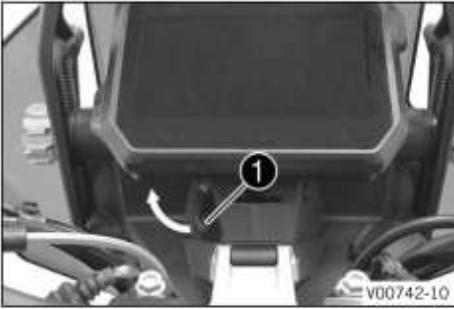
The **Cornering Light Test** is performed on the left cornering light in the **Left** submenu.
 The **Cornering Light Test** is performed on the right cornering light in the **Right** submenu.
 The **Cornering Light Test** is completed in the **Off** submenu.

- Press the **SET** button in order to perform or switch off the desired **Cornering Light Test**.

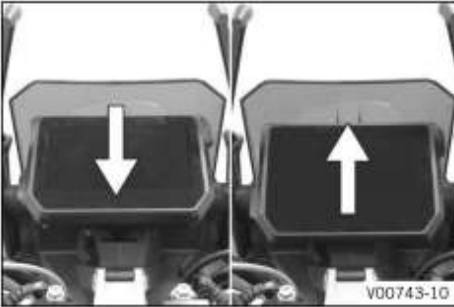
Info

The respective cornering light segments light up in succession, starting with the lower segment.
 When the test of the respective cornering light is complete, the upper segment lights up continuously.

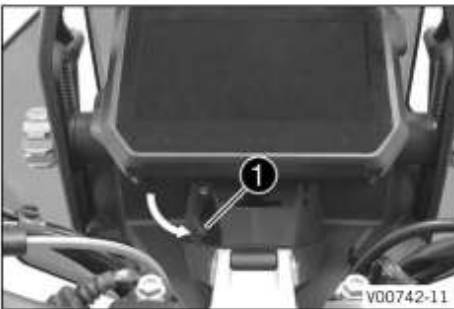
18.29.52 Adjusting the tilt of the combination instrument



- Pull clamping lever **1** in the direction of the arrow.
- ✓ The combination instrument is unlocked.



- To move the combination instrument to the desired position, press the combination instrument upward or downward.



- Pull clamping lever **1** in the direction of the arrow.
- ✓ The combination instrument is locked.

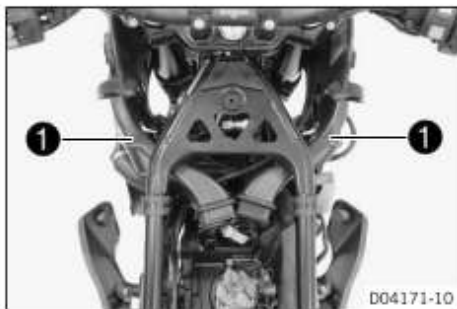
19.1 Removing the engine

Preparatory work

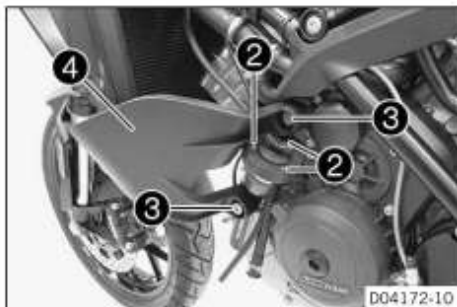
- Raise the vehicle with the center stand. (p. 15)
- Remove the engine guard. (p. 46)
- Remove the passenger seat. (p. 80)
- Remove the front rider's seat. (p. 79)
- Switch off ignition - to do this briefly press the Race-on button (maximum of 1 second) with the ignition switched on.
- Disconnect the negative cable of the 12-V battery. (p. 136)
- Remove the front side cover. (p. 97)
- Remove the fuel tank cover. (p. 98)
- Remove the mask spoiler. (p. 100)
- Remove the fuel tank. (p. 80)
- Remove the upper part of the air filter box. (p. 73)
- Remove the air filter box. (p. 76)
- Remove the throttle valve body. (p. 387)
- Drain the coolant. (p. 332)
- Remove main silencer. (p. 67)
- Remove the manifold. (p. 68)

Main work

- Remove intake snorkel ❶ toward the rear.

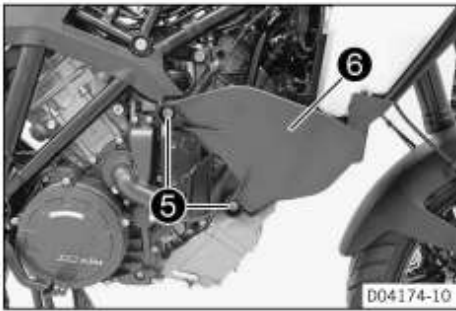


- Remove screws ❷.
- Remove screws ❸. Remove tank guard ❹.



- Pull the heat protector off the holder from the front.

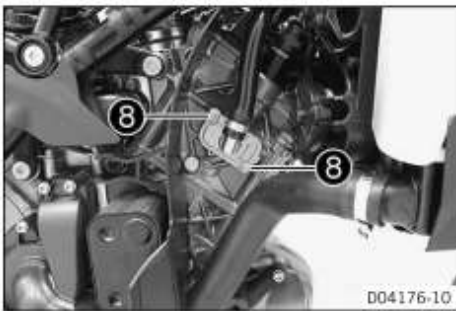




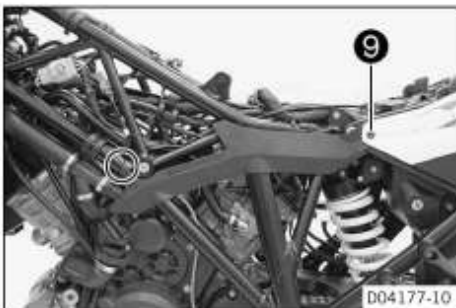
- Remove screws ⑤. Remove tank guard ⑥.



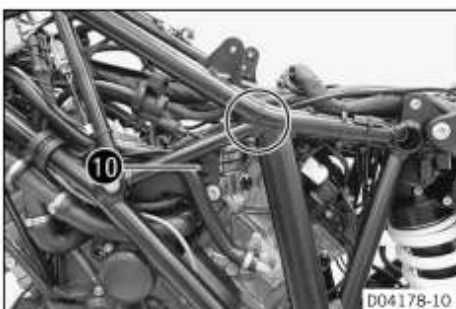
- Remove screws ⑦.



- Remove screws ⑧.



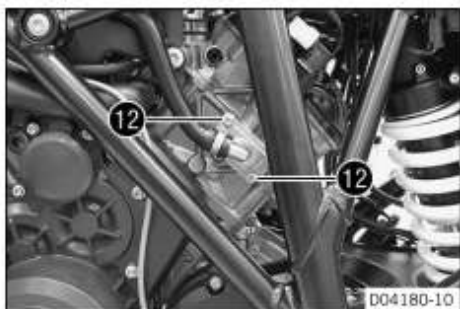
- Remove the cable ties.
- Remove screw ⑨.
- Remove the heat protector.



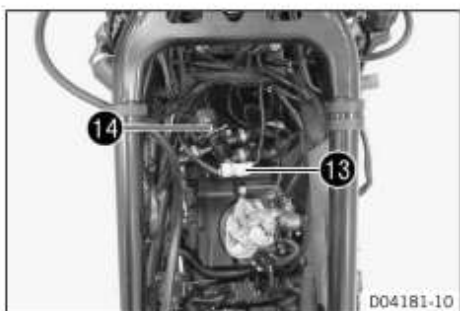
- Remove the cable ties.
- Remove screw ⑩.



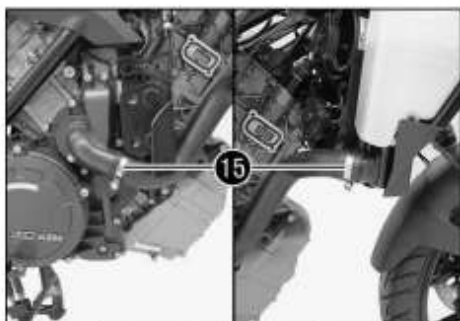
- Pull the fuel evaporation valve **11** off the holder and hang to the side.



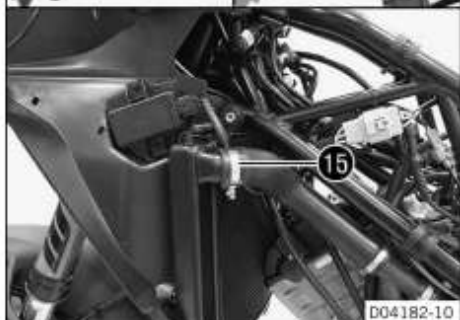
- Remove screws **12**.

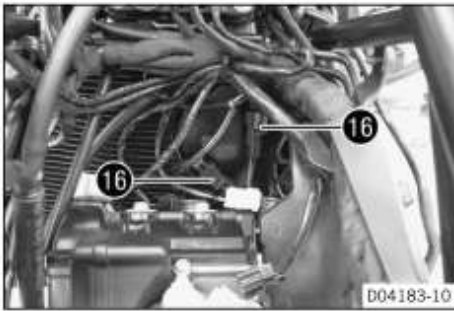


- Disconnect plug-in connector **13**.
- Remove SAS valve **14** with hoses.



- Loosen hose clips **15**.
- Remove the radiator hose on the right.
- Pull off the radiator hose from the radiator on the left.



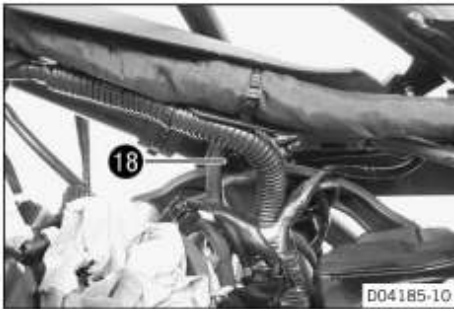


- Pull off and separate two plug-in connectors 16 from the holder.



- Remove screws 17.
- Remove the radiator in a downward direction.

i **Info**
Pay attention to the cooling fins.



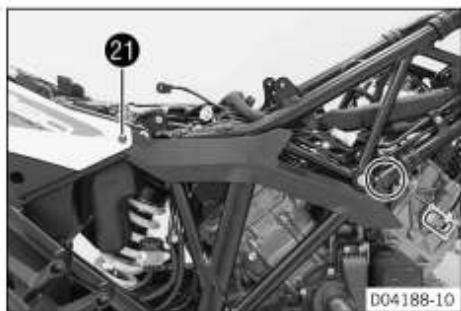
- Remove screw 18.



- Pull back the protection cap.
- Remove nut 19 and hang the positive cable to the side.



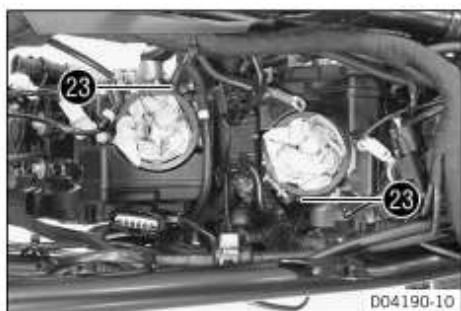
- Disconnect plug-in connector 20.
- Expose the cable.



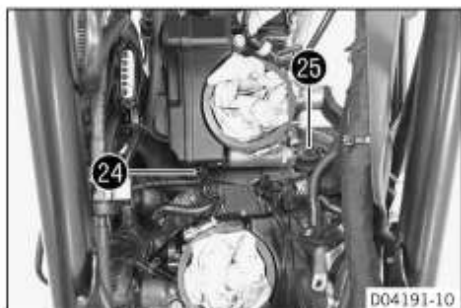
- Remove the cable ties.
- Remove screw 21.
- Remove the heat protector.



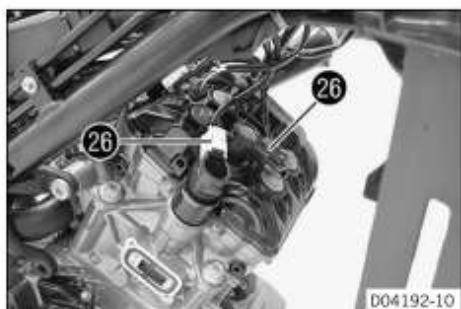
- Remove screws 22.
- Hang the ground wire to the side.



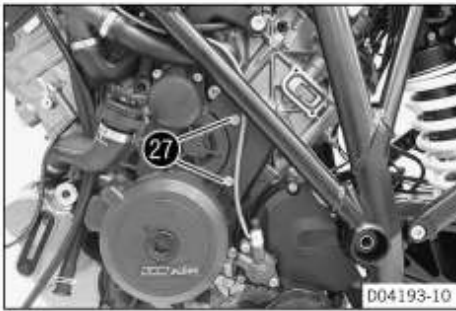
- Remove hose clamps 23.
- Pull off the hose from the cylinder head.



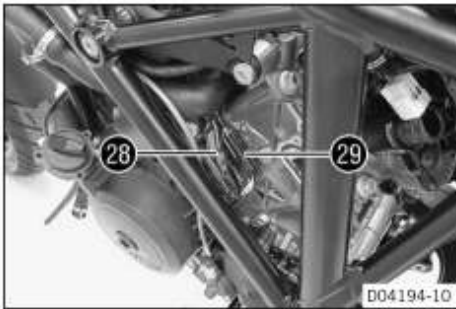
- Unplug connector 24.
- Unplug connector 25.



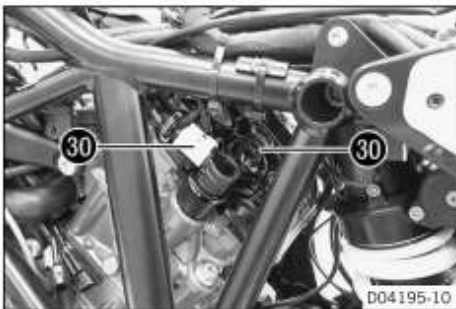
- Detach connector 26.



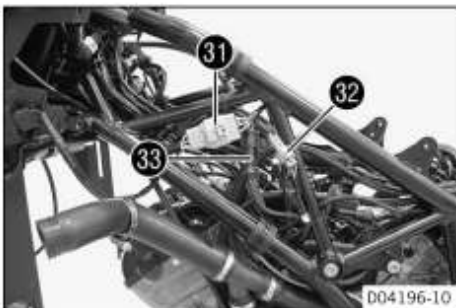
- Remove screws 27.
- Take off the cover.



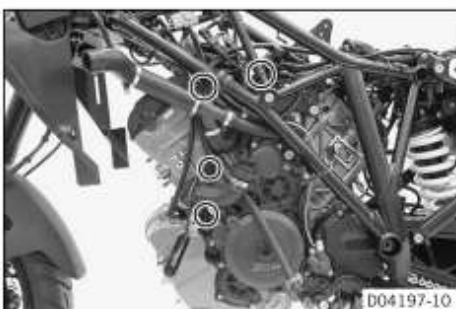
- Disconnect plug-in connector 28.
- Disconnect plug-in connector 29.



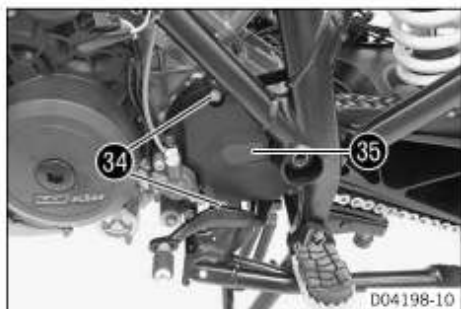
- Detach connector 30.



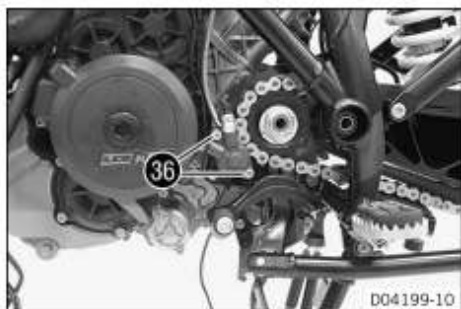
- Disconnect plug-in connector 31.
- Disconnect plug-in connector 32.
- Disconnect plug-in connector 33.



- Remove the cable ties and expose the cables.



- Remove screws 34.
- Take off engine sprocket cover 35.



- Remove screws 36.
- Take off the slave cylinder of the clutch and hang it to one side.



Info

Do not activate the clutch lever while the slave cylinder of the clutch is removed.
Do not kink the clutch line.



- Remove the spacer.
- Remove screw 37.



Info

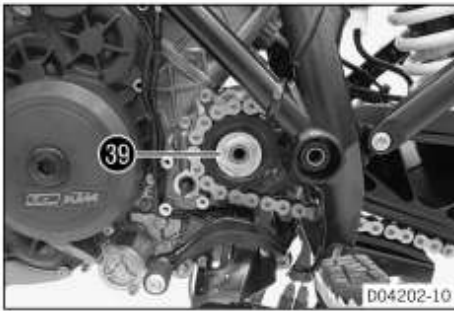
Do not misplace the spacer.



- Remove screw 38.
- Remove the chain securing guide with the spacer.



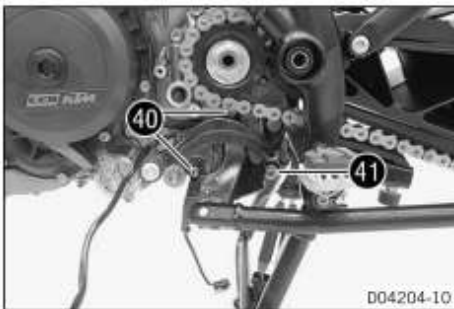
- Remove pin A.



- Bend up the lock washer.
- Have an assistant operate the rear brake.
- Loosen nut 39.



- Remove the cable ties and expose the cables.



- Remove screws 40.
- Remove screw 41.
- Remove the side stand bracket.



- Remove nut 42.
- Remove the chain adjuster.



- Push the rear wheel into the foremost position.
- Remove the chain from the rear sprocket.

**Info**

Cover the components to protect them against damage.



- Remove nut 39 with the lock washer.
- Take off the engine sprocket.



- Remove screw 43 with washers.
- Take off the shift lever.



- Position the floor jack with a special tool.

Floor jack attachment (61329055000) (見 p. 503)

i Info

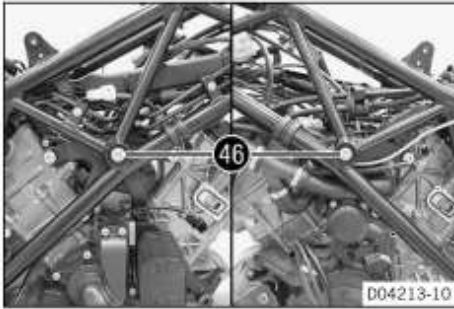
It is a good idea to have assistance when carrying out the following steps.



- Remove screws 44.
- Remove the link fork position sensor and hang to the side.



- Remove nut 45.
- Pull out the fork pivot.



- Remove screws 46 with the seating.



- Pull the engine forward slightly and lower carefully.

19.2 Installing the engine

Preparatory work

- Prepare the engine for installation. (p. 222)

Main work

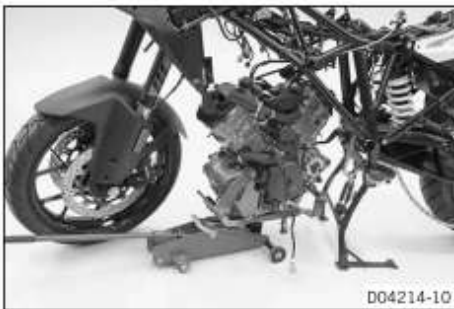
- Position the engine on a floor jack under the vehicle.

Floor jack attachment (61329055000) (p. 503)
--



Info

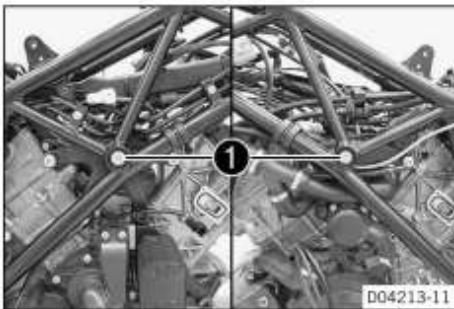
The help of an assistant is useful in this step.



- Position the engine in the frame.
- Position screws 1 with seating, but do not tighten yet.

Guideline

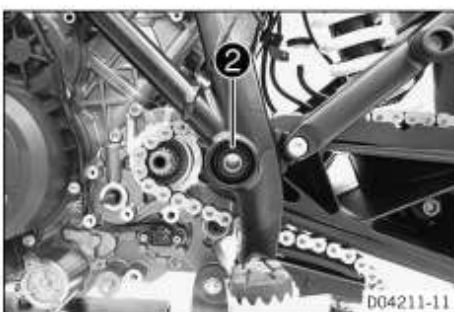
Engine carrying screw	M10	45 Nm (33.2 lbf ft)
-----------------------	-----	---------------------

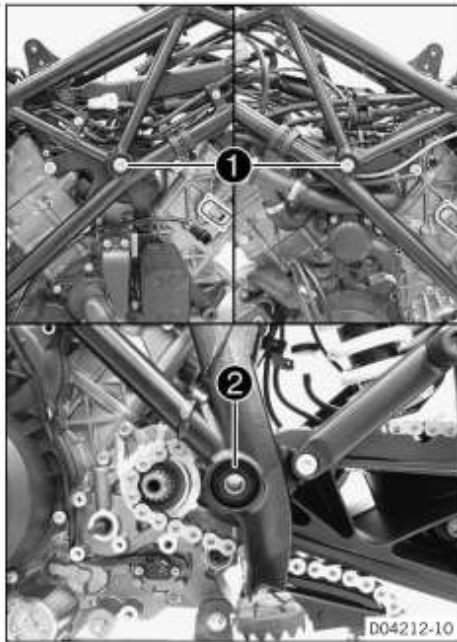


- Mount the fork pivot.
- Mount nut 2, but do not tighten it yet.

Guideline

Nut, fork pivot	M19x1.5	130 Nm (95.9 lbf ft) Thread greased
-----------------	---------	--





- Tighten screws ①.

Guideline

Engine carrying screw	M10	45 Nm (33.2 lbf ft)
-----------------------	-----	---------------------

- Tighten nut ②.

Guideline

Nut, fork pivot	M19x1.5	130 Nm (95.9 lbf ft) Thread greased
-----------------	---------	--

- Remove the floor jack.



- Position the shift lever.
- Position and tighten screw ③ with washers.

Guideline

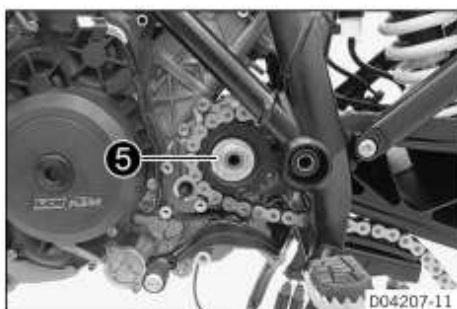
Screw, shift lever	M6	15 Nm (11.1 lbf ft) Loctite®243™
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- Position the link fork position sensor.
- Mount and tighten screws ④.

Guideline

Swing angle sensor screw	M5	5 Nm (3.7 lbf ft) Loctite®243™
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- Lay a chain over the engine sprocket.
- Mount the engine sprocket.
- Mount nut ⑤ with lock washer, but do not tighten yet.

Guideline

Nut of engine sprocket	M20x1.5	100 Nm (73.8 lbf ft) Loctite®243™
------------------------	---------	---



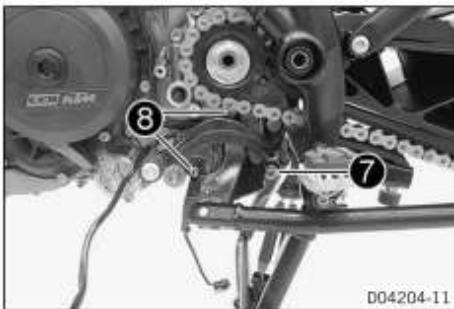
- Lay a chain over the rear sprocket.



- 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 ⑥.

Guideline

Nut, rear wheel spindle	M25x1.5	90 Nm (66.4 lbf ft) Thread greased
-------------------------	---------	---------------------------------------



- Position the side stand bracket.
- Mount screw ⑦, but do not tighten yet.

Guideline

Screw, side stand bracket	M10	45 Nm (33.2 lbf ft) Loctite®243™
---------------------------	-----	--

- Mount and tighten screws ⑧.

Guideline

Screw, side stand bracket	M8	25 Nm (18.4 lbf ft)
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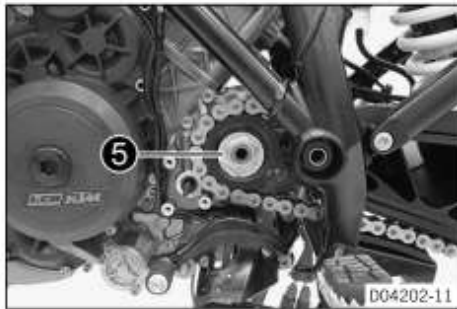
- Tighten screw ⑦.

Guideline

Screw, side stand bracket	M10	45 Nm (33.2 lbf ft) Loctite®243™
---------------------------	-----	--



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



- Have an assistant operate the rear brake.
- Tighten nut 5.

Guideline

Nut of engine sprocket	M20x1.5	100 Nm (73.8 lbf ft) Loctite®243™
------------------------	---------	---

- Secure the nut with the lock washer.



- Mount pin A.



- Position the chain securing guide with the spacer.
- Mount and tighten screw 9 with spacer.

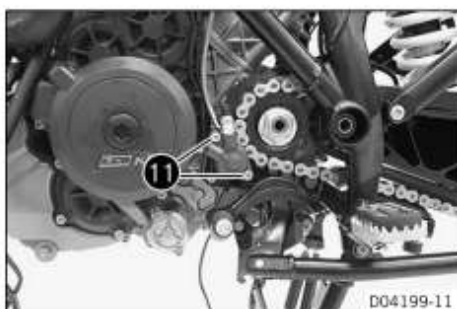
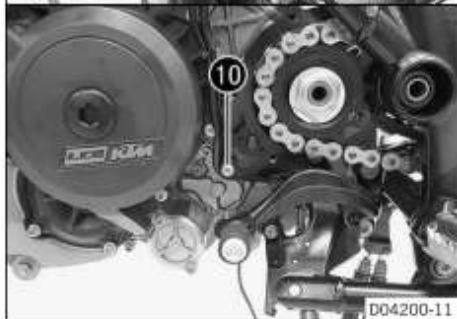
Guideline

Remaining screws, chassis	M8	25 Nm (18.4 lbf ft)
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- Mount and tighten screw 10.

Guideline

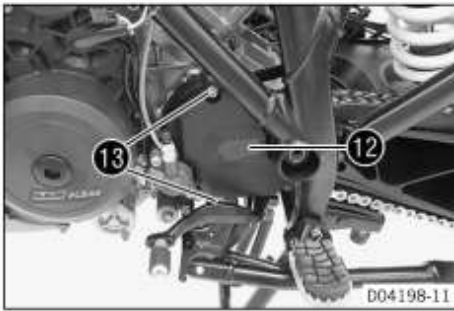
Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
---------------------------	----	--------------------



- Mount the clutch slave cylinder with the spacer.
- Route the clutch line without kinks.
- Mount and tighten screws 11.

Guideline

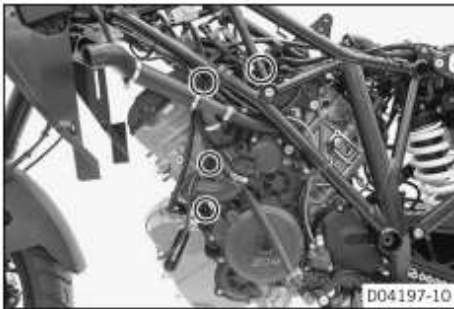
Clutch slave cylinder screw	M6	10 Nm (7.4 lbf ft)
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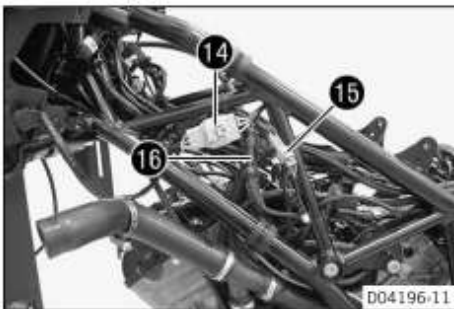
- Position engine sprocket cover 12.
- Mount and tighten screws 13.

Guideline

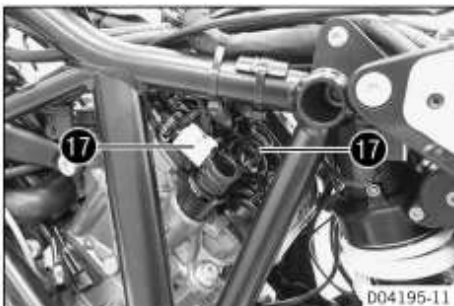
Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
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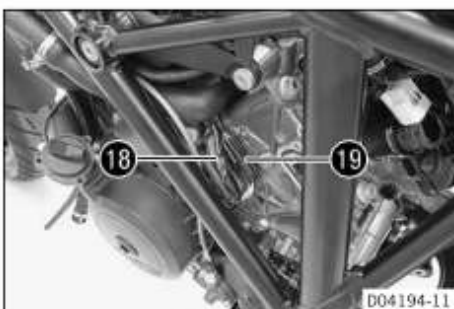
- Route the cables without tension and secure with cable ties.



- Join plug-in connector 14.
- Join plug-in connector 15.
- Join plug-in connector 16.



- Plug in the connectors 17.
- ✓ The white connector is connected to the outer ignition coil.



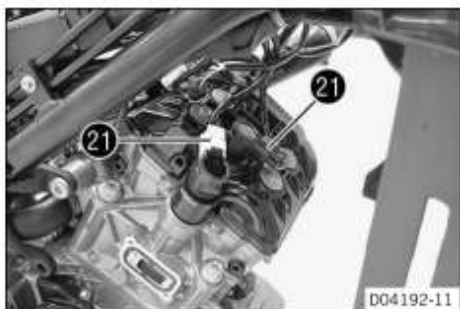
- Join plug-in connector 18.
- Join plug-in connector 19.



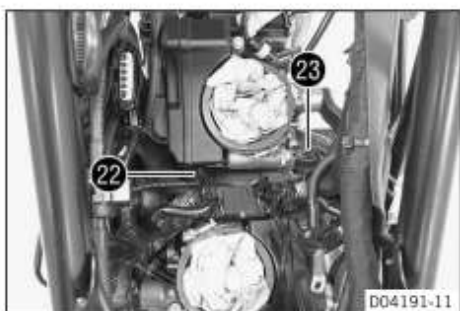
- Position the cover.
- Mount and tighten screws **20**.

Guideline

Remaining engine screws	M6	10 Nm (7.4 lbf ft)
-------------------------	----	--------------------



- Plug in the connectors **21**.
- ✓ The white connector is connected to the outer ignition coil.



- Plug in connector **22**.
- Plug in connector **23**.



- Position the hoses on the cylinder head and secure with hose clamps **24**.



- Position the ground wire.
- Mount and tighten screws **25**.

Guideline

Screw, starter motor	M6	10 Nm (7.4 lbf ft)
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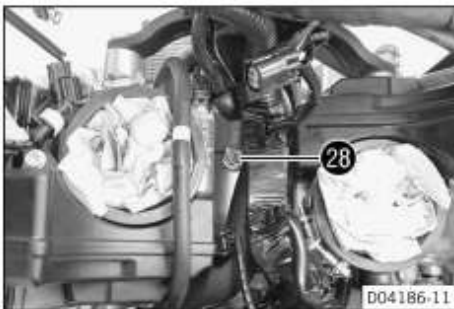
- Position the heat protector.
- Mount the cable ties.
- Mount and tighten screw 26.

Guideline

Screw, cover part	M5	3.5 Nm (2.58 lbf ft)
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- Join plug-in connector 27.



- Position the positive cable on the starter motor.
- Mount and tighten nut 28.

Guideline

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



- Position the wiring harness.
- Mount and tighten screw 29.

Guideline

Remaining screws, chassis	M5	5 Nm (3.7 lbf ft)
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- Position the radiator.

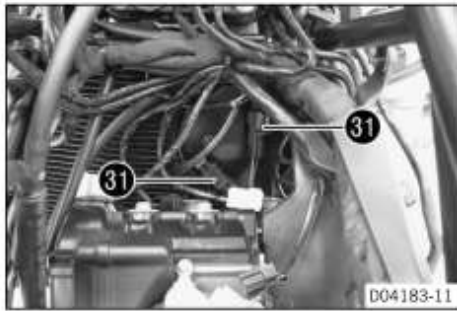
i Info

Pay attention to the cooling fins.

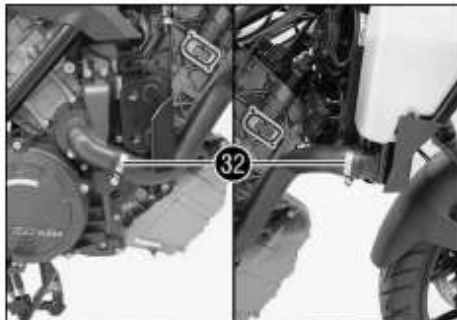
- Mount and tighten screws 30.

Guideline

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



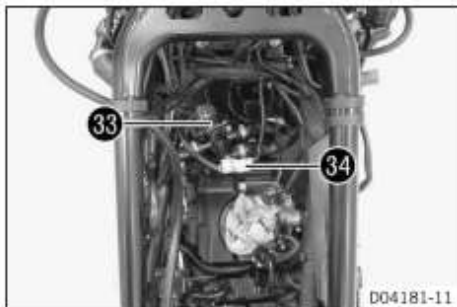
- Connect both plug-in connectors 31 and position them in the holder.



- Mount the radiator hoses.
- Position and tighten hose clips 32.



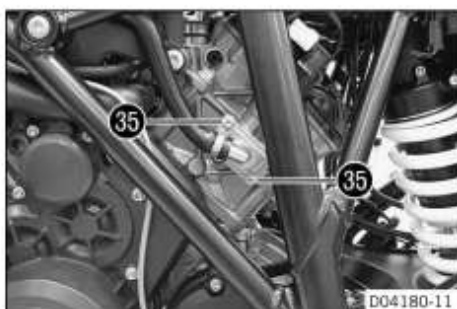
- Position SAS valve 33 with hoses.
- Join plug-in connector 34.

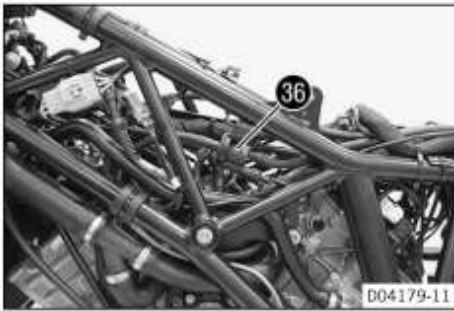


- Position the SAS cover.
- Mount and tighten screws 35.

Guideline

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





- Position fuel evaporation valve **36** on the holder.

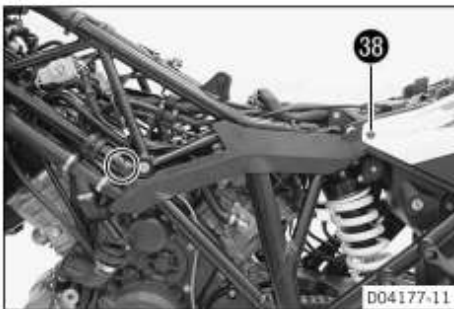


- Position the wiring harness.
- Mount and tighten screw **37**.

Guideline

Remaining screws, chassis	M5	5 Nm (3.7 lbf ft)
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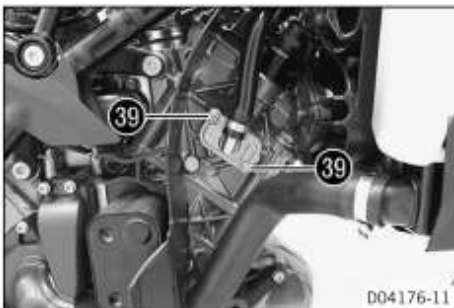
- Route the cable without tension and secure it with a cable tie.



- Position the heat protector.
- Mount the cable ties.
- Mount and tighten screw **38**.

Guideline

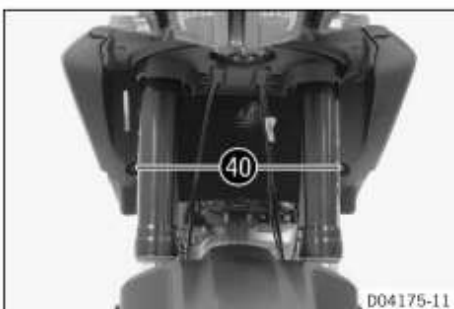
Screw, cover part	M5	3.5 Nm (2.58 lbf ft)
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- Position the SAS cover.
- Mount and tighten screws **39**.

Guideline

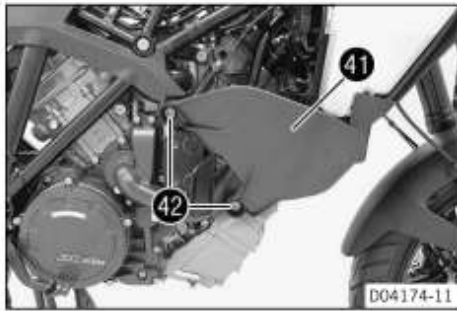
Remaining screws, engine	M6	10 Nm (7.4 lbf ft)
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- Mount and tighten screws **40**.

Guideline

Remaining screws, chassis	M5	5 Nm (3.7 lbf ft)
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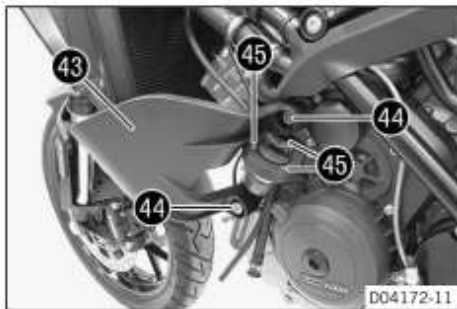
- Position tank guard 41.
- Mount and tighten screws 42.

Guideline

Remaining screws, chassis	M8	25 Nm (18.4 lbf ft)
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- Mount the heat protector on the holder.



- Position tank guard 43.
- Mount and tighten screws 44.

Guideline

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

- Mount and tighten screws 45.



- Position intake snorkel 46.



- Have the entire filling quantity available.

Engine oil Ambient temperature: $\geq 0\text{ }^{\circ}\text{C}$ ($\geq 32\text{ }^{\circ}\text{F}$)	3.60 l (3.8 qt.)	Engine oil (SAE 10W/50) (p. 488)
Engine oil Ambient temperature: $< 0\text{ }^{\circ}\text{C}$ ($< 32\text{ }^{\circ}\text{F}$)		Engine oil (SAE 5W/40) (p. 489)

- Remove filler plug 47 with O-ring and fill with the initial partial quantity.

Engine oil (1st partial quantity) approx. Ambient temperature: ≥ 0 °C (≥ 32 °F)	3.0 l (3.2 qt.)	Engine oil (SAE 10W/50) (☞ p. 488)
Engine oil (1st partial quantity) approx. Ambient temperature: < 0 °C (< 32 °F)		Engine oil (SAE 5W/40) (☞ p. 489)

- Mount filler plug  with O-ring.

Finishing work

- Install the throttle valve body. (☞ p. 388)
- Install the lower part of the air filter box. (☞ p. 77)
- Install the upper part of the air filter box. (☞ p. 75)
- Add coolant/bleed the cooling system. (☞ p. 333)
- Install the manifold. (☞ p. 70)
- Install the main silencer. (☞ p. 67)
- Install the engine guard. (☞ p. 47)
- Install the fuel tank. (☞ p. 83)
- Install the mask spoiler. (☞ p. 101)
- Install the fuel tank cover. (☞ p. 99)
- Install the front side cover. (☞ p. 97)
- Connect the negative cable of the 12-V battery. (☞ p. 137)
- Mount the front rider's seat. (☞ p. 79)
- Mount the passenger seat. (☞ p. 80)
- Set the time and date.



Danger

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

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

- Start the engine and check for tightness.
- Switch off the engine.
- Remove the filler plug with the O-ring and add the second partial quantity up to the upper marking on the engine oil level viewer.

Engine oil (2nd partial quantity) approx. Ambient temperature: ≥ 0 °C (≥ 32 °F)	0.60 l (0.63 qt.)	Engine oil (SAE 10W/50) (☞ p. 488)
--	-------------------	------------------------------------

Engine oil (2nd partial quantity) approx. Ambient temperature: < 0 °C (< 32 °F)	0.60 l (0.63 qt.)	Engine oil (SAE 5W/40) (p. 489)
---	-------------------	---------------------------------

- Mount the filler plug with the O-ring.
- Perform the initialization run. (p. 389)
- Check the lubrication system for leaks.
- Check the cooling system for leaks.
- Go for a short test ride.
- Read out the fault memory using the KTM diagnostics tool.
- Check the engine oil level. (p. 363)
- Check the coolant level in the compensating tank. (p. 330)

19.3 Preparing the engine for installation



- Position both radiator hoses. Position and tighten the hose clips.
- Position the vent hose.
- Mount the intake flanges.
- Remove engine fixing arm 1.

Engine fixing arm (61230066100)

- Mount the engine fixing arm.

Engine fixing arm (60303006000)

- Mount and tighten the screws.

Guideline

Screw, engine bearer	M8	20 Nm (14.8 lbf ft) Loctite®243™
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D04215-10

19.4 Preparing the engine for clamping in the engine assembly stand



- Remove the hose clips.
- Remove both radiator hoses.
- Remove the vent hose.
- Remove the intake flanges.
- Mount the engine fixing arm ❶.

Engine fixing arm (61230066100)



D04215-10

19.5 Setting the engine to ignition top dead center of the rear cylinder

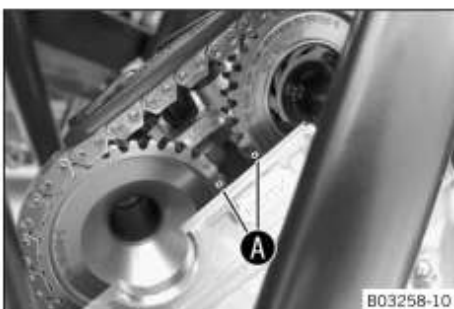
Condition

The valve cover has been removed.



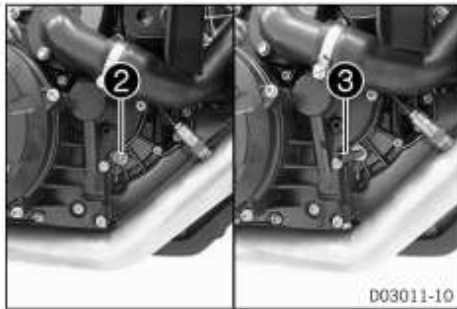
D04108-10

- Remove screw plug ❶ with O-ring.



B03258-10

- Turn the crankshaft counterclockwise until markings A are flush with the edge of the cylinder head.



- Remove screw **2** with the washer.
- Look through the hole to check that the position notch of the crankshaft is visible.
- Screw in special tool **3**.

Locking screw (61229015000) (見 p. 499)

19.6 Setting the engine to ignition top dead center of the front cylinder

Condition

The engine is positioned at ignition top dead center of the rear cylinder.



- Loosen special tool **1** by several turns.

Locking screw (61229015000) (見 p. 499)



- Keep turning the crankshaft counterclockwise until markings **A** are flush with the edge of the cylinder head.
- Screw special tool **1** back in.

19.7 Engine disassembly

19.7.1 Clamping the engine into the engine assembly stand

Preparatory work

- Prepare the engine for clamping in the engine assembly stand. (見 p. 223)

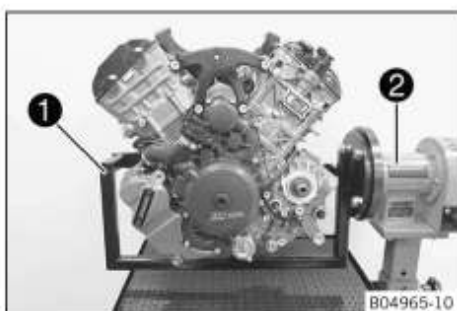
Main work

- Mount special tool **1** on engine assembly stand **2**.

Engine assembly stand (61229001000) (見 p. 498)

Engine bracket for engine work stand (61229002000) (見 p. 498)

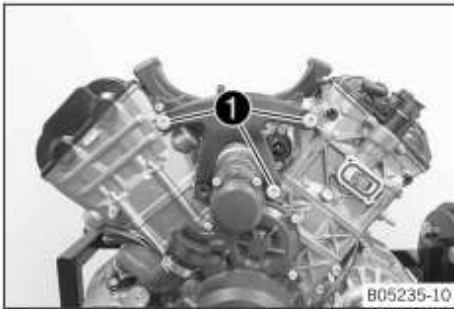
- Mount the engine on special tool **1**.



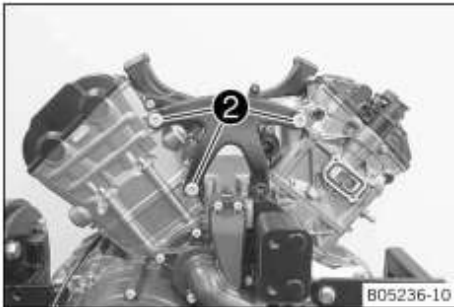
Info

Work with an assistant or an engine hoist.

19.7.2 Removing the engine bearer

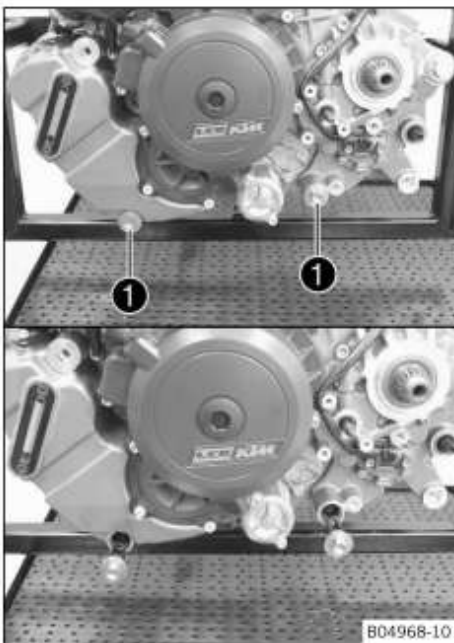


- Remove screws ① and take off the engine bearer.



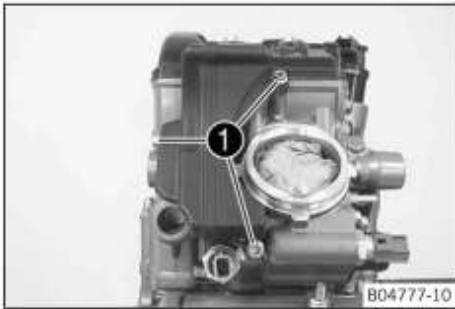
- Remove screws ② and take off the engine bearer.

19.7.3 Draining the engine oil



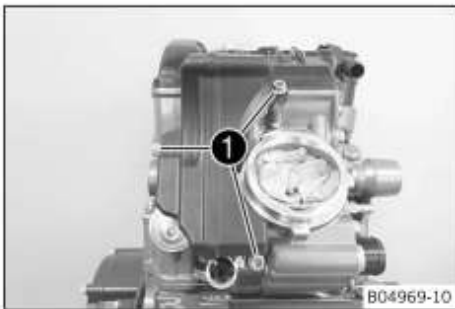
- Remove oil drain plug ① with the magnet, O-rings and oil screen.
- Completely drain the engine oil.

19.7.4 Removing the front resonator



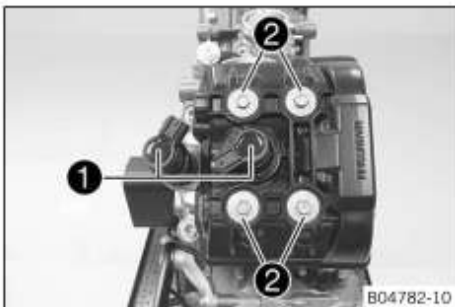
- Remove screws **1**.
- Take off resonator with O-rings.

19.7.5 Removing rear resonator



- Remove screws **1**.
- Take off resonator with O-rings.

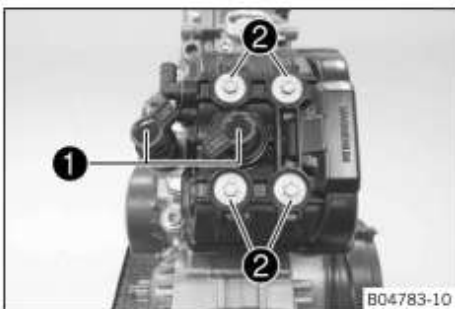
19.7.6 Removing the front valve cover



- Remove ignition coils **1**.
- Remove screws **2**. Take off the valve cover with the valve cover seal.
- Remove the spark plugs using the special tool.

Spark plug wrench with link (77229172000) (見 p. 504)

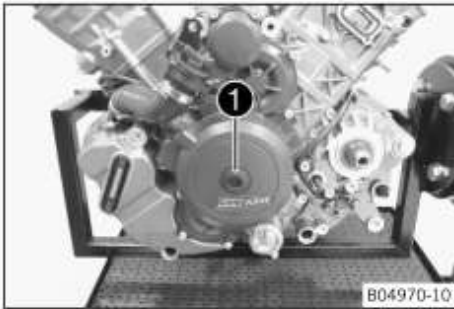
19.7.7 Removing the rear valve cover



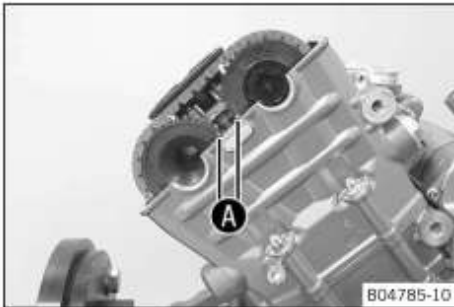
- Remove ignition coils **1**.
- Remove screws **2**. Take off the valve cover with the valve cover seal.
- Remove the spark plugs using the special tool.

Spark plug wrench with link (77229172000) (見 p. 504)

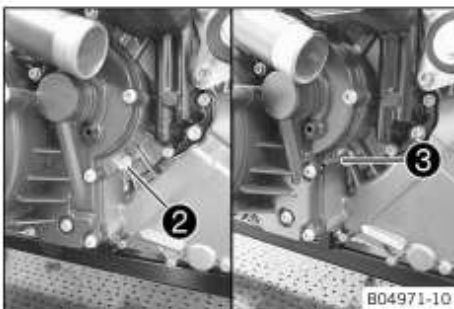
19.7.8 Setting the engine to ignition top dead center of the rear cylinder



- Remove screw plug **1** with O-ring.



- Turn the crankshaft counterclockwise until markings **A** of the rear camshafts are flush with the edge of the cylinder head.



- Remove screw **2** with the washer.
- Look through the hole to check that the position notch of the crankshaft is visible.
- Screw in special tool **3**.

Locking screw (61229015000) (☞ p. 499)

19.7.9 Removing the starter motor



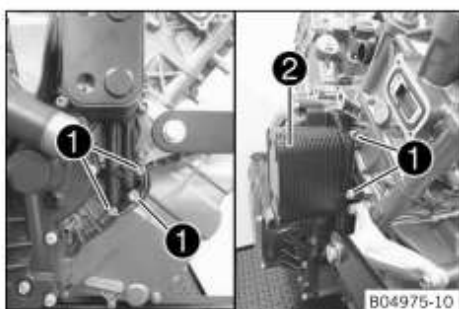
- Take off the starter motor.

19.7.10 Removing the oil filler tube

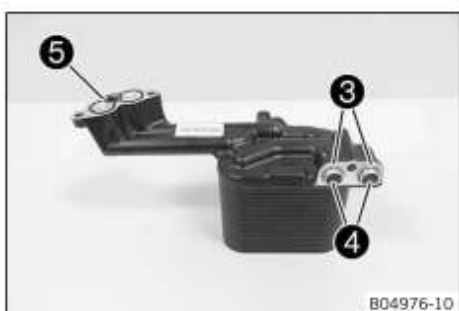


- Remove screws **1**.
- Remove the oil filler tube with the O-ring.

19.7.11 Removing the heat exchanger

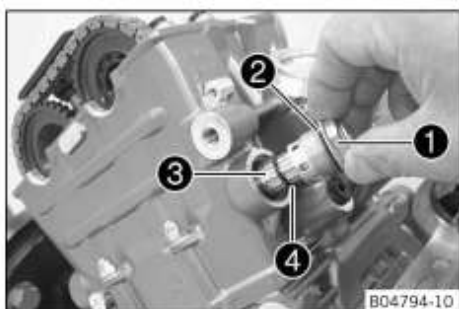


- Remove screws **1** of heat exchanger **2**.
- Remove the heat exchanger.



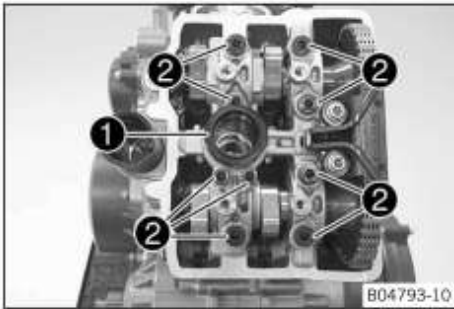
- Remove O-rings **3** and sleeves **4**.
- Remove seal **5**.

19.7.12 Removing the rear timing chain tensioner



- Remove screw **1** with O-ring **2**.
- Remove timing chain tensioner **3** with O-ring **4**.

19.7.13 Removing the rear camshafts



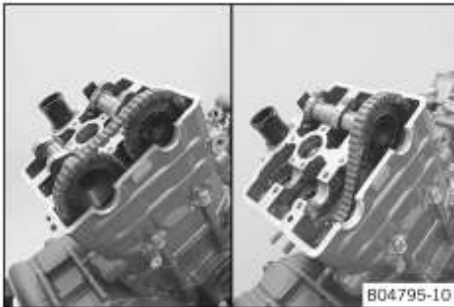
- Remove the spark plug shaft insert **1** with the gasket.
- Loosen and remove screws **2** from the outside to the inside.



Info

The cams should not activate the valves.

- Remove the camshaft bearing support.

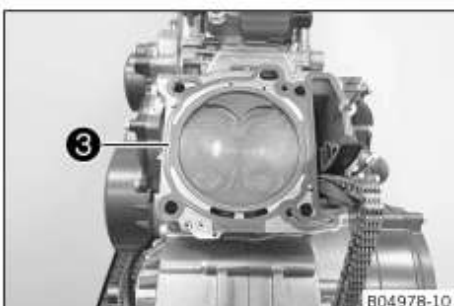
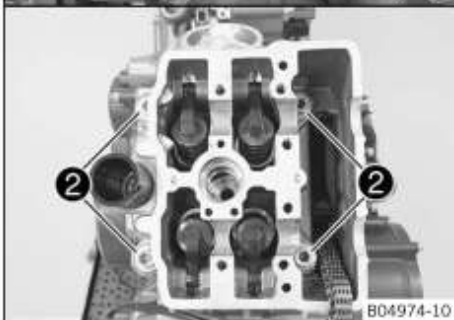


- Raise the camshafts at the rear and take the timing chain off the rear sprocket. Remove the camshafts.

19.7.14 Removing the rear cylinder head

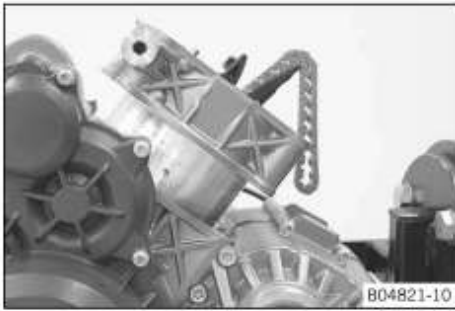


- Remove nuts **1** with the washers.
- Alternately loosen screws **2** and remove them.
- Take off the cylinder head.



- Remove cylinder head gasket **3**.

19.7.15 Removing the rear piston

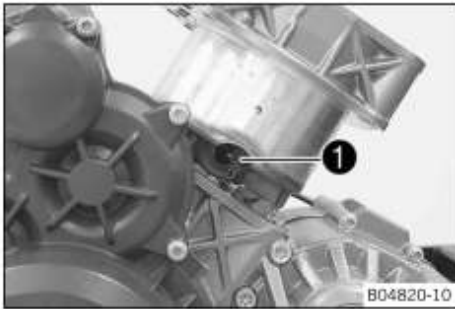


- Push the cylinder up.



Info

Push the cylinder up until the piston pin can be removed.
Make sure that the two pins remain in place.

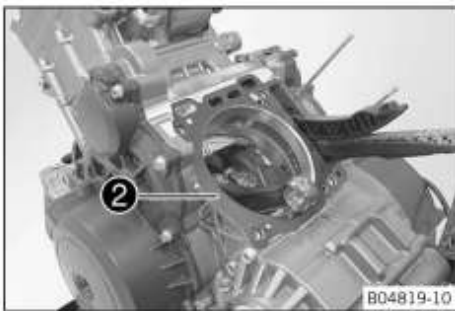


- Remove piston pin retainer **1**.
- Remove the piston pin.
- Remove the cylinder with the piston.
- Push the piston upward out of the cylinder.



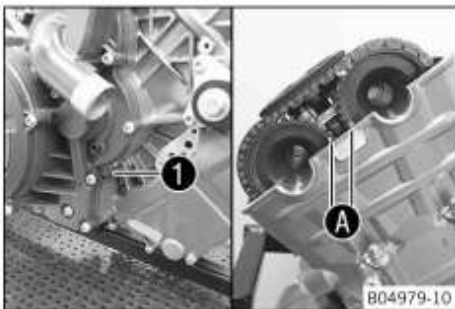
Info

If no additional work needs to be performed on the cylinder and piston, the piston can remain in the cylinder.



- Remove cylinder base gasket **2**.

19.7.16 Setting the engine to ignition top dead center of the front cylinder

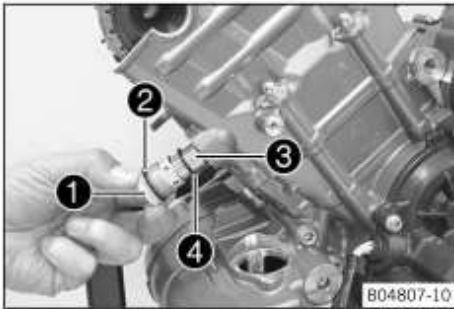


- Loosen special tool **1** by several turns.

Locking screw (61229015000) (p. 499)

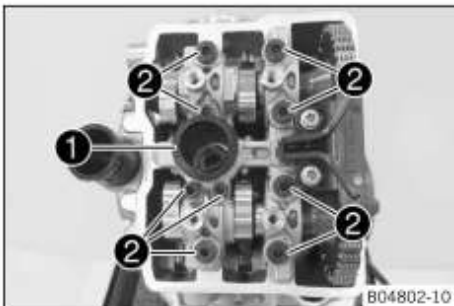
- Keep the timing chain taut. Hold the connecting rod in the center of the drill hole.
- Keep turning the crankshaft counterclockwise until markings **A** of the front camshafts are flush with the edge of the cylinder head.
- Screw special tool **1** back in.

19.7.17 Removing the front timing chain tensioner



- Remove screw 1 with O-ring 2.
- Take off timing chain tensioner 3 with O-ring 4.

19.7.18 Removing the front camshafts



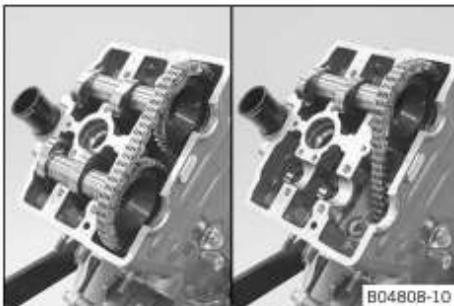
- Remove the spark plug shaft insert 1 with the gasket.
- Loosen and remove screws 2 from the outside to the inside.



Info

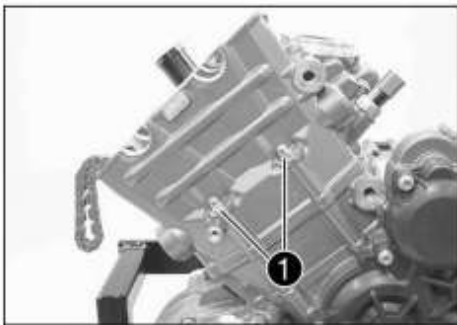
The cams should not activate the valves.

- Remove the camshaft bearing support.

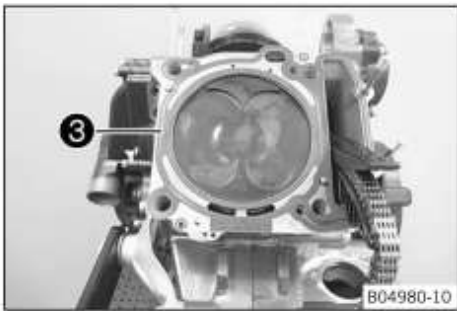
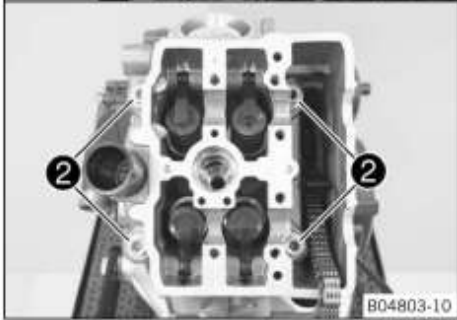


- Raise the camshafts at the rear and take the timing chain off the rear sprocket. Remove the camshafts.

19.7.19 Removing the front cylinder head



- Remove nuts **1** with washers.
- Loosen screws **2** in a crisscross pattern and remove them.
- Remove the cylinder head.



- Remove cylinder head gasket **3**.

19.7.20 Removing the front piston



- Push the cylinder upward.



Info

Only push the cylinder as far up as necessary to take the piston pin out.
Make sure that the two pins remain in place.

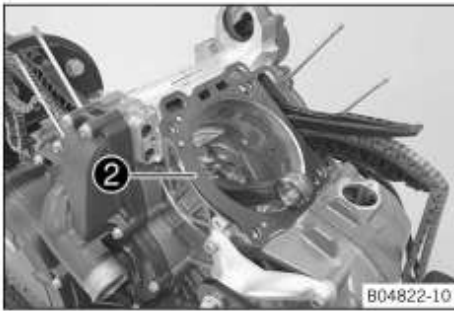


- Remove piston ring lock **1**.
- Remove the piston pin.
- Take off the cylinder and piston.
- Push the piston upward out of the cylinder.



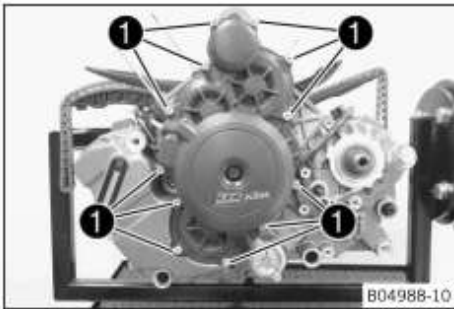
Info

If no further work is to be performed on the cylinder and piston, the piston can remain in the cylinder.

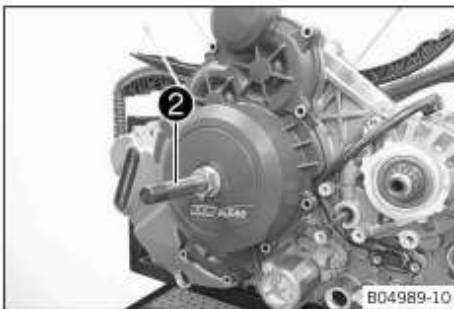


- Remove cylinder base gasket **2**.

19.7.21 Removing the alternator cover



- Remove screws **1**.



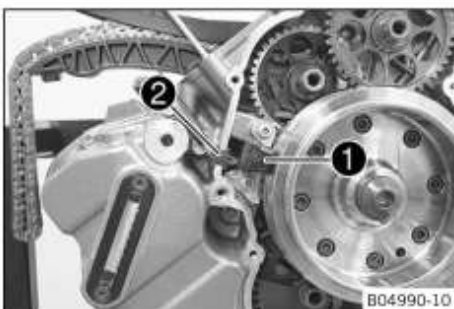
- Screw in special tool **2** and pull off the alternator cover.

Puller (61229010000) (see p. 499)

i Info
Strike the alternator cover lightly with a rubber mallet to prevent strain.

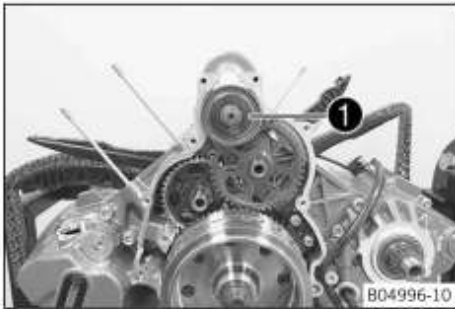
- Take off the alternator cover seal. Take off the dowels.

19.7.22 Removing the crankshaft speed sensor



- Remove the screws of crankshaft speed sensor **1**.
- Pull rubber grommet **2** out of the engine case. Take off the crankshaft speed sensor.

19.7.23 torque limiter, removing



- Remove torque limiter **1** with washer below it.

19.7.24 Removing the rotor

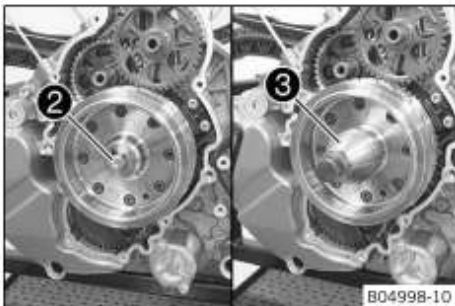


- Loosen and remove screw **1** of the rotor.



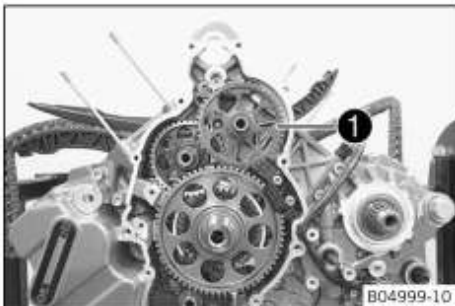
Info

The crankshaft must be blocked.



- Screw special tool **2** into the crankshaft.
Pressing tool (61229008100) (p. 499)
- Mount special tool **3** on the rotor, apply counterpressure, and pull off the rotor by screwing in the screw.
Puller (75029021000) (p. 503)
- Remove the special tools.

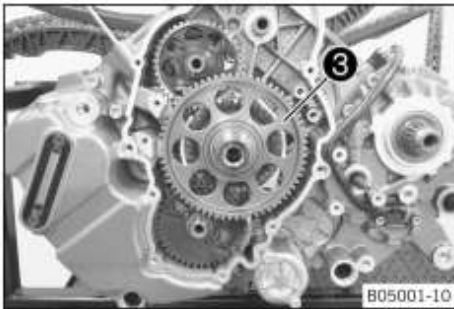
19.7.25 Removing the intermediate gear and the timing chain on the left



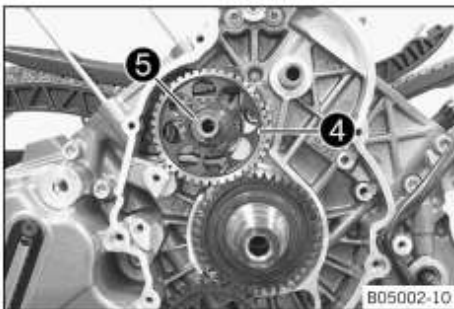
- Remove intermediate gear **1** with the washers and needle bearing.



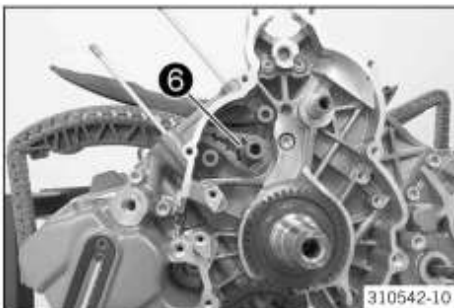
- Remove screws ② and take off freewheel holder.



- Remove freewheel gear ③.



- Take off intermediate gear ④ with washer ⑤.

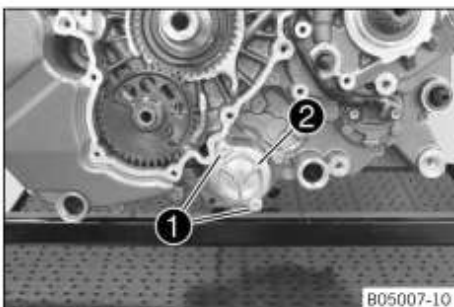


- Remove the timing chain, needle bearing ⑥ and the washer lying behind it.

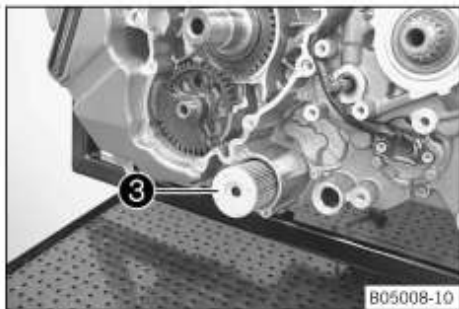
**Info**

If the timing chain is to be used again, mark on it the direction of travel and the cylinder to which it belongs.

19.7.26 Removing the oil filter



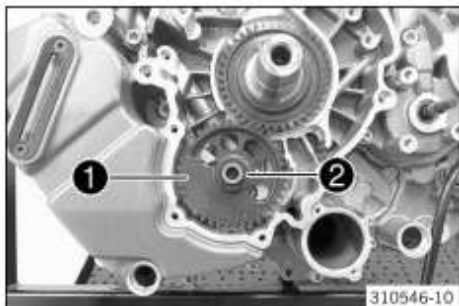
- Remove screws ①. Take off oil filter cover ② with the O-ring.



- Pull oil filter **3** out of the oil filter housing.

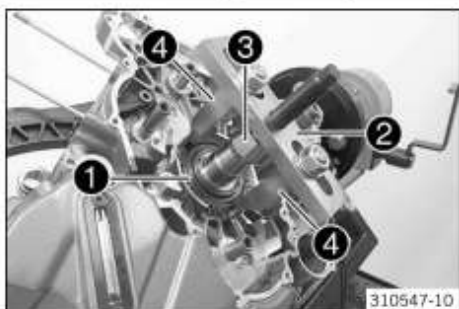
Lock ring plier (51012011000) (see p. 494)
--

19.7.27 Removing the balancer shaft



- Remove balancer shaft **1** with washer **2**.
- Mount the needle bearing and the rear washer.

19.7.28 Removing the drive gear wheel of the balancer shaft



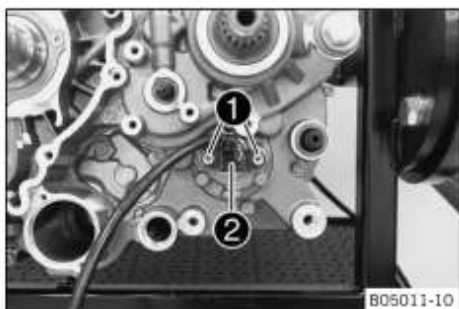
- Remove drive gear wheel **1** of the balancer shaft with special tool **2**, **3** and **4**.

Puller (78029033100) (see p. 504)

Pressing tool (61229018000) (see p. 500)
--

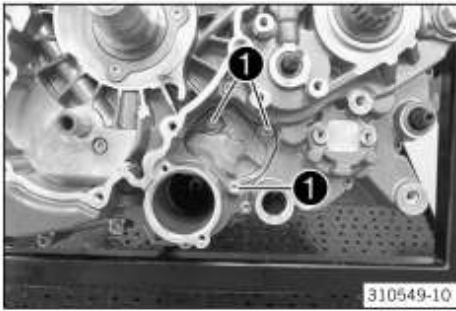
Arms for puller (61229017000) (see p. 500)
--

19.7.29 Removing the gear position sensor



- Remove screws **1** with the washers.
- Remove gear sensor **2**.

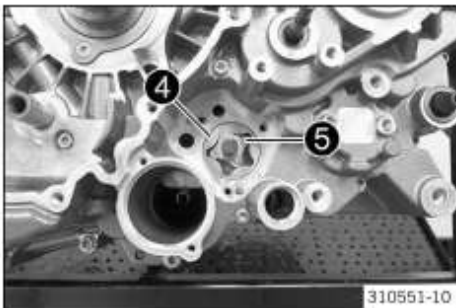
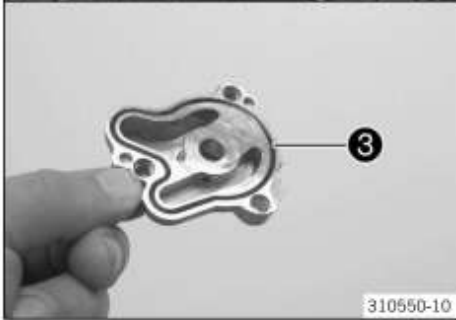
19.7.30 Removing the left suction pump



- Remove screws ①.



- Screw suitable screws into the oil pump cover.
- Remove the oil pump cover by screwing in the screws.
- Remove oil pump cover ②.
- Remove gasket ③.

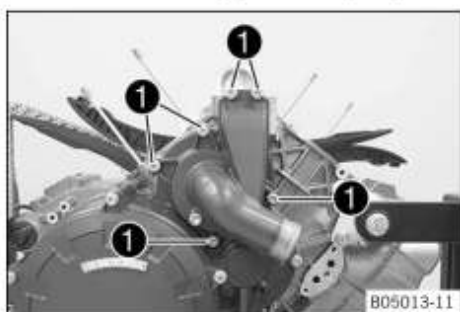


- Remove external rotor ④ and internal rotor ⑤.

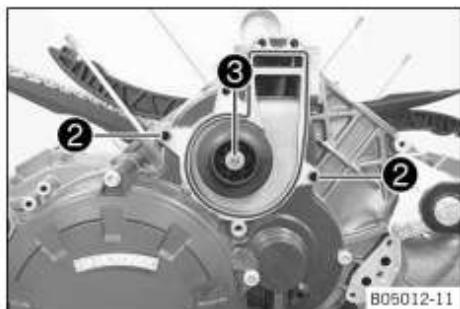


- Remove pin ⑥.

19.7.31 Removing the water pump wheel

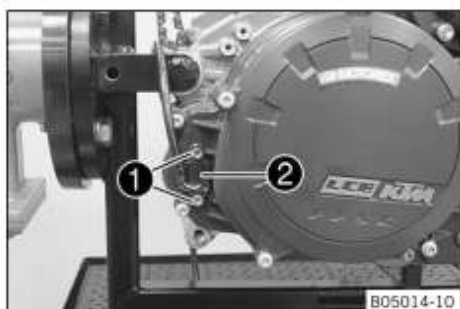


- Remove screws ①.
- Take off the water pump cover.



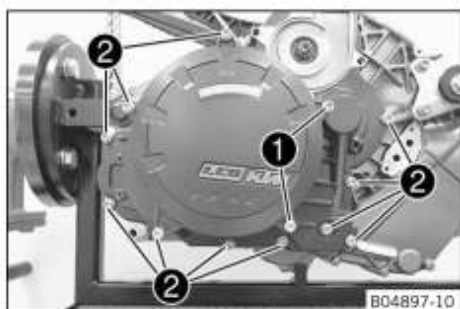
- Remove dowels ②.
- Remove screw ③. Take off the water pump wheel with the washer below it.

19.7.32 Removing shift shaft sensor

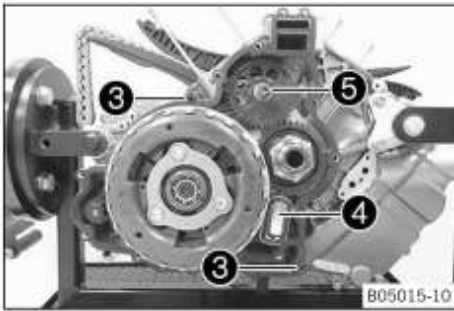


- Remove screws ①.
- Take off the shift shaft sensor ②.

19.7.33 Removing the clutch cover

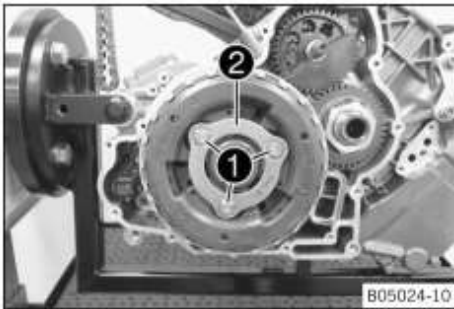


- Loosen screws ① of the outer clutch cover.
- Remove screws ②.
- Take off the clutch cover.

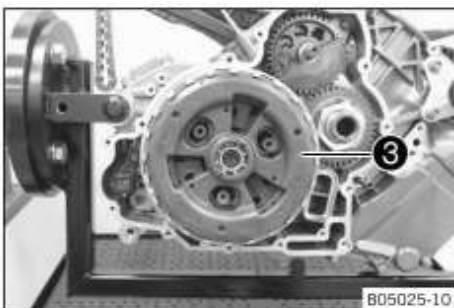


- Take off dowels **3**. Remove the clutch cover gasket.
- Remove check valve **4**.
- Remove water pump sleeve **5** from the intermediate gear.

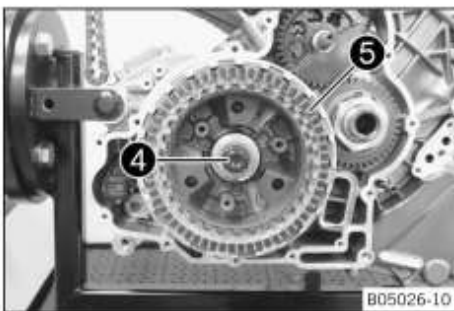
19.7.34 Removing the clutch discs



- Remove screws **1**.
- Take off clutch center **2** and the springs.

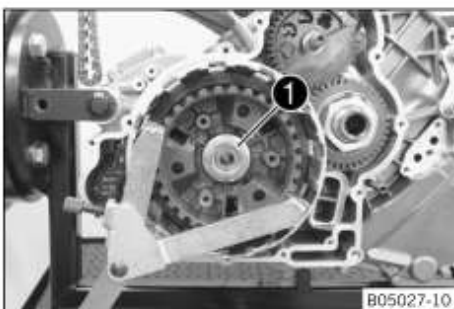


- Remove clutch pressure cap **3**.



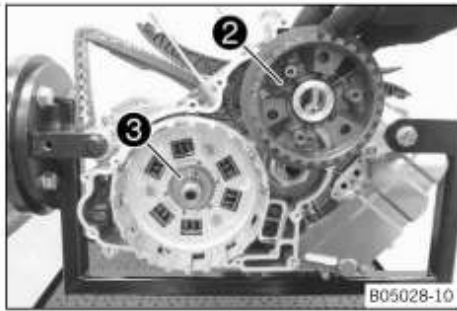
- Remove clutch push rod **4**.
- Remove clutch discs **5**, support ring, and pretension ring.

19.7.35 Removing the clutch basket



- Hold the inner clutch hub with the special tool,

Holding wrench (51129003000) (見 p. 495)
- Remove nut **1** with the washer.

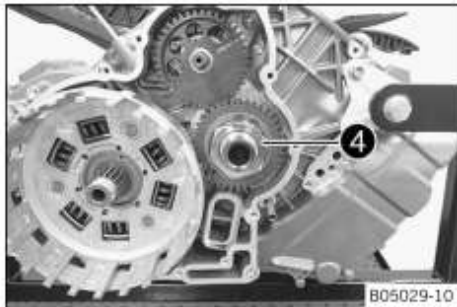


- Take off inner clutch hub **2** and washer **3**.



Info

The washer usually sticks to the inner clutch hub.



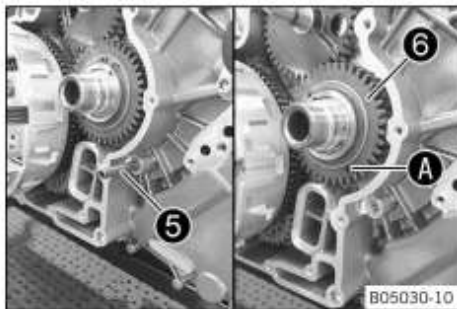
- Remove nut **4** of the primary gear with the washer.



Info

LH thread!

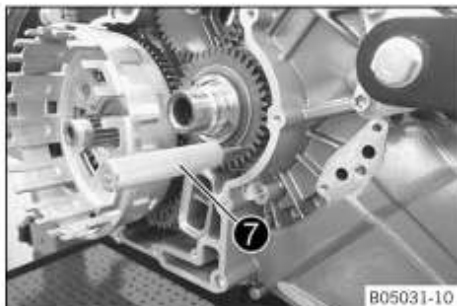
Make sure that the crankshaft is blocked.



- Remove special tool **5**.

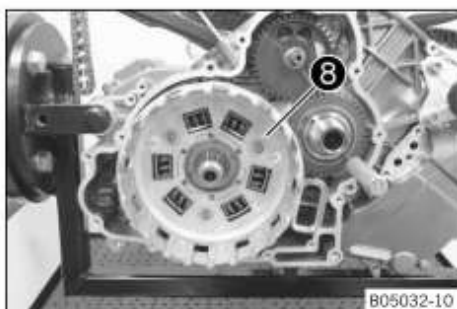
Locking screw (61229015000) (☞ p. 499)

- Keep the timing chain taut. Hold the both connectings rod in the center of the drill hole.
- Turn primary gear **6** counterclockwise.
- ✓ Hole **A** is accessible.

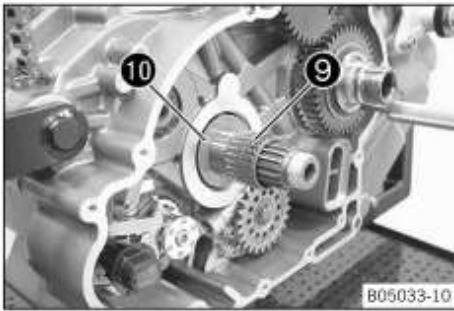


- Mount special tool **7** until it stops.

Locking pin (61329033000) (☞ p. 503)

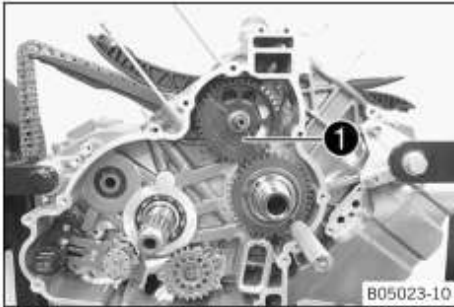


- Remove clutch basket **8** with oil pump drive gear.



- Remove needle bearing 9 and washer 10.

19.7.36 Removing the intermediate gear and the timing chain on the right



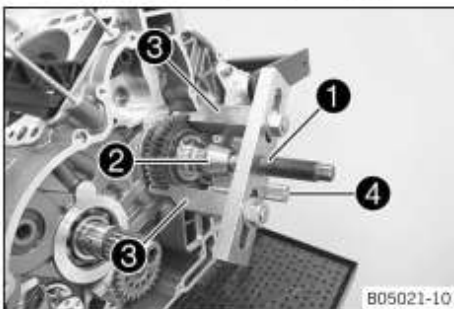
- Take off intermediate gear 1.
- Take off the timing chain.



Info

If the timing chain is to be used again, mark on it the direction of travel and the cylinder to which it belongs.

19.7.37 Removing the primary gear wheel



- Remove the primary gear wheel with special tool 1, 2 and 3.

Puller (78029033100) (see p. 504)

Pressing tool (61229018000) (see p. 500)
--

Arms for puller (61229017000) (see p. 500)
--



Warning

Risk of injury Spring-loaded parts snap back.

- Disassemble spring-loaded parts taking the spring force into account (clamp in a vise).

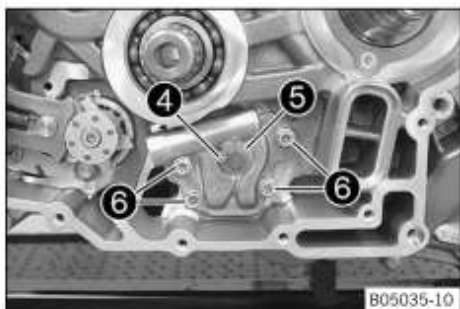
- Do not remove special tool 4.

Locking pin (61329033000) (see p. 503)
--

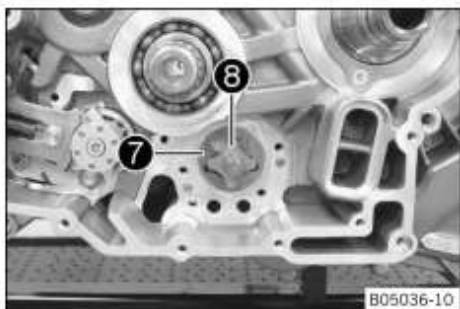
19.7.38 Removing the force pump



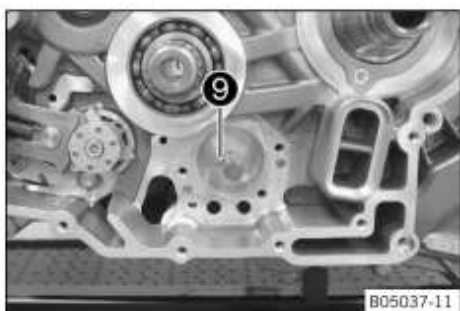
- Remove lock washer 1 and washer 2.
- Take off oil pump gear wheel 3.



- Remove pin 4 and washer 5.
- Remove screws 6.
- Remove the oil pump cover.

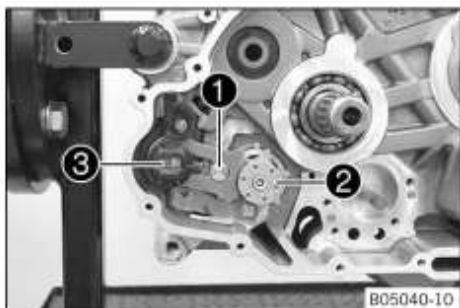


- Remove external rotor 7 and internal rotor 8.



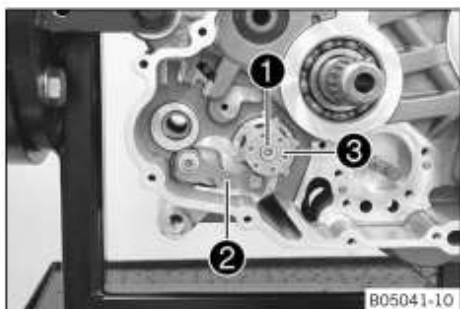
- Remove pin 9.

19.7.39 Removing the shift shaft



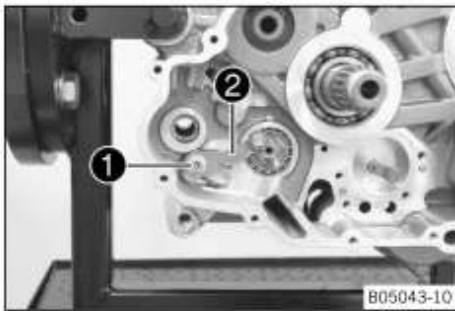
- Push sliding plate 1 away from shift drum locating unit 2.
- Remove shift shaft 3 with washer.

19.7.40 Removing the shift drum locating



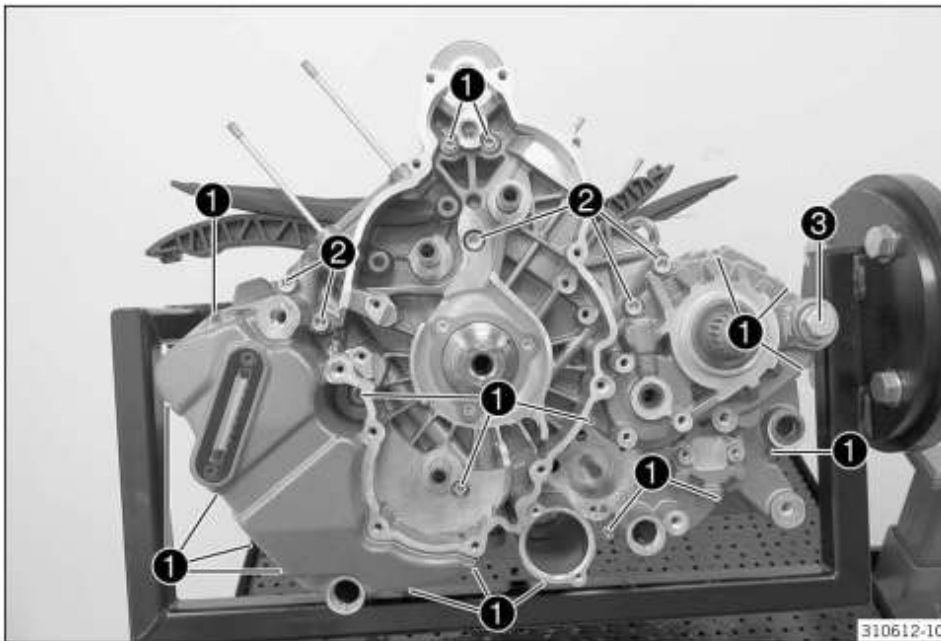
- Remove screw 1.
- Press locking lever 2 away from shift drum locating 3 and take off the shift drum locating.
- Release the locking lever.

19.7.41 Removing the locking lever

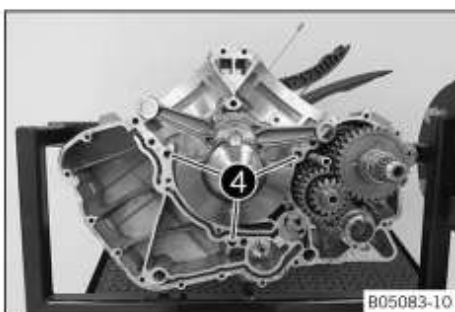


- Remove screw ①.
- Take off locking lever ② with the sleeve and spring.

19.7.42 Removing the left engine case



- Remove screws ① and ②.
- Swing the left section of the engine case upward. Remove screw ③.
- Loosen the left section of the engine case by striking it lightly with a plastic hammer and remove it.



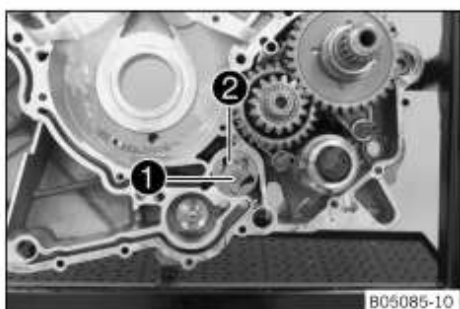
- Remove dowels ④.

19.7.43 Removing the crankshaft

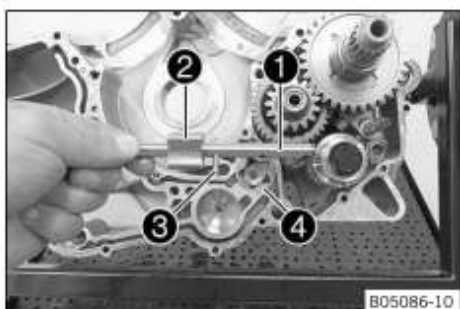


- Remove crankshaft.

19.7.44 Removing the middle suction pump

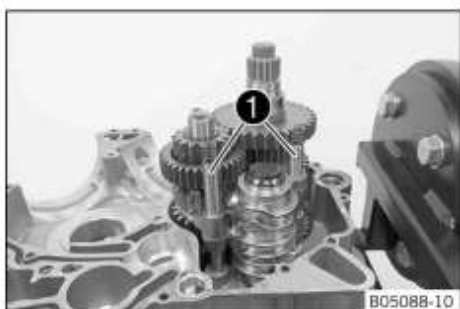


- Take off oil pump shaft **1** with internal rotor **2**.

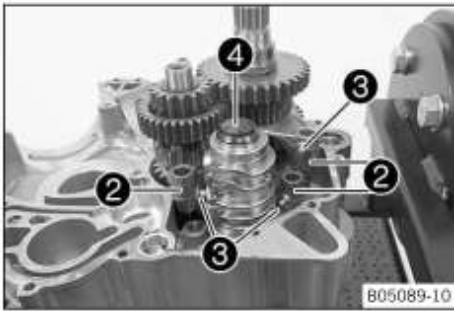


- Remove internal rotor **2** and pin **3** from the oil pump shaft **1**.
- Remove external rotor **4**.

19.7.45 Removing the transmission shaft



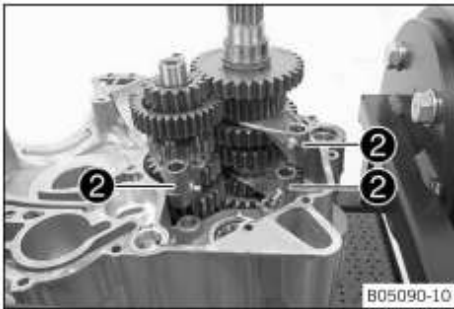
- Remove shift rails **1** with the springs.



- Swing shift forks **2** to one side.

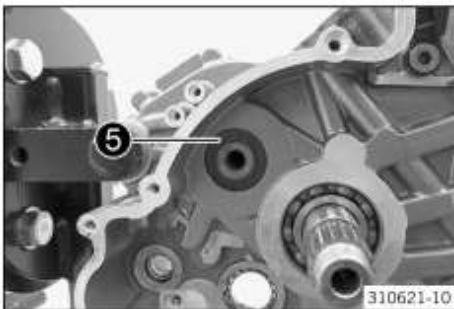
i **Info**
Make sure not to misplace shift rollers **3**.

- Remove shift drum **4**.



- Remove shift forks **2**.

i **Info**
Make sure not to misplace the shift rollers.

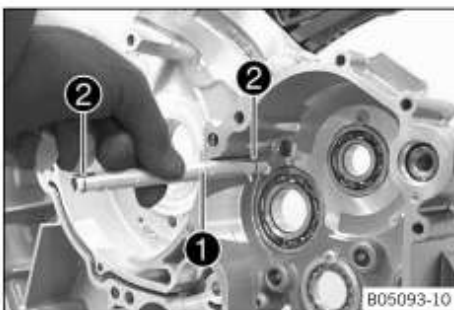


- Place the engine in an upright position.
- Remove lock ring **5** and the stop disk.



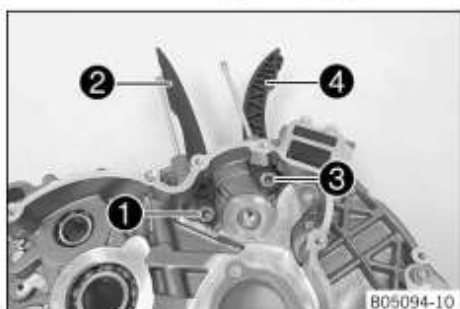
- Pull both transmission shafts out of the bearing seats together.

19.7.46 Removing the oil spray tube



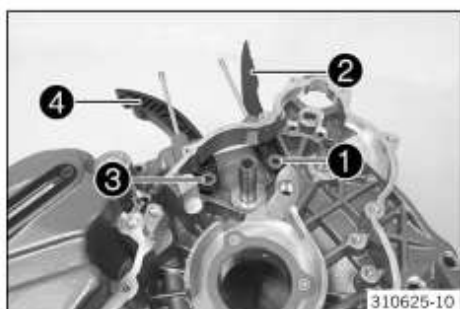
- Remove oil spray tube **1**. Remove O-rings **2**.

19.7.47 Removing the timing chain rails of the right engine case section



- Remove screw ①. Remove timing chain guide rail ②.
- Remove screw ③. Remove timing chain tensioning rail ④.

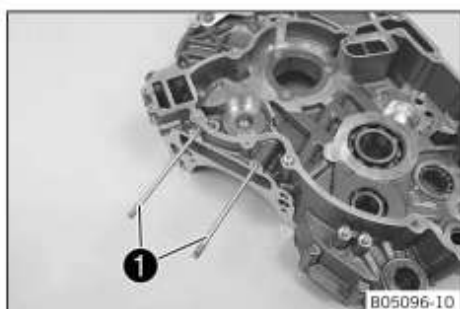
19.7.48 Removing the timing chain rails of the left engine case section



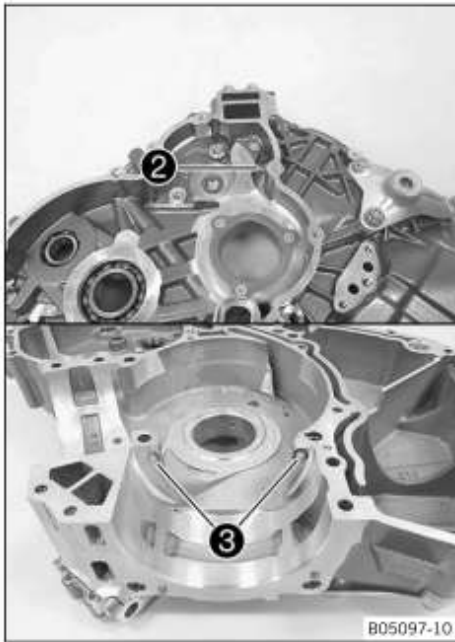
- Remove screw ①. Remove timing chain guide rail ②.
- Remove screw ③. Remove timing chain tensioning rail ④.

19.8 Working on individual parts

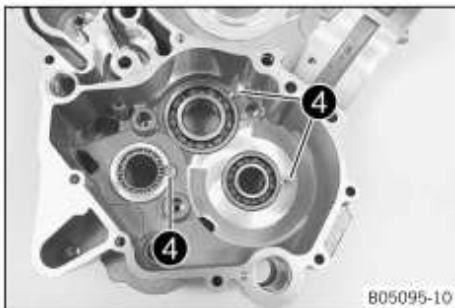
19.8.1 Working on the right section of the engine case



- Remove studs ①.



- Remove oil nozzle ②.
- Remove oil nozzles ③.



- Remove bearing retainers ④.
- Remove dowels.
- Remove any remnants of 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 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.

- Warm the section of the engine case again.

Guideline

130 °C (266 °F)

- Insert the new cold bearings into the bearing seats of the hot section of the engine case and, if necessary, use a suitable press drift to push the bearings from the inside to the outside, all the way to the stop or so it is flush.



Info

When pressing in, ensure that the section of the engine case lies flat in order prevent damage.
Only press the bearings in using the outer bearing race; otherwise, the bearings will be damaged when they are pressed in.

- After the section of the engine case has cooled, check that the bearings are firmly seated.

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.

- Mount and tighten bearing retainers **4**.

Guideline

Screw, bearing retainer	M5	6 Nm (4.4 lbf ft) Loctite®243™
-------------------------	----	--

- Mount and tighten oil nozzle **2**.

Guideline

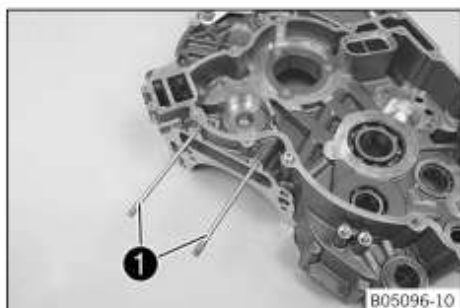
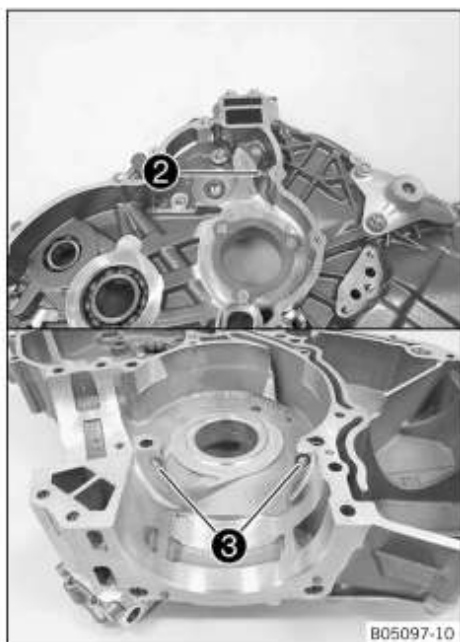
Nozzle 100	M6x0.75	4 Nm (3 lbf ft) Loctite®243™
------------	---------	--

- Mount and tighten oil nozzles **3**.

Guideline

Oil nozzle	M5	2 Nm (1.5 lbf ft) Loctite®243™
------------	----	--

- Mount the dowels.



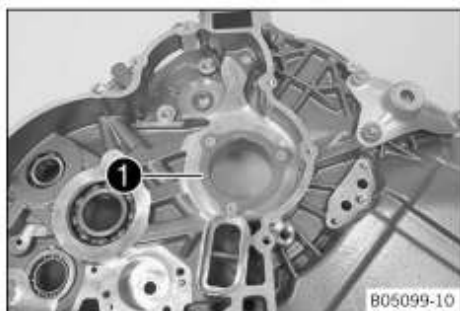
- Mount studs **1**.

Guideline

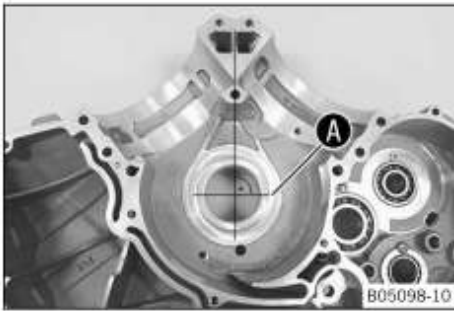
Stud, timing chain shaft	M6	8 Nm (5.9 lbf ft)
--------------------------	----	-------------------

- Blow compressed air through all oil channels and check that they are clear.

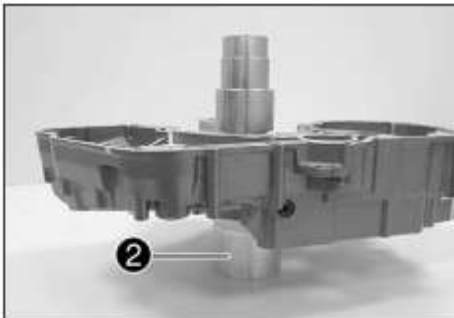
19.8.2 Removing the right main bearing



- Remove the screws and take off bearing shell bracket **1**.



- Mark face **A** of the main bearing shells as shown in the figure.

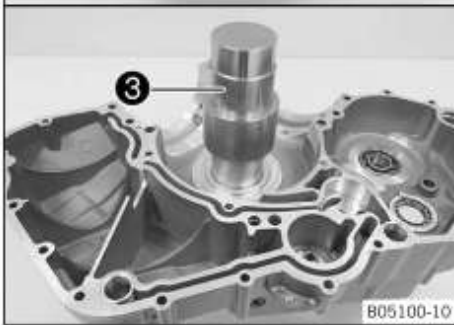


- Place the engine case section on special tool **2**.

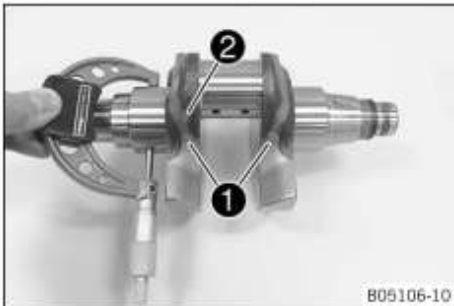
Pressing tool (61229045000) (p. 502)

- Place special tool **3** with the smaller diameter on the bearing shells and press from the inside to the outside.

Pressing tool (61229044000) (p. 501)



19.8.3 Selecting the main bearing shells



New crankshaft

- Select the new bearing shells according to color marking **1**.



Info

Color marking **2** refers to the conrod bearing.

Used crankshaft

- Measure both pivot points and select the new bearing shells accordingly.

Guideline

Crankshaft - main bearing diameter	
Yellow	52.965 ... 52.975 mm (2.08523 ... 2.08563 in)
Blue	52.976 ... 52.985 mm (2.08567 ... 2.08602 in)
Red	52.986 ... 52.995 mm (2.08606 ... 2.08641 in)

19.8.4 Installing the right main bearing

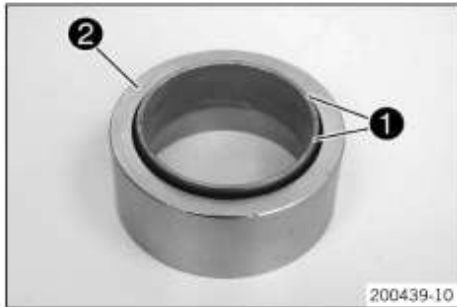
Preparatory work

- Select the main bearing shells, (☞ p. 249)

Main work

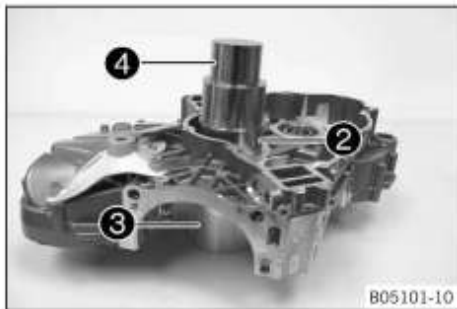
- Center the new main bearing shells **1** using special tool **2**.

Pressing tool (61229044000) (☞ p. 501)



- Place the inside of the engine case section on special tool **3**.

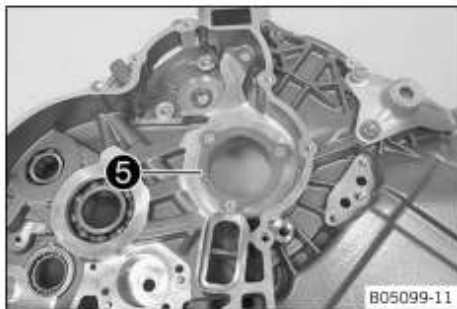
Pressing tool (61229045000) (☞ p. 502)



- Align the face of the new bearing shell with the marking made when it was disassembled.

- Press the bearing shells with the stepped side of special tool **4** through press sleeve **2** from the outside to the inside, all the way to the stop.

Pressing tool (61229044000) (☞ p. 501)



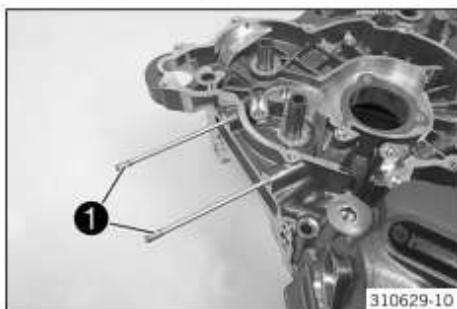
- Position bearing shell bracket **5**. Mount and tighten the screws.

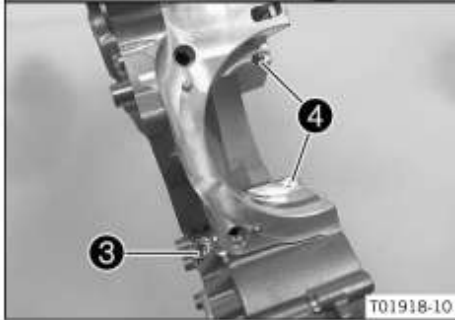
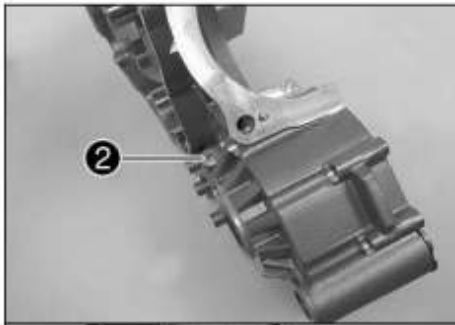
Guideline

Screw, bearing retainer	M5	6 Nm (4.4 lbf ft) Loctite®243™
-------------------------	----	--

19.8.5 Working on the left section of the engine case

- Remove studs **1**.





- Remove screw ② with the O-ring.
- Remove oil nozzle ③.
- Remove oil nozzles ④.

- Remove shaft seal rings ⑤.
- Remove shaft seal ring ⑥ of the clutch push rod.
- Remove any remnants of 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 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.

- Warm the section of the engine case again.

Guideline

130 °C (266 °F)

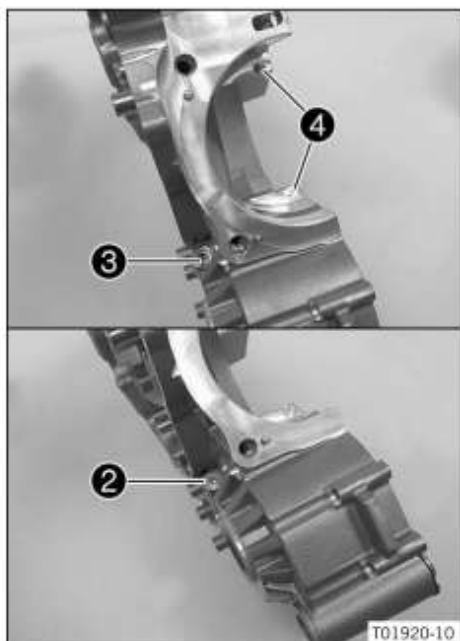
- Insert the new cold bearings into the bearing seats of the hot section of the engine case and, if necessary, use a suitable press drift to push the bearings from the inside to the outside, all the way to the stop or so it is flush.



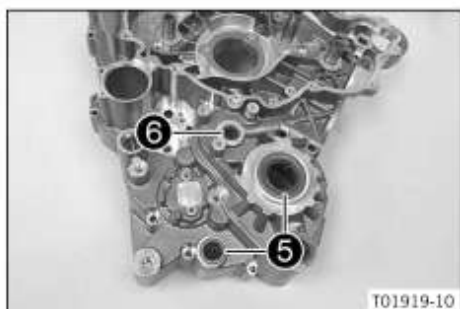
Info

When pressing in, ensure that the section of the engine case lies flat in order prevent damage.
Only press the bearings in using the outer bearing race; otherwise, the bearings will be damaged when they are pressed in.

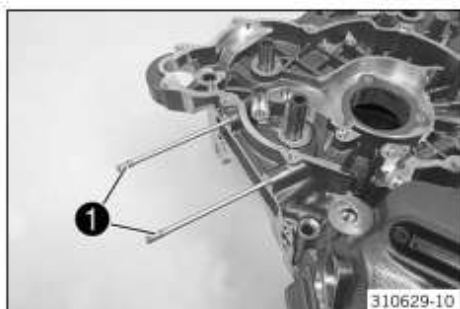
- After the section of the engine case has cooled, check that the bearings are firmly seated.



T01920-10



T01919-10



310629-10

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.

- Mount oil nozzles **4**.

Guideline

Oil nozzle	M5	2 Nm (1.5 lbf ft) Loctite®243™
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- Mount oil nozzle **3**.

Guideline

Oil nozzle for clutch lubrication	M6x0.75	4 Nm (3 lbf ft)
-----------------------------------	---------	-----------------

- Mount screw **2** with the O-ring and tighten.

Guideline

Plug, clutch lubrication	M10x1	10 Nm (7.4 lbf ft)
--------------------------	-------	--------------------

- Press in shaft seal rings **5** until they are flush.
- Press in the shaft seal ring of clutch push rod **6**.

Pressing tool (61229013000) (見 p. 499)

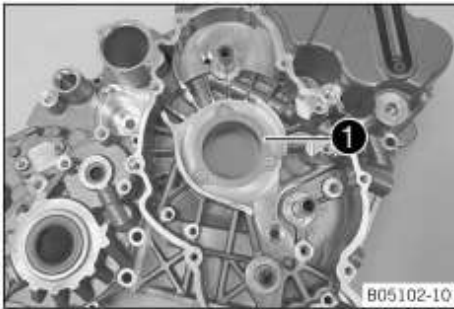
- Mount studs **1**.

Guideline

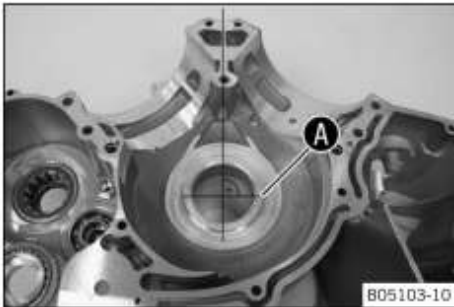
Stud, timing chain shaft	M6	8 Nm (5.9 lbf ft)
--------------------------	----	-------------------

- Blow compressed air through all oil channels and check that they are clear.

19.8.6 Removing the left main bearing



- Remove the screws and take off bearing shell bracket **1**.



- Mark joint **A** of the main bearing shells as shown in the figure.



- Place the engine case section on special tool **2**.

Pressing tool (61229045000) (p. 502)

- Place special tool **3** with the smaller diameter on the bearing shells and press from the inside to the outside.

Pressing tool (61229044000) (p. 501)

19.8.7 Installing the left main bearing

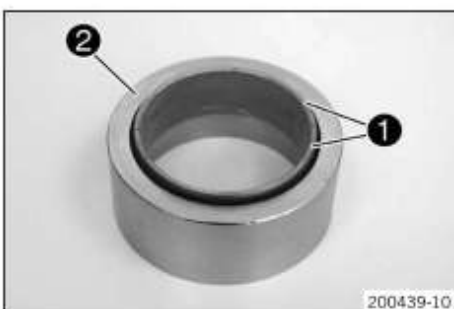
Preparatory work

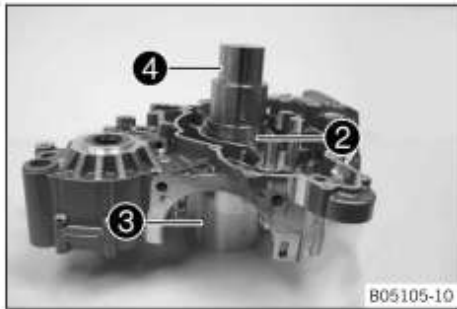
- Select the main bearing shells. (p. 249)

Main work

- Center the new main bearing shells **1** using special tool **2**.

Pressing tool (61229044000) (p. 501)





- Place the inside of the engine case section on special tool ③.

Pressing tool (61229045000) (p. 502)

- Align the face of the new bearing shell with the marking made when it was disassembled.
- Press the bearing shells with the stepped side of special tool ④ through press sleeve ② from the outside to the inside, all the way to the stop.

Pressing tool (61229044000) (p. 501)



- Position bearing shell bracket ⑤. Mount and tighten the screws.

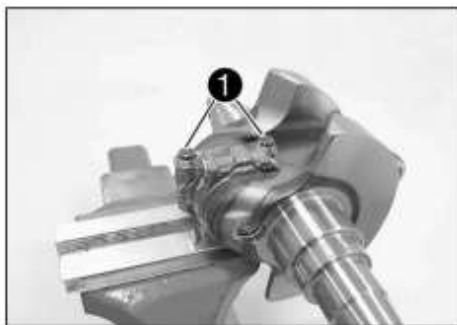
Guideline

Screw, bearing retainer	M5	6 Nm (4.4 lbf ft) Loctite®243™
-------------------------	----	--

19.8.8 Changing the conrod bearing

i Info

Perform this step on both connecting rods.



- Clamp each connecting rod individually.

Guideline

Use soft jaws.

- Remove screws ①.

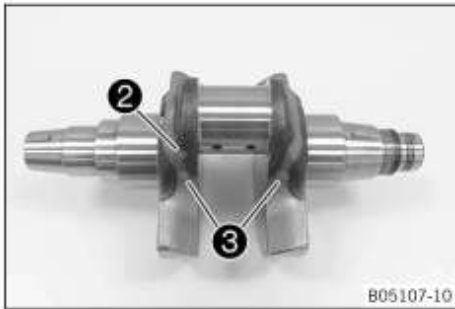
Multi-tooth wrench socket (60029075000) (p. 497)

- Take off the bearing cap and connecting rod. Remove the bearing shells.



i Info

Mark the conrod bearing cover and connecting rod to ensure that each conrod bearing cover is mounted on the same connecting rod.



B05107-10

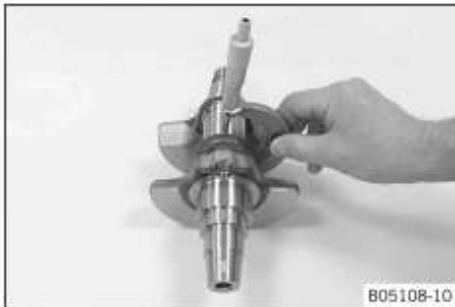
New crankshaft

- Select the new bearing shells according to color coding ②.



Info

Color coding ③ refers to the crankshaft bearing.



B05108-10

Used crankshaft

- Measure the crank pin diameter and select the new bearing shells accordingly.

Guideline

Crankshaft - crank pin diameter	
Yellow	41.978 ... 41.989 mm (1.65267 ... 1.65311 in)
Blue	41.990 ... 42.000 mm (1.65315 ... 1.65354 in)
Red	42.001 ... 42.011 mm (1.65358 ... 1.65397 in)

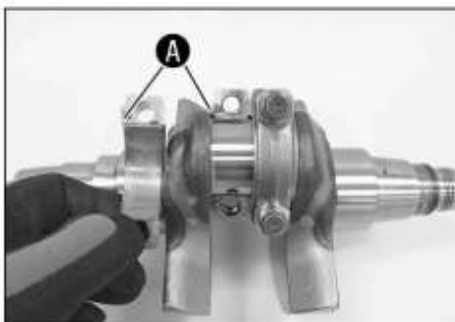
- Check the radial clearance of lower conrod bearing. (☞ p. 258)
- Oil the bearing shells.
- Position the conrod bearing cover according to the markings made during disassembly. Mount the new connecting rod screws and tighten them using the special tool.

Guideline

Screw, conrod bearing	M10x1	Step 1
		25 Nm (18.4 lbf ft)
		Step 2
		30 Nm (22.1 lbf ft)
		Step 3
		90°

Multi-tooth wrench socket (60029075000) (☞ p. 497)

Angle disc (60029010000) (☞ p. 496)



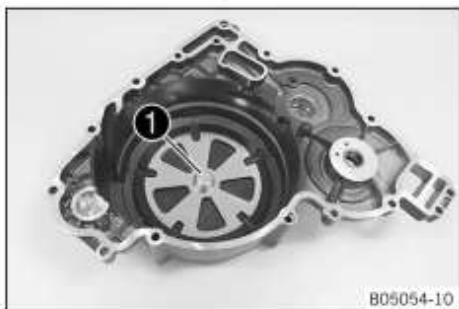
B05110-10



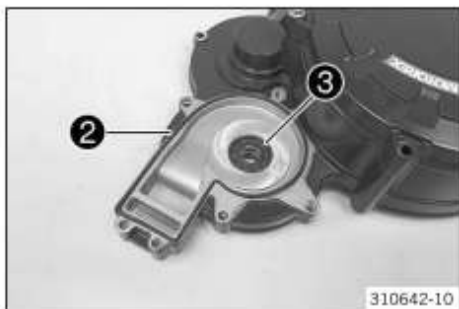
Info

The conrod bearing shells are positioned laterally offset in the connecting rod to make space for radius A of the crank shaft. If mounted in reverse, the bearing shells push on the radius and the connecting rods block.

19.8.9 Working on the clutch cover



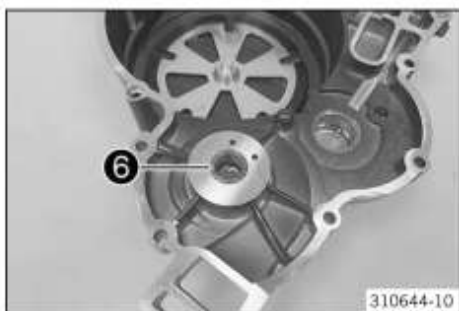
- Remove screw **1** with the bushing.
- Remove the damping plate.



- Remove water pump cover seal **2**.
- Remove outer shaft seal ring **3**.



- Remove lock ring **4**.
- Remove the inner shaft seal ring **5**.



- Remove bearing bush **6**.

Bearing puller (15112017000) (p. 493)

Internal bearing puller (15112018100) (p. 494)
--

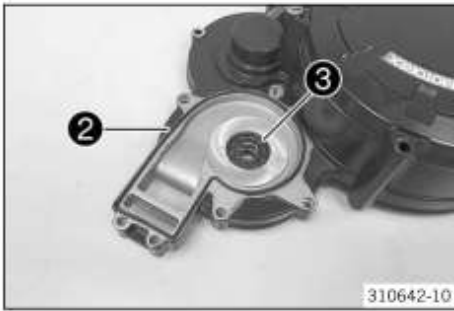
- Press in the new bearing bush until it is flush using a suitable press drift.
- Change the support bearing of the crankshaft. (p. 257)



- Grease inner shaft seal ring **5** and press in with the closed side to the bearing bush as far as it will go.

Long-life grease (p. 490)

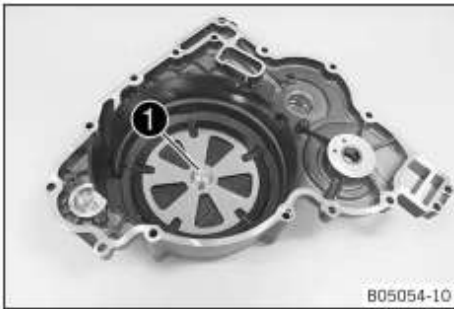
- Mount lock ring **4**.



- Grease outer shaft seal ring **3** and press in with the open side flush and facing outwards.

Long-life grease (see p. 490)

- Insert water pump cover seal **2**.

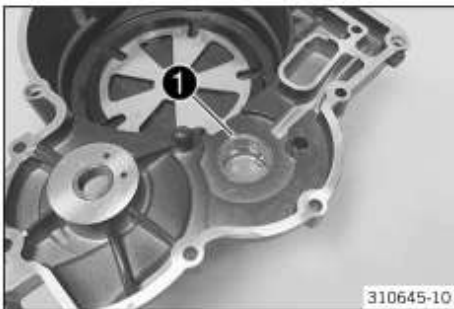


- Position the damping plate.
- Mount and tighten screw **1** with the bushing.

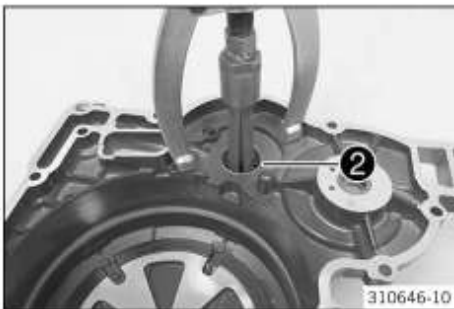
Guideline

Screw, damping plate	EJOT ALtracs® M6x14	10 Nm (7.4 lbf ft) Loctite®243™
----------------------	------------------------	------------------------------------

19.8.10 Changing the support bearing of the crankshaft



- Mark the position of bearing joint **1**.



- Pull out support bearing shells **2** with the special tool.

Bearing puller (15112017000) (see p. 493)

Internal bearing puller (60029018000) (see p. 496)



- Center the new support bearing shells **2** with the special tool.

Pressing tool (60029046128) (see p. 497)



- Support the clutch cover directly under the support bearing. Press in the support bearing shells using the special tool until they are flush.

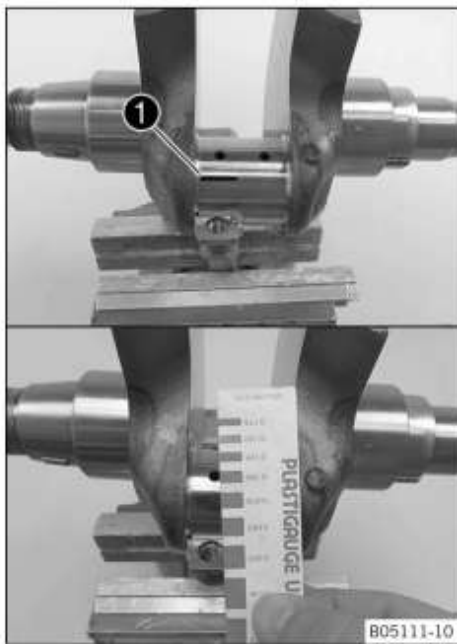
Pressing tool (60029046128) (☞ p. 497)

19.8.11 Checking the radial clearance of lower conrod bearing



Info

Perform operations for both connecting rods.



- Position the bearing shells. Insert **Plastigauge** clearance gauge ① offset by 90° to the bearing joint.

Plastigauge clearance gauge (60029012000) (☞ p. 496)

- Position the conrod bearing cover. Mount and tighten the screws.

Guideline

Screw, conrod bearing	M10x1	Step 1 25 Nm (18.4 lbf ft) Step 2 30 Nm (22.1 lbf ft) Step 3 90°
-----------------------	-------	---



Info

Do not twist connecting rod.

- Remove the conrod bearing cover again. Compare the **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)

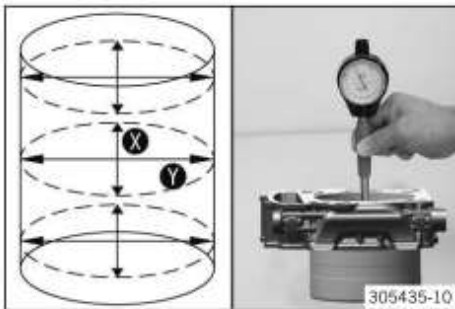


Info

The width of the **Plastigauge** clearance gauge is equal to the bearing play.

- Clean the parts.

19.8.12 Checking/measuring the cylinder



- Check the cylinder bearing surface for damage.
 - » If the cylinder bearing surface is damaged:
 - Change the cylinder and piston.
- Measure the bore diameter at several locations of the contact surface on the **X**- and **Y**-axes using a micrometer to identify oval wear.

Guideline

Cylinder - bore diameter	
Size I	108.000 ... 108.012 mm (4.25196 ... 4.25243 in)
Size II	108.012 ... 108.025 mm (4.25243 ... 4.25294 in)



- The cylinder size **1** is marked on the cylinder base.



- Using a straightedge and the special tool, check the sealing surface of the cylinder head for distortion.

Feeler gauge (59029041100) (☞ p. 496)	
Cylinder/cylinder head - sealing area distortion	≤ 0.05 mm (≤ 0.002 in)

- » If the measured value does not meet specifications:
 - Change the cylinder.

19.8.13 Checking/measuring the piston



- Check the piston bearing surface for damage.
 - » If the piston bearing surface is damaged:
 - Change the piston and, if necessary, the cylinder.
- Check that the piston rings can move easily in the piston ring grooves.
 - » If the piston ring is stiff:
 - Clean the piston ring groove.

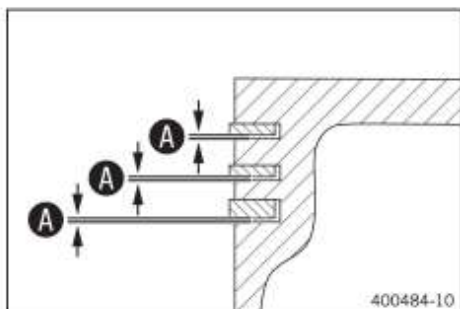
i Tip
Use an old piston ring to clean the piston ring groove.

- Check the piston rings for damage.
 - » If the piston ring is damaged:
 - Change the piston ring.



Info

Mount the piston ring with the marking facing upward.



- 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)	$\leq 0.08 \text{ mm}$ ($\leq 0.0031 \text{ in}$)
Second ring (lower compression ring)	$\leq 0.08 \text{ mm}$ ($\leq 0.0031 \text{ in}$)
Oil scraper ring	$\leq 0.06 \text{ mm}$ ($\leq 0.0024 \text{ in}$)

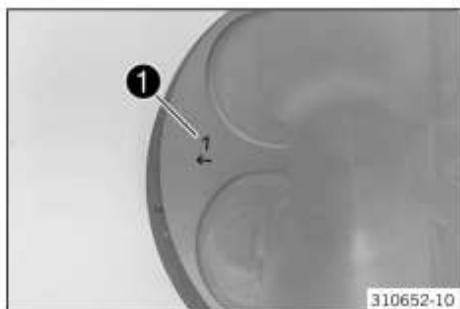
Feeler gauge (59029041100) (see p. 496)

- » If clearance **A** is larger than the specified value:
 - Change the piston and piston rings.
 - Check/measure the cylinder. (see p. 259)
 - Check the piston pin for discoloration or signs of wear.
 - » If the piston pin has strong discoloration/signs of wear:
 - Change the piston pin.
 - Insert the piston pin into the connecting rod and check the bearing for play.
 - » If the piston pin bearing has too much play:
 - Change the connecting rod and the piston pin.
 - Measure the piston at the piston skirt, at right angles to the piston pin, at a distance **B**.

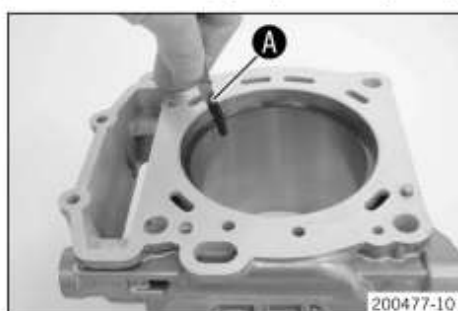
Guideline

Piston - diameter	
Size I	107.960 ... 107.990 mm (4.25039 ... 4.25157 in)
Size II	107.970 ... 108.000 mm (4.25078 ... 4.25196 in)
Distance B	6 mm (0.24 in)

- Piston size **1** is marked on the piston head.



19.8.14 Checking the piston ring end gap



- Remove the piston ring from the piston.
- Place the piston ring in the cylinder and align it with the piston.

Guideline

Under the upper edge of the cylinder	10 mm (0.39 in)
--------------------------------------	-----------------

- Measure the end gap with special tool **A**.

Guideline

Piston ring end gap	
First ring (rectangular ring)	≤ 0.50 mm (≤ 0.0197 in)
Second ring (lower compression ring)	≤ 0.60 mm (≤ 0.0236 in)
Oil scraper ring	≤ 0.60 mm (≤ 0.0236 in)

Feeler gauge (59029041100) (☞ p. 496)

- * If the end gap is greater than the specified value:
 - Check/measure the cylinder. (☞ p. 259)
- * If the cylinder wear is within the tolerance range:
 - Change the piston ring.
- Mount the piston ring with the marking facing toward the piston head.



19.8.15 Checking the piston/cylinder mounting clearance



- Check/measure the cylinder. (☞ p. 259)
- Check/measure the piston. (☞ p. 259)
- 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	
Size I	0.010 ... 0.042 mm (0.00039 ... 0.00165 in)
Size II	0.012 ... 0.052 mm (0.00047 ... 0.00205 in)
Wear limit	0.11 mm (0.0043 in)

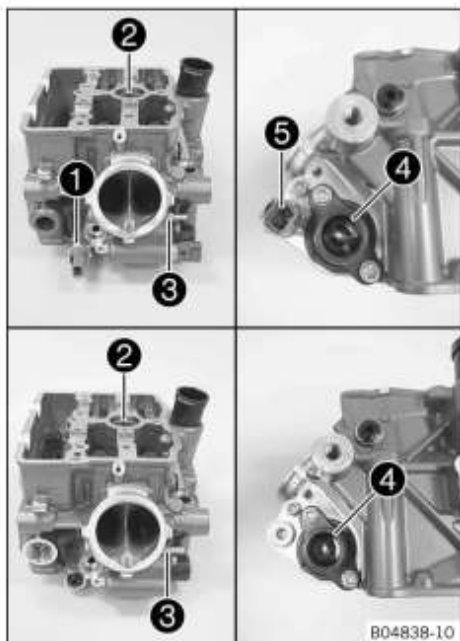


19.8.16 Working on the cylinder head



Info

The following work steps apply to both cylinder heads.



- Remove oil pressure sensor **1** with O-ring.



Info

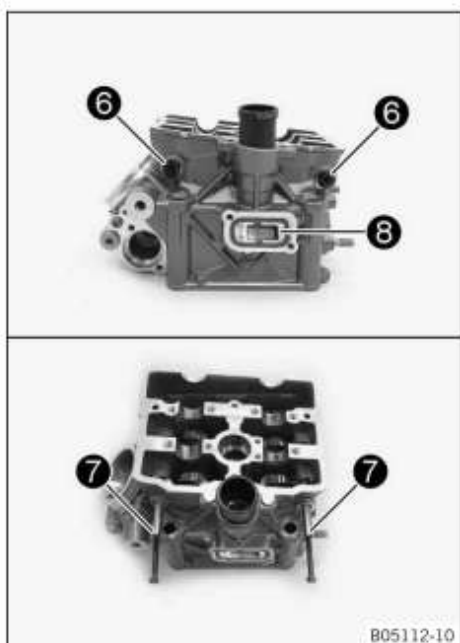
This only applies to the front cylinder head!

- Remove O-rings **2**.
- Remove vacuum connections **3**.
- Remove screws.
- Remove thermostat case **4** and the thermostat.
- Remove coolant temperature sensor **5** with O-ring.



Info

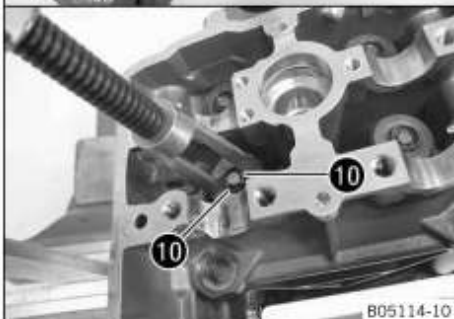
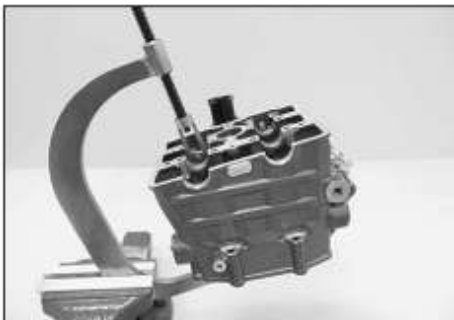
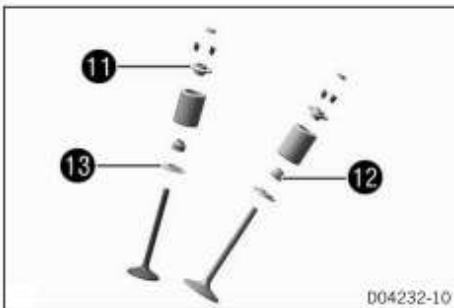
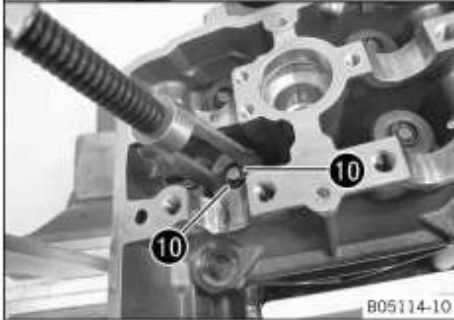
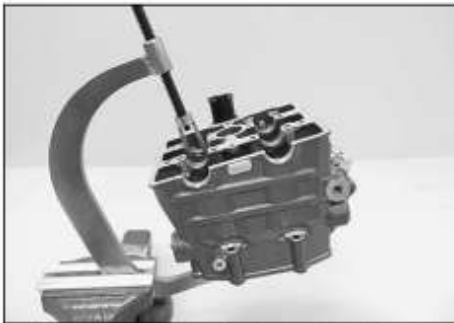
This only applies to the front cylinder head!



- Remove screw plugs **6** with the O-rings.
- Pull out cam lever shafts **7** with a suitable screw M5 and remove the cam lever.
- Remove SAS membrane **8**.



- Remove shims **9** and label according to their normal built-in position.



- Tension the valve spring with a special tool.

Valve spring mounter (59029019000) (☞ p. 495)

Insert for valve spring lever (78029060000) (☞ p. 505)
--

- Remove valve keys **10** and release tension on the valve spring.

- Remove valve spring retainer **11**, valve spring, valve stem seals **12** and valve spring seats **13**.

i Info

Place the valves in a box according to their normal built-in position and label them.

- Check the cylinder head. (☞ p. 265)
- Mount valve spring seats **13** and new valve stem seals **12**.
- Mount valve spring and valve spring retainer **11**.
- ✓ The tight winding of the valve spring is at the bottom.

- Tension the valve spring with a special tool.

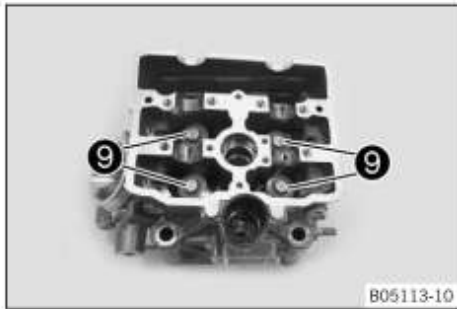
Valve spring mounter (59029019000) (☞ p. 495)

Insert for valve spring lever (78029060000) (☞ p. 505)
--

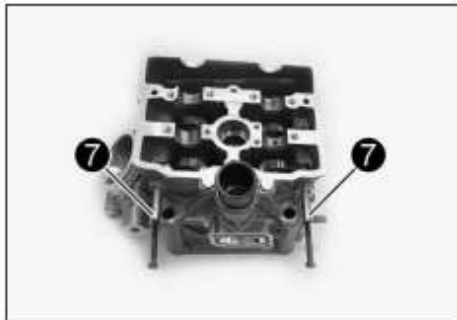
- Mount valve keys **10**. Release the tension on the valve spring.

i Info

When mounting the valve keys, check that they are seated correctly; preferably, fix the valve keys to the valve with a little grease.



- Place shims **9** into the valve spring retainer according to their normal built-in position.

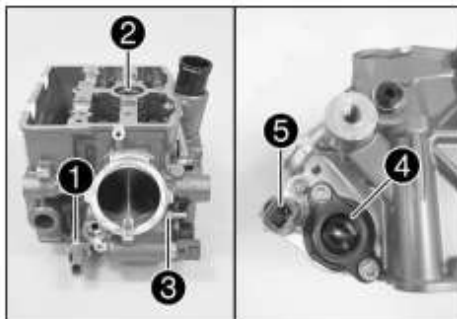
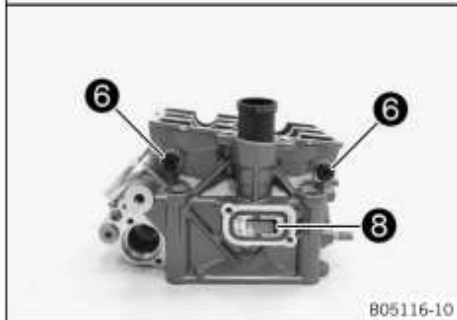


- Position the cam lever and mount cam lever shafts **7**.
- Mount screw plugs **6** with new O-rings.

Guideline

Plug, cam lever axis	M10x1	15 Nm (11.1 lbf ft)
----------------------	-------	---------------------

- Mount SAS membrane **8**.
- ✓ The SAS membrane is positioned flush in the cylinder.



- Mount coolant temperature sensor **5** with new O-ring.

Guideline

Coolant temperature sensor	M12x1.5	12 Nm (8.9 lbf ft)
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Info

This only applies to the front cylinder head!

- Mount thermostats and thermostat case **4**.
- Mount and tighten the screws.

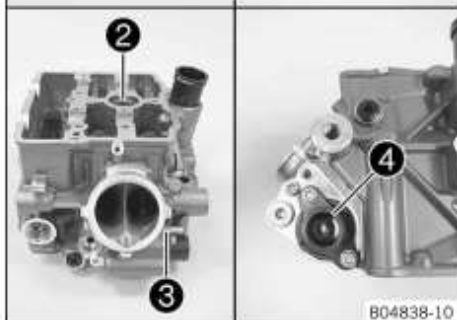
Guideline

Screw, thermostat case	M6	10 Nm (7.4 lbf ft) Loctite®243™
------------------------	----	---

- Mount vacuum connections **3**.

Guideline

Vacuum connection	M6	5 Nm (3.7 lbf ft) Loctite®243™
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- Mount and grease O-rings **2**.
- Mount oil pressure sensor **1** with new O-ring.

Guideline

Oil pressure sensor	M10x1	10 Nm (7.4 lbf ft)
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Info

This only applies to the front cylinder head!

19.8.17 Checking the cylinder head

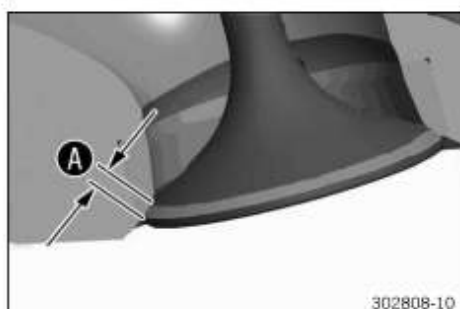


- Check the sealing surface of the spark plug thread and the valve seats for damage and cracking.
 - » If there is damage or cracking:
 - Change the cylinder head.
- Check the valve guides using the special tool.

Limit plug gauge (59029026006) (p. 495)

Valve guide - diameter	
New condition	6.004 ... 6.016 mm (0.23638 ... 0.23685 in)
Wear limit	6.150 mm (0.24213 in)

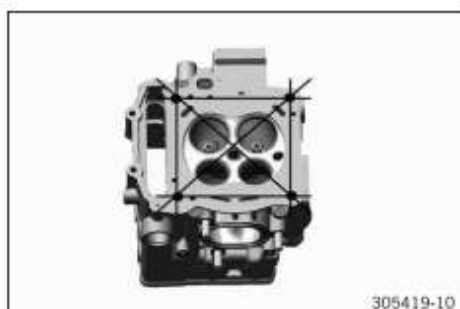
- » If the special tool is easy to insert into the valve guide:
 - Change the valve guide and valve.



- Check sealing seat **A** of the valves.

Valve - sealing seat width	
Intake: New condition	0.90 mm (0.0354 in)
Intake: Wear limit	1.5 mm (0.059 in)
Exhaust: New condition	1.0 mm (0.039 in)
Exhaust: Wear limit	2.0 mm (0.079 in)

- » If the measured value does not meet specifications:
 - Machine the valve seat.

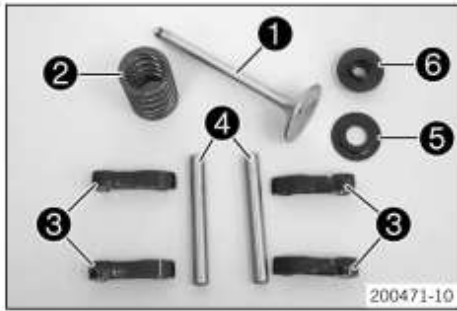


- Check the sealing surface of the cylinder for distortion using a straightedge and the special tool.

Feeler gauge (59029041100) (p. 496)

Cylinder/cylinder head - sealing area distortion	≤ 0.05 mm (≤ 0.002 in)
--	------------------------

- » If the measured value does not meet specifications:
 - Change the cylinder head.
- Check the pivot points of the camshafts in the cylinder head and in the camshaft bearing bridge for damage and wear.
 - » If there is damage or wear:
 - Change the cylinder head with the camshaft bearing support.



- Check valve **1** for damage and wear.
 - » If there is damage or wear:
 - Change the valve.
- Check the valve for run-out.

Valve - run-out	
Intake: on the valve plate	≤ 0.1 mm (≤ 0.004 in)
Exhaust: on the valve plate	≤ 0.1 mm (≤ 0.004 in)

- » If the measured value does not meet specifications:
 - Change the valve.
- Check the valve stem diameter.

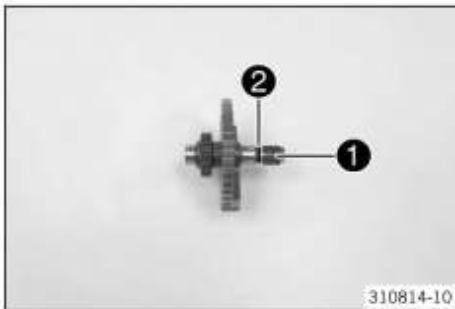
Valve - valve stem diameter	
Exhaust	5.956 ... 5.970 mm (0.23449 ... 0.23504 in)
Intake	5.966 ... 5.980 mm (0.23488 ... 0.23543 in)

- » If the measured value does not meet specifications:
 - Change the valve.
- Check valve spring **2** for damage and wear.
 - » If there is damage or wear:
 - Change the valve spring.
- Measure the length of the valve springs.

Valve spring - length	
New condition	42.70 mm (1.6811 in)
Wear limit	42 mm (1.65 in)

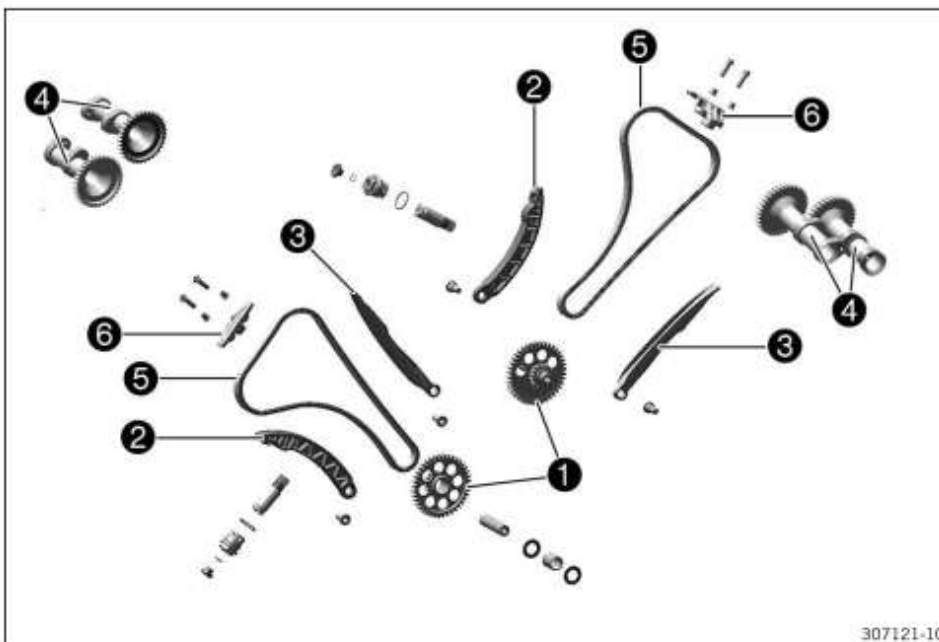
- » If the measured value does not meet specifications:
 - Change the valve springs.
- Check cam lever **3** for damage and wear.
 - » If there is damage or wear:
 - Change the cam lever.
- Check cam lever shaft **4** for damage and wear.
 - » If there is damage or wear:
 - Change the cam lever shaft.
- Check valve spring seat **5** for damage and wear.
 - » If there is damage or wear:
 - Change the valve spring seat.
- Check valve spring retainer **6** for damage and wear.
 - » If there is damage or wear:
 - Change the valve spring retainer.

19.8.18 Working on the right intermediate gear



- Remove bushing **1**.
- Remove O-ring **2**.
- Mount new O-ring **2**.
- Mount the new bushing **1**.

19.8.19 Checking the timing assembly



- Clean all parts well.
- Check intermediate gear **1** for damage and wear.
 - » If there is damage or wear:
 - Change the intermediate gear.
- Check timing chain tensing rail **2** for damage and wear.
 - » If there is damage or wear:
 - Replace the timing chain tensing rail.
- Check timing chain guide rail **3** for damage and wear.
 - » If there is damage or wear:
 - Replace the timing chain guide rail.
- Check camshaft **4** for damage and wear.
 - » If there is damage or wear:
 - Change the camshaft.
 - If the surface of the cams is damaged, check the oil supply to the camshaft and cam lever.
- 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.

19.8.20 Preparing the timing chain tensioner for installation



200171-10



200172-10

- Fully compress the timing chain tensioner.



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 timing chain tensioner piston. 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)
---------------------------------------	----------------



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.

19.8.21 Pretensioning the spread transmission



310815-10

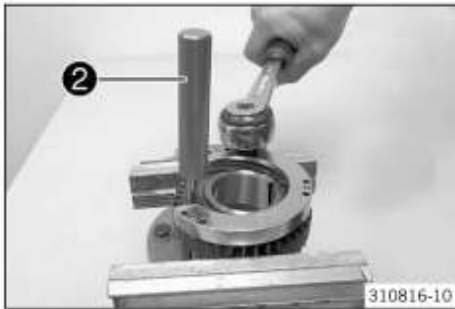
- Secure the primary gear wheel in the vise.

Guideline

Use soft jaws.

- Mount special tool **1**.

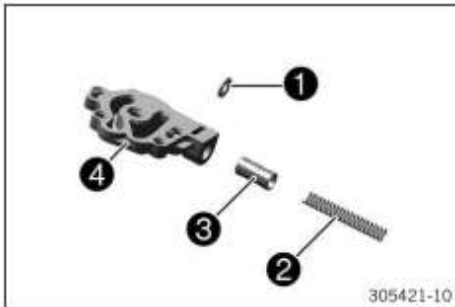
Spread transmission fixture (61329035000) (p. 503)
--



- Clamp the spread transmission until the holes align.
- Mount special tool **2** until it stops.

Locking pin (61329033000) (見 p. 503)

19.8.22 Checking the oil pressure control valve



- Remove supporting plate **1** and spring **2**.
- Measure the length of spring **2**.

Oil pressure regulator valve - minimum length spring	39 mm (1.54 in)
--	-----------------

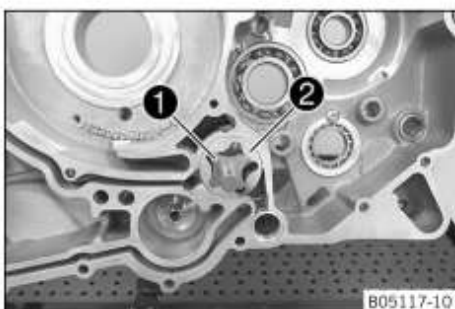
- » If the measured length is less than the specified value:
 - Change the spring.
- Check control piston **3** for damage and wear.
 - » If there is damage or wear:
 - Change the control piston.
- Check the control piston bore in oil pump cover **4** for damage and wear.
 - » If there is damage or wear:
 - Change the oil pump cover.
- Thoroughly oil control piston **3** and spring **2** and mount them.
- Mount supporting plate **1**.

19.8.23 Checking the lubrication system



Info

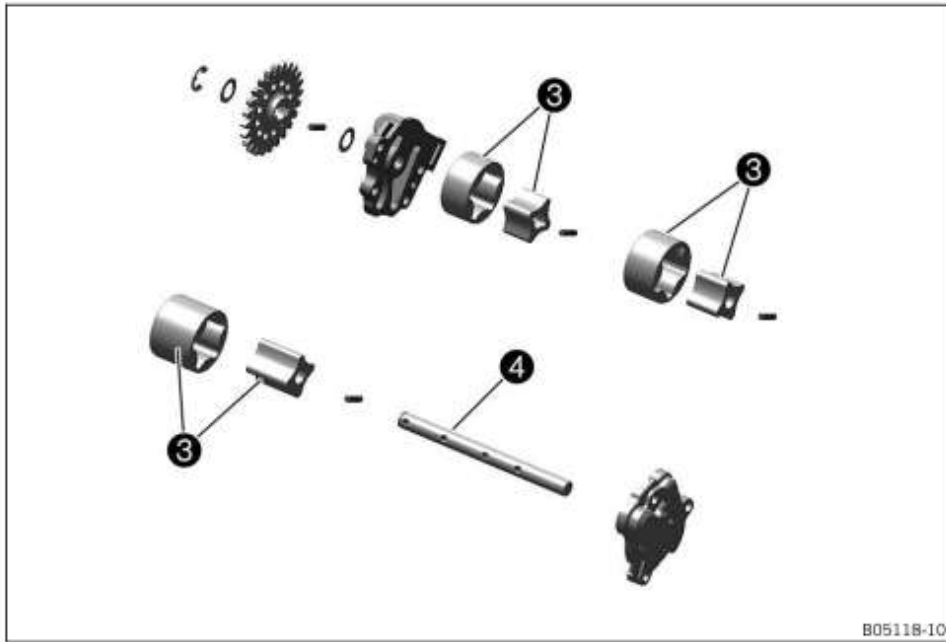
The following operations apply to all three oil pumps.



- Check the clearance between internal rotor **1** and external rotor **2** and between the external rotor and the engine case.

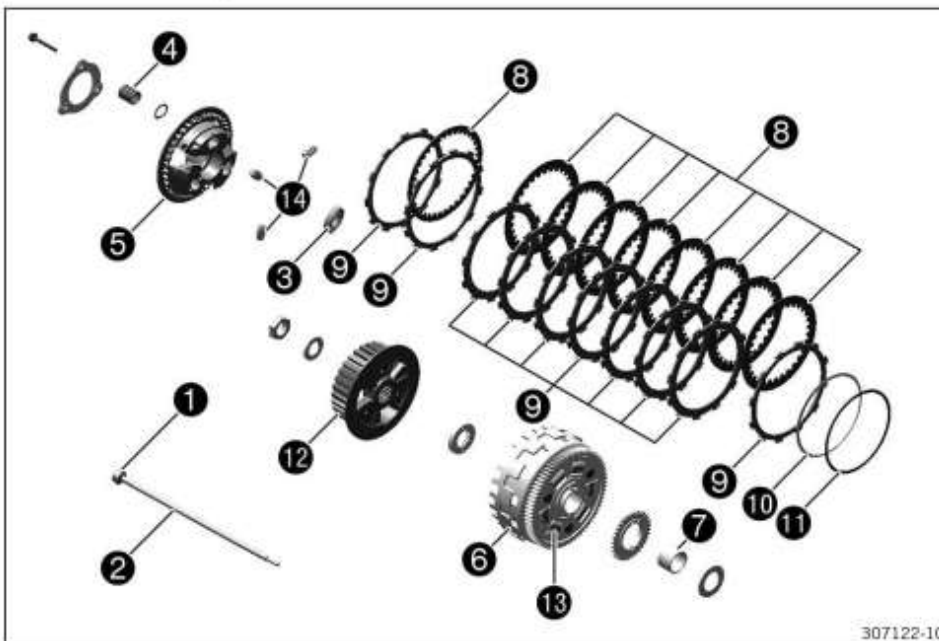
Oil pumps	
Clearance between external rotor and engine case	0.20 ... 0.40 mm (0.0079 ... 0.0157 in)
Clearance between external rotor and internal rotor	0.10 ... 0.25 mm (0.0039 ... 0.0098 in)
Axial clearance	0.04 ... 0.25 mm (0.0016 ... 0.0098 in)

- » If the clearance exceeds the specifications:
 - Change the oil pump and, if necessary, the engine case.



- Check the internal rotor and external rotor of oil pumps **3** for damage and wear.
 - » If there is damage or wear:
 - Change the oil pumps.
- Check oil pump shaft **4** for damage and wear.
 - » If there is damage or wear:
 - Change the oil pump shaft.
- Check the oil pump cover for damage and wear.
 - » If there is damage or wear:
 - Change the oil pump cover.

19.8.24 Checking the clutch



307122-10

- Check clutch throw-out **1** for damage and wear.
 - » If there is damage or wear:
 - Change the clutch push rod.
- Place the clutch push rod **2** on a flat surface and check for run-out.
 - » If there is run-out:
 - Change the clutch push rod.
- Check axial bearing **3** for damage and wear.
 - » If there is damage or wear:
 - Change the axial bearing.
- Check the length of clutch springs **4**.

Clutch spring - length	≥ 45.8 mm (≥ 1.803 in)
------------------------	------------------------

- » If the clutch spring length is shorter than specified:
 - Change all clutch springs.
- Check the contact surface of clutch pressure cap **5** 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 **6** for wear.

Clutch basket - thrust surface of clutch facing discs	
Wear limit	0.5 mm (0.02 in)

- » If the thrust surface exhibits excessive wear:
 - Change the clutch disc pack and the clutch basket.
- Check needle bearing **7** for damage and wear.
 - » If there is damage or wear:
 - Change the needle bearing.
- Check intermediate clutch discs **8** for damage and wear.
 - » If the intermediate clutch discs are not level and are pitted:
 - Change the clutch disc pack.

- Check clutch facing discs **9** 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	47.20 ... 48.00 mm (1.8583 ... 1.8898 in)
Wear limit	46.00 mm (1.811 in)

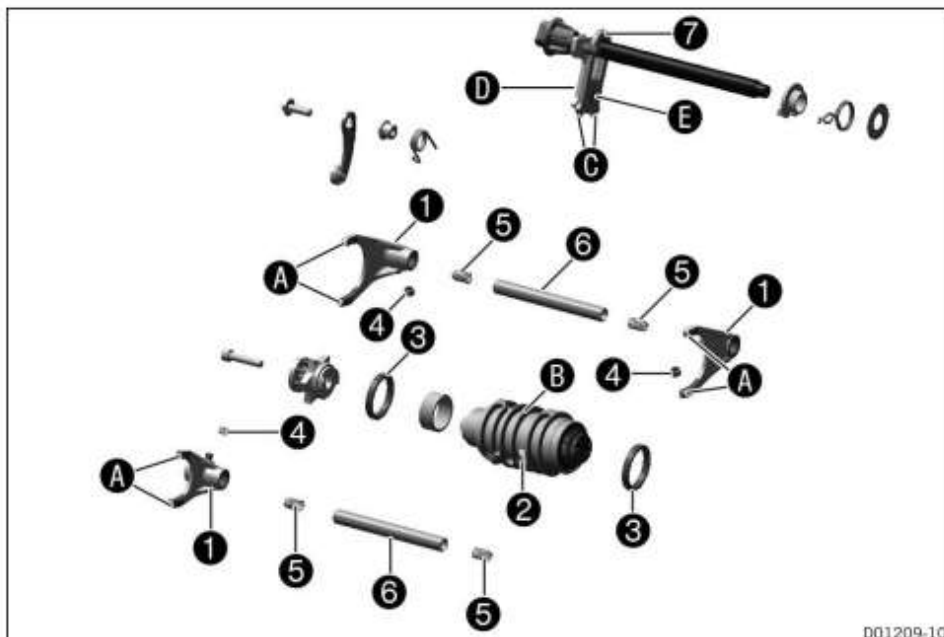
- » If the clutch disc pack does not meet the specified value:
 - Change the clutch disc pack.
- Check pretension ring **10** and support ring **11** for damage and wear.
 - » If there is damage or wear:
 - Change the pretension ring and support ring.
- Check inner clutch hub **12** for damage and wear.
 - » If there is damage or wear:
 - Change the inner clutch hub.
- Check springs **13** of the clutch basket for damage and wear.
 - » If there is damage, wear or play in the direction of rotation:
 - Change the clutch basket.
- Check damper **14** for damage and wear.

i Info

If the clutch pressure cap can be mounted without resistance from the damper, the dampers are too hard and are worn out.

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

19.8.25 Checking the shift mechanism

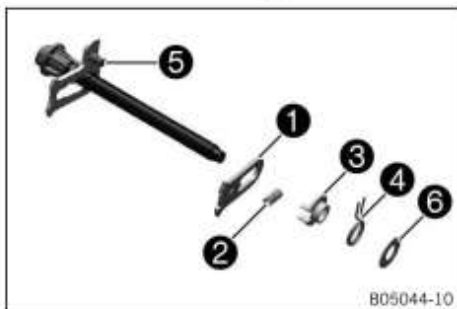


- Check shift forks **1** at leaf **A** for wear.

Shift fork	
Thickness at plate	4.85 ... 4.95 mm (0.1909 ... 0.1949 in)
Clearance in the sliding gear groove: New condition	0.35 ... 0.55 mm (0.0138 ... 0.0217 in)
Clearance in the sliding gear groove: Wear limit	0.70 mm (0.0276 in)

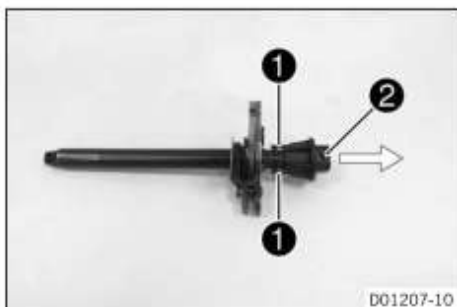
- » If the measured value does not equal the specified value:
 - Change the shift fork and gear wheel pair.
- Check shift grooves **B** of shift drum **2** for wear.
 - » If the shift groove is worn:
 - Change the shift drum.
- Check the seat of the shift drum in bearings **3**.
 - » If the shift drum is not seated correctly:
 - Change the shift drum and/or the bearing.
- Check bearing **3** for stiffness and wear.
 - » If the bearings do not move freely or are worn:
 - Change the bearings.
- Check shift drums **4** for ovality, surface damage and cracking.
 - » If the shift drum is oval, or shows signs of surface damage or cracks:
 - Change the shift drum.
- Check springs **5** of the shift rails for damage and wear.
 - » If the spring is broken or worn:
 - Change the spring of the shift rail.
- Check the shift rails **6** on a flat surface for run-out.
 - » If there is run-out:
 - Change the shift rail.
- Check shift rails for scoring, signs of corrosion and stiffness in the shift fork.
 - » If there is scoring or corrosion, or if the shift fork is stiff:
 - Change the shift rail.
- Check sliding plate **7** 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.

19.8.26 Preassembling shift shaft



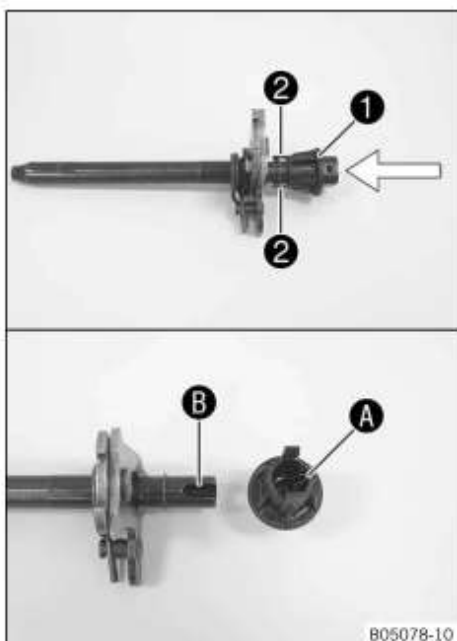
- Mount sliding plate **1** with the guide pin facing downward and put the guide pin on the shift quadrant.
- Mount pressure spring **2**.
- Slide on spring guide **3**, push return spring **4**, with the offset end facing upward, over the spring guide and lift the offset end over abutment bolt **5**.
- Mount stop disk **6**.

19.8.27 Removing magnetic holder



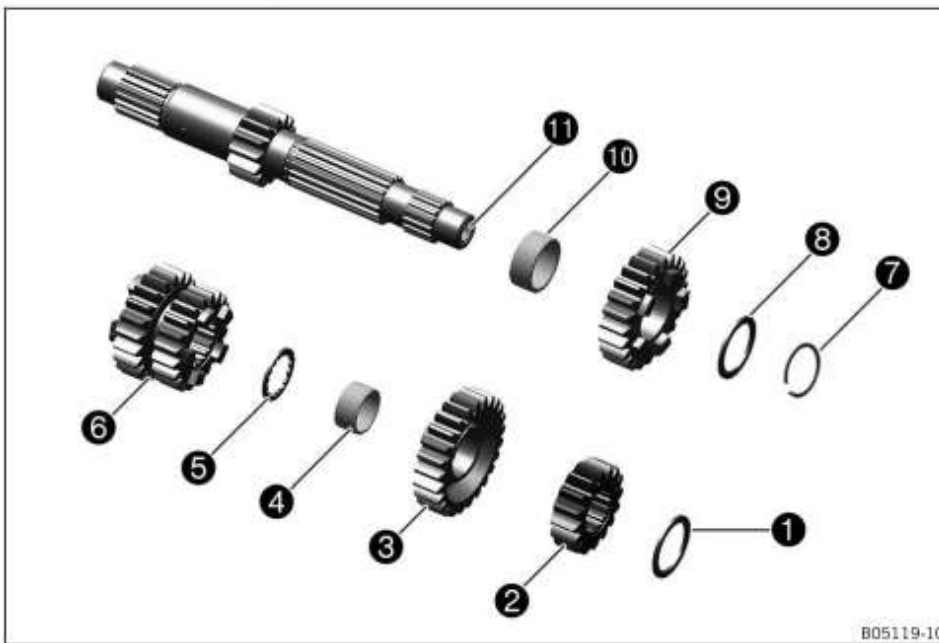
- Raise the locking hooks **1** slightly.
- Take off magnet holder **2**.

19.8.28 Installing magnet holder



- Position magnet holder **1**.
 - ✓ Guide **A** engages in the recess **B** of the shift shaft.
 - ✓ Retaining clips **2** engage on the slip ring.

19.8.29 Disassembling the main shaft



B05119-10

- Secure the main shaft with the toothed end facing downward in the bench vise.

Guideline

Use soft jaws.

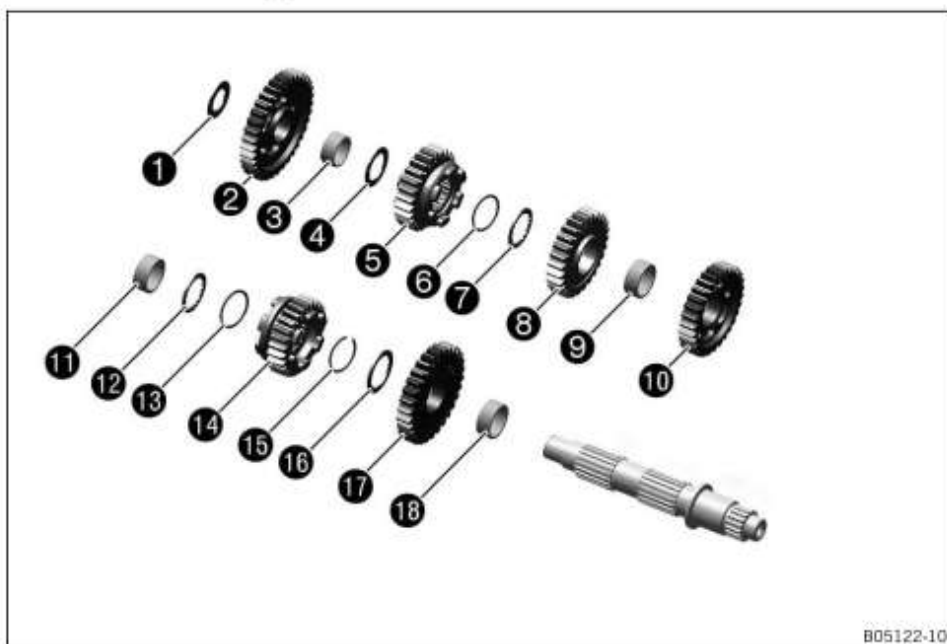
- Remove stop disk **1** and second-gear fixed gear **2**.
- Remove sixth-gear idler gear **3**.
- Remove needle bearing **4** and stop disk **5**.
- Remove third/fourth-gear sliding gear **6**.
- Remove lock ring **7**.
- Remove stop disk **8** and fifth-gear idler gear **9**.
- Remove needle bearing **10**.
- Remove needle bushing **11** with a suitable tool.



Info

Only needs to be removed in case of wear.

19.8.30 Disassembling the countershaft



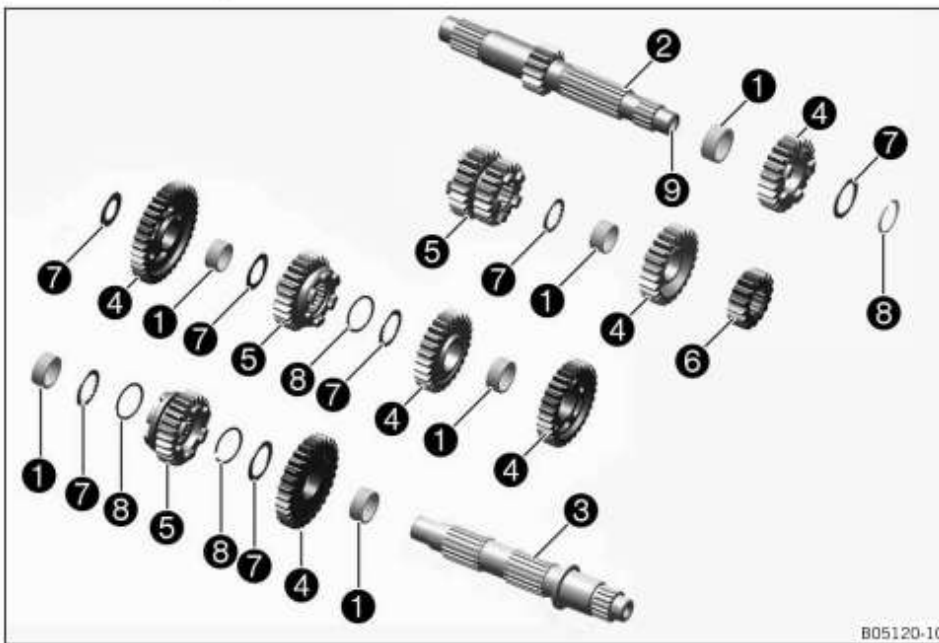
- Secure the countershaft in the bench vise with the toothed end facing downward.

Guideline

Use soft jaws.

- Remove stop disk **1** and first-gear idler gear **2**.
- Remove needle bearing **3** and stop disk **4**.
- Remove the fifth-gear sliding gear **5** and lock ring **6**.
- Remove stop disk **7** and fourth-gear idler gear **8**.
- Remove needle bearing **9** and third-gear idler gear **10**.
- Remove needle bearing **11** and stop disk **12**.
- Remove lock ring **13** and sixth-gear sliding gear **14**.
- Remove lock ring **15** and stop disk **16**.
- Remove second-gear idler gear **17** and needle bearing **18**.

19.8.31 Checking the transmission



B05120-10

- 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 solid gear does not move freely:
 - Change the sliding gear or the main shaft.
- Check sliding gears **5** for smooth operation in the profile of countershaft **3**.
 - » If the solid gear does not move freely:
 - Change the sliding gear or the countershaft.
- Check stop disks **7** for damage and wear.

- » If there is damage or wear:
 - Change the stop disks.
- Use new lock rings **8** with every repair.
- Check stop disks **9** for damage and wear.
 - » If there is damage or wear:
 - Change the needle bushing.

19.8.32 Assembling the main shaft

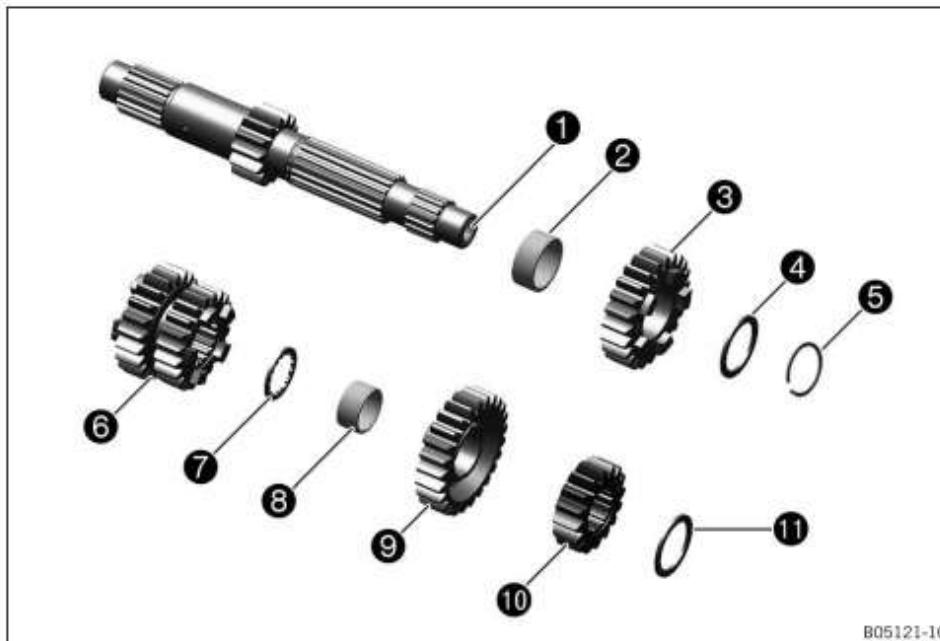


Info

Use new lock rings with every repair.

Preparatory work

- Carefully lubricate all parts before assembling.
- Check the transmission. (▣ p. 277)



B05121-10

Main work

- Secure the main shaft in the vise with the gear teeth facing downward.

Guideline

Use soft jaws.

- If removed, mount the new needle bushing **1** with suitable tools.
- Mount needle bearing **2** and mount fifth-gear idler gear **3** with the shift dogs facing up.
- Mount stop disk **4** and new lock ring **5**.
- Mount third/fourth-gear sliding gear **6** with the small gear wheel facing up.
- Attach stop disk **7** and needle bearing **8**.
- Attach sixth gear idler gear **9** with the shift dog facing downward.
- Attach second-gear fixed gear **10** with the collar facing downward and stop disk **11**.
- Finally, check all the gear wheels for smooth operation.

19.8.33 Assembling the countershaft

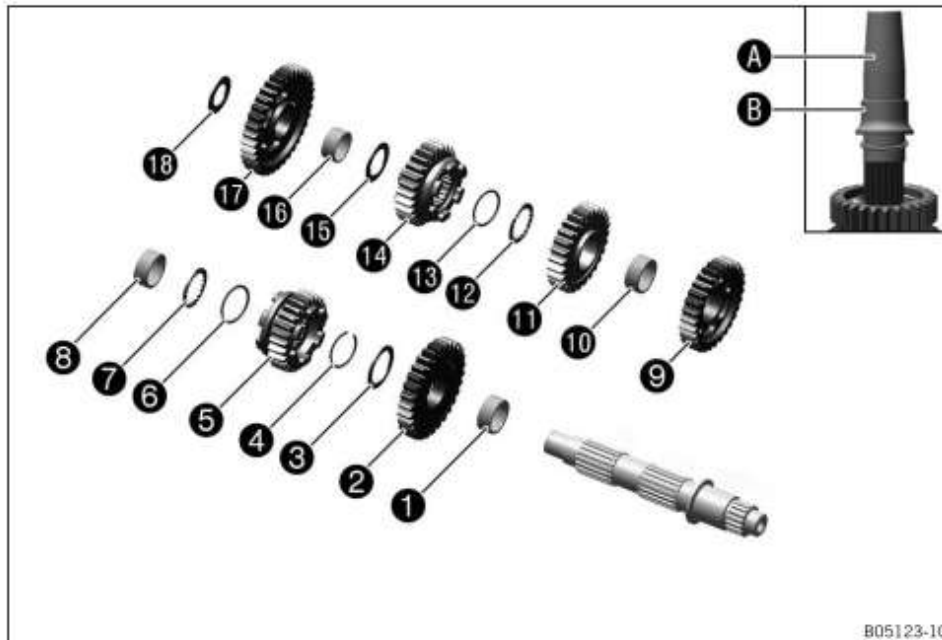


Info

Use new lock rings with every repair.

Preparatory work

- Carefully lubricate all parts before assembling.
- Check the transmission. (📖 p. 277)



B05123-10

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**.
- Mount lock ring **4**.
 - ✓ 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.

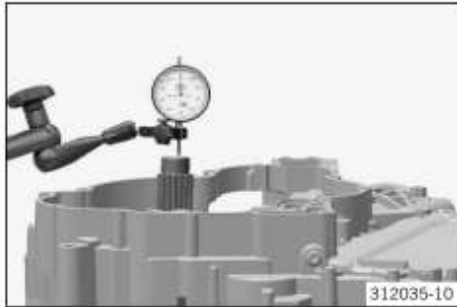
Mounting tool for lock ring (61229032000) (📖 p. 501)

- Position 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 (61229032000) (📖 p. 501)

- Position 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, first-gear idler gear 17 with the recess facing down, and stop disk 18.
- Finally, check all the gear wheels for smooth operation.

19.8.34 Measuring the main shaft axial play



- Mount transmission in the right section of the engine case.



Info

Do not forget the dowels.

- Mount the left section of the engine case.
- Mount and tighten the screws.

Guideline

Screw, engine case	Expansion screw M8	18 Nm (13.3 lbf ft)
Screw, engine case	M6	10 Nm (7.4 lbf ft)

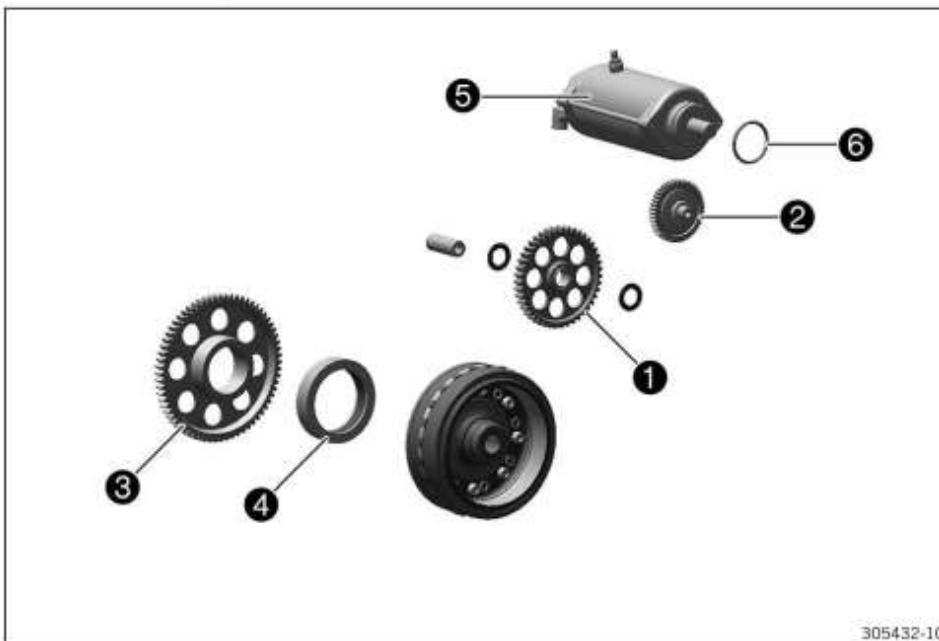
- Mount the dial gauge support on the engine case and measure and note down the main shaft axial play.

Guideline

Main shaft axial clearance	0.05 ... 0.15 mm (0.002 ... 0.0059 in)
----------------------------	--

- If the measured value does not meet specifications:
 - Calculate the thickness of the stop disk.
 - Remove screws and take off section of the engine case.
 - Mount corresponding stop disk on the main shaft.

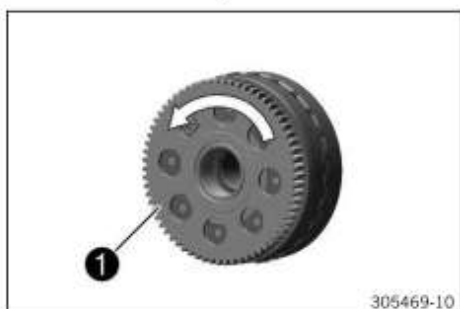
19.8.35 Checking the electric starter drive



305432-10

- Check gear mesh and bearing of starter idler gear **1** for damage and wear.
 - » If there is damage or wear:
 - Change starter idler gear.
- Check 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 freewheel.
- Check gear teeth of 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-volt 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.

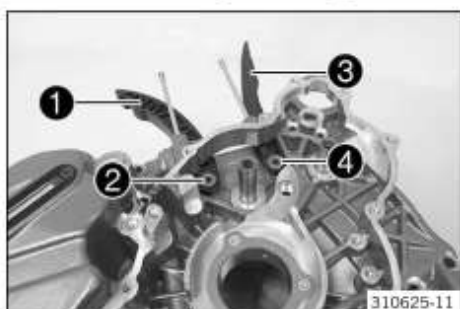
19.8.36 Checking the free-wheel



- Insert freewheel gear **1** into the freewheel hub while turning the freewheel gear counterclockwise; do not wedge it.
- Check the locking action of free-wheel-gear **1**.
 - » The freewheel gear cannot be turned counterclockwise and does not block clockwise:
 - Change the freewheel.

19.9 Engine assembly

19.9.1 Installing the timing chain rails of the left engine case section



- Position timing chain guide rail **1**. Mount and tighten screw **2**.

Guideline

Screw, timing chain guide 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 timing chain guide rail may block and brake.

- Position timing chain tensioning rail **3**. Mount and tighten screw **4**.

Guideline

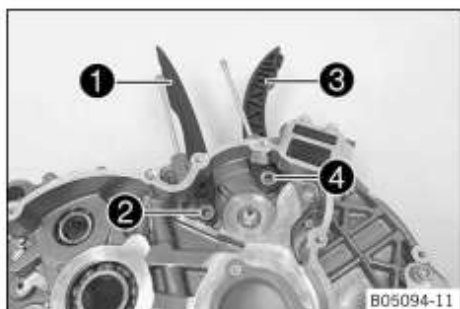
Screw, timing chain tensioning rail	M8	15 Nm (11.1 lbf ft) Loctite®243™
-------------------------------------	----	--

i Info

Ensure that there is no thread locker on the collar of the screw; otherwise, the timing chain tensioning rail may block and brake.

- Check both timing chain rails for freedom of motion.

19.9.2 Installing the timing chain rails of the right engine case section



- Position timing chain guide rail **1**. Mount and tighten screw **2**.

Guideline

Screw, timing chain guide 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 timing chain guide rail may block and brake.

- Position timing chain tensioning rail ③. Mount and tighten screw ④.

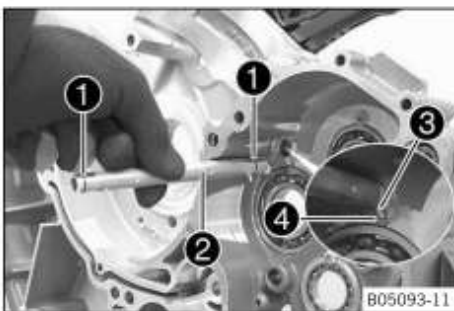
Guideline

Screw, timing chain 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 timing chain tensioning rail may block and brake.

- Check both timing chain rails for freedom of motion.

19.9.3 Installing the oil spray tube

- Mount new O-rings ① on oil spray tube ②.
- Mount the oil spray tube.
- ✓ Pin ③ must engage in recess ④.

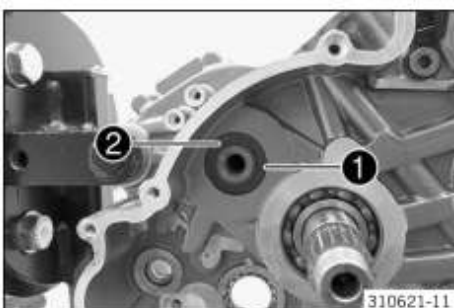
19.9.4 Installing the transmission shaft

- Clamp the right section of the engine case.

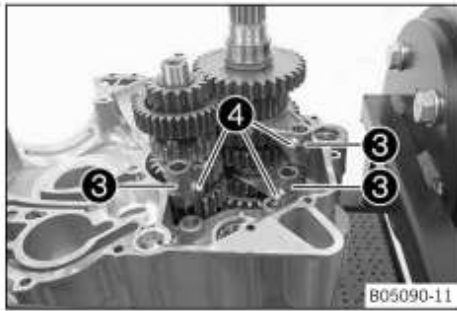
Engine assembly stand (61229001000) (p. 498)
--

Engine bracket for engine work stand (61229002000) (p. 498)

- Assemble the two transmission shafts and slide them into the bearing seats together.



- Mount stop disk ① and lock ring ② of the countershaft.



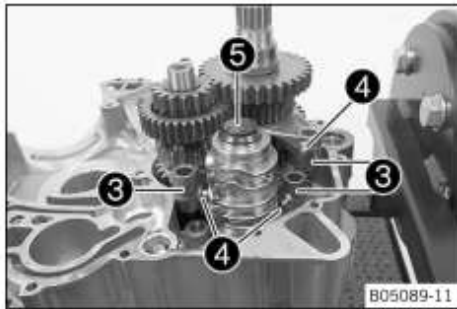
B05090-11

- Tilt the engine.
- Mount shift forks **3** with shift rollers **4**.



Info

Use a small amount of grease to fix the shift rollers to the shift forks.



B05089-11

- Swing shift forks **3** to one side.



Info

Watch out for the shift rollers **4**.

- Insert shift drum **5** into the bearing seat.
- Let the shift forks engage in the shift grooves.



B05088-11

- Mount shift rails **6** with the springs.

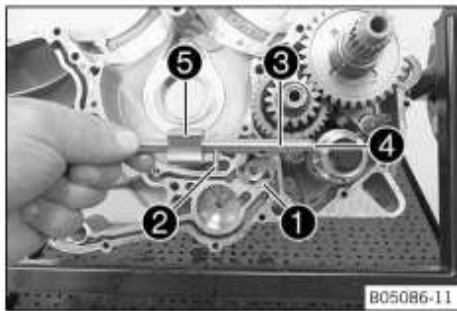


Info

Affix the springs to the shift rails with grease.

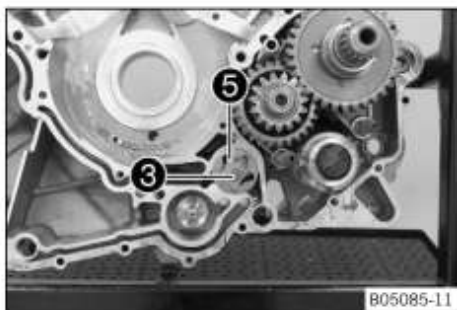
- Check the transmission for smooth operation.

19.9.5 Installing middle suction pump



B05086-11

- Mount external rotor **1**.
 ✓ The markings on the external rotor and internal rotor face the engine case.
- Mount pin **2** into the third hole of oil pump shaft **3** after shaft keyway **4**.
- Slide internal rotor **5** over the pin.



B05085-11

- Mount oil pump shaft **3** with internal rotor **5**.
- Oil the parts.

19.9.6 Installing the crankshaft

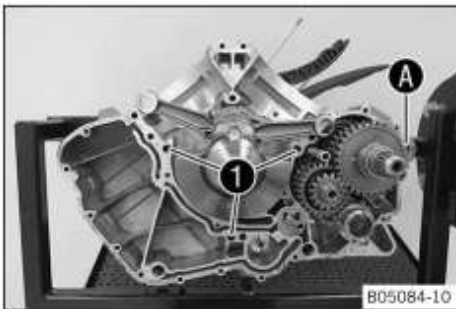


- Oil the bearing shells.
- Slide the crankshaft into the bearing seat.

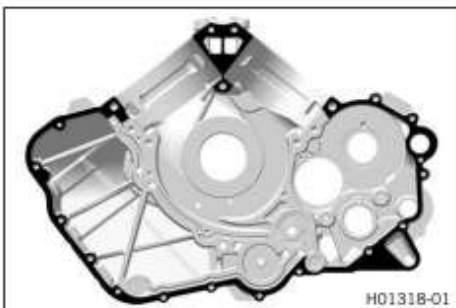

Info

Position the connecting rods as shown.

19.9.7 Installing the left engine case



- Mount dowels ①.
- Check that dowel ① is correctly seated.

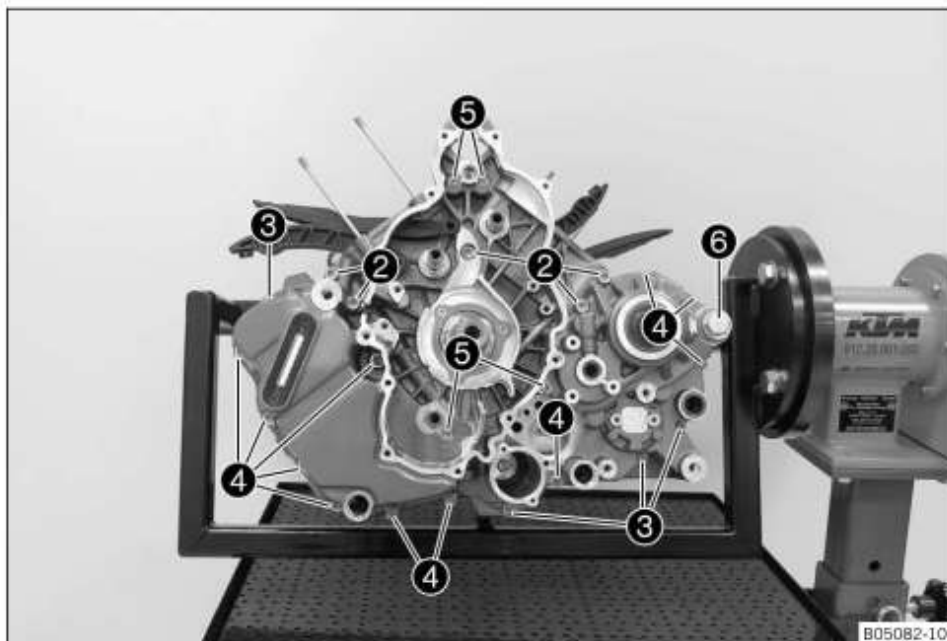


- Degrease the sealing surface and coat thinly with Sealing compound.

Loctite® 5910


Info

Only coat the sealing surface around the outside as shown.



- Attach the left engine case, using a plastic hammer if necessary to seat it properly.



Info

Do not use the screws to pull the two sections of the engine case together.

- Mount and tighten screws ②.

Guideline

Screw, engine case	Expansion screw M8	18 Nm (13.3 lbf ft)
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- Mount and tighten screws ③.

Guideline

Screw, engine case	M6x60	10 Nm (7.4 lbf ft)
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- Mount and tighten screws ④.

Guideline

Screw, engine case	M6x80	10 Nm (7.4 lbf ft)
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- Mount and tighten screws ⑤.

Guideline

Screw, engine case	M6x90	10 Nm (7.4 lbf ft)
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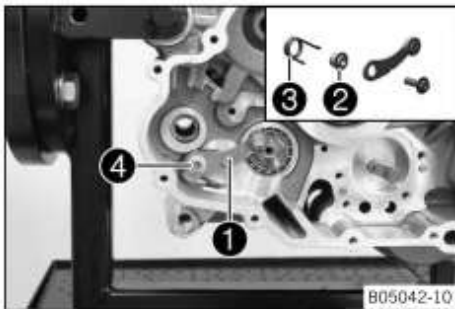


Info

Screws ⑤ must always be replaced with new screws.

- Mount screw ⑥.

19.9.8 Installing the locking lever

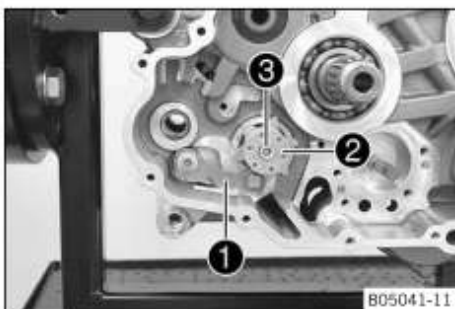


- Position locking lever ① with sleeve ② and spring ③.
- Mount and tighten screw ④.

Guideline

Screw, locking lever	M6	10 Nm (7.4 lbf ft) Loctite®243™
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19.9.9 Installing the shift drum locating



- Press locking lever ① down and position shift drum locating ②.



Info

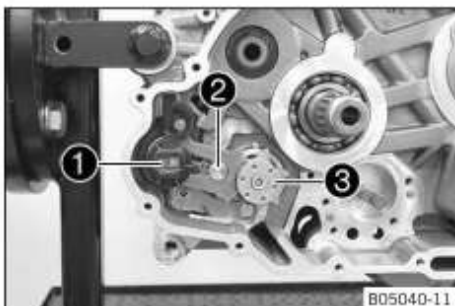
The flat surfaces of the shift drum locating unit are not symmetric.

- Release the locking lever.
- Mount and tighten screw ③.

Guideline

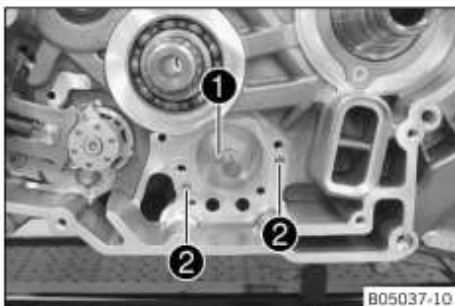
Screw, shift drum locating	M6 – 12.9	18 Nm (13.3 lbf ft) Loctite®243™
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19.9.10 Installing the shift shaft



- Slide shift shaft ① with the washer into the bearing seat.
- Push sliding plate ② away from the shift drum locating ③.
- Insert the shift shaft all the way.
- Let the sliding plate engage in the shift drum locating.
- Shift through the transmission.

19.9.11 Installing the force pump

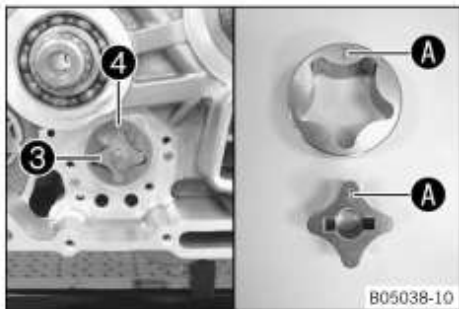


- Mount pin ①.

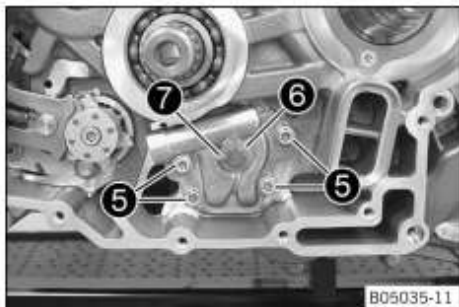


Info

Ensure that pins ② are seated correctly.



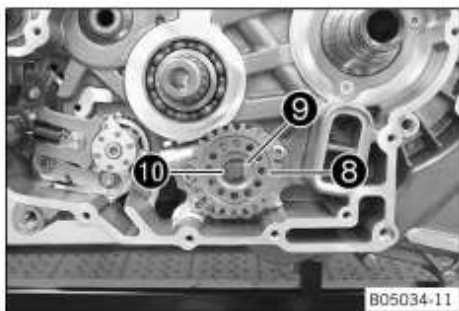
- Mount internal rotor ③ and external rotor ④.
- ✓ T-marking A points towards engine case.
- Oil the parts.



- Position the oil pump cover. Mount and tighten screws ⑤.

Screw, oil pump cover	M6	10 Nm (7.4 lbf ft) Loctite®243™
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- Mount washer ⑥ and pin ⑦.

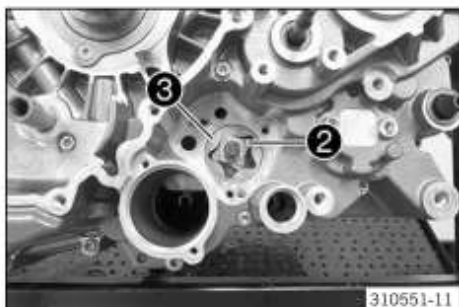


- Mount oil pump gear wheel ⑧, washer ⑨ and lock washer ⑩.

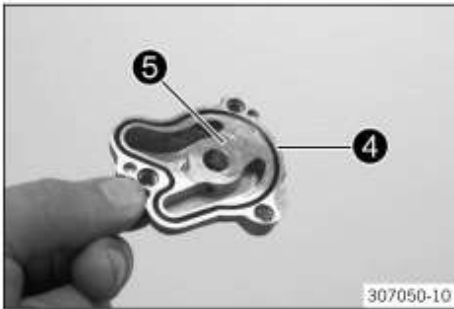
19.9.12 Installing the left suction pump



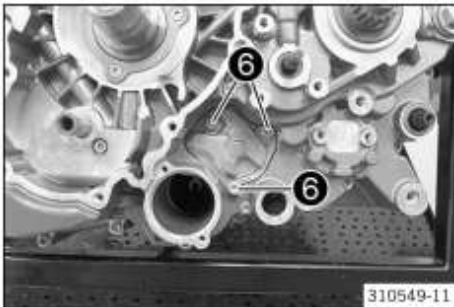
- Mount pin ①.



- Mount internal rotor ② and external rotor ③.
- ✓ The rounded side of the external rotor must face the engine case.
- Oil the parts.



- Insert new gasket **4** into the oil pump cover.
- Position the oil pump cover **5**.



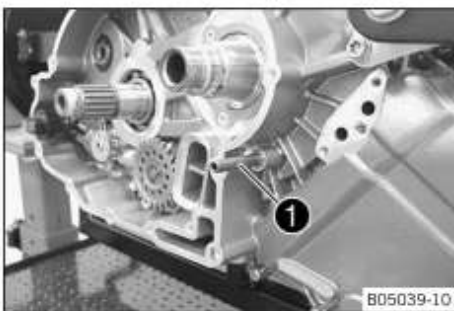
- Mount and tighten screws **6**.

Guideline

Screw, oil pump cover	M6	10 Nm (7.4 lbf ft) Loctite®243™
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- Turn the oil pump gear wheel and ensure the oil pump moves easily.

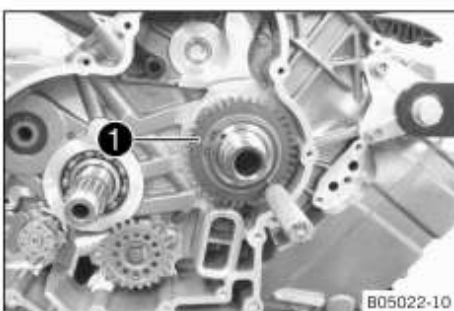
19.9.13 Setting the engine to ignition top dead center of the rear cylinder



- Set the crankshaft to top dead center of the rear cylinder.
 - ✓ The position notch of the crankshaft is visible in the hole.
- Screw in special tool **1**.

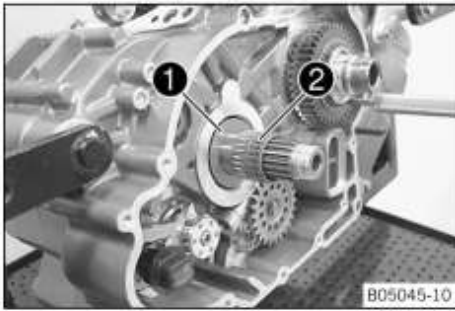
Locking screw (61229015000) (see p. 499)
--

19.9.14 Installing the primary gear wheel

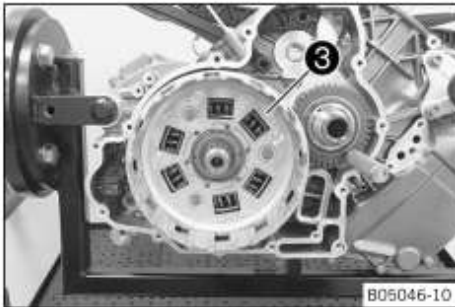


- Ensure that the woodruff key is seated properly.
- Mount primary gear wheel **1**.
- Ensure that the spread transmission is pretensioned.
 - » If the spread transmission is not pretensioned:
 - Pretension the spread transmission. (see p. 268)

19.9.15 Installing the clutch basket



- Mount washer ① and needle bearing ②.



- Mount clutch basket ③ with oil pump drive gear.



Info

Turn the clutch basket and the oil pump gear wheel backwards and forwards slightly to help them mesh more easily.



- Remove special tool ④.

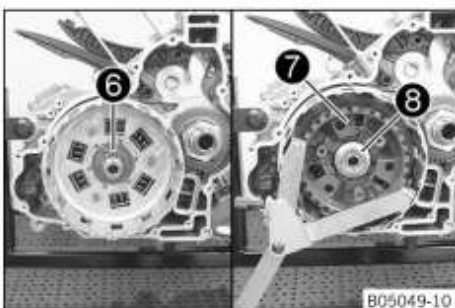
Locking pin (61329033000) (☞ p. 503)



- Mount the washer and nut ⑤ and tighten the nut.

Guideline

Nut, primary gear wheel	M33LHx1.5	130 Nm (95.9 lbf ft) Loctite®243™
-------------------------	-----------	---



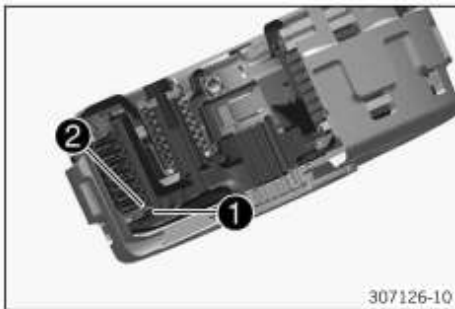
- Mount washer ⑥.
- Mount inner clutch hub ⑦.
- Mount nut ⑧ with the washer.
- Tighten the nut, holding the inner clutch hub with a special tool.

Guideline

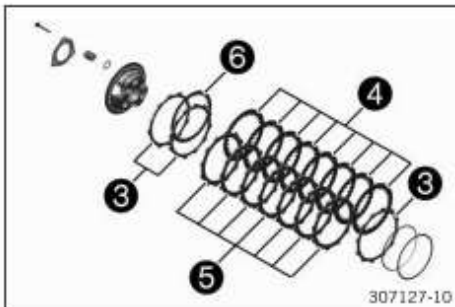
Nut, inner clutch hub	M22x1.5	120 Nm (88.5 lbf ft) Loctite®243™
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Holding wrench (51129003000) (☞ p. 495)

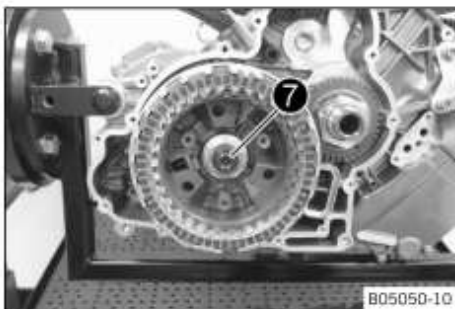
19.9.16 Installing the clutch discs



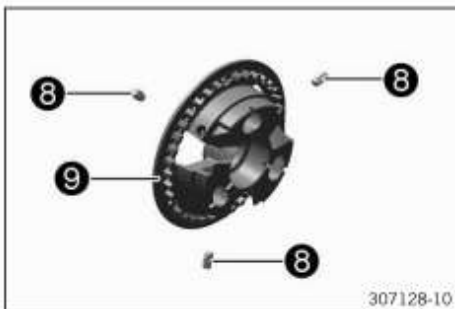
- Mount support ring **1** and pretension ring **2**.
- ✓ The pretension ring rests against the support ring on the inside and the outside faces away from the support ring.



- Thoroughly oil the clutch facing discs.
- Mount a clutch facing disc **3** with a larger inside diameter.
- Alternately mount 8 intermediate clutch discs **4** and 7 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.
- Mount the outer clutch facing disc offset by one mesh.



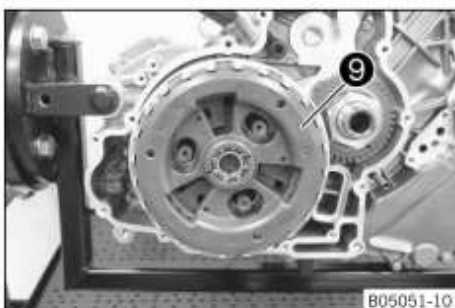
- Mount clutch push rod **7**.



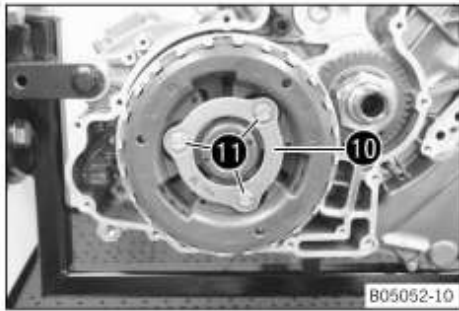
- Mount damper **8** in the clutch pressure cap **9**.

**Info**

When changing the clutch discs, always renew the damper.



- Position clutch pressure cap **9**.
- ✓ The teeth of the outer intermediate clutch disc engages in the clutch pressure cap.
- ✓ The clutch pressure cap rests flush against the outer lining disc.

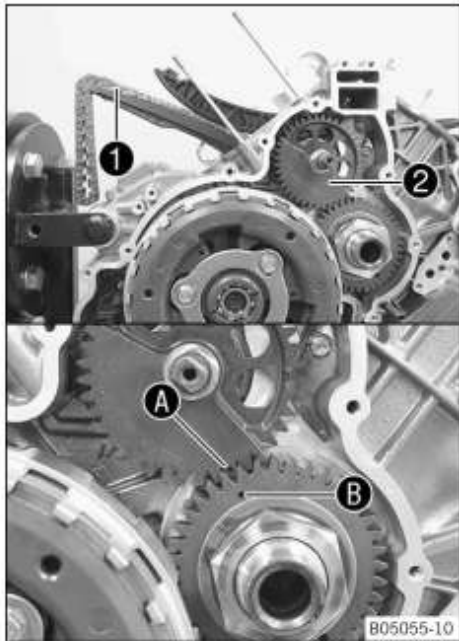


- Position clutch center **10** and the springs.
- Mount and tighten screws **11**.

Guideline

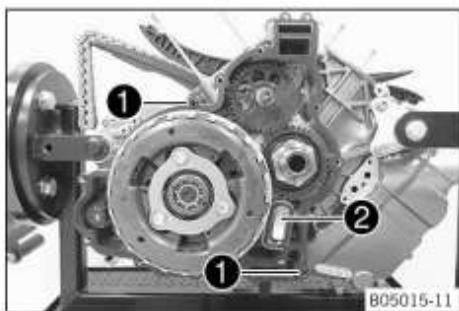
Screw, clutch spring	M6	12 Nm (8.9 lbf ft)
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19.9.17 Installing the intermediate gear and the timing chain on the right

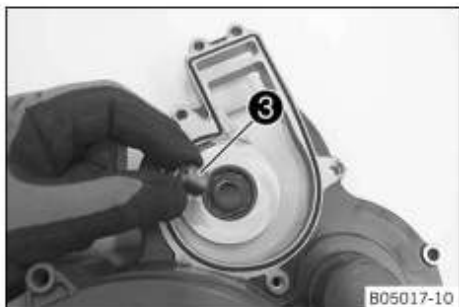


- Position timing chain **1** according to the direction of travel.
- Place the timing chain over the gear teeth of intermediate gear **2**.
- ✓ Align markings **A** and **B**.
- Slide on the intermediate gear.

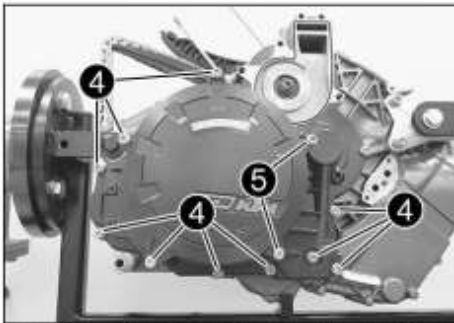
19.9.18 Installing the clutch cover



- Mount dowels **1** and position the clutch cover gasket.
- Mount check valve **2**.



- Position water pump sleeve **3** in both seal rings.

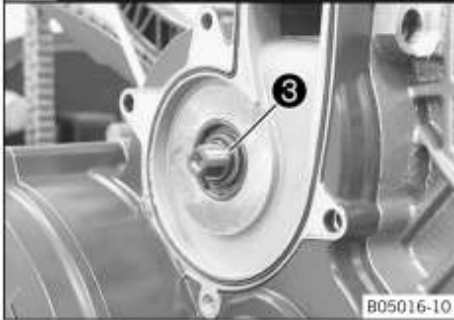


- Mount the clutch cover. Mount and tighten screws 4 and 5.

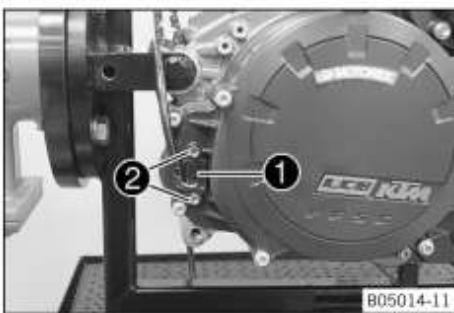
Guideline

Screw, clutch cover	M6	10 Nm (7.4 lbf ft)
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- Push water pump sleeve 3 all the way.
- ✓ Water pump sleeve 3 is flush with the recess of the water pump shaft.



19.9.19 Installing the shift shaft sensor

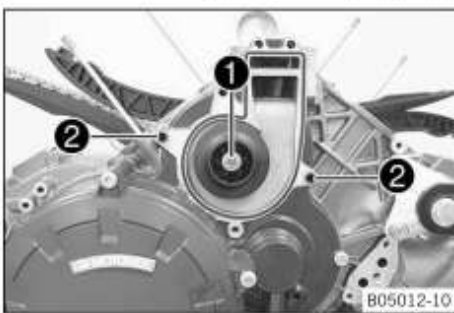


- Position the shift shaft sensor 1.
- Mount and tighten screws 2.

Guideline

Screw, shift shaft sensor	M5	6 Nm (4.4 lbf ft) Loctite®243™
---------------------------	----	--

19.9.20 Installing the water pump impeller

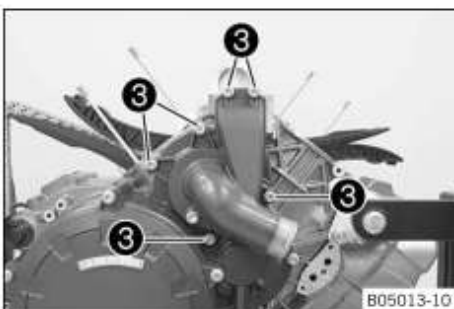


- Mount the washer and water pump impeller.
- Mount and tighten screw 1.

Guideline

Screw, water pump wheel	M6	10 Nm (7.4 lbf ft) Loctite®243™
-------------------------	----	---

- Mount dowels 2.

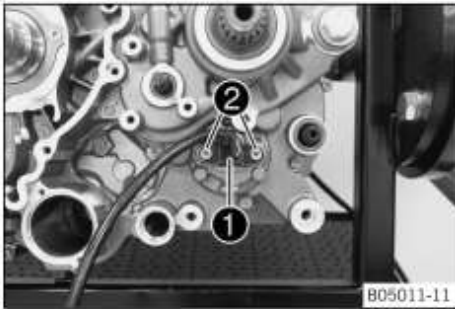


- Mount the water pump cover.
- Mount and tighten screws 3.

Guideline

Screw, water pump cover	M6	10 Nm (7.4 lbf ft)
-------------------------	----	--------------------

19.9.21 Installing the gear position sensor

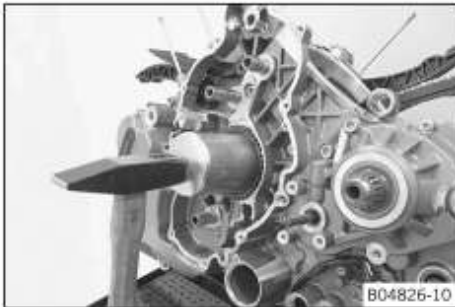


- Position gear position sensor **1**.
- Mount and tighten screws **2** with the washers.

Guideline

Screw, gear sensor	M5	6 Nm (4.4 lbf ft) Loctite®243™
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19.9.22 Installing the drive gear wheel of the balancer shaft



- Warm up the drive gear wheel of the balancer shaft.

Guideline

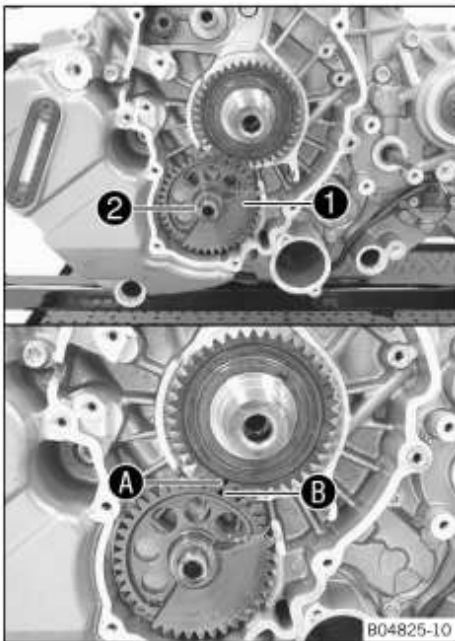
200 °C (392 °F)

- Ensure that the woodruff key is seated properly. Mount the drive gear wheel of the balancer shaft with the beveled edge facing forward.

Pressing tool (61229016000) (見 p. 500)

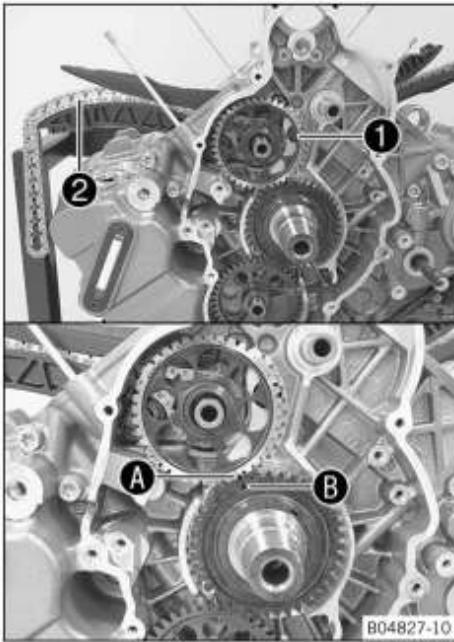
- ✓ The markings are visible after mounting.

19.9.23 Installing the balancer shaft

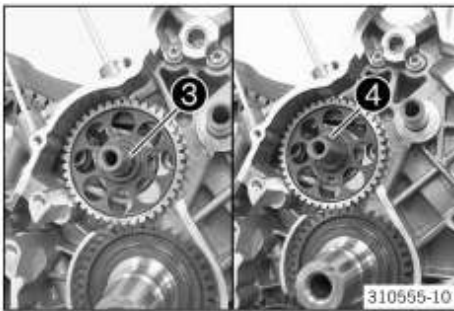


- Mount the rear washer and needle bearing.
- Mount balancer shaft **1**.
✓ Markings **A** and **B** are aligned.
- Mount washer **2**.

19.9.24 Installing the intermediate gear and the timing chain on the left

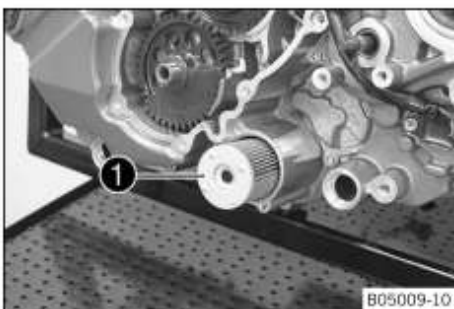


- Mount the rear washer.
- Mount intermediate gear ① with timing chain ② in accordance with the direction of travel.
- ✓ Markings A and B are aligned.

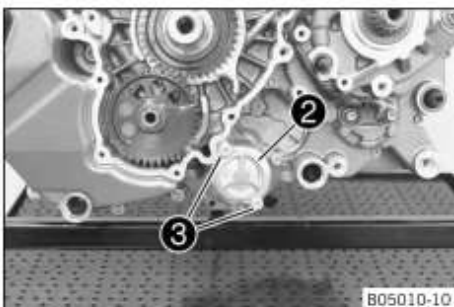


- Mount needle bearing ③.
- Mount washer ④.

19.9.25 Installing the oil filter



- Tilt the engine sideways and fill the oil filter housing to about 1/3 full with engine oil.
- Insert oil filter ①.

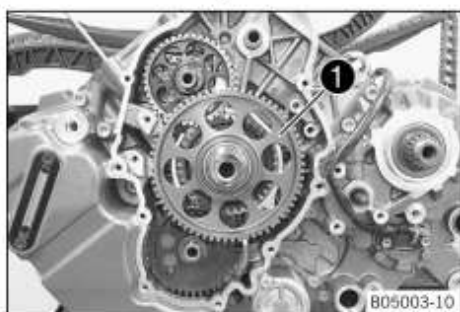


- Lubricate the O-ring of oil filter cover ②. Mount the oil filter cover.
- Mount and tighten screws ③.

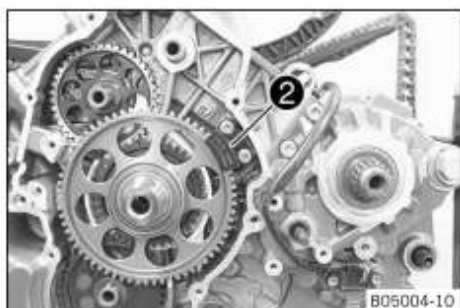
Guideline

Remaining engine screws	M5	6 Nm (4.4 lbf ft)
-------------------------	----	-------------------

19.9.26 Installing the rotor



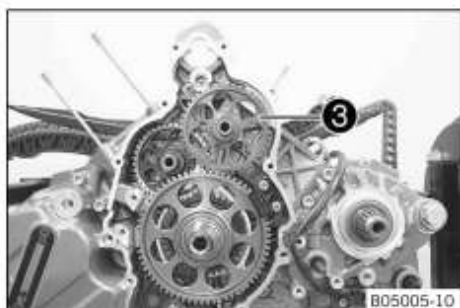
- Mount freewheel gear **1**.



- Position freewheel holder **2**. Mount and tighten the screws.

Guideline

Screw, free-wheel holder	M6	10 Nm (7.4 lbf ft) Loctite®243™
--------------------------	----	---



- Mount the rear washer, needle bearing, intermediate gear **3** and front washer.



- Mount the rotor.



Info

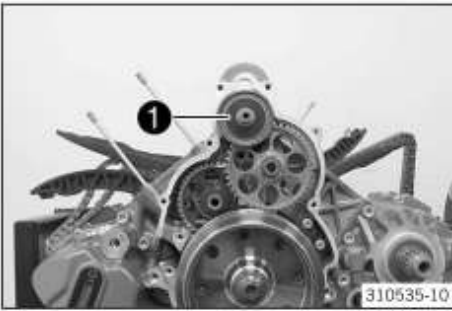
Ensure that the woodruff key is seated properly. For easier mounting, turn the intermediate gear counterclockwise.

- Mount and tighten rotor screw **4**.

Guideline

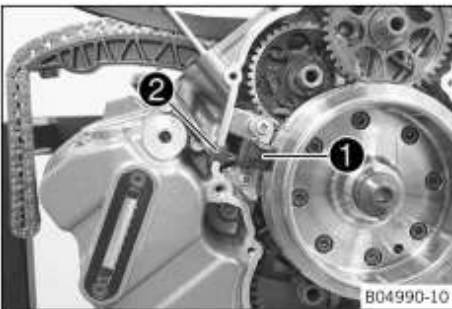
Rotor screw	M12x1.5	90 Nm (66.4 lbf ft)
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19.9.27 Installing the torque limiter



- Mount torque limiter **1** with the rear washer.

19.9.28 Installing the crankshaft speed sensor



- Position crankshaft speed sensor **1**.
- Mount and tighten the screws.

Guideline

Screw, crankshaft speed sensor	M5	6 Nm (4.4 lbf ft) Loctite®243™
--------------------------------	----	--

- Position the cable, thinly coat rubber grommet **2** with the sealing compound and insert it in the engine case.

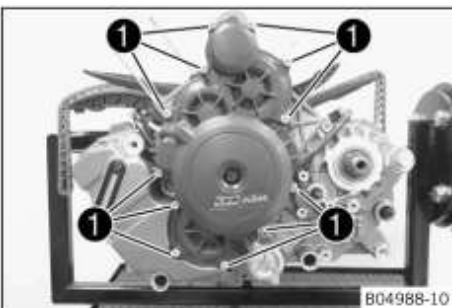
Loctite® 5910

- Check the distance between the crankshaft speed sensor and rotor.

Guideline

Crankshaft speed sensor/rotor – distance	0.40 mm (0.0157 in)
--	---------------------

19.9.29 Installing the alternator cover



- Mount the new alternator cover seal and dowels.
- Position the alternator cover.
- Mount and tighten screws **1**.

Guideline

Remaining engine screws	M6	10 Nm (7.4 lbf ft)
-------------------------	----	--------------------

19.9.30 Rear piston assembly



- Adjust impact of the piston rings by 120°.
- Mount oiled piston in the special tool.

Piston assembly ring (61329015108) (see p. 502)



- Position the special tool on the cylinder with the piston.
- Slide the piston carefully into the cylinder.
 - ✓ The piston rings may not be left hanging, as they may be damaged.



- Place the new cylinder base gasket **1** into position.



- Ensure that piston marking **2** faces the exhaust side.



- Cover the engine case opening with a cloth. Thread the timing chain through the timing chain shaft. Mount the piston pin.



B04818-01



B04821-10

- Position the new piston ring lock.

**Info**

For purposes of illustration, the following operations are shown on the deinstalled piston.

- Insert the special tool and press it with force towards the piston.
- Turn the special tool counterclockwise and, in doing so, press the piston ring lock into the groove.

Insertion for piston ring lock (75029035000) (見 p. 504)

- Ensure that the piston ring lock is in the correct position on both sides.

- Remove the cloth.
- Keep the timing chain taut. Press the cylinder down carefully and bring dowel pins into contact.

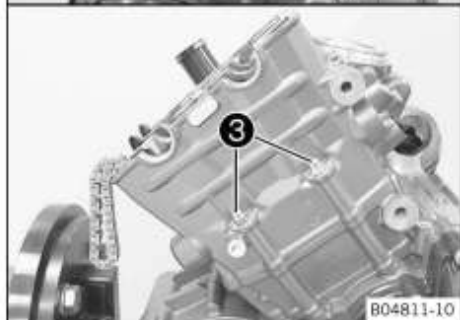
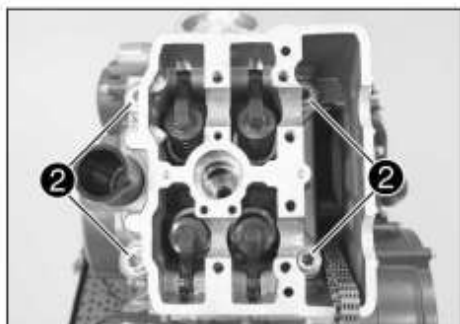


19.9.31 Installing rear cylinder head



B04983-10

- Fit the new cylinder head gasket ①.



- Position the cylinder head and mount and tighten the new cylinder head screws **2** with washers.

Guideline

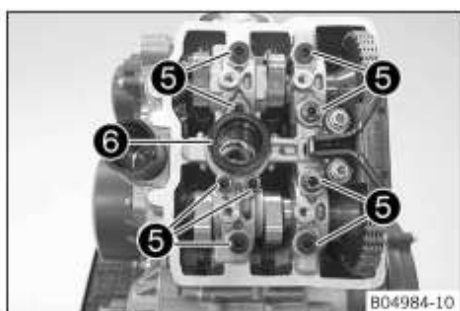
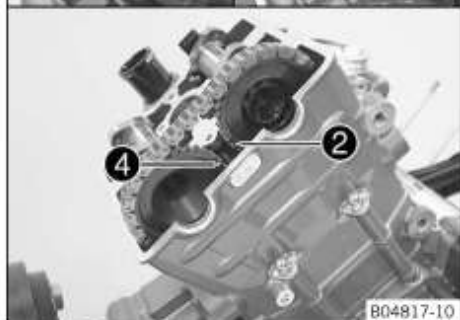
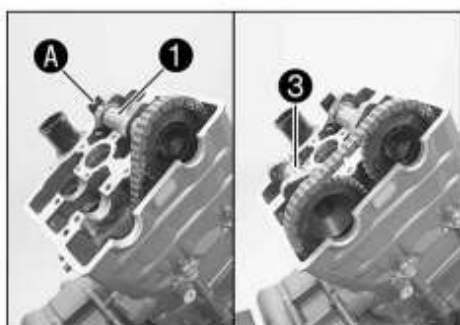
Cylinder head screw	M11x1.5	Tightening sequence: Using a crisscross pattern Step 1 15 Nm (11.1 lbf ft) Step 2 30 Nm (22.1 lbf ft) Step 3 90° Step 4 90° Lubricated with engine oil
---------------------	---------	--

- Mount and tighten nuts **3** with the washers.

Guideline

Nut, cylinder head	M6	9 Nm (6.6 lbf ft)
--------------------	----	-------------------

19.9.32 Installing the rear camshafts



- Pull up the timing chain and insert intake camshaft **1**.

i Info

The intake camshaft is marked **eh**.

- Place the timing chain over the rear sprocket of the intake camshaft.
✓ Marking **2** is aligned.
- Ensure that bleeder **A** is positioned properly.
- Slip in exhaust camshaft **3**.

i Info

The exhaust camshaft is marked **ah**.

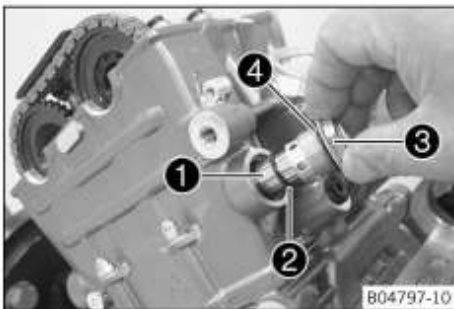
- Place the timing chain over the rear sprocket and position the camshaft in the bearing seat.
✓ Marking **4** is aligned.
- Clean all oil nozzles thoroughly and blow out with compressed air.
- Mount the camshaft bearing support.
- Mount screws **5** and tighten them from the inside to the outside.

Guideline

Screw, camshaft bearing support	M6 – 10.9	10 Nm (7.4 lbf ft)
Screw, camshaft bearing support	M8 – 10.9	Step 1 10 Nm (7.4 lbf ft) Step 2 18 Nm (13.3 lbf ft)

- Grease the O-rings and mount spark plug shaft insert **6** with gasket.

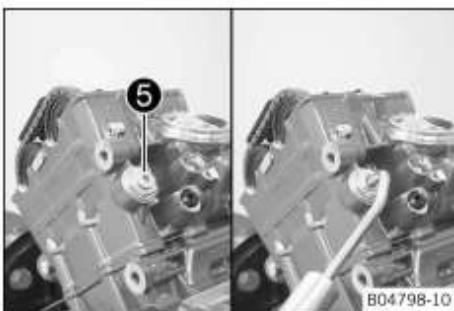
19.9.33 Installing the rear timing chain tensioner



- Position timing chain tensioner **1** and insert it with new O-ring **2**.
- Mount and tighten screw plug **3** with the O-ring **4**.

Guideline

Plug, timing-chain tensioner	M24x1.5	25 Nm (18.4 lbf ft)
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- Remove screw **5** with O-ring and use the special tool to push the timing chain tensioner toward the timing chain.

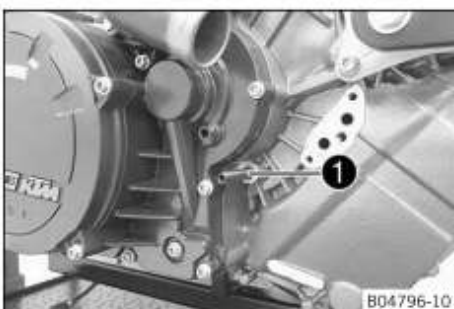
Release device for timing chain tensioner (61229021000) (p. 500)		
--	--	--

- ✓ The timing chain tensioner unlocks.
- Mount and tighten screw **5** with the O-ring.

Guideline

Screw, timing chain tensioner release	M10x1	10 Nm (7.4 lbf ft)
---------------------------------------	-------	--------------------

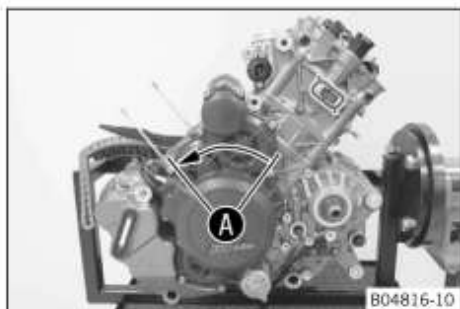
19.9.34 Setting the engine to ignition top dead center of the front cylinder



- Remove special tool **1**.
- Keep the timing chain tensioned.
- Turn the crankshaft counterclockwise by the specified value.

Guideline

1 turn		
--------	--	--



- Turn the crankshaft counterclockwise by the specified value **A**.

Guideline

75°

- ✓ The position notch of the crankshaft is visible in the hole.

- Screw in special tool **1**.

Locking screw (61229015000) (見 p. 499)

19.9.35 Installing the front piston



- Shift the gap of the piston rings by 120°.
- Mount the oiled piston in the special tool.

Piston assembly ring (61329015108) (見 p. 502)



- Position the special tool on the cylinder with the piston.
- Slide the piston carefully into the cylinder.
- ✓ The piston rings may not be left hanging, as they may be damaged.



- Place new cylinder base gasket **1** in position.



- Ensure that piston marking **2** faces the exhaust side.



- Cover the engine case opening with a cloth. Thread the timing chain through the timing chain shaft. Mount the piston pin.



- Position the new piston ring lock.

**Info**

For purposes of illustration, the following operations are shown on the removed piston.



- Insert the special tool and press it with force towards the piston.
- Turn the special tool counterclockwise and, in doing so, press the piston ring lock into the groove.

Insertion for piston ring lock (75029035000) (see p. 504)

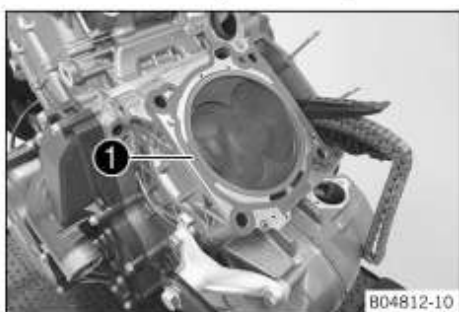


- Ensure that the piston ring lock is in the correct position on both sides.

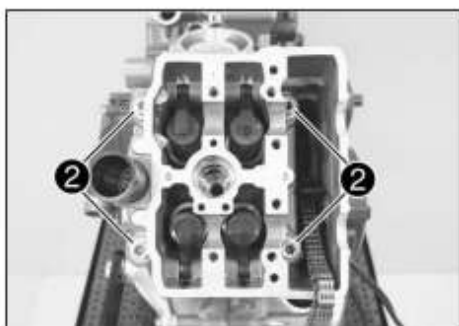


- Remove the cloth.
- Keep the timing chain taut. Press the cylinder down carefully and bring dowel pins into contact.

19.9.36 Installing the front cylinder head



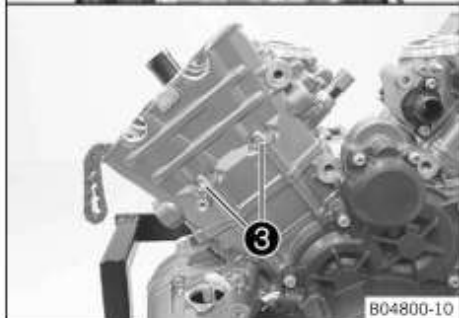
- Fit the new cylinder head gasket **1**.



- Put the cylinder head in place. Mount and tighten the new cylinder head screws **2** with washers.

Guideline

Cylinder head screw	M11x1.5	Tightening sequence: Using a crisscross pattern Step 1 15 Nm (11.1 lbf ft) Step 2 30 Nm (22.1 lbf ft) Step 3 90° Step 4 90° Lubricated with engine oil
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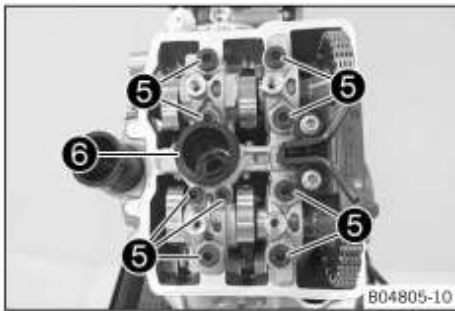
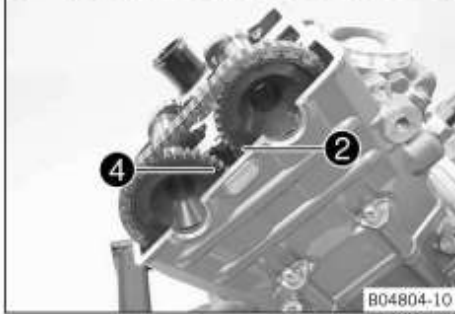
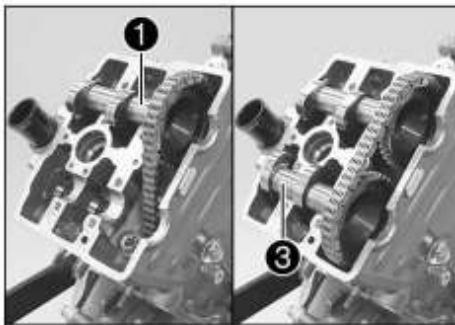


- Mount and tighten nuts **3** with the washers.

Guideline

Nut, cylinder head	M6	9 Nm (6.6 lbf ft)
--------------------	----	-------------------

19.9.37 Installing the front camshafts



- Pull up the timing chain and insert intake camshaft ①.



Info

The intake camshaft is marked **ev**.

- Place the timing chain over the rear sprocket of the intake camshaft.
✓ Marking ② is aligned.
- Slip in exhaust camshaft ③.



Info

The exhaust camshaft is marked **av**.

- Place the timing chain over the rear sprocket and position the camshaft in the bearing seat.
✓ Marking ④ is aligned.

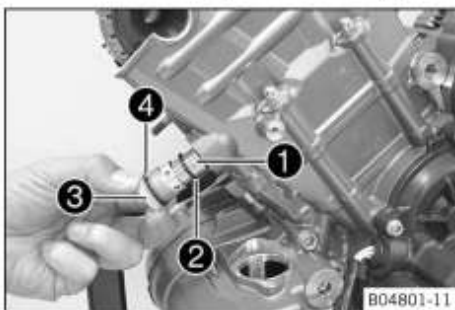
- Clean all oil nozzles thoroughly and blow out with compressed air.
- Mount the camshaft bearing support.
- Mount screws ⑤ and tighten them from the inside to the outside.

Guideline

Screw, camshaft bearing support	M6 – 10.9	10 Nm (7.4 lbf ft)
Screw, camshaft bearing support	M8 – 10.9	Step 1 10 Nm (7.4 lbf ft) Step 2 18 Nm (13.3 lbf ft)

- Grease the O-rings and mount spark plug shaft insert ⑥ with gasket.

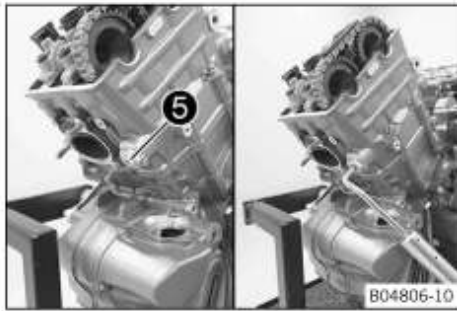
19.9.38 Installing the front timing chain tensioner



- Position timing chain tensioner ① and insert it with new O-ring ②.
- Mount and tighten screw plug ③ with new O-ring ④.

Guideline

Plug, timing-chain tensioner	M24x1.5	25 Nm (18.4 lbf ft)
------------------------------	---------	---------------------



- Remove screw **5** with O-ring and use the special tool to push the timing chain tensioner toward the timing chain.

Release device for timing chain tensioner (61229021000)
(p. 500)

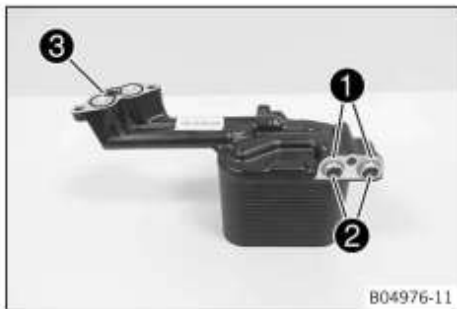
✓ The timing chain tensioner is unlocked.

- Mount and tighten screw **5** with the O-ring.

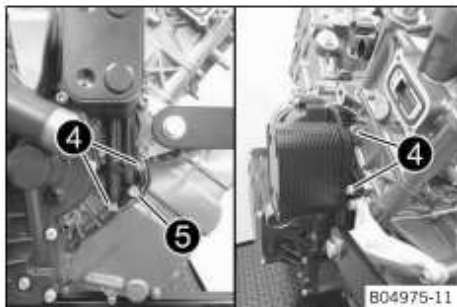
Guideline

Screw, timing chain tensioner release	M10x1	10 Nm (7.4 lbf ft)
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19.9.39 Installing the heat exchanger



- Oil and mount O-rings **1**.
- Mount sleeves **2**.
- Mount gasket **3**.



- Position the heat exchanger.
- Mount and tighten screws **4**.

Guideline

Remaining engine screws	M6	10 Nm (7.4 lbf ft)
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- Mount and tighten screw **5**.

Guideline

Screw, heat exchanger	M8	15 Nm (11.1 lbf ft)
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19.9.40 Installing the starter motor



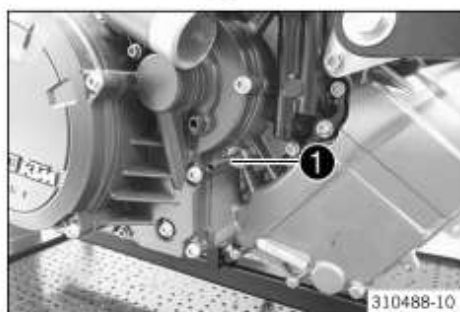
- Grease the O-ring. Position the starter motor.

Long-life grease (p. 490)

Info

The screws are mounted only in the vehicle.

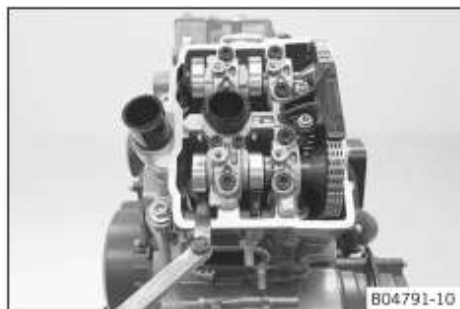
19.9.41 Checking the rear valve clearance



- Remove special tool ①.

Locking screw (61229015000) (p. 499)

- Crank the engine several times.
- Set the engine to ignition top dead center of the rear cylinder. (p. 227)



- On all valves, check the valve clearance between the camshaft and cam lever.

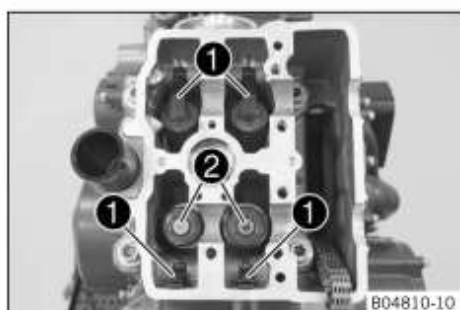
Guideline

Valve clearance	
Exhaust at: 20 °C (68 °F)	0.25 ... 0.30 mm (0.0098 ... 0.0118 in)
Intake at: 20 °C (68 °F)	0.10 ... 0.15 mm (0.0039 ... 0.0059 in)

Feeler gauge (59029041100) (p. 496)

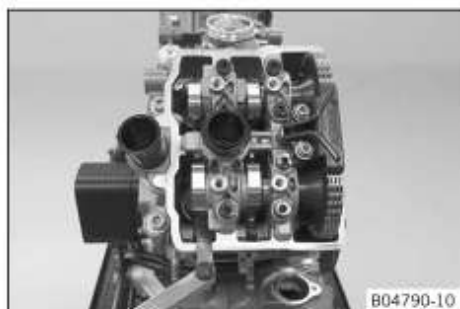
- * If valve clearance does not meet specifications:
 - Adjust the rear valve clearance. (p. 307)

19.9.42 Adjusting the rear valve clearance



- Remove the rear timing chain tensioner. (p. 228)
- Remove the rear camshafts. (p. 229)
- Swing up cam lever ①.
- Remove shims ② and set them down according to the installation position.
- Correct the shims as indicated by the results of the valve clearance check.
- Insert suitable shims.
- Install the rear camshaft. (p. 300)
- Install the rear timing chain tensioner. (p. 301)
- Check the rear valve clearance. (p. 307)

19.9.43 Checking the front valve clearance



- Remove the special tool.

Locking screw (61229015000) (p. 499)

- Crank the engine several times.
- Set the engine to ignition top dead center of the front cylinder. (p. 230)
- Check the valve clearance between the camshaft and cam lever on all valves.

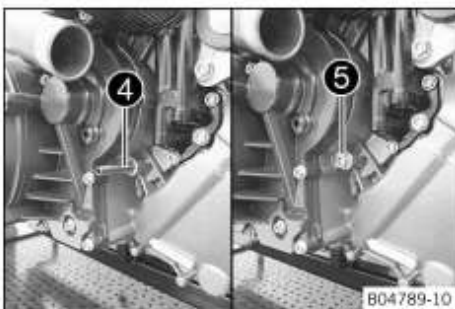
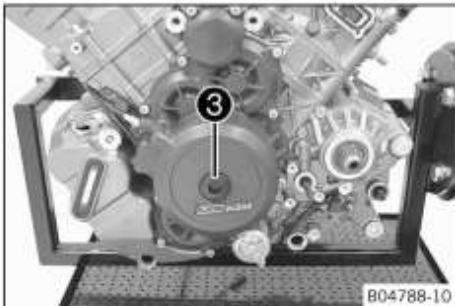
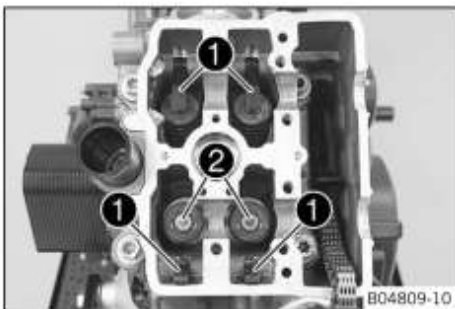
Guideline

Valve clearance	
Exhaust at: 20 °C (68 °F)	0.25 ... 0.30 mm (0.0098 ... 0.0118 in)
Intake at: 20 °C (68 °F)	0.10 ... 0.15 mm (0.0039 ... 0.0059 in)

Feeler gauge (59029041100) (☞ p. 496)

- * If the valve clearance does not meet specifications:
 - Adjust the front valve clearance. (☞ p. 308)

19.9.44 Adjusting the front valve clearance



- Remove the front timing chain tensioner. (☞ p. 231)
- Remove the front camshafts. (☞ p. 231)
- 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.
- Install the front camshafts. (☞ p. 305)
- Install the front timing chain tensioner. (☞ p. 305)
- Check the front valve clearance. (☞ p. 307)
- Mount and tighten screw plug ③ with the O-ring.

Guideline

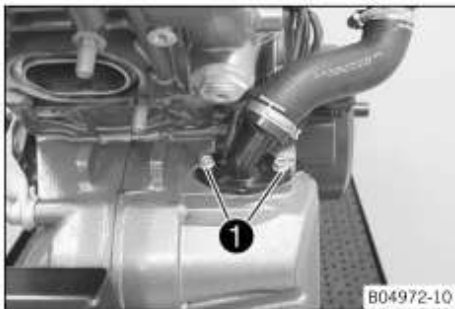
Screw plug, alternator cover	M24x1.5	8 Nm (5.9 lbf ft)
------------------------------	---------	-------------------

- Remove special tool ④. Mount and tighten screw ⑤ with the washer.

Guideline

Plug, crankshaft retainer	M8	15 Nm (11.1 lbf ft)
---------------------------	----	---------------------

19.9.45 Installing the oil filler tube

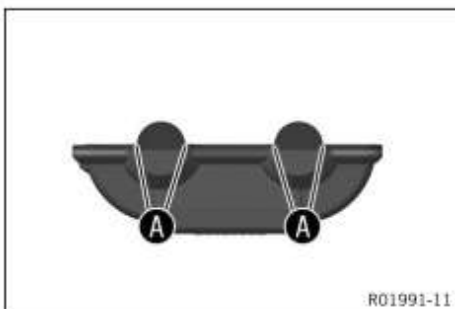


- Mount the oil filler tube with the O-ring.
- Mount and tighten screws ①.

Guideline

Remaining engine screws	M6	10 Nm (7.4 lbf ft)
-------------------------	----	--------------------

19.9.46 Installing the front valve cover

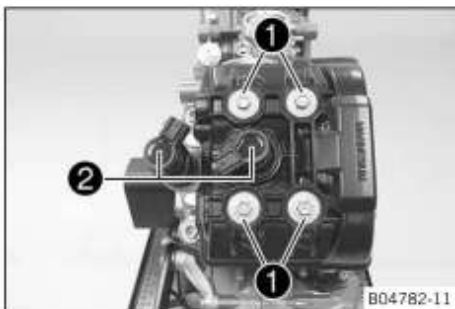


- Clean and degrease the valve cover seal.
- Apply a thin layer of sealing compound to area A.

Loctite® 5910



Info
The rear valve cover is equipped with a connector for the engine vent.
The front valve cover is not equipped with a connector for the engine vent.



- Put the valve cover in place with the gasket. Mount and tighten screws ①.

Guideline

Screw, valve cover	M6	10 Nm (7.4 lbf ft)
--------------------	----	--------------------



Info
The front valve cover is not equipped with a connector for the engine vent.

- Mount and tighten the spark plugs using a special tool.

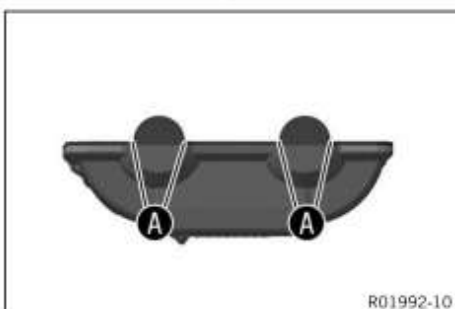
Guideline

Spark plug	M12x1.5	18 Nm (13.3 lbf ft)
Spark plug	M10x1	11 Nm (8.1 lbf ft)

Spark plug wrench with link (77229172000) (Ⓜ p. 504)

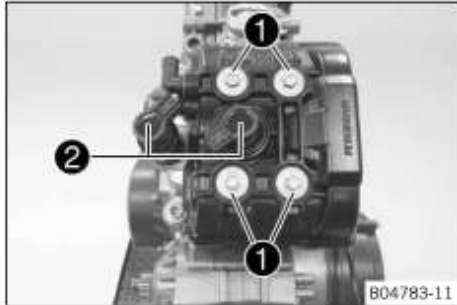
- Mount ignition coils ②.

19.9.47 Installing rear valve cover



- Clean and degrease the valve cover seal.
- Apply a thin layer of sealing compound to area A.

Loctite® 5910



B04783-11

i Info

The rear valve cover is equipped with a connector for the engine vent.
The front valve cover is not equipped with a connector for the engine vent.

- Put the valve cover in place with the gasket. Mount and tighten screws **1**.

Guideline

Screw, valve cover	M6	10 Nm (7.4 lbf ft)
--------------------	----	--------------------

- Mount and tighten the spark plugs using a special tool.

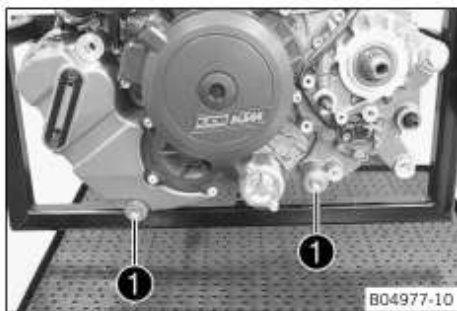
Guideline

Spark plug	M12x1.5	18 Nm (13.3 lbf ft)
Spark plug	M10x1	11 Nm (8.1 lbf ft)

Spark plug wrench with link (77229172000) (見 p. 504)		
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- Mount ignition coils **2**.

19.9.48 Installing the oil drain plug



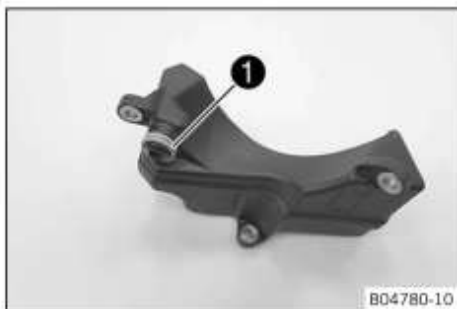
B04977-10

- Mount the new O-rings.
- Mount and tighten oil drain plug **1** with the magnet, O-rings and oil screen.

Guideline

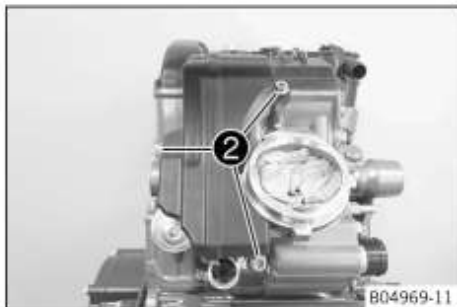
Oil drain plug	M20x1.5	20 Nm (14.8 lbf ft)
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19.9.49 Installing rear resonator



B04780-10

- Oil and mount the two O-rings **1**.



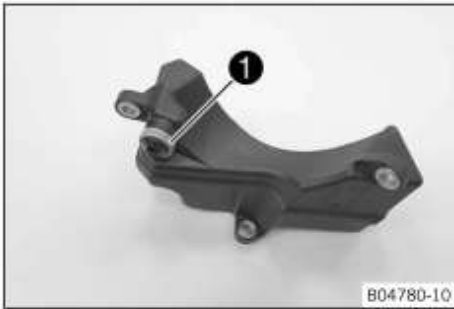
B04969-11

- Position resonator on the cylinder head.
- Mount and tighten screws **2**.

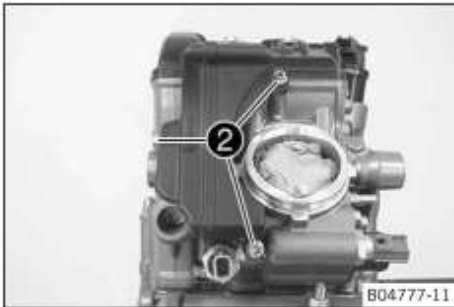
Guideline

Screw, resonator	M5	8 Nm (5.9 lbf ft) Loctite®243™
------------------	----	--

19.9.50 Installing the front resonator



- Oil and mount the two O-rings ①.

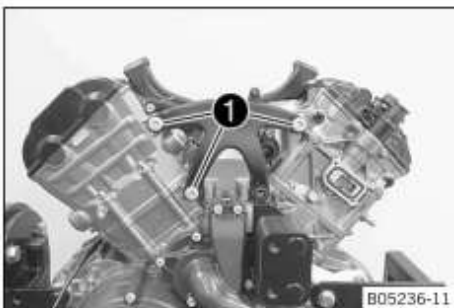


- Position resonator on the cylinder head.
- Mount and tighten screws ②.

Guideline

Screw, resonator	M5	8 Nm (5.9 lbf ft) Loctite®243™
------------------	----	--

19.9.51 Mounting the engine bearer



- Position the engine bearer.
- Mount and tighten screws ①.

Guideline

Screw, engine bearer	M10	45 Nm (33.2 lbf ft)
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- Position the engine bearer.
- Mount and tighten screws ②.

Guideline

Screw, engine bearer	M10	45 Nm (33.2 lbf ft)
----------------------	-----	---------------------

19.9.52 Removing the engine from the engine assembly stand



- Remove the screw connections.
- Remove the engine from the engine assembly stand.



Info

Have an assistant help you or use a crane.

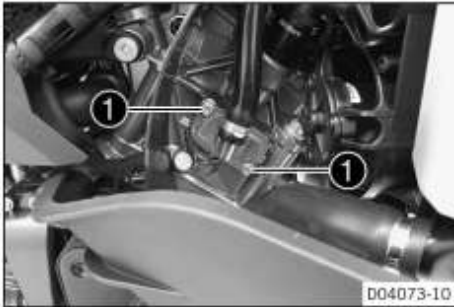
20.1 Changing the SAS membrane

Preparatory work

- Remove the passenger seat. (p. 80)
- Remove the front rider's seat. (p. 79)
- Remove the front side cover. (p. 97)
- Remove the fuel tank cover. (p. 98)
- Remove the mask spoiler. (p. 100)
- Remove the fuel tank. (p. 80)

Main work

- Remove screws ①.
- Pull off the cover and hang it to one side.



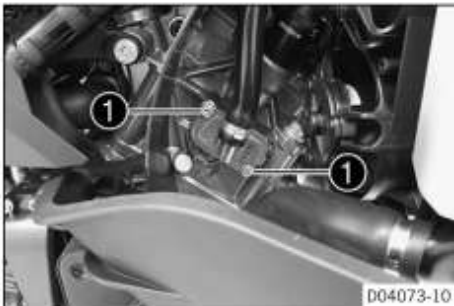
- Remove SAS membrane ②.
- Mount the new SAS membrane.
- ✓ The SAS membrane is positioned flush in the cylinder.



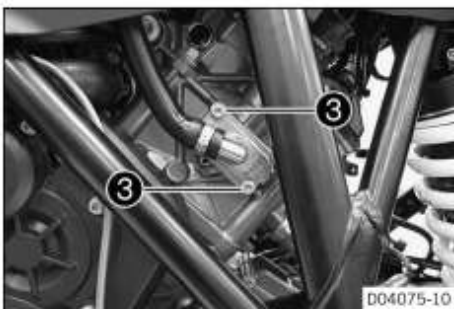
- Position the cover.
- Mount and tighten screws ①.

Guideline

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

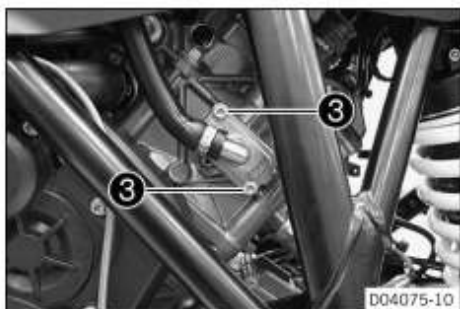


- Remove screws ③.
- Pull off the cover and hang it to one side.





- Remove SAS membrane ④.
- Mount the new SAS membrane.
- ✓ The SAS membrane is positioned flush in the cylinder.



- Position the cover.
- Mount and tighten screws ③.

Guideline

Remaining screws, engine	M6	10 Nm (7,4 lbf ft)
-----------------------------	----	--------------------

Finishing work

- Install the fuel tank. (☞ p. 83)
- Install the mask spoiler. (☞ p. 101)
- Install the fuel tank cover. (☞ p. 99)
- Install the front side cover. (☞ p. 97)
- Mount the front rider's seat. (☞ p. 79)
- Mount the passenger seat. (☞ p. 80)

21.1 Checking/correcting the fluid level of the hydraulic clutch



Warning

Skin irritation Brake fluid causes skin irritation.

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



Note

Environmental hazard Hazardous substances cause environmental damage.

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



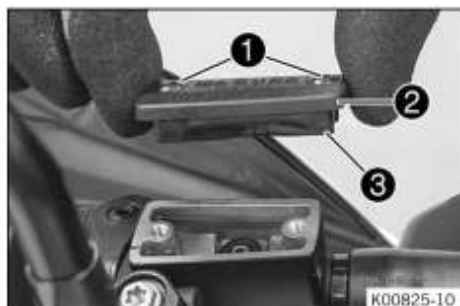
Info

The fluid level rises with increasing wear of the clutch facing discs.

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

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

Only use clean brake fluid from a sealed container.



- Move the clutch fluid reservoir mounted on the handlebar to a horizontal position.
- Remove screws ①.
- Remove cover ② with membrane ③.
- Check the fluid level.

Fluid level below container rim	4 mm (0.16 in)
---------------------------------	----------------

» If the fluid level does not meet specifications:

- Correct the fluid level of the hydraulic clutch.

Brake fluid DOT 4 / DOT 5.1 (see p. 488)
--

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



Info

Clean up overflowed or spilled brake fluid immediately with water.

21.2 Changing the hydraulic clutch fluid

**Warning****Skin irritation** Brake fluid causes skin irritation.

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

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

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

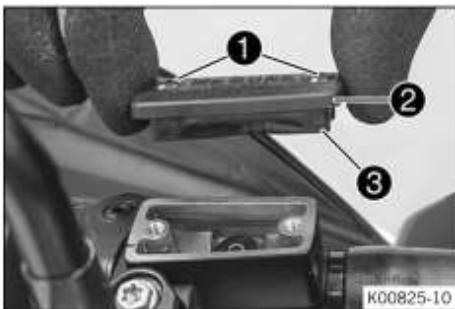
**Info**

The fluid level rises with increasing wear of the clutch facing discs.

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

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

Only use clean brake fluid from a sealed container.



- Move the clutch fluid reservoir mounted on the handlebar to a horizontal position.
- Remove screws ①.
- Remove cover ② with membrane ③.



- Fill bleeding syringe ④ with the appropriate hydraulic fluid.

Syringe (50329050000) (☞ p. 494)

Brake fluid DOT 4 / DOT 5.1 (☞ p. 488)

- On the slave cylinder, remove the bleeder screw and mount bleeding syringe ④.



- Now press the fluid into the system until it emerges from hole 5 of the master cylinder without bubbles.
- Now and then, extract the fluid from the master cylinder reservoir to prevent overflow.
- Remove the bleeding syringe. Mount and tighten the bleeder screw.
- Correct the fluid level of the hydraulic clutch.

Guideline

Fluid level below container rim	4 mm (0.16 in)
---------------------------------	----------------

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

21.3 Checking the clutch



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

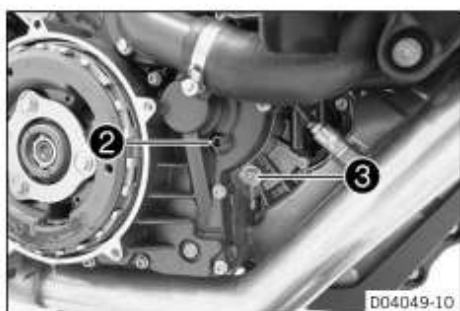
Environmental hazard Hazardous substances cause environmental damage.

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



Main work

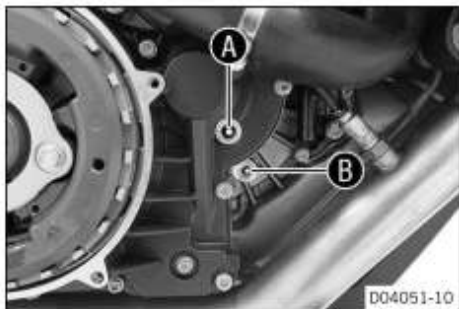
- Place an appropriate container under the engine.
- Remove screws 1.
- Take off the outer clutch cover.



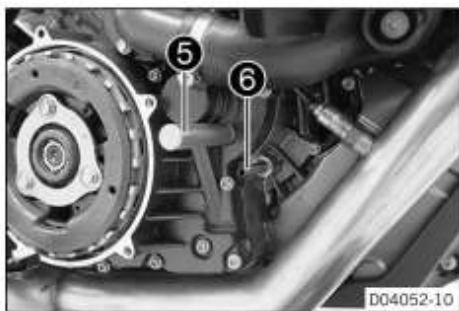
- Remove screw 2.
- Remove screw 3 with washer.



- Remove screw plug **4** with O-ring.



- Turn the crankshaft counterclockwise until holes **A** and **B** are visible.

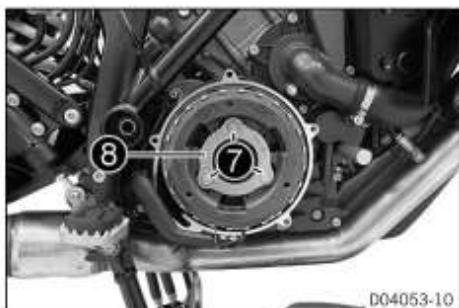


- Mount special tool **5** until it stops.

Locking pin (61329033000) (☞ p. 503)

- Screw in special tool **6**.

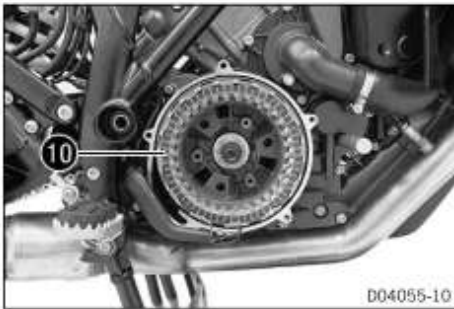
Locking screw (61229015000) (☞ p. 499)



- Remove screws **7**.
- Take off clutch center **8** and the springs.



- Take off clutch pressure cap **9**.



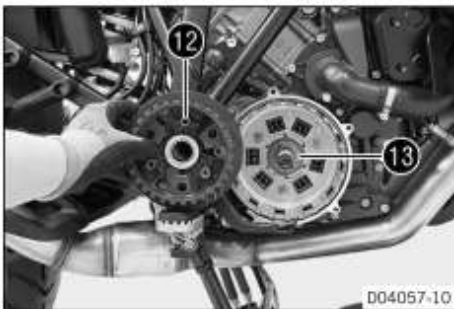
- Remove clutch discs **10**, support ring, and pretension ring.



- Hold the inner clutch hub with a special tool.

Holding wrench (51129003000) (p. 495)

- Remove nut **11** with washer.



- Take off inner clutch hub **12** and washer **13**.



Info

The washer usually sticks to the inner clutch hub.

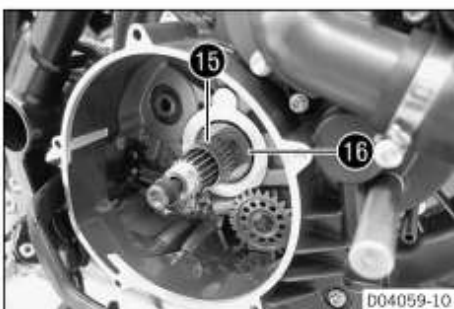


- Remove clutch basket **14** with oil pump drive gear.

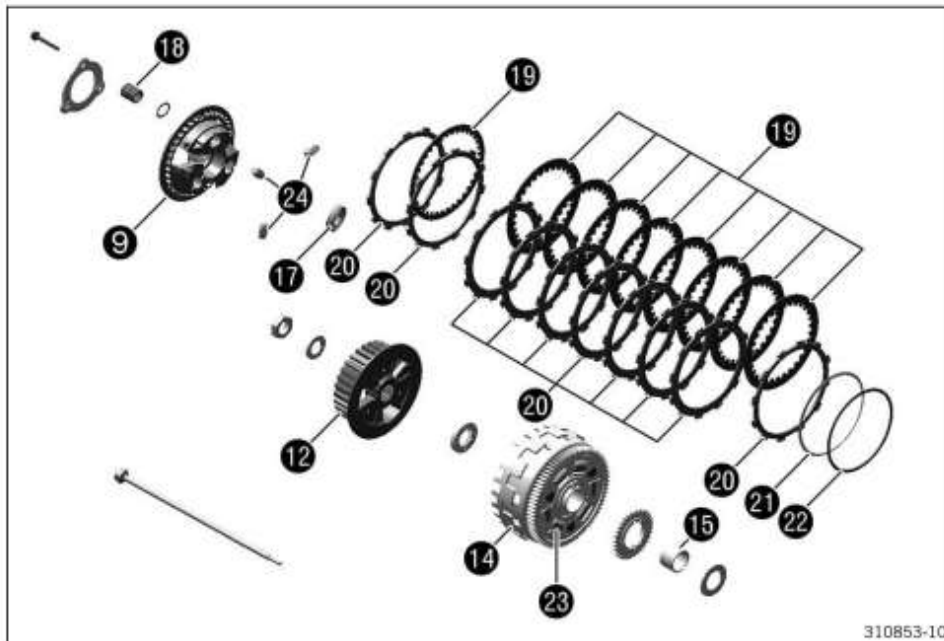


Info

Ensure that the spread transmission is blocked.



- Remove needle bearing **15** and washer **16**.



310853-10

- Check axial bearing **17** for damage and wear.

- » If there is damage or wear:
 - Change the axial bearing.

- Check length of clutch springs **18**.

Clutch spring - length	≥ 45.8 mm (≥ 1.803 in)
------------------------	------------------------

- » If the clutch spring length is shorter than specified:
 - Change all clutch springs.

- Check the contact surface of clutch pressure cap **9** 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 **14** for wear.

Clutch basket - thrust surface of clutch facing discs	
Wear limit	0.5 mm (0.02 in)

- » If the thrust surface exhibits excessive wear:
 - Change the clutch disc pack and clutch basket.

- Check needle bearing **15** for damage and wear.

- » If there is damage or wear:
 - Change the needle bearing.

- Check intermediate clutch discs **19** for damage and wear.

- » If the intermediate clutch discs are not level and are pitted:
 - Change the clutch disc pack.

- Check clutch facing discs **20** for discoloration and scoring.

- » If there is discoloration or scoring:
 - Change the clutch disc pack.

- Check the thickness of the clutch disc pack.

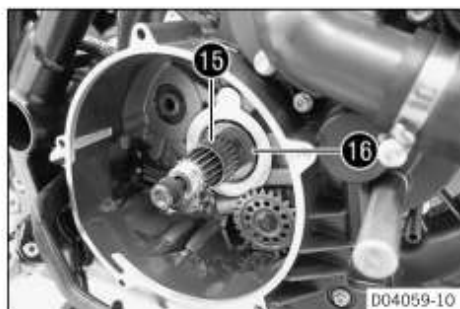
Clutch disc pack - thickness	
New condition	47.20 ... 48.00 mm (1.8583 ... 1.8898 in)
Wear limit	46.00 mm (1.811 in)

- » If the clutch disc pack does not meet the specified value:
 - Change the clutch disc pack.
- Check pretension ring **21** and support ring **22** for damage and wear.
 - » If there is damage or wear:
 - Change the pretension ring and support ring.
- Check inner clutch hub **12** for damage and wear.
 - » If there is damage or wear:
 - Change the inner clutch hub.
- Check springs **23** of the clutch basket for damage and wear.
 - » If there is damage, wear or play in the direction of rotation:
 - Change the clutch basket.
- Check damper **24** for damage and wear.

i **Info**

If the clutch pressure cap can be mounted without resistance from the damper, the dampers are too hard and are worn out.

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



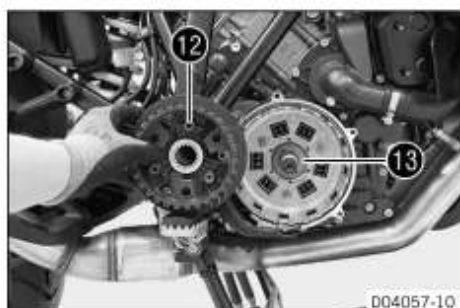
- Mount washer **16** and needle bearing **15**.



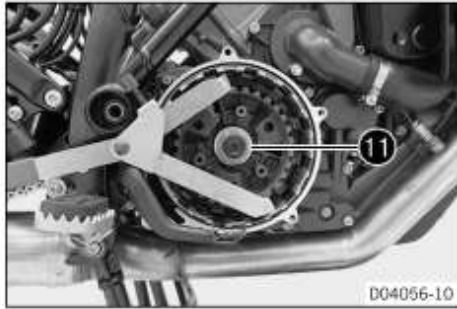
- Mount clutch basket **14** with oil pump drive gear.

i **Info**

Turn the clutch basket and the oil pump gear wheel backwards and forwards slightly to help them mesh more easily.



- Mount washer **13**.
- Mount inner clutch hub **12**.

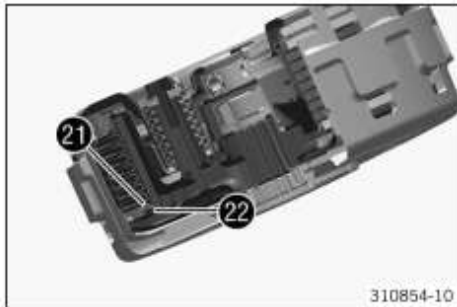


- Mount nut **11** with washer.
- Tighten the nut, holding the inner clutch hub with a special tool.

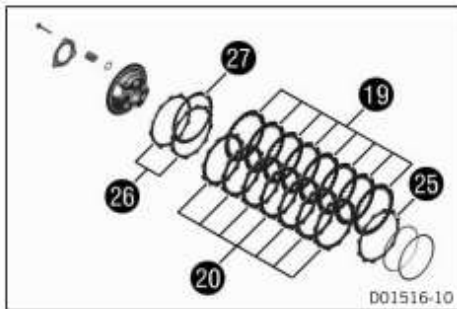
Guideline

Nut, inner clutch hub	M22x1.5	120 Nm (88.5 lbf ft) Loctite®243™
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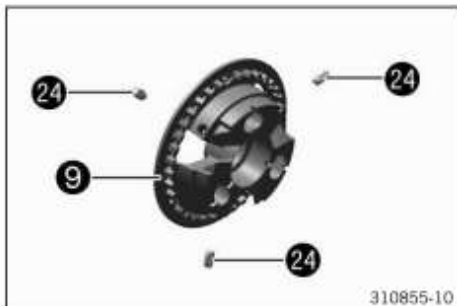
Holding wrench (51129003000) (見 p. 495)



- Mount support ring **22** and pretension ring **21**.
- ✓ 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 **25** with a larger inside diameter.
- Alternately mount 8 intermediate clutch discs **19** and 7 of the same clutch facing discs **20**.
- Alternately mount 2 clutch facing discs **26** and an intermediate clutch disc **27** with a larger inside diameter.
- Mount the outer clutch facing disc offset by one mesh.



- Mount damper **24** in the clutch pressure cap **9**.

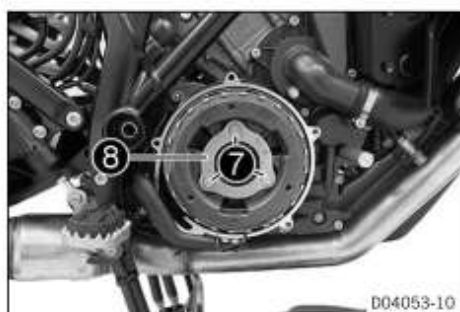


Info

When changing the clutch discs, always renew the damper.



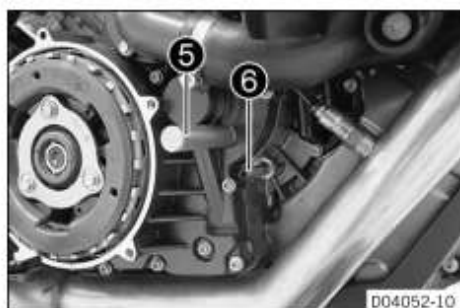
- Position clutch pressure cap **9**.
- ✓ The teeth of the outer intermediate clutch disc engages in the clutch pressure cap.
- ✓ The clutch pressure cap rests flush against the outer lining disc.



- Position clutch center **8** and the springs.
- Mount and tighten screws **7**.

Guideline

Screw, clutch spring	M6	12 Nm (8.9 lbf ft)
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- Remove special tool **5**.

Locking pin (61329033000) (見 p. 503)

- Remove special tool **6**.

Locking screw (61229015000) (見 p. 499)
--



- Mount and tighten screw **2**.

Guideline

Screw plug	M10	10 Nm (7.4 lbf ft)
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- Mount and tighten screw **3** with washer.

Guideline

Plug, crankshaft retainer	M8	15 Nm (11.1 lbf ft)
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- Mount and tighten screw plug **4** with O-ring.

Guideline

Screw plug, alternator cover	M24x1.5	8 Nm (5.9 lbf ft)
------------------------------	---------	-------------------



- Position the outer clutch cover.
- Mount screws **1** and tighten in a crisscross pattern.

Guideline

Screw, clutch cover	M6	10 Nm (7.4 lbf ft)
---------------------	----	--------------------

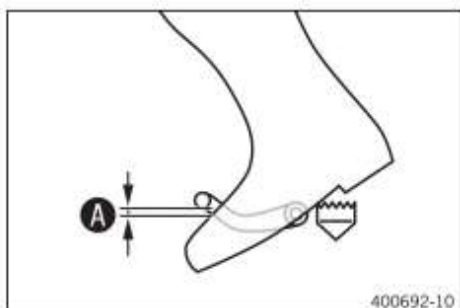
Finishing work

- Check the engine oil level. (見 p. 363)

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.

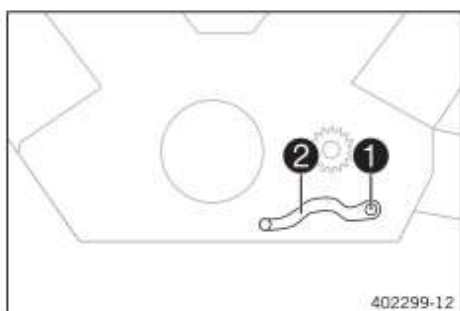


- Sit on the vehicle in the riding position and determine distance **A** between the upper edge of your boot and the shift lever.

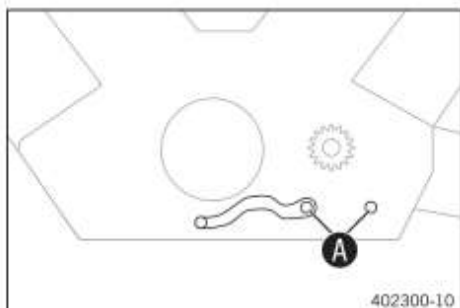
Distance between shift lever and upper edge of boot	10 ... 20 mm (0.39 ... 0.79 in)
---	---------------------------------

- » If the distance does not meet specifications:
 - Adjust the basic position of the shift lever. (p. 324)

22.2 Adjusting the basic position of the shift lever



- Remove screw **1** with the washers and take off shift lever **2**.



- Clean gear teeth **A** of the shift lever and shift shaft.
- Mount the shift lever on the shift shaft in the required position and engage gearing.

i Info

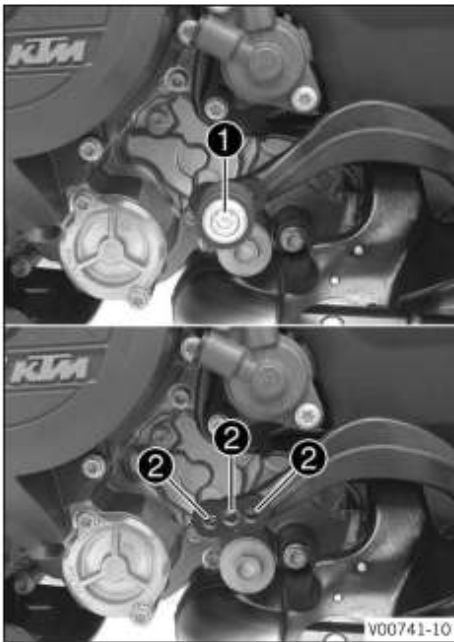
The range of adjustment is limited. The shift lever must not come into contact with any other vehicle components during the shift procedure.

- Mount and tighten screw **1** with the washers.

Guideline

Screw, shift lever	M6	15 Nm (11.1 lbf ft) Loctite®243™
--------------------	----	--

22.3 Setting the shift lever stub



- Remove screw **1** along with the shift lever stub.
- Position the shift lever stub with the screw in one of drilled holes **2** depending on the desired lever length.

Guideline

Standard	Middle hole
----------	-------------

- Tighten the screw.

Guideline

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

22.4 Changing the gear position sensor

Preparatory work

- Raise the vehicle with the center stand. (p. 15)

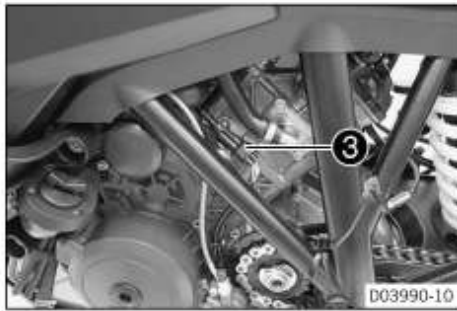
Main work

- Remove screws **1**.
- Take off the engine sprocket cover.



- Remove screws **2**.
- Take off the cover.

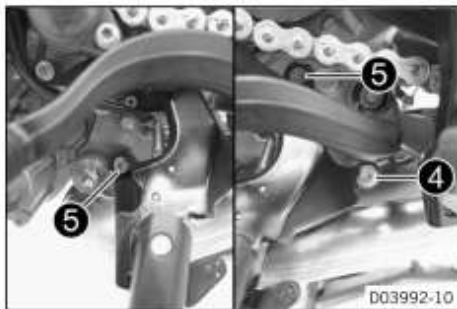




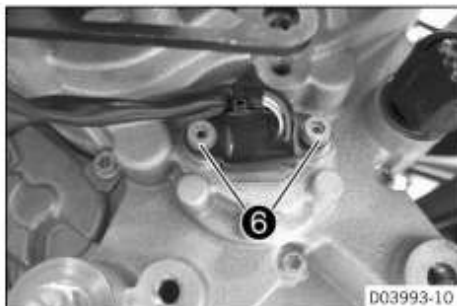
- Disconnect plug-in connector **3**.



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



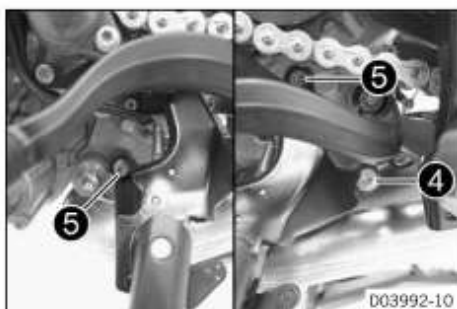
- Remove screw **4**.
- Remove screws **5**.
- Remove the side stand bracket and hang it to one side.



- Remove screws **6** with the washers.
- Take off the gear position sensor.
- Position the new gear position sensor.
- Mount and tighten screws **6** with the washers.

Guideline

Screw, gear sensor	M5	6 Nm (4.4 lbf ft) Loctite®243™
--------------------	----	--



- Position the side stand bracket.
- Mount screw **4** but do not tighten yet.

Guideline

Screw, side stand bracket	M10	45 Nm (33.2 lbf ft) Loctite®243™
---------------------------	-----	--

- Mount and tighten screws **5**.

Guideline

Screw, side stand bracket	M8	25 Nm (18.4 lbf ft)
---------------------------	----	---------------------

- Tighten screw **4**.

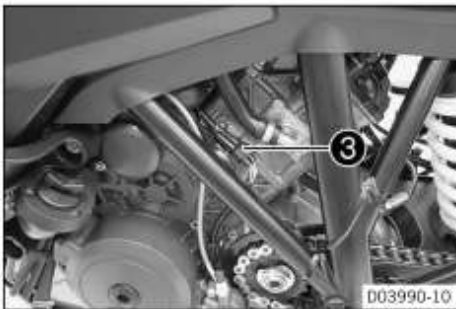
Guideline

Screw, side stand bracket	M10	45 Nm (33.2 lbf ft) Loctite®243™
---------------------------	-----	--

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



- Join plug-in connector ③.



- Position the cover.
- Mount and tighten screws ②.

Guideline

Remaining engine screws	M6	10 Nm (7.4 lbf ft)
-------------------------	----	--------------------



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

Guideline

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



Finishing work

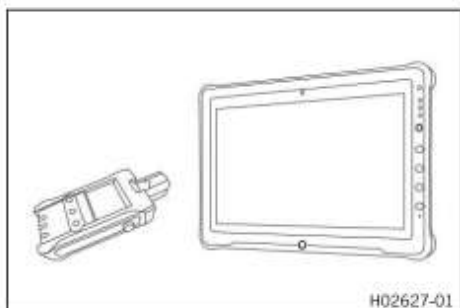
- Remove the vehicle from the center stand. (☞ p. 15)
- Program the gear position sensor. (☞ p. 328)

22.5 Programming the gear position sensor

Condition

The diagnostic tool is connected and running.

- Execute **"Engine electronics" > "Functions" > "Program the gear position sensor"**.
- Switch the ignition off and on again.
 - ✓ The green idle indicator lamp **N** lights up.



22.6 Changing the shift shaft sensor

Preparatory work

- Remove the passenger seat. (📖 p. 80)
- Remove the front rider's seat. (📖 p. 79)

Main work

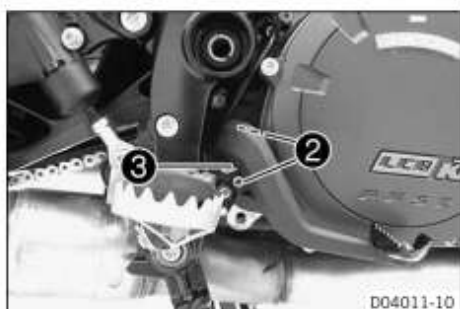
- Remove the cable ties.



- Loosen plug-in connector **1** from the plug holder and disconnect.
- Expose the cable.



- Remove screws **2**.
- Take off the shift shaft sensor **3**.
- Position new shift shaft sensor **3**.
- Mount and tighten screws **2**.



Guideline

Screw, shift shaft sensor	M5	6 Nm (4.4 lbf ft) Loctite®243™
---------------------------	----	--



- Route the cable without tension.
- Join the plug-in connector ① and mount in the plug holder.



- Mount the cable ties.

Finishing work

- Mount the front rider's seat. (見 p. 79)
- Mount the passenger seat. (見 p. 80)
- Program shift shaft sensor. (見 p. 329)

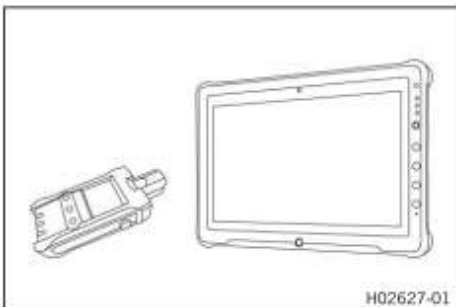


22.7 Programming shift shaft sensor

Condition

The diagnostic tool is connected and running.

- Execute **"Engine electronics" > "Functions" > "Program shift shaft sensor"**.



23.1 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 toxic and a health hazard.

- Keep coolant out of the reach of children.
- Do not allow coolant to come into contact with the skin, the eyes and clothing.
- Consult a doctor immediately if coolant is swallowed.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly with water and consult a doctor immediately if coolant gets into the eyes.
- Change clothing if coolant spills onto your clothing.

Condition

The engine is cold.

The radiator is completely full.

- Park the motorcycle on a horizontal surface.
- Check the coolant level in the compensating tank ①.



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!

- Add coolant/bleed the cooling system. (p. 333)
- » If the coolant 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. 338)

23.2 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 toxic and a health hazard.

- Keep coolant out of the reach of children.
- Do not allow coolant to come into contact with the skin, the eyes and clothing.
- Consult a doctor immediately if coolant is swallowed.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly with water and consult a doctor immediately if coolant gets into the eyes.
- Change clothing if coolant spills onto your clothing.

Condition

The engine is cold.

Preparatory work

- Park the motorcycle on a horizontal surface.
- Raise the vehicle with the center stand. (see p. 15)
- Remove the passenger seat. (see p. 80)
- Remove the front rider's seat. (see p. 79)
- Remove the front side cover. (see p. 97)
- Remove the fuel tank cover. (see p. 98)
- Remove the mask spoiler. (see p. 100)
- Remove the fuel tank. (see p. 80)

Main work

- Remove radiator cap ❶ and the cover of the compensating tank.
- 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 fuel tank. (see p. 83)
- Install the mask spoiler. (see p. 101)
- Install the fuel tank cover. (see p. 99)
- Install the front side cover. (see p. 97)
- Mount the front rider's seat. (see p. 79)
- Mount the passenger seat. (see p. 80)
- Remove the vehicle from the center stand. (see p. 15)



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 toxic and a health hazard.

- Keep coolant out of the reach of children.
- Do not allow coolant to come into contact with the skin, the eyes and clothing.
- Consult a doctor immediately if coolant is swallowed.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly with water and consult a doctor immediately if coolant gets into the eyes.
- Change clothing if coolant spills onto your clothing.

Condition

The engine is cold.

Preparatory work

- Raise the vehicle with the center stand. (see p. 15)
- Remove the passenger seat. (see p. 80)
- Remove the front rider's seat. (see p. 79)
- Remove the front side cover. (see p. 97)
- Remove the fuel tank cover. (see p. 98)
- Remove the mask spoiler. (see p. 100)
- Remove the fuel tank. (see p. 80)

Main work

- Place an appropriate container under the radiator.
- Remove screw **1** with seal ring.
- Remove the radiator cap.
- Completely drain the coolant.
- Mount and tighten screw **1** with a new seal ring.

Guideline

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



- Place an appropriate container under the engine.
- Remove screw **2** with seal ring.
- Completely drain the coolant.
- Mount and tighten screw **2** with a new seal ring.

Guideline

Screw, water pump cover	M6	10 Nm (7.4 lbf ft)
-------------------------	----	--------------------



23.4 Adding coolant/bleeding the cooling system



Warning

Danger of poisoning Coolant is toxic and a health hazard.

- Keep coolant out of the reach of children.
- Do not allow coolant to come into contact with the skin, the eyes and clothing.
- Consult a doctor immediately if coolant is swallowed.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly with water and consult a doctor immediately if coolant gets into the eyes.
- Change clothing if coolant spills onto your clothing.

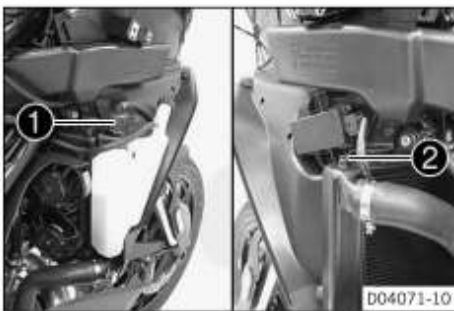
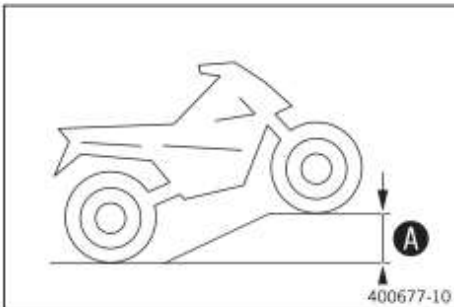
Condition

The fuel tank is removed.

- Move the vehicle into the position shown and prevent it from rolling away. Height difference **A** must be reached.

Guideline

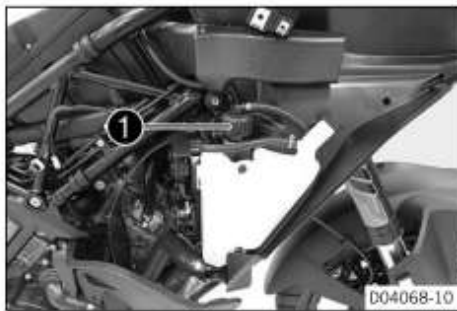
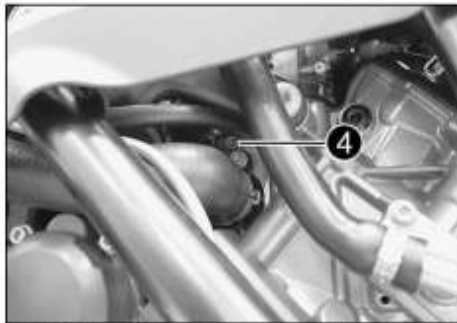
Height difference A	50 cm (19.7 in)
----------------------------	-----------------



- Remove radiator cap **1** and bleeder screw **2** of the radiator.



- Remove the cable ties.
- Lift heat protector **3** upward.



- Remove bleeder screws ④.
- Add coolant until it exits from the vent holes without bubbles.

Coolant	2.40 l (2.54 qt.)	Coolant (☞ p. 488)
---------	----------------------	--------------------

- Mount and tighten bleeder screws ② and ④ with new seal rings.

Guideline

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

- Completely fill the radiator with coolant and close it with radiator cap ①.
- Position the vehicle on a horizontal surface.
- Remove the cover of the compensating tank.
- Add coolant to the compensating tank until the coolant reaches the specified level.

Guideline

The coolant level must be between MIN and MAX .

- Mount the cover of the compensating tank.
- Position heat protector ③ and secure it with a cable tie.

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 toxic and a health hazard.

- Keep coolant out of the reach of children.
- Do not allow coolant to come into contact with the skin, the eyes and clothing.
- Consult a doctor immediately if coolant is swallowed.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly with water and consult a doctor immediately if coolant gets into the eyes.
- Change clothing if coolant spills onto your clothing.

Condition

The engine is cold.

Preparatory work

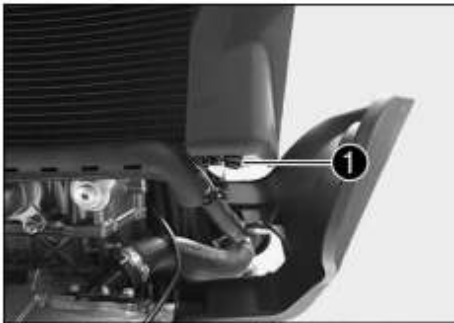
- Raise the vehicle with the center stand. (☞ p. 15)
- Remove the passenger seat. (☞ p. 80)
- Remove the front rider's seat. (☞ p. 79)
- Remove the front side cover. (☞ p. 97)
- Remove the fuel tank cover. (☞ p. 98)
- Remove the mask spoiler. (☞ p. 100)
- Remove the fuel tank. (☞ p. 80)

Main work

- Place an appropriate container under the radiator.
- Remove screw **1** with seal ring.
- Take off radiator cap **2**.
- Completely drain the coolant.
- Mount and tighten screw **1** with a new seal ring.

Guideline

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



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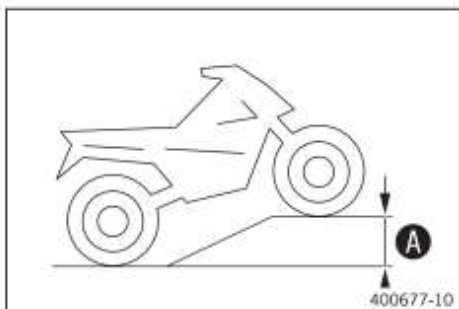


T01895-10

- Place an appropriate container under the engine.
- Remove screw **3** with seal ring.
- Completely drain the coolant.
- Mount and tighten screw **3** with a new seal ring.

Guideline

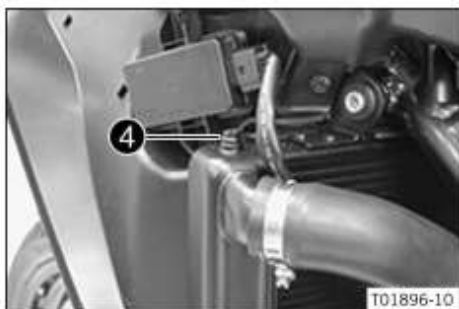
Screw, water pump cover	M6	10 Nm (7.4 lbf ft)
-------------------------	----	--------------------



- Move the vehicle into the position shown and prevent it from rolling away. Height difference **A** must be reached.

Guideline

Height difference A	50 cm (19.7 in)
----------------------------	-----------------



- Remove bleeder screw **4** of the radiator with seal ring.



- Remove the cable ties.
- Lift heat protector **5** upward.



- Remove bleeder screws **6** with seal rings.
- Add coolant until it exits from the vent holes without bubbles.

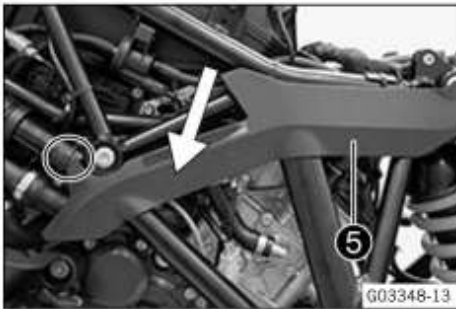
Coolant	2.40 l (2.54 qt.)	Coolant (p. 488)
---------	----------------------	------------------

- Mount and tighten bleeder screws **4** and **6** with new seal rings.

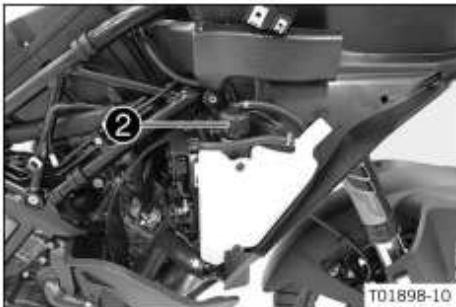
Guideline

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





- Position heat protector **5** and secure it with a cable tie.



- Completely fill the radiator with coolant and close it with radiator cap **2**.



- Position the vehicle on a horizontal surface.
- Remove cover **7** of the compensating tank.
- Add coolant to the compensating tank until the coolant reaches the specified level.

Guideline

The coolant level must be between **MIN** and **MAX**.

- Mount the cover of the compensating tank.

Finishing work

- Install the fuel tank. (☞ p. 83)
- Install the mask spoiler. (☞ p. 101)
- Install the fuel tank cover. (☞ p. 99)
- Install the front side cover. (☞ p. 97)
- Mount the front rider's seat. (☞ p. 79)
- Mount the passenger seat. (☞ p. 80)



Danger

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

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

- Start the engine and let it warm up.
- 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.
- Remove the vehicle from the center stand. (☞ p. 15)

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 toxic and a health hazard.

- Keep coolant out of the reach of children.
- Do not allow coolant to come into contact with the skin, the eyes and clothing.
- Consult a doctor immediately if coolant is swallowed.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly with water and consult a doctor immediately if coolant gets into the eyes.
- Change clothing if coolant spills onto your clothing.

Condition

The engine is cold.
The radiator is completely full.

Preparatory work

- Check the coolant level in the compensating tank. (📖 p. 330)
- Remove the front side cover. (📖 p. 97)



Info

Only disassemble the right-hand side.



Main work

- Remove cover **1**.
- Remove cover **2** 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. 488)

- Mount cover ② of the compensating tank.
- Mount cover ①.

Finishing work

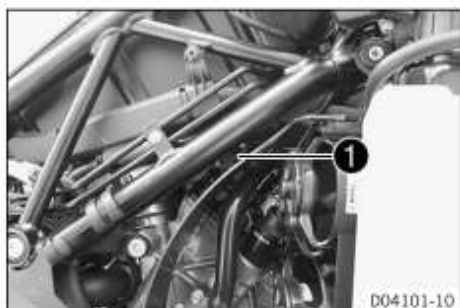
- Install the front side cover. (☞ p. 97)



24.1 Checking the valve clearance

Condition

The air filter is removed.



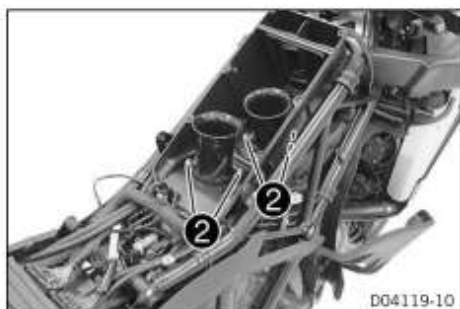
- Remove spring band clamp **1**.

Spring band clamps plier (60029057100) (見 p. 497)



- Pull off the air release hose.

- Remove the cable ties.



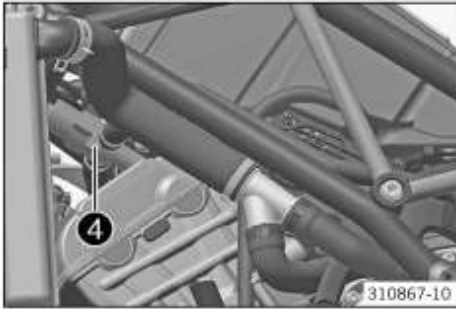
- Remove screws **2** with bushings.
- Take off the intake trumpets.



- Press intake snorkel **3** forwards out of the air filter box.



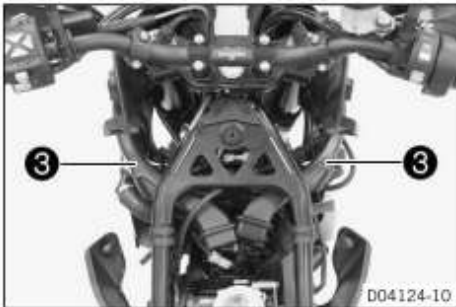
- Raise the lower part of the air filter box and pull it back gently.



- Remove SAS valve ④ from the holder.



- Take off the lower part of the air filter box.



- Remove intake snorkel ③ toward the rear.



- Remove screws ⑤.
- Remove the fuel hose with the guide.



- Remove screws ⑥.
- Remove the lower fairing section.

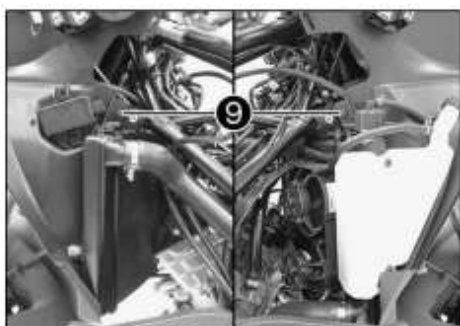


- Disconnect plug-in connector 7.

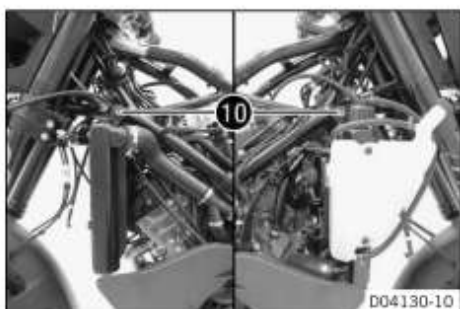
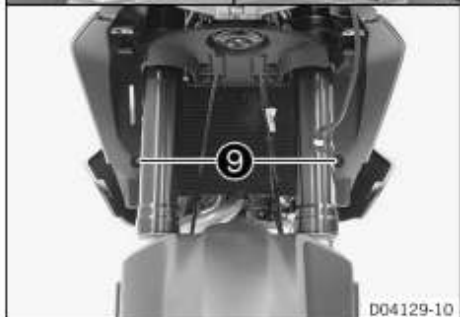


(EU/US/CN)

- Unplug connector 8.



- Remove screws 9.
- Remove the inside cover on both sides.

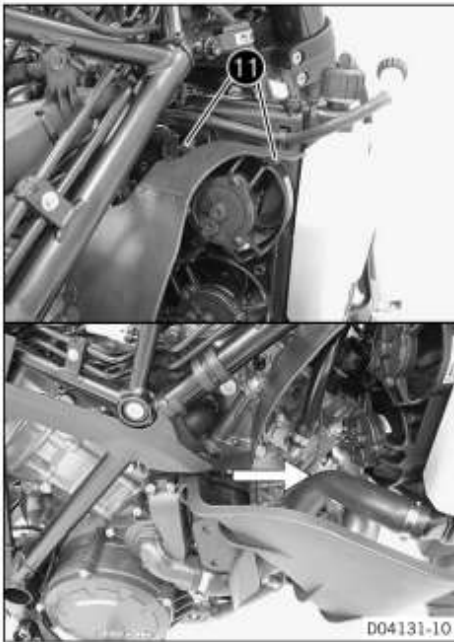


- Remove screws 10.
- Detach the radiator on both sides.

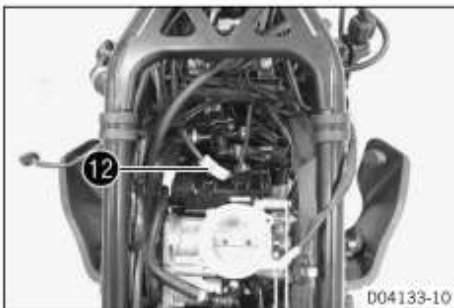


Info

Pay attention to the cooling fins.



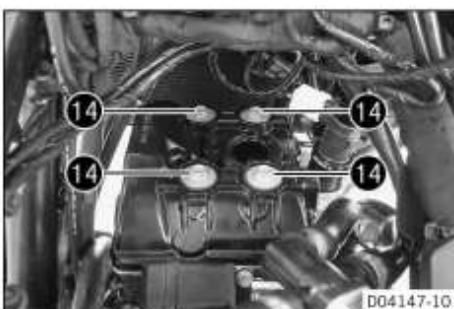
- Remove screws **11**.
- Pull the heat protector off the holder from the front and remove protector.



- Disconnect plug-in connector **12**.
- Pull the SAS valve back and fix it into position.



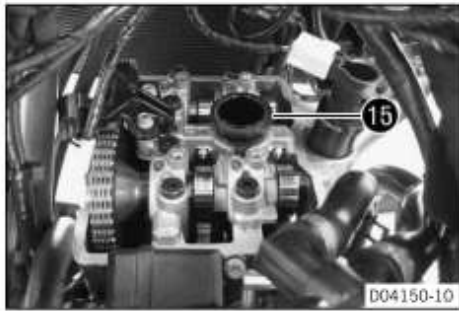
- Detach connector **13** of the ignition coil.
- Remove the ignition coil.



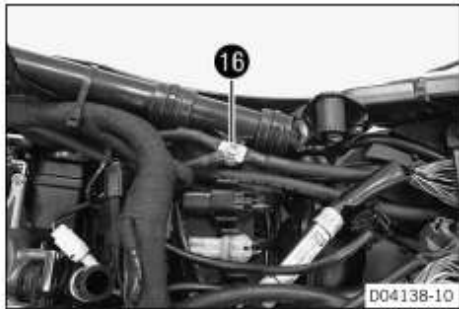
- Remove the spark plug using a special tool.

Spark plug wrench with link (77229172000) (☞ p. 504)

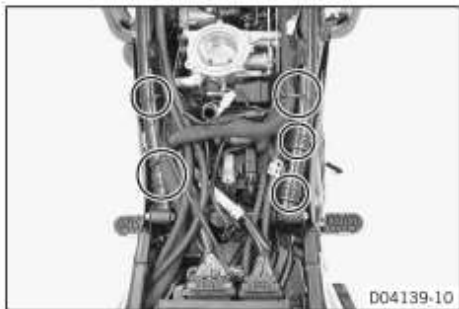
- Remove screws **14**.
- Take off the valve cover with the gasket.



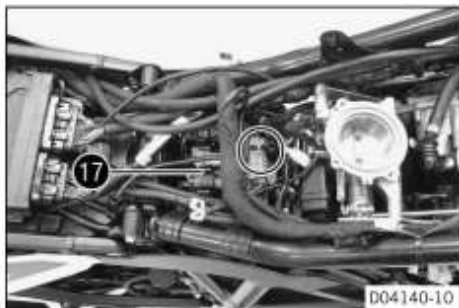
- Remove gasket 15.



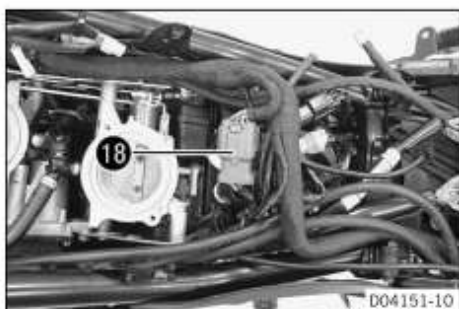
- Remove screw 16 with the washer.



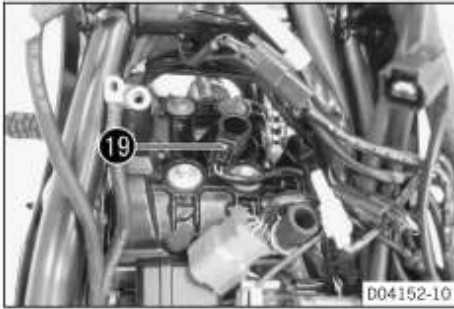
- Remove the cable ties.
- Push the cables slightly to the side.



- Remove the cable ties.
- Loosen all plug-in connectors from connector holder 17.
- Remove the plug holder.

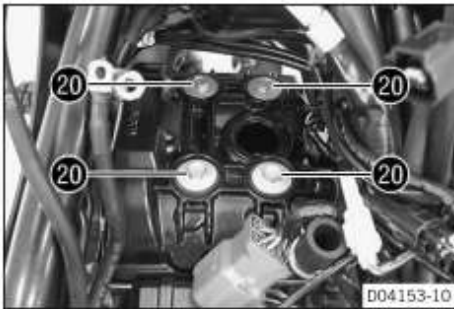


- Disconnect plug-in connector 18.

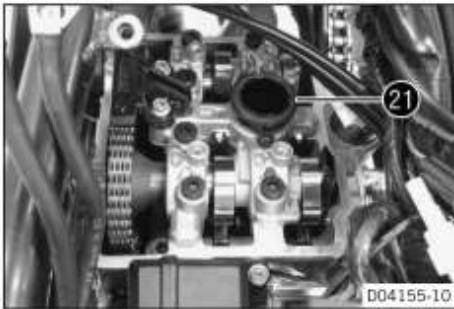


- Detach connector 19 of the ignition coil.
- Remove the ignition coil.
- Remove the spark plug using a special tool.

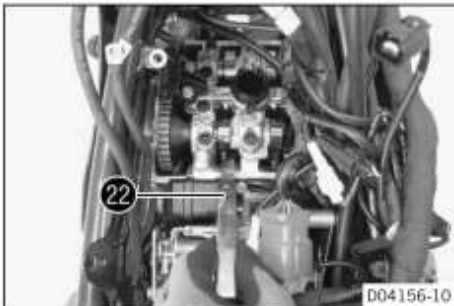
Spark plug wrench with link (77229172000) (p. 504)



- Remove screws 20.
- Take off the valve cover with the gasket.



- Remove gasket 21.
- Set the engine to ignition top dead center of the rear cylinder. (p. 223)



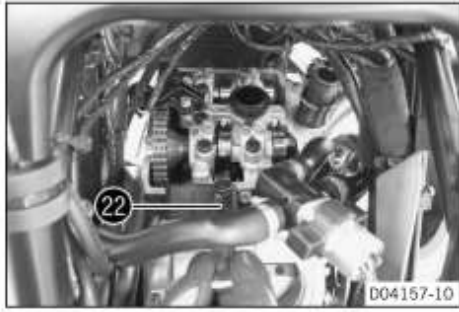
- On all valves, check the valve clearance between the camshaft and cam lever with special tool 22.

Guideline

Valve clearance	
Exhaust at: 20 °C (68 °F)	0.25 ... 0.30 mm (0.0098 ... 0.0118 in)
Intake at: 20 °C (68 °F)	0.10 ... 0.15 mm (0.0039 ... 0.0059 in)

Feeler gauge (59029041100) (p. 496)

- * If the valve clearance does not meet specifications:
 - Set the valve clearance of the rear cylinder. (p. 356)
- Set the engine to ignition top dead center of the front cylinder. (p. 224)



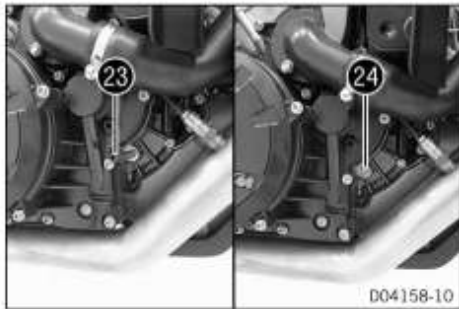
- On all valves, check the valve clearance between the camshaft and cam lever with special tool 22.

Guideline

Valve clearance	
Exhaust at: 20 °C (68 °F)	0.25 ... 0.30 mm (0.0098 ... 0.0118 in)
Intake at: 20 °C (68 °F)	0.10 ... 0.15 mm (0.0039 ... 0.0059 in)

Feeler gauge (59029041100) (p. 496)

- » If the valve clearance does not meet specifications:
 - Set the valve clearance of the front cylinder. (p. 357)



- Remove special tool 23.
- Crank the engine several times. Check the valve clearance and correct it if necessary.
- Remove special tool 23 and mount and tighten screw 24 with washer.

Guideline

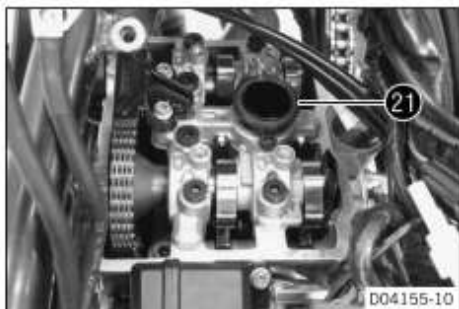
Plug, crankshaft retainer	M8	15 Nm (11.1 lbf ft)
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- Mount and tighten screw plug 25 with the O-ring.

Guideline

Screw plug, alternator cover	M24x1.5	8 Nm (5.9 lbf ft)
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- Mount gasket 21.



- Clean and degrease the valve cover seal.
- Apply a thin layer of sealing compound to area **A**.

Loctite® 5910



Info

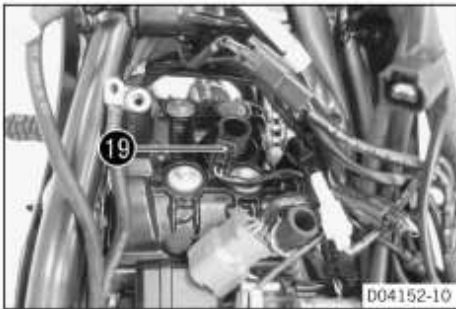
The rear valve cover is equipped with a connector for the engine vent.
The front valve cover is not equipped with a connector for the engine vent.



- Put the valve cover in place with the gasket. Mount and tighten screws **20**.

Guideline

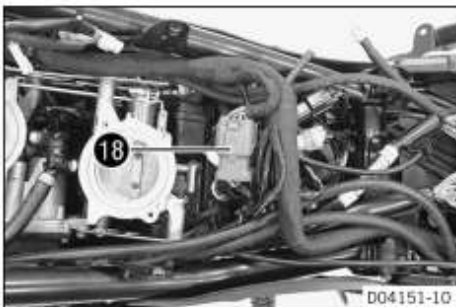
Screw, valve cover	M6	10 Nm (7.4 lbf ft)
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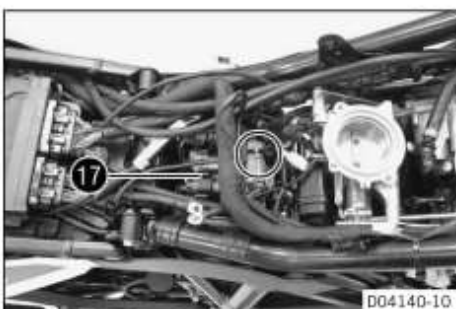
- Mount and tighten the spark plug using a special tool.

Spark plug wrench with link (77229172000) (see p. 504)

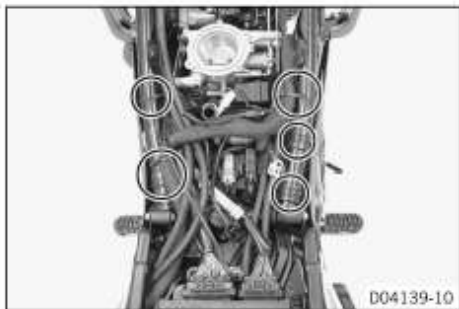
- Mount the ignition coil.
- Attach connector **19** of the ignition coil.
- ✓ The white connector is connected to the outer ignition coil.



- Join plug-in connector **18**.



- Position the plug holder.
- Connect all plug-in connectors in connector holder **17**.
- Mount the cable ties.



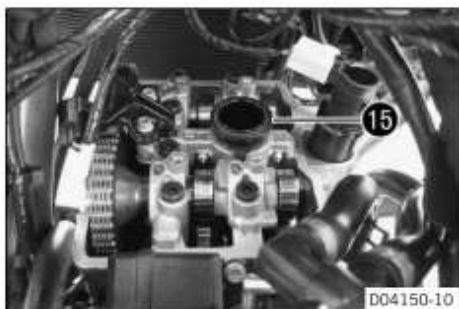
- Route the cables without tension.
- Mount the cable ties.



- Mount and tighten screw **16** with washer.

Guideline

Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
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- Position gasket **15**.

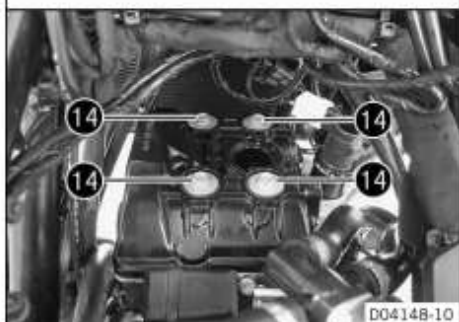


- Clean and degrease the valve cover seal.
- Apply a thin layer of sealing compound to area **B**.

Loctite® 5910

i Info

The rear valve cover is equipped with a connector for the engine vent.
The front valve cover is not equipped with a connector for the engine vent.



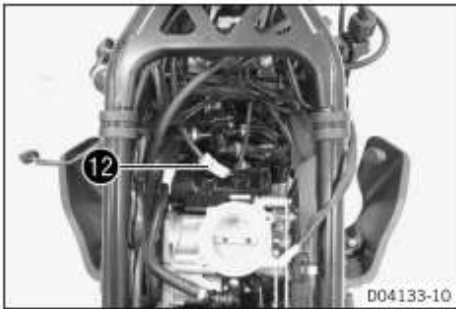
- Mount the valve cover with the gasket.
- Mount and tighten screws **14**.

Guideline

Screw, valve cover	M6	10 Nm (7.4 lbf ft)
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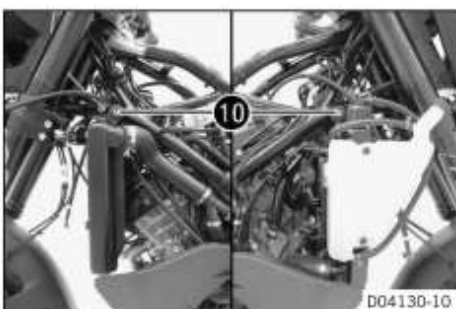
- Mount and tighten the spark plug using a special tool.
- Spark plug wrench with link (77229172000) (見 p. 504)
- Mount the ignition coil.
 - Attach connector 13 of the ignition coil.
 - ✓ The white connector is connected to the outer ignition coil.



- Position the SAS valve.
- Join plug-in connector 12.



- Position the heat protector and mount to holder.
- Mount and tighten screws 11.



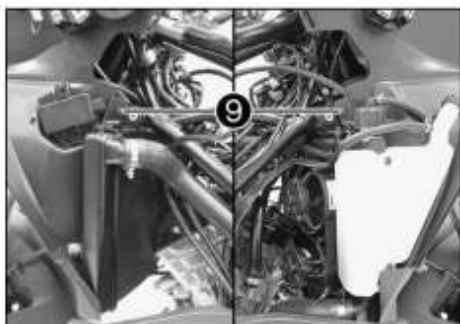
- Attach the radiator on both sides.

i Info
Pay attention to the cooling fins.

- Mount and tighten screws 10.

Guideline

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



- Position the inside cover on both sides.
- Mount and tighten screws **9**.

Guideline

Screw, cover part	M5	3.5 Nm (2.58 lbf ft)
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D04129-10



D04128-10

(EU/US/CN)

- Plug in connector **8**.



D04127-10

- Join plug-in connector **7**.

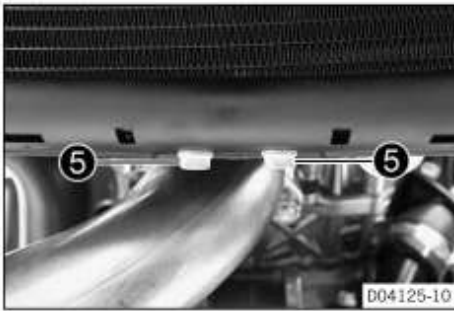


D04126-10

- Position the lower fairing section.
- Mount and tighten screws **6**.

Guideline

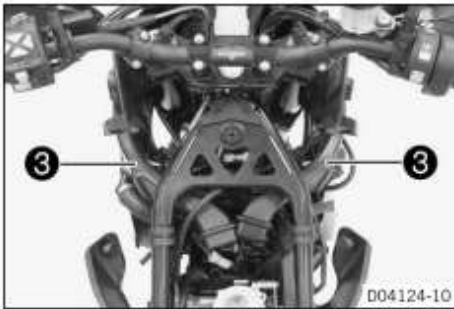
Screw, cover part	M5	3.5 Nm (2.58 lbf ft)
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- Position the fuel hose with the guide.
- Mount and tighten screws 5.

Guideline

Remaining screws, chassis	M5	5 Nm (3.7 lbf ft)
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- Position intake snorkel 3.

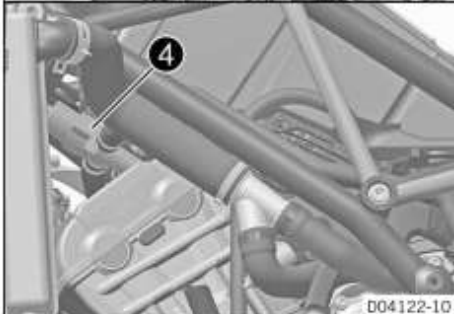


- Position the lower part of air filter box in the frame.



Info

Ensure that the O-rings are seated correctly.



- Mount SAS valve 4 on the holder.

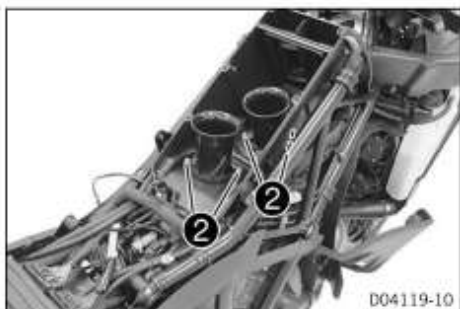


- Mount intake snorkel 3.



Info

Ensure that the seals are seated correctly.



D04119-10

- Position the intake trumpets and mount and tighten screws **2** with bushings.

Guideline

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



D04102-10

- Route the hose without kinks and secure it with cable ties.



D04101-10

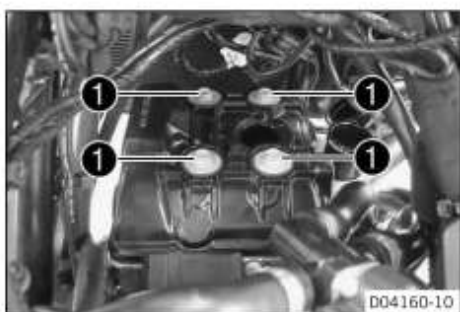
- Mount the vent hose.
- Position spring band clamp **1** with a special tool.

Spring band clamps plier (60029057100) (see p. 497)

24.2 Checking the valve clearance (air filter and spark plugs removed)

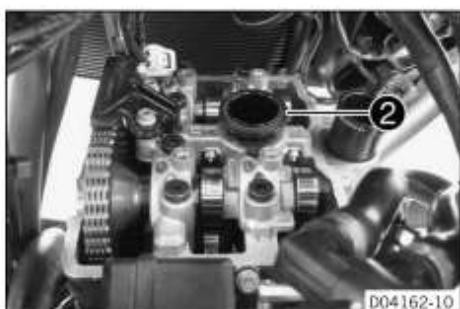
Condition

The air filter and spark plugs are removed.



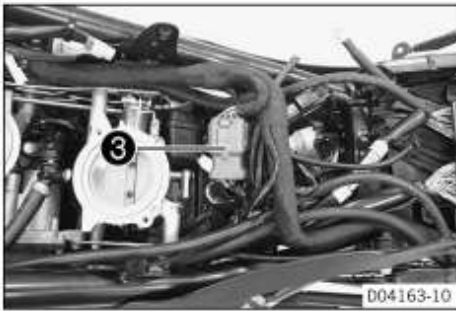
D04160-10

- Remove screws **1**.
- Take off the valve cover with the gasket.

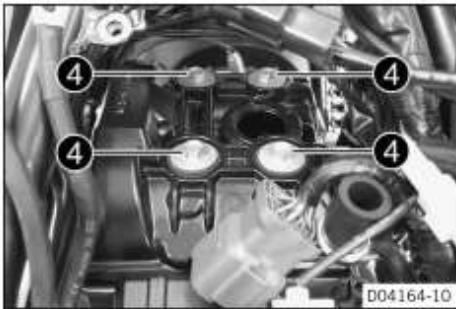


D04162-10

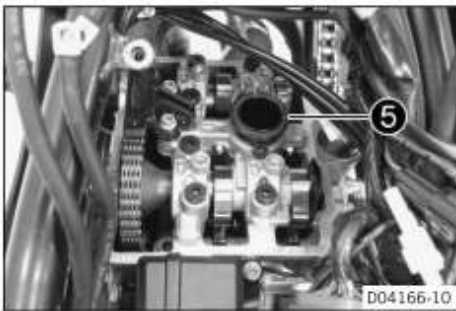
- Remove gasket **2**.



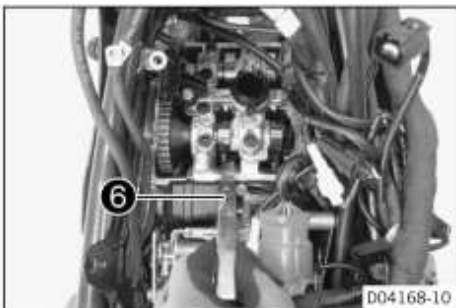
- Disconnect plug-in connector **3**.



- Remove screws **4**.
- Take off the valve cover with the gasket.



- Remove gasket **5**.
- Set the engine to ignition top dead center of the rear cylinder. (p. 223)



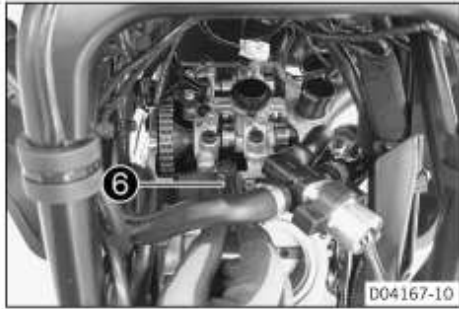
- On all valves, check the valve clearance between the camshaft and cam lever with special tool **6**.

Guideline

Valve clearance	
Exhaust at: 20 °C (68 °F)	0.25 ... 0.30 mm (0.0098 ... 0.0118 in)
Intake at: 20 °C (68 °F)	0.10 ... 0.15 mm (0.0039 ... 0.0059 in)

Feeler gauge (59029041100) (p. 496)

- * If the valve clearance does not meet specifications:
 - Set the valve clearance of the rear cylinder. (p. 356)
- Set the engine to ignition top dead center of the front cylinder. (p. 224)



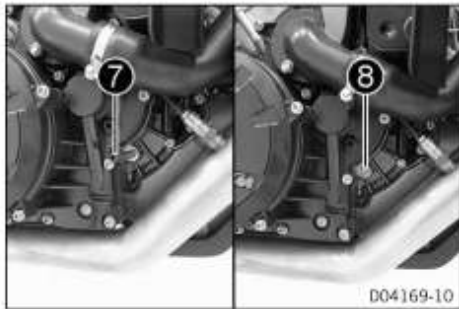
- On all valves, check the valve clearance between the camshaft and cam lever with special tool **6**.

Guideline

Valve clearance	
Exhaust at: 20 °C (68 °F)	0.25 ... 0.30 mm (0.0098 ... 0.0118 in)
Intake at: 20 °C (68 °F)	0.10 ... 0.15 mm (0.0039 ... 0.0059 in)

Feeler gauge (59029041100) (📖 p. 496)

- » If the valve clearance does not meet specifications:
 - Set the valve clearance of the front cylinder. (📖 p. 357)



- Remove special tool **7**.
- Crank the engine several times. Check the valve clearance and correct it if necessary.
- Remove special tool **7** and mount and tighten screw **8** with washer.

Guideline

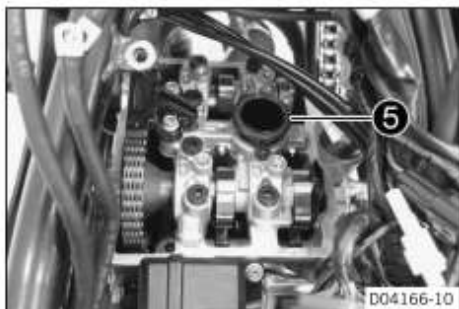
Plug, crankshaft retainer	M8	15 Nm (11.1 lbf ft)
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- Mount and tighten screw plug **9** with O-ring.

Guideline

Screw plug, alternator cover	M24x1.5	8 Nm (5.9 lbf ft)
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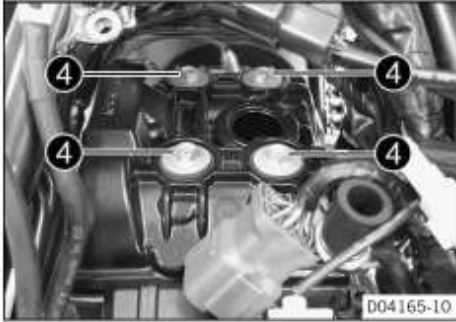
- Mount gasket **5**.



- Clean and degrease the valve cover seal.
- Apply a thin layer of sealing compound to area **A**.

Loctite® 5910

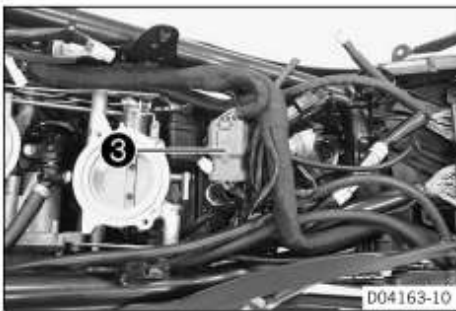
i Info
 The rear valve cover is equipped with a connector for the engine vent.
 The front valve cover is not equipped with a connector for the engine vent.



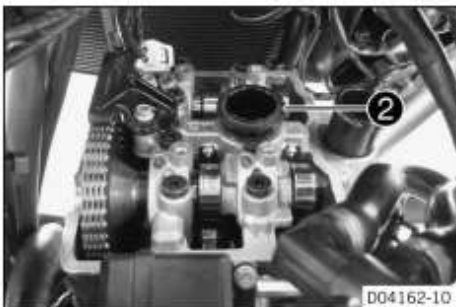
- Put the valve cover in place with the gasket. Mount and tighten screws **4**.

Guideline

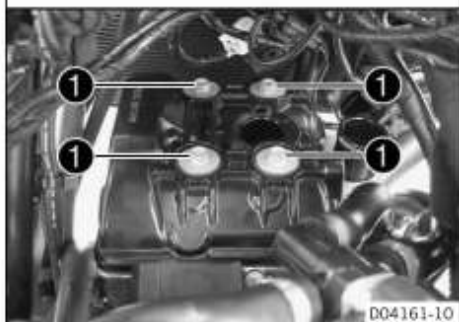
Screw, valve cover	M6	10 Nm (7.4 lbf ft)
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- Join plug-in connector **3**.



- Position gasket **2**.



- Clean and degrease the valve cover seal.
- Apply a thin layer of sealing compound to area **B**.

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i Info

The rear valve cover is equipped with a connector for the engine vent.
The front valve cover is not equipped with a connector for the engine vent.

- Mount and tighten screws **1**.

Guideline

Screw, valve cover	M6	10 Nm (7.4 lbf ft)
--------------------	----	--------------------

24.3 Setting the valve clearance of the rear cylinder

i Info

For purposes of illustration, the following operations are shown with the engine deinstalled.
Removal is not necessary.

Condition

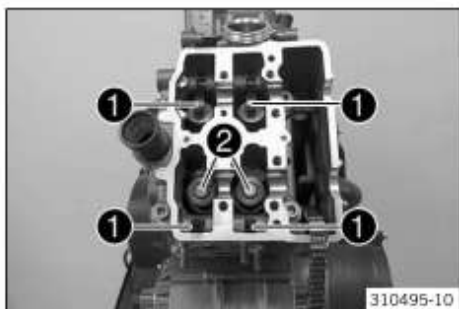
The engine is positioned at ignition top dead center of the rear cylinder

Preparatory work

- Disassemble the camshafts of the rear cylinder. (☞ p. 357)

Main work

- Lift cam lever **1**.
- Remove shims **2** and set them down according to the installation position.
- Correct and insert the shims as indicated by the results of the valve clearance check.



Finishing work

- Install the camshafts of the rear cylinder. (☞ p. 358)

24.4 Setting the valve clearance of the front cylinder

i Info

For purposes of illustration, the following operations are shown with the engine deinstalled. Removal is not necessary.

Condition

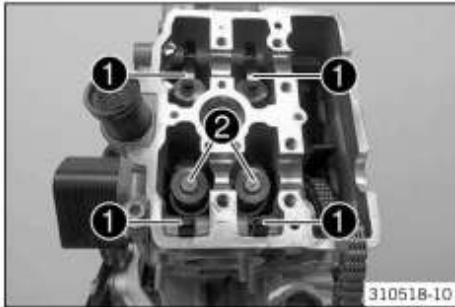
The engine is positioned at ignition top dead center of the front cylinder

Preparatory work

- Disassemble the camshafts of the front cylinder. (☞ p. 359)

Main work

- Lift cam lever **1**.
- Remove shims **2** and set them down according to the installation position.
- Correct and insert the shims as indicated by the results of the valve clearance check.



Finishing work

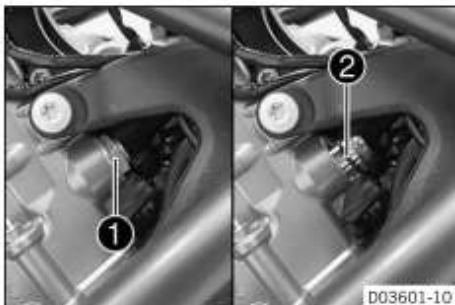
- Install the camshafts of the front cylinder. (☞ p. 360)

24.5 Disassembling the camshafts of the rear cylinder

Condition

The heat protector right is removed and the engine is positioned at ignition top dead center of the rear cylinder

- Remove screw **1** with the O-ring.
- Pull out timing chain tensioner **2**.

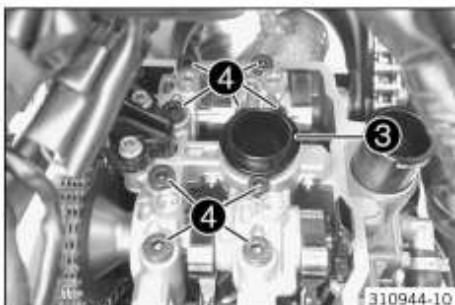


- Remove spark plug shaft insert **3**.
- Loosen and remove screws **4** from the outside to the inside.

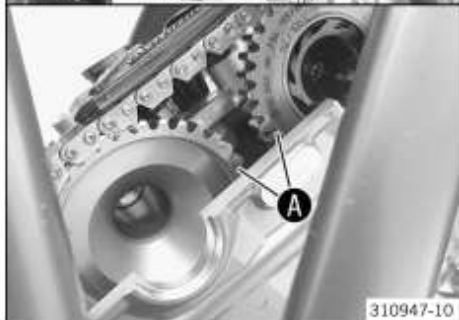
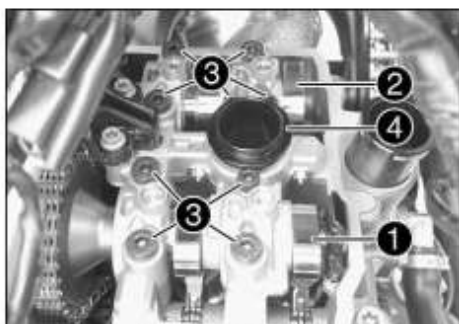
i Info

The cams should not activate the valves.

- Remove camshaft bearing support.
- Remove timing chain from the rear sprocket. Remove camshafts.



24.6 Installing the camshafts of the rear cylinder



310947-10

- Pull up the timing chain and insert intake camshaft **1**.

i Info

The intake camshaft is marked **eh**.

- Place a timing chain over the rear sprocket of the intake camshaft.
- Ensure that the bleeder is seated correctly.
- Slip in exhaust camshaft **2**.

i Info

The exhaust camshaft is marked **ah**.

- Place the timing chain over the rear sprocket and position the camshaft in the bearing seat.
- ✓ Markings **A** must be flush with the edge of the cylinder head.
- Mount the camshaft bearing support.
- Mount screws **3** and tighten them from the inside to the outside.

Guideline

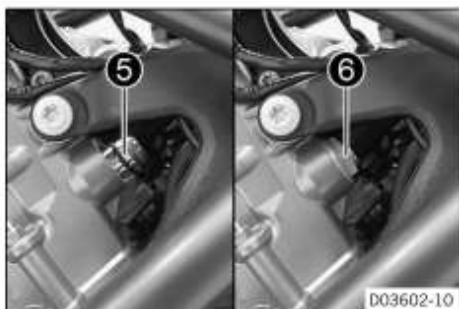
Screw, camshaft bearing support	M6 – 10.9	10 Nm (7.4 lbf ft)
Screw, camshaft bearing support	M8 – 10.9	Step 1 10 Nm (7.4 lbf ft) Step 2 18 Nm (13.3 lbf ft)
Screw, camshaft bearing support	M8 – 10.9	Step 1 8.5 Nm (6.27 lbf ft) Step 2 14.5 Nm (10.7 lbf ft) Only applies when using: Hexagon socket bit (61229025000) (p. 501)

Hexagon socket bit (61229025000) (p. 501)

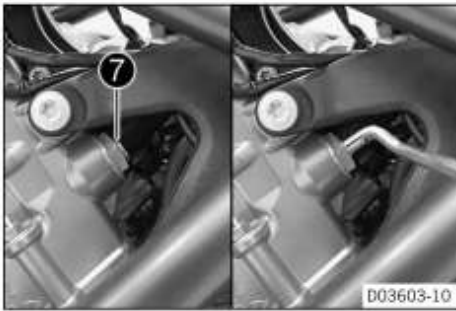
- Grease the O-rings and mount spark plug shaft insert **4**.
- Prepare the timing chain tensioner for installation. (p. 268)
- After it has been positioned in the installation location, insert a timing chain tensioner **5** with a new O-ring.
- Mount and tighten screw plug **6** with a new seal ring.

Guideline

Plug, timing-chain tensioner	M24x1.5	25 Nm (18.4 lbf ft)
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D03602-10



- Remove screw **7** and use a special tool to push the timing chain tensioner toward the timing chain.

Release device for timing chain tensioner (61229021000)
(see p. 500)

✓ The timing chain tensioner unlocks.

- Mount and tighten screw **7**.

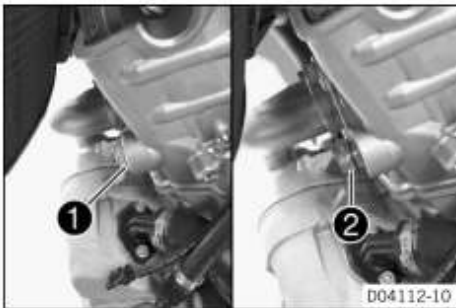
Guideline

Screw, timing chain tensioner release	M10x1	10 Nm (7.4 lbf ft)
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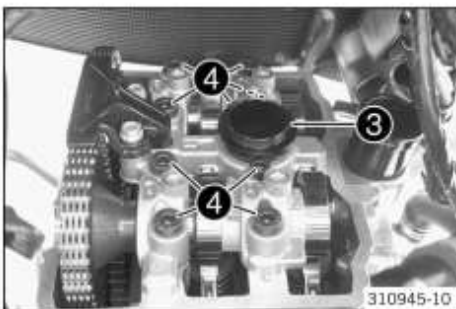
24.7 Disassembling the camshafts of the front cylinder

Condition

The engine is positioned at ignition top dead center of the front cylinder



- Remove screw **1** with the O-ring.
- Pull out timing chain tensioner **2**.

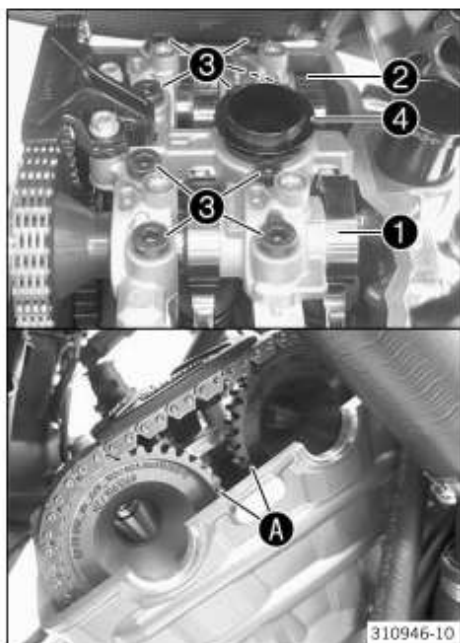


- Remove the spark plug shaft insert **3**.
- Loosen and remove screws **4** from the outside to the inside.

i Info
The cams should not activate the valves.

- Remove the camshaft bearing support.
- Remove the timing chain from the rear sprocket. Remove the camshafts.

24.8 Installing the camshafts of the front cylinder



- Pull up the timing chain and insert intake camshaft **1**.



Info

The intake camshaft is marked **ev**.

- Place a timing chain over the rear sprocket of the intake camshaft.
- Slip in exhaust camshaft **2**.



Info

The exhaust camshaft is marked **av**.

- Place the timing chain over the rear sprocket and position the camshaft in the bearing seat.
 - ✓ Markings **A** must be flush with the edge of the cylinder head.
- Mount the camshaft bearing support.
- Mount screws **3** and tighten them from the inside to the outside.

Guideline

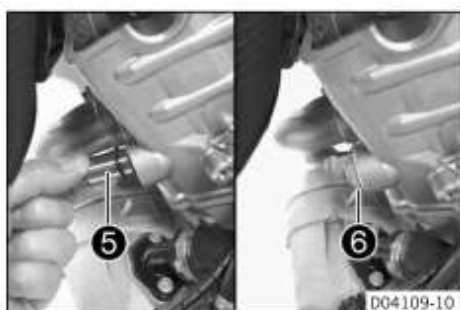
Screw, camshaft bearing support	M6 – 10.9	10 Nm (7.4 lbf ft)
Screw, camshaft bearing support	M8 – 10.9	Step 1 10 Nm (7.4 lbf ft) Step 2 18 Nm (13.3 lbf ft)
Screw, camshaft bearing support	M8 – 10.9	Step 1 8.5 Nm (6.27 lbf ft) Step 2 14.5 Nm (10.7 lbf ft) Only applies when using: Hexagon socket bit (61229025000) (p. 501)

Hexagon socket bit (61229025000) ([p. 501](#))

- Grease the O-rings and mount spark plug shaft insert **4**.
- Prepare the timing chain tensioner for installation. ([p. 268](#))
- After it has been positioned in the installation location, insert a timing chain tensioner **5** with a new O-ring.
- Mount and tighten screw plug **6** with a new seal ring.

Guideline

Plug, timing-chain tensioner	M24x1.5	25 Nm (18.4 lbf ft)
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- Remove screw 7 and use a special tool to push the timing chain tensioner toward the timing chain.

Release device for timing chain tensioner (61229021000) (see p. 500)

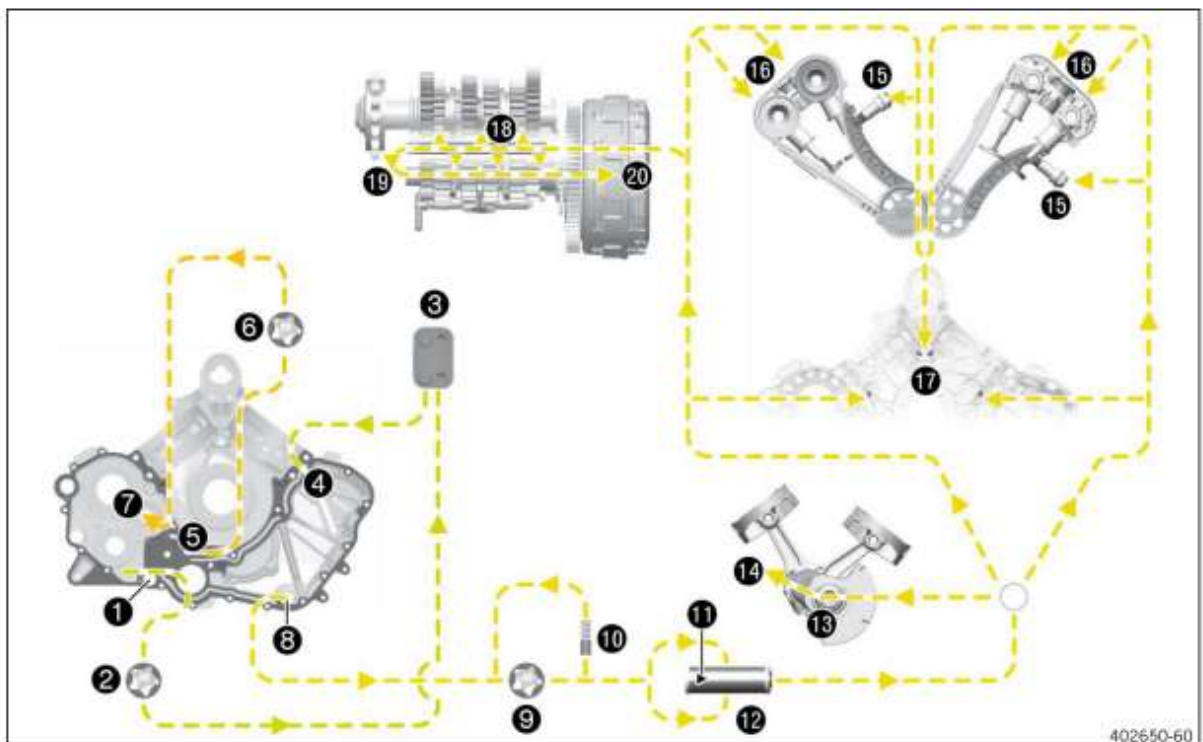
✓ The timing chain tensioner is unlocked.

- Mount and tighten screw 7.

Guideline

Screw, timing chain tensioner release	M10x1	10 Nm (7.4 lbf ft)
---------------------------------------	-------	--------------------

25.1 Oil circuit



402650-60

Oil circuit of middle suction pump

- ① Oil screen of oil drain plug in gearbox
- ② Middle suction pump
- ③ Heat exchanger
- ④ Oil exit in oil tank

Oil circuit of left suction pump

- ⑤ Crankcase
- ⑥ Left suction pump
- ⑦ Lubricating slots in gearbox

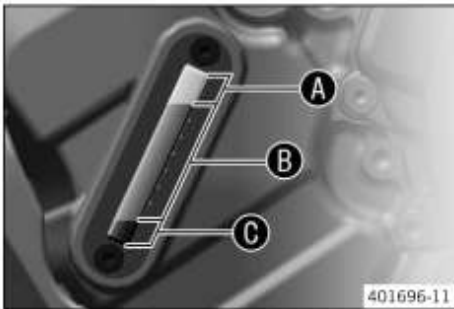
Oil circuit of force pump

- ⑧ Oil screen of oil drain plug in oil tank
- ⑨ Force pump
- ⑩ Oil pressure control valve
- ⑪ Bypass valve
- ⑫ Oil filter
- ⑬ Crankshaft
- ⑭ Oil nozzle for alternator cooling
- ⑮ Timing chain tensioner
- ⑯ Camshaft lubrication/oil nozzles for valve gear lubrication
- ⑰ Oil nozzles for piston cooling
- ⑱ Oil spray tube
- ⑲ Oil nozzle for clutch lubrication
- ⑳ Clutch

25.2 Checking the engine oil level

i Info

Oil consumption depends on the riding style and the operating conditions.



Condition

The engine is at operating temperature.

Preparatory work

- Stand the motorcycle upright on a horizontal surface.

Main work

- Check the engine oil level in the engine oil level viewer.

i Info

After switching off the engine, wait one minute before checking the level.

The engine oil level should be in the upper part of the range **B** of the engine oil level viewer.

- » When the engine oil level is in area **A** of the engine oil level viewer:
 - Do not add engine oil.
- » When the engine oil level is in area **B** of the engine oil level viewer:
 - Engine oil can be added.
- » When the engine oil level is in area **C** of the engine oil level viewer:
 - Add engine oil. (📖 p. 366)

25.3 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.



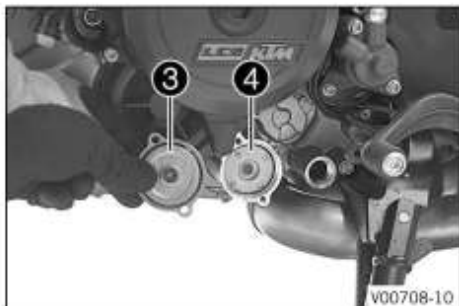
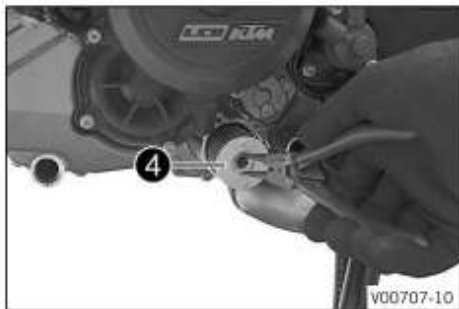
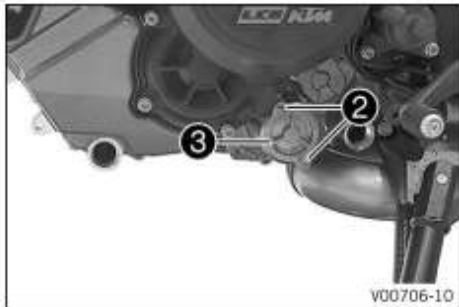
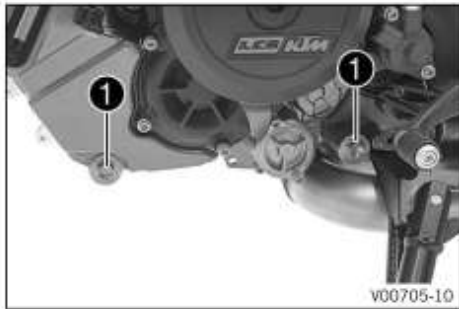
Note

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.

Preparatory work

- Remove the engine guard. (📖 p. 46)



Main work

- Stand the motorcycle on its side stand on a horizontal surface.
- Place an appropriate container under the engine.
- Remove oil drain plugs **1** with magnets, O-rings, and oil screens.

- Remove screws **2**. Take off oil filter cover **3** with O-ring.

- Pull oil filter **4** out of the oil filter housing.

Lock ring plier (51012011000) (表 p. 494)

- Completely drain the engine oil.
- Thoroughly clean the parts and sealing surface.

- Insert new oil filter **4**.

Info

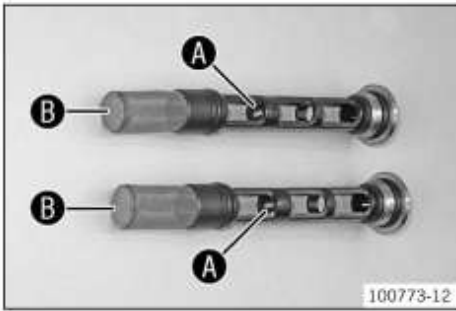
Only insert the oil filter by hand.

- Lubricate the O-ring of the oil filter cover. Mount oil filter cover **3**.

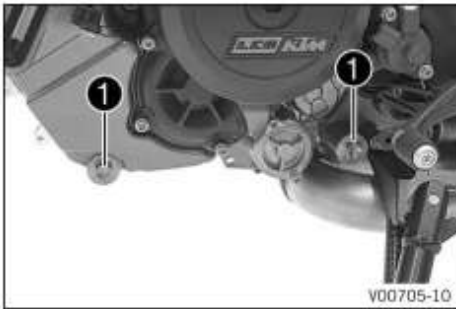
- Mount and tighten screws **2**.

Guideline

Remaining engine screws	M5	6 Nm (4.4 lbf ft)
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- Thoroughly clean magnets **A** and oil screens **B** of the oil drain plugs.



- Mount and tighten oil drain plugs **1** with magnets, O-rings, and oil screens.

Guideline

Oil drain plug	M20x1.5	20 Nm (14.8 lbf ft)
----------------	---------	---------------------



- Have the entire filling quantity available.

Engine oil Ambient temperature: $\geq 0\text{ }^{\circ}\text{C}$ ($\geq 32\text{ }^{\circ}\text{F}$)	3.60 l (3.8 qt.)	Engine oil (SAE 10W/50) (p. 488)
Engine oil Ambient temperature: $< 0\text{ }^{\circ}\text{C}$ ($< 32\text{ }^{\circ}\text{F}$)		Engine oil (SAE 5W/40) (p. 489)

- Add the oil quantity in two separate operations.
- Remove filler plug **5** with the O-ring and fill with the initial partial quantity.

Engine oil (1st partial quantity) approx. Ambient temperature: $\geq 0\text{ }^{\circ}\text{C}$ ($\geq 32\text{ }^{\circ}\text{F}$)	3.0 l (3.2 qt.)	Engine oil (SAE 10W/50) (p. 488)
Engine oil (1st partial quantity) approx. Ambient temperature: $< 0\text{ }^{\circ}\text{C}$ ($< 32\text{ }^{\circ}\text{F}$)		Engine oil (SAE 5W/40) (p. 489)

- Mount filler plug **5** with the O-ring.



Danger

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

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



- Start the engine and check for tightness.
- Switch off the engine.
- Remove the filler plug with the O-ring and add the second partial quantity up to the upper marking **C** on the engine oil level viewer.

Engine oil (2nd partial quantity) approx. Ambient temperature: $\geq 0\text{ }^{\circ}\text{C}$ ($\geq 32\text{ }^{\circ}\text{F}$)	0.60 l (0.63 qt.)	Engine oil (SAE 10W/50) (see p. 488)
Engine oil (2nd partial quantity) approx. Ambient temperature: $< 0\text{ }^{\circ}\text{C}$ ($< 32\text{ }^{\circ}\text{F}$)		Engine oil (SAE 5W/40) (see p. 489)

- Mount the filler plug with the O-ring.



Danger

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

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

- Start the engine and check for tightness.

Finishing work

- Check the engine oil level. (see p. 363)
- Install the engine guard. (see p. 47)

25.4 Adding engine oil



Info

Too little engine oil or poor-quality engine oil results in premature wear to the engine. The engine may be damaged if the engine oil level is too high.

Condition

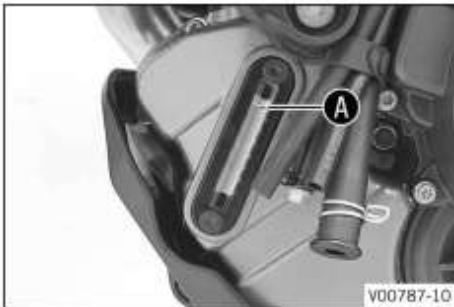
The engine is at operating temperature.

Preparatory work

- Stand the motorcycle upright on a horizontal surface.
- Check the engine oil level. (see p. 363)

**Main work**

- Remove filler plug ① with the O-ring.



- Add the engine oil to upper marking A on the engine oil level viewer.

Condition

Ambient temperature: $\geq 0\text{ }^{\circ}\text{C}$ ($\geq 32\text{ }^{\circ}\text{F}$)

Engine oil (SAE 10W/50) (☞ p. 488)

Condition

Ambient temperature: $< 0\text{ }^{\circ}\text{C}$ ($< 32\text{ }^{\circ}\text{F}$)

Engine oil (SAE 5W/40) (☞ p. 489)

**Info**

In order to achieve optimal engine oil performance, it is not advisable to mix different engine oils. KTM recommends changing the engine oil.

- Mount the filler plug with the O-ring.

**Danger**

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

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

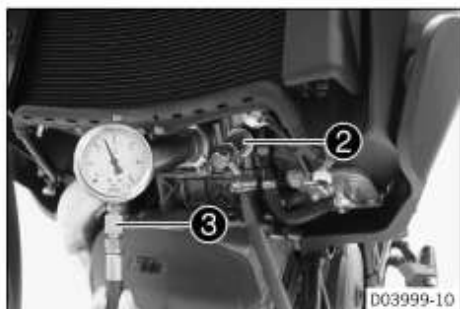
- Start the engine and check for tightness.

Finishing work

- Check the engine oil level. (☞ p. 363)

25.5 Checking the oil pressure

- Check the engine oil level. (☞ p. 363)
- Remove screw ①.



- Mount and tighten special tool ②.

Guideline

Oil pressure adapter	M10x1	10 Nm (7.4 lbf ft)
----------------------	-------	--------------------

Oil pressure adapter (77329006000) (☞ p. 504)

- Connect pressure tester ③ without the t-plate on the special tool.

Pressure testing tool (61029094000) (☞ p. 498)



Danger

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

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

- Start the engine and let it warm up.
- Check the oil pressure.

Oil pressure	
Coolant temperature: ≥ 60 °C (≥ 140 °F)	1.8 ... 4.5 bar (26 ... 65 psi)
Idle speed	

- * If the measured value is less than the specification:
 - Check the oil pumps for wear. Check that all oil holes are clear.
- Switch off the engine.



Warning

Danger of burns Some vehicle components get very hot when the machine is driven.

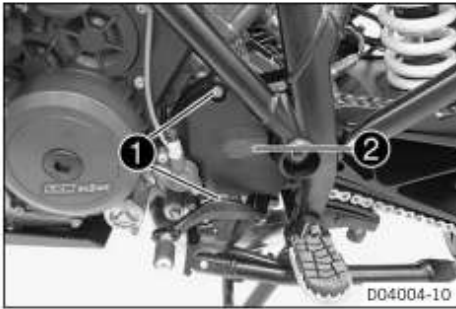
- Wear appropriate protective clothing and safety gloves. In case of burns, rinse immediately with lukewarm water.

- Remove the special tools.
- Mount and tighten screw ①.

Guideline

Screw, timing chain tensioner release	M10x1	10 Nm (7.4 lbf ft)
---------------------------------------	-------	--------------------

25.6 Removing the oil nozzle for the clutch lubrication



- Remove screws ①.
- Take off engine sprocket cover ②.



- Remove screws ③.
- Take off the cover.



- Remove screw plug ④ with O-ring.



- Remove oil nozzle ⑤.

Mounting tool (61229035000) (see p. 501)

25.7 Checking/cleaning the oil nozzle for clutch lubrication

Preparatory work

- Remove the oil nozzle for the clutch lubrication. (see p. 369)



Main work

- 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.

Finishing work

- Install the oil nozzle for the clutch lubrication. (☞ p. 370)

25.8 Installing the oil nozzle for the clutch lubrication



- Mount and tighten oil nozzle **1**.

Guideline

Oil nozzle for clutch lubrication	M6x0.75	4 Nm (3 lbf ft)
-----------------------------------	---------	-----------------

Mounting tool (61229035000) (☞ p. 501)



- Mount and tighten screw plug **2** with the O-ring.

Guideline

Plug, clutch lubrication	M10x1	10 Nm (7.4 lbf ft)
--------------------------	-------	--------------------

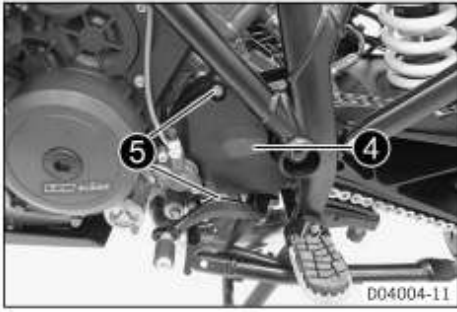


- Position the cover.

- Mount and tighten screws **3**.

Guideline

Remaining engine screws	M6	10 Nm (7.4 lbf ft)
-------------------------	----	--------------------



- Position engine sprocket cover ④.
- Mount and tighten screws ⑤.

Guideline

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

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)	0.15 ... 0.30 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)	0.15 ... 0.30 Ω

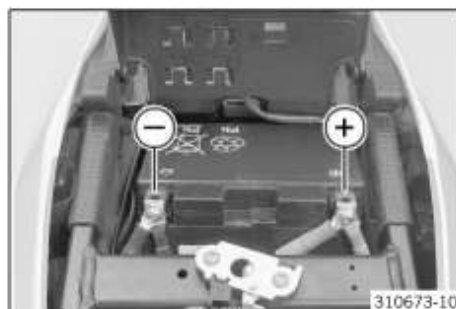
- » If the indicated value does not correspond to the setpoint value:
 - Change the stator.

Stator winding measurement III - check 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)	0.15 ... 0.30 Ω

- » If the indicated value does not correspond to the setpoint value:
 - Change the stator.

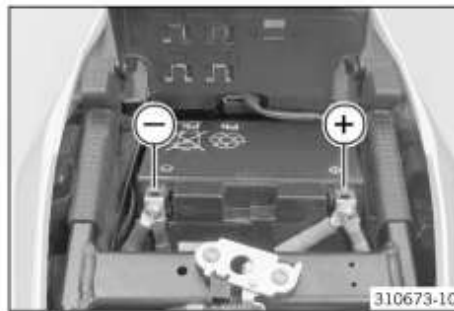


Stator winding I - check short circuit to ground (terminal 31).

- 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.

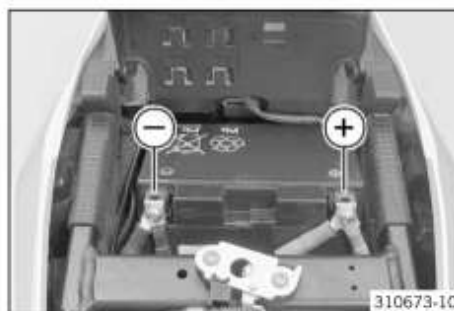


Stator winding II - check short circuit to ground (terminal 31).

- **Ω** Measure the resistance between the specified points.
Stator, connector **HQ** pin **2** – Measuring point **Ground (-)**

Resistance	$\infty \Omega$
------------	-----------------

- » If the indicated value does not correspond to the setpoint value:
 - Change the stator.



Stator winding III - check short circuit to ground (terminal 31).

- **Ω** Measure the resistance between the specified points.
Stator, connector **HQ** pin **3** – Measuring point **Ground (-)**

Resistance	$\infty \Omega$
------------	-----------------

- » If the indicated value does not correspond to the setpoint value:
 - Change the stator.

- Start the motorcycle to check the function. (📖 p. 17)



Stator winding measurement I - check voltage.

- **V** 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)	$\geq 50 \text{ V}$

- » If the indicated value does not correspond to the setpoint value:
 - Change the stator.

Stator winding measurement II - check 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 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 Changing spark plugs (air filter removed)

Condition

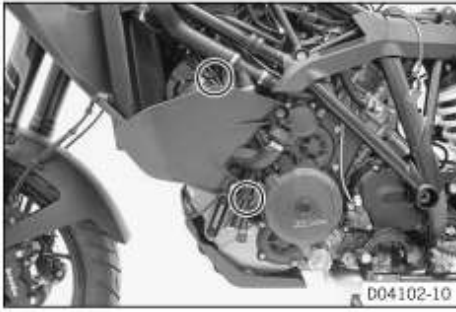
The air filter is removed.

- Remove spring band clamp **1**.

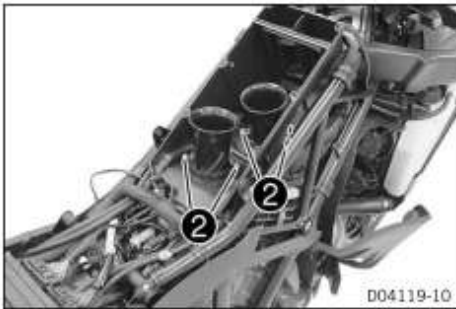
Spring band clamps plier (60029057100) (EB p. 497)

- Pull off the air release hose.

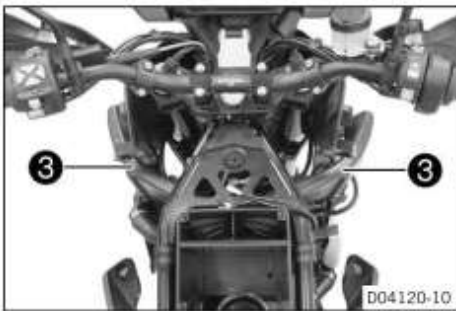




- Remove the cable ties.



- Remove screws 2 with the bushings.
- Take off the intake trumpets.



- Press intake snorkel 3 forwards out of the air filter box.



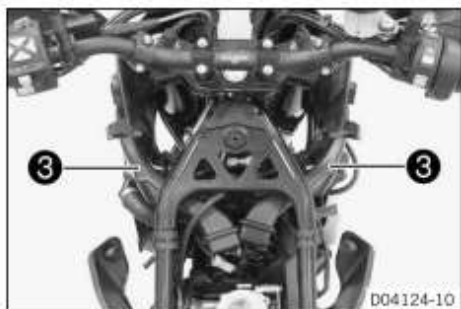
- Raise the lower part of the air filter box and pull it back gently.



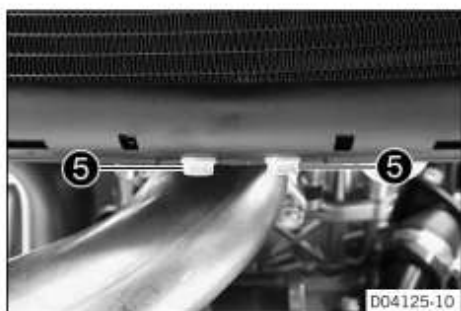
- Remove SAS valve 4 from the holder.



- Take off the lower part of the air filter box.



- Remove intake snorkel **3** toward the rear.



- Remove screws **5**.
- Remove the fuel hose with the guide.



- Remove screws **6**.
- Remove the lower fairing section.

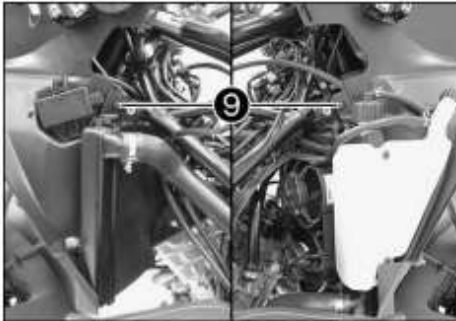


- Disconnect plug-in connector **7**.

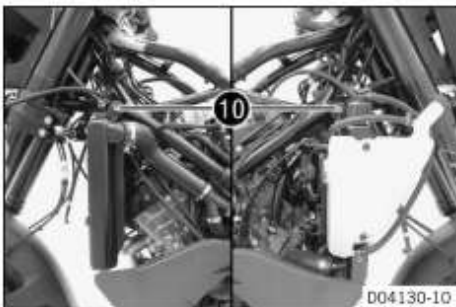
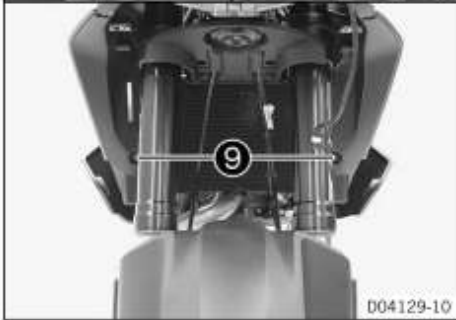


(EU/US/CN)

- Unplug connector 8.



- Remove screws 9.
- Remove the inside cover on both sides.



- Remove screws 10.
- Detach radiator on both sides.

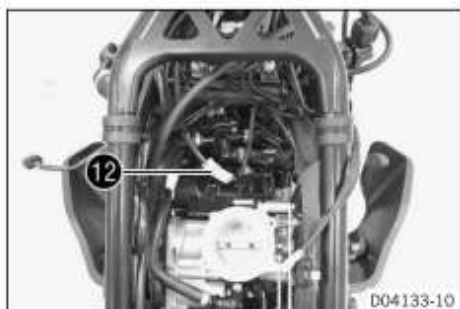
i **Info**
Pay attention to the cooling fins.



- Remove screws 11.
- Pull heat protector off the holder from the front and remove protector.

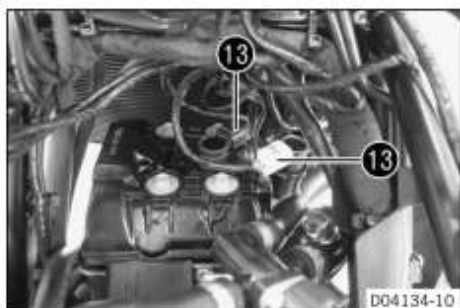


D04131-10



D04133-10

- Disconnect plug-in connector 12.
- Pull the SAS valve back and fix it into position.



D04134-10

- Disconnect connectors 13 of the ignition coils.



D04135-10

- Remove ignition coils 14.



- Remove the spark plug with special tool **15**.

Spark plug wrench with link (77229172000) (see p. 504)
--

- Mount and tighten the new spark plug using the special tool.
Guideline

Spark plug	M12x1.5	18 Nm (13.3 lbf ft)
------------	---------	---------------------



- Remove the spark plug with special tool **15**.

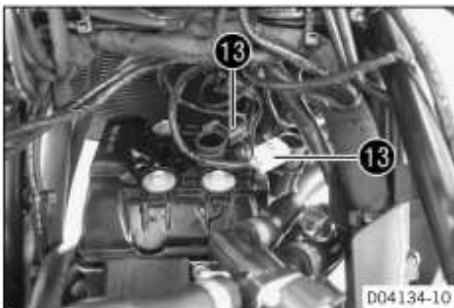
Spark plug wrench with link (77229172000) (see p. 504)
--

- Mount and tighten the new spark plug using the special tool.
Guideline

Spark plug	M10x1	11 Nm (8.1 lbf ft)
------------	-------	--------------------

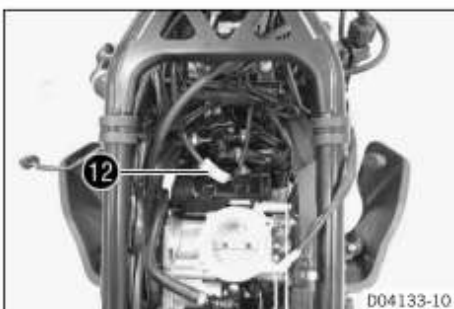


- Mount ignition coils **14**.



- Plug in connectors **13** of the ignition coils.

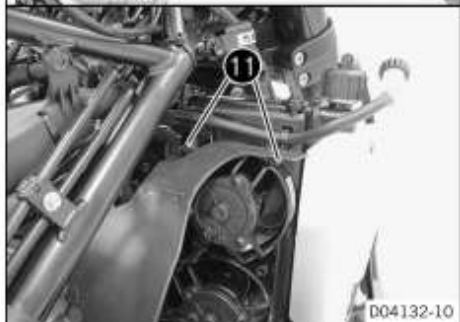
✓ The white connector is connected to the outer ignition coil.



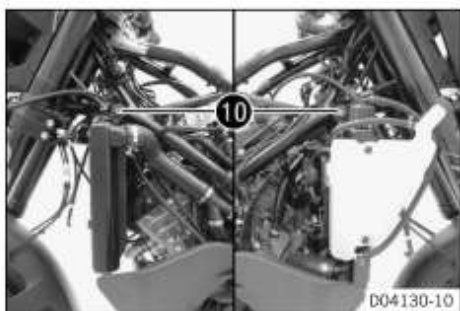
- Position SAS valve.
- Join plug-in connector **12**.



- Position the heat protector and mount to holder.
- Mount and tighten screws **11**.



D04132-10



D04130-10

- Attach radiator on both sides.



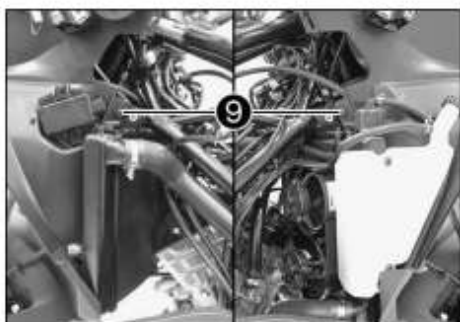
Info

Pay attention to the cooling fins.

- Mount and tighten screws **10**.

Guideline

Remaining screws, chassis	M6	10 Nm (7,4 lbf ft)
---------------------------	----	--------------------



D04129-10

- Position the inside cover on both sides.
- Mount and tighten screws **9**.

Guideline

Screw, cover part	M5	3.5 Nm (2.58 lbf ft)
-------------------	----	-------------------------

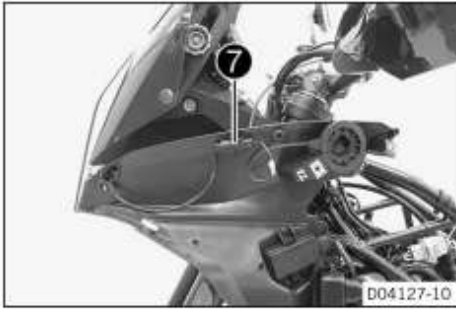


D04129-10

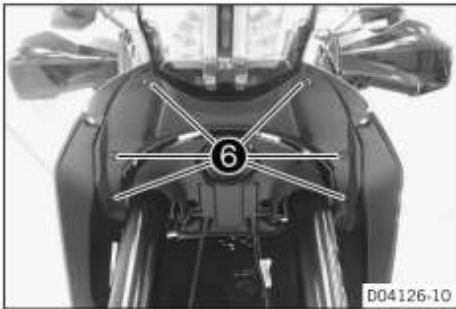


(EU/US/CN)

- Plug in connector **8**.



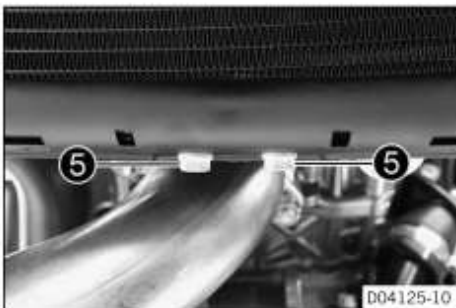
- Join plug-in connector **7**.



- Position the lower fairing section.
- Mount and tighten screws **6**.

Guideline

Screw, cover part	M5	3.5 Nm (2.58 lbf ft)
-------------------	----	-------------------------



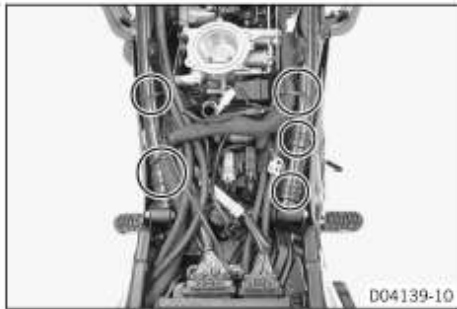
- Position the fuel hose with the guide.
- Mount and tighten screws **5**.

Guideline

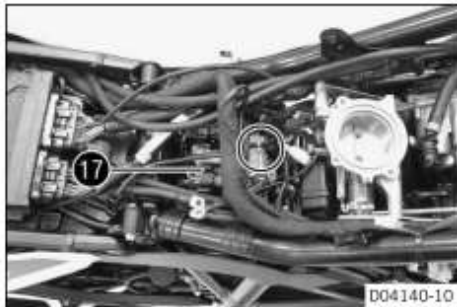
Remaining screws, chassis	M5	5 Nm (3.7 lbf ft)
---------------------------	----	-------------------



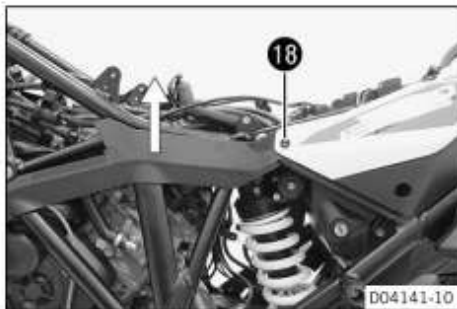
- Remove screw **16** with the washer.



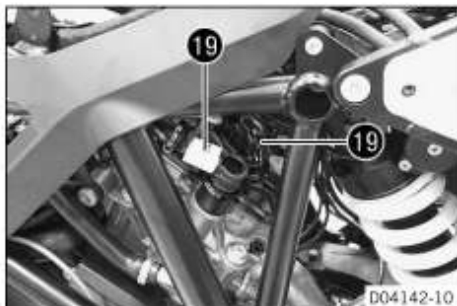
- Remove the cable ties.
- Push the cables slightly to the side.



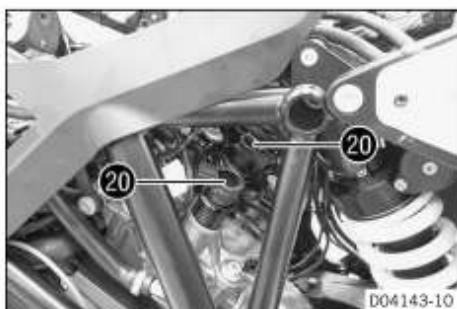
- Remove the cable tie(s).
- Loosen all plug-in connectors from connector holder **17**.
- Remove the plug holder.



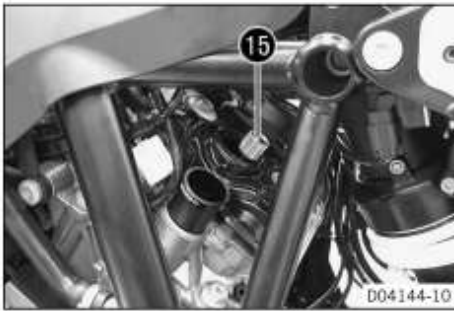
- Remove screw **18**.
- Lift up the heat protector.



- Disconnect connectors **19** of the ignition coils.



- Remove ignition coils **20**.

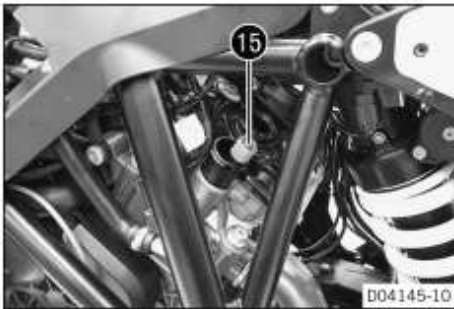


- Remove the spark plug with special tool 15.

Spark plug wrench with link (77229172000) (see p. 504)
--

- Mount and tighten the new spark plug using the special tool.
Guideline

Spark plug	M12x1.5	18 Nm (13.3 lbf ft)
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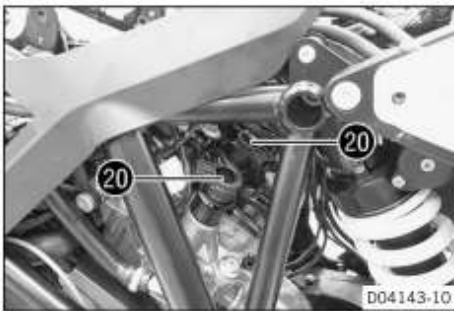


- Remove the spark plug with special tool 15.

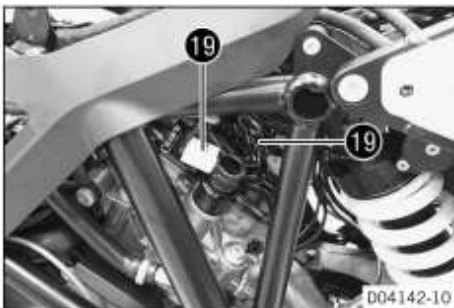
Spark plug wrench with link (77229172000) (see p. 504)
--

- Mount and tighten the new spark plug using the special tool.
Guideline

Spark plug	M10x1	11 Nm (8.1 lbf ft)
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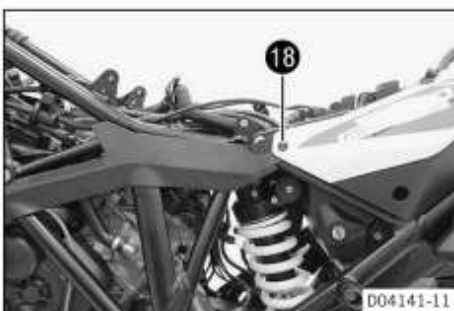


- Mount ignition coils 20.



- Plug in connectors 19 of the ignition coils.

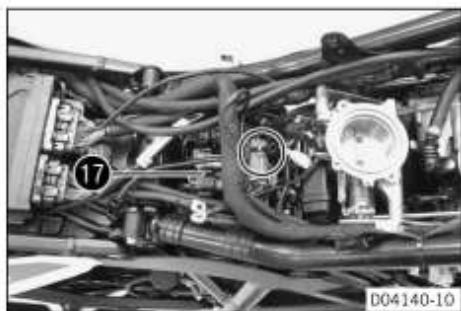
- ✓ The white connector is connected to the outer ignition coil.



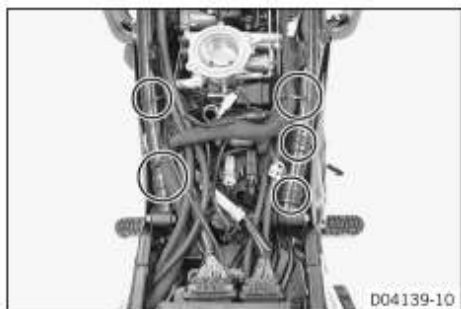
- Position the heat protector.
- Mount and tighten screw 18.

Guideline

Screw, cover part	M5	3.5 Nm (2.58 lbf ft)
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- Position the plug holder.
- Connect all plug-in connectors in connector holder **17**.
- Mount the cable tie(s).



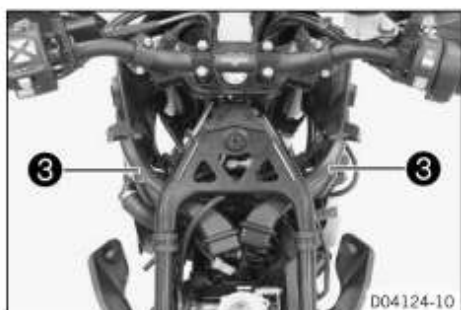
- Route the cables without tension.
- Mount the cable ties.



- Mount and tighten screw **16** with the washer.

Guideline

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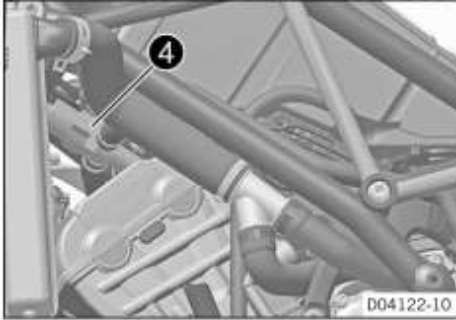


- Position intake snorkel **3**.

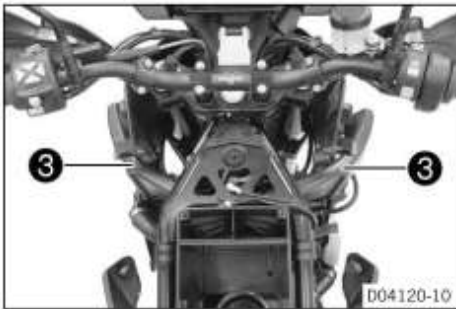


- Position the lower part of air filter box in the frame.

i Info
Ensure that the O-rings are seated correctly.

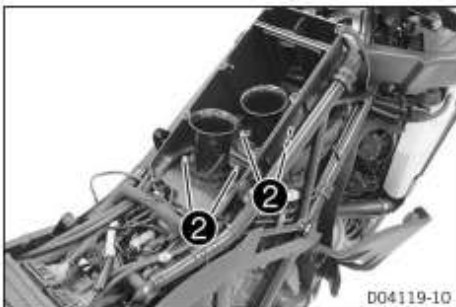


- Mount SAS valve **4** on the holder.



- Mount intake snorkel **3**.

i Info
Ensure that the seals are seated correctly.



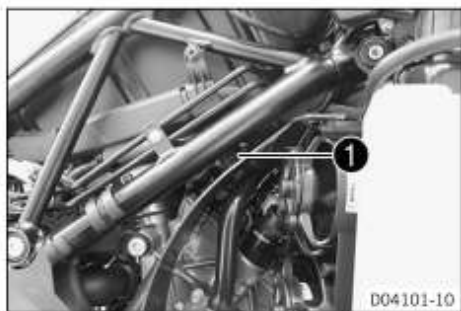
- Position the intake trumpets and mount and tighten screws **2** with the bushings.

Guideline

Remaining screws, chassis	M5	5 Nm (3.7 lbf ft)
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- Route the hose without kinks and secure it with cable ties.



- Mount the vent hose.
- Position spring band clamp **1** with special tool.

Spring band clamps plier (60029057100) (📖 p. 497)

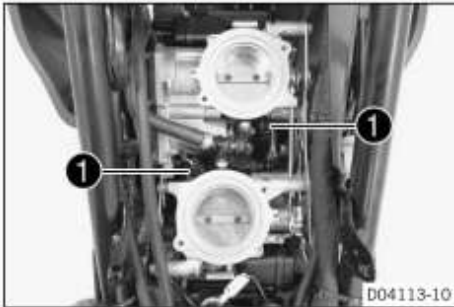
27.1 Removing the throttle valve body

Preparatory work

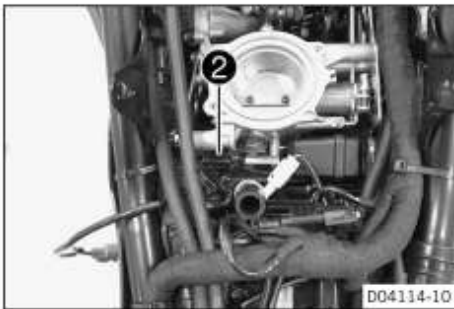
- Remove the passenger seat. (p. 80)
- Remove the front rider's seat. (p. 79)
- Remove the front side cover. (p. 97)
- Remove the fuel tank cover. (p. 98)
- Remove the mask spoiler. (p. 100)
- Remove the fuel tank. (p. 80)
- Remove the upper part of the air filter box. (p. 73)
- Remove the air filter box. (p. 76)

Main work

- Detach connector ①.



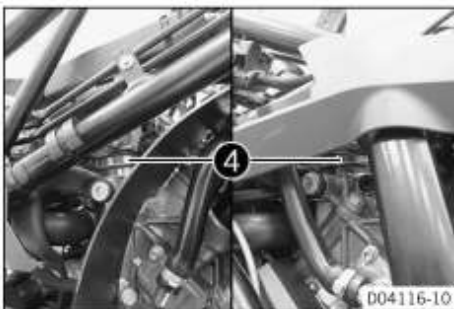
- Unplug connector ②.



- Unplug connector ③.

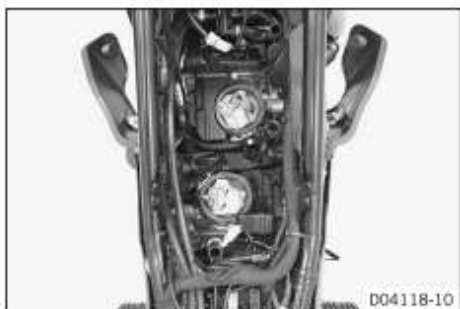


- Loosen clamps ④.



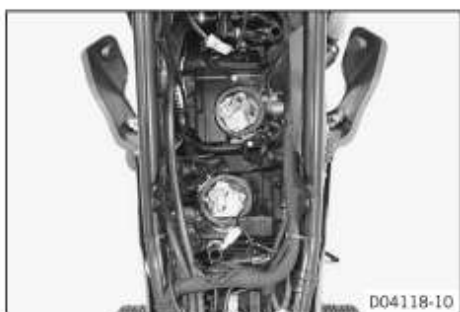


- Lift the throttle valve body.
- Detach connectors 5 and remove the throttle valve body.



- Cover the intake duct with a cloth.

27.2 Installing the throttle valve body

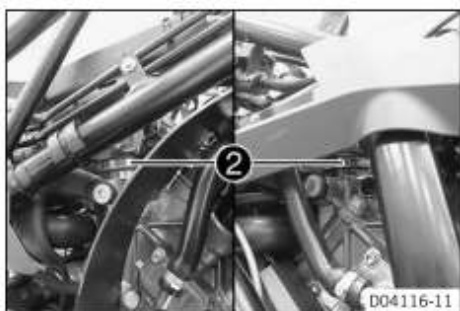


Main work

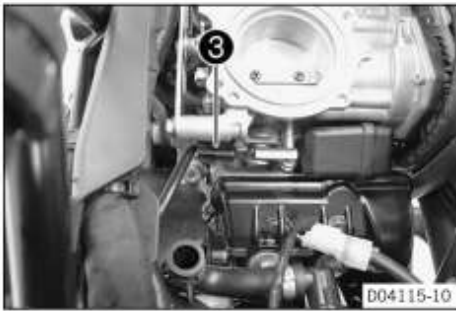
- Remove the cloth from the intake duct.



- Plug in connector 1.
- Position the throttle valve body.



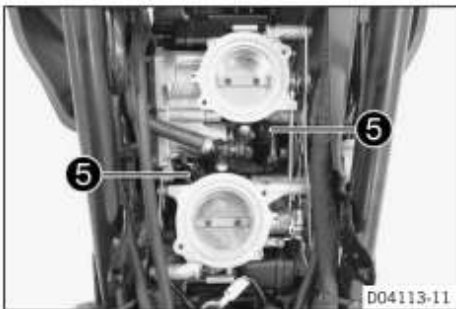
- Position and tighten clamps 2.



- Plug in connector ③.



- Plug in connector ④.



- Plug in the connectors ⑤.

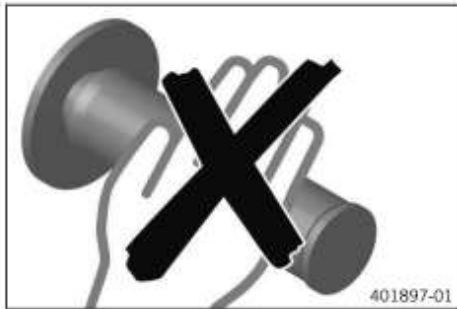
Finishing work

- Install the lower part of the air filter box. (📖 p. 77)
- Install the upper part of the air filter box. (📖 p. 75)
- Install the fuel tank. (📖 p. 83)
- Install the mask spoiler. (📖 p. 101)
- Install the fuel tank cover. (📖 p. 99)
- Install the front side cover. (📖 p. 97)
- Mount the front rider's seat. (📖 p. 79)
- Mount the passenger seat. (📖 p. 80)
- Perform the initialization run. (📖 p. 389)

27.3 Performing the initialization run

Condition

The diagnostic tool is connected and running.



- Execute **"Engine electronics" > "Functions" > "Clear adaptation values"**.
 - ✓ The adaptation values are deleted.
- Select **"Engine electronics" > "Measured values" > "Temperature sensor - coolant (TW1)"**.
 - ✓ The coolant temperature is displayed during the initialization run.



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.

Guideline

Coolant temperature	< 25 °C (< 77 °F)
---------------------	-------------------

- Allow the engine warm up to the specified temperature at idle speed.

Guideline

Coolant temperature	80 ... 90 °C (176 ... 194 °F)
---------------------	-------------------------------



Info

Do not operate the throttle grip during the initialization process.

- Switch off the ignition when the specified temperature is reached.



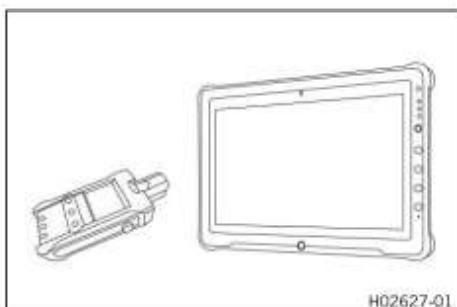
Info

If initialization is not completed or if the initialization process was interrupted, the entire process must be restarted.

27.4 Checking the CO adjustment using the KTM diagnostics tool

Condition

The diagnostic tool is connected and running.



- Select **"Engine electronics" > "Functions" > "CO adjustment when idling"**.
- Confirm the warning using **"Next"**.
- Check the position of the bars in the measurement range for both cylinders.
 - * The bars are in the middle of the green area of the measurement range.
 - Quit the function using **"Cancel"**.

- » The bars are not in the middle of the green area of the measurement range.
 - Select **"Cylinder 1"** or **"Cylinder 2"**.
 - Using the + button or – button to position to bars in the middle of the measurement range.
 - Quit the function using **"Save"**.
- Quit the process using **"Execute"**.




28.1 Engine

Design	2-cylinder 4-stroke Otto engine, 75° V arrangement, water-cooled
Displacement	1,301 cm ³ (79.39 cu in)
Stroke	71 mm (2.8 in)
Bore	108 mm (4.25 in)
Compression ratio	13.1:1
Idle speed	1,280 ... 1,480 rpm
Control	DOHC, 4 valves per cylinder, chain-driven
Valve - valve plate diameter	
Intake	42 mm (1.65 in)
Exhaust	34 mm (1.34 in)
Valve clearance	
Exhaust at: 20 °C (68 °F)	0.25 ... 0.30 mm (0.0098 ... 0.0118 in)
Intake at: 20 °C (68 °F)	0.10 ... 0.15 mm (0.0039 ... 0.0059 in)
Crankshaft bearing	Sleeve bearing
Conrod bearing	Sleeve bearing
Piston	Forged light alloy
Piston ring	1 upper compression (rectangular) ring, 1 lower compression ring, 1 oil scraper ring
Engine lubrication	Pressure circulation lubrication with three rotary pumps
Primary transmission	40:76
Clutch	Antihopping clutch in oil bath/hydraulically operated
Transmission	6-gear transmission, claw shifted
Transmission ratio	
1st gear	12:35
2nd gear	15:32
3rd gear	18:30
4th gear	20:27
5th gear	24:27
6th gear	35:32
Mixture preparation	Electronic fuel injection
Ignition system	Contactless controlled fully electronic ignition with digital ignition adjustment
Alternator	12 V, 450 W
Spark plug	
Inside spark plug	NGK LKAR9BI-10
Outside spark plug	NGK LMAR7DI-10
Electrode gap, spark plug	1.0 mm (0.039 in)
Cooling	Water cooling, permanent circulation of coolant by water pump
Cold start device	Starter motor

28.2 Tolerance, engine wear limits

Camshaft - cam height	
Intake	39.150 ... 39.291 mm (1.54134 ... 1.54689 in)
Exhaust	38.390 ... 38.542 mm (1.51141 ... 1.5174 in)
Camshaft - bearing pin	
	23.959 ... 23.980 mm (0.94327 ... 0.94409 in)
Camshaft bearing - radial clearance	
New condition	0.020 ... 0.054 mm (0.00079 ... 0.00213 in)
Wear limit	0.065 mm (0.00256 in)
Valve guide - diameter	
New condition	6.004 ... 6.016 mm (0.23638 ... 0.23685 in)
Wear limit	6.150 mm (0.24213 in)
Valve - sealing seat width	
Intake: New condition	0.90 mm (0.0354 in)
Intake: Wear limit	1.5 mm (0.059 in)
Exhaust: New condition	1.0 mm (0.039 in)
Exhaust: Wear limit	2.0 mm (0.079 in)
Valve - run-out	
Intake: on the valve plate	≤ 0.1 mm (≤ 0.004 in)
Exhaust: on the valve plate	≤ 0.1 mm (≤ 0.004 in)
Valve - valve stem diameter	
Exhaust	5.956 ... 5.970 mm (0.23449 ... 0.23504 in)
Intake	5.966 ... 5.980 mm (0.23488 ... 0.23543 in)
Valve spring - length	
New condition	42.70 mm (1.6811 in)
Wear limit	42 mm (1.65 in)
Cylinder head - bearing hole of camshaft	
	24.000 ... 24.021 mm (0.94488 ... 0.94571 in)
Cylinder - distortion of sealing surface	
	≤ 0.05 mm (≤ 0.002 in)
Cylinder head - distortion of sealing surface	
	≤ 0.10 mm (≤ 0.0039 in)
Cylinder - bore diameter	
Size I	108.000 ... 108.012 mm (4.25196 ... 4.25243 in)
Size II	108.012 ... 108.025 mm (4.25243 ... 4.25294 in)
Piston - diameter	
Size I	107.960 ... 107.990 mm (4.25039 ... 4.25157 in)
Size II	107.970 ... 108.000 mm (4.25078 ... 4.25196 in)
Piston/cylinder - mounting clearance	
Size I	0.010 ... 0.042 mm (0.00039 ... 0.00165 in)
Size II	0.012 ... 0.052 mm (0.00047 ... 0.00205 in)
Wear limit	0.11 mm (0.0043 in)
Piston - piston pin hole diameter	
	20.010 ... 20.020 mm (0.78779 ... 0.78819 in)
Piston ring	
Width, first ring (rectangular ring)	1.170 ... 1.200 mm (0.04606 ... 0.04724 in)
Width, second ring (lower compression ring)	1.170 ... 1.200 mm (0.04606 ... 0.04724 in)
Width, oil scraper ring	1.970 ... 2.000 mm (0.07756 ... 0.07874 in)
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)
Piston ring end gap	
First ring (rectangular ring)	≤ 0.50 mm (≤ 0.0197 in)
Second ring (lower compression ring)	≤ 0.60 mm (≤ 0.0236 in)
Oil scraper ring	≤ 0.60 mm (≤ 0.0236 in)
Piston pin - diameter	19.995 ... 20.000 mm (0.7872 ... 0.7874 in)
Connecting rod - diameter of upper conrod eye	20.007 ... 20.013 mm (0.78768 ... 0.78791 in)
Connecting rod - axial clearance of lower conrod bearing	
New condition	0.15 ... 0.35 mm (0.0059 ... 0.0138 in)
Wear limit	0.40 mm (0.0157 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)
Connecting rod - large end width	20.950 ... 21.000 mm (0.8248 ... 0.82677 in)
Crankshaft - axial clearance	
New condition	0.10 ... 0.40 mm (0.0039 ... 0.0157 in)
Wear limit	1.00 mm (0.0394 in)
Crankshaft - crank pin width	42.100 ... 42.150 mm (1.65748 ... 1.65945 in)
Crankshaft - crank pin diameter	
Yellow	41.978 ... 41.989 mm (1.65267 ... 1.65311 in)
Blue	41.990 ... 42.000 mm (1.65315 ... 1.65354 in)
Red	42.001 ... 42.011 mm (1.65358 ... 1.65397 in)
Crankshaft - main bearing diameter	
Yellow	52.965 ... 52.975 mm (2.08523 ... 2.08563 in)
Blue	52.976 ... 52.985 mm (2.08567 ... 2.08602 in)
Red	52.986 ... 52.995 mm (2.08606 ... 2.08641 in)
Crankshaft - radial clearance of main bearing	
New condition	0.025 ... 0.055 mm (0.00098 ... 0.00217 in)
Wear limit	0.10 mm (0.0039 in)
Crankshaft - step bearing diameter	27.985 ... 28.000 mm (1.10177 ... 1.10236 in)
Crankshaft - radial clearance of step bearing	
New condition	0.030 ... 0.070 mm (0.00118 ... 0.00276 in)
Wear limit	0.090 mm (0.00354 in)
Clutch disc pack - thickness	
New condition	47.20 ... 48.00 mm (1.8583 ... 1.8898 in)
Wear limit	46.00 mm (1.811 in)
Clutch spring - length	≥ 45.8 mm (≥ 1.803 in)
Clutch basket - thrust surface of clutch facing discs	
Wear limit	0.5 mm (0.02 in)
Oil pressure regulator valve - minimum length spring	39 mm (1.54 in)
Oil pumps	
Clearance between external rotor and engine case	0.20 ... 0.40 mm (0.0079 ... 0.0157 in)
Clearance between external rotor and internal rotor	0.10 ... 0.25 mm (0.0039 ... 0.0098 in)
Axial clearance	0.04 ... 0.25 mm (0.0016 ... 0.0098 in)
Oil pressure	

Coolant temperature: ≥ 60 °C (≥ 140 °F) Idle speed	1.8 ... 4.5 bar (26 ... 65 psi)
Oil consumption	
After the vehicle is run-in	≤ 0.4 l/1.000 km (≤ 0.4 qt./600 mi)
	 Info Oil consumption depends on the riding style and the operating conditions.
Shift fork	
Thickness at plate	4.85 ... 4.95 mm (0.1909 ... 0.1949 in)
Clearance in the sliding gear groove: New condition	0.35 ... 0.55 mm (0.0138 ... 0.0217 in)
Clearance in the sliding gear groove: Wear limit	0.70 mm (0.0276 in)
Shift shaft - play in sliding plate/shift quadrant	0.40 ... 0.80 mm (0.0157 ... 0.0315 in)
Sliding gear - width of shift fork groove	5.30 ... 5.40 mm (0.2087 ... 0.2126 in)
Main shaft axial clearance	0.05 ... 0.15 mm (0.002 ... 0.0059 in)

28.3 Engine tightening torques

Screw, damping plate	EJOT ALtracs® M6x14	10 Nm (7.4 lbf ft)	Loctite®243™
Screw, retaining bracket, valve cover, rear	EJOT ALtracs® M6x10	10 Nm (7.4 lbf ft)	
Hose clip, intake flange	M4	1.5 Nm (1.11 lbf ft)	
Oil nozzle	M5	2 Nm (1.5 lbf ft)	Loctite®243™
Remaining engine screws	M5	6 Nm (4.4 lbf ft)	
Screw, bearing retainer	M5	6 Nm (4.4 lbf ft)	Loctite®243™
Screw, bearing shells retaining bracket	M5	6 Nm (4.4 lbf ft)	Loctite®243™
Screw, crankshaft speed sensor	M5	6 Nm (4.4 lbf ft)	Loctite®243™
Screw, engine oil level viewer	M5	4 Nm (3 lbf ft)	
Screw, gear sensor	M5	6 Nm (4.4 lbf ft)	Loctite®243™
Screw, resonator	M5	8 Nm (5.9 lbf ft)	Loctite®243™
Screw, shift shaft sensor	M5	6 Nm (4.4 lbf ft)	Loctite®243™
Swing angle sensor screw	M5	5 Nm (3.7 lbf ft)	Loctite®243™
Bleeder screw, water pump cover	M6	10 Nm (7.4 lbf ft)	
Coolant connection screw on the cylinder head	M6	8 Nm (5.9 lbf ft)	Loctite®243™
Freewheel ring bolt	M6 – 10.9	15 Nm (11.1 lbf ft)	Loctite® 648™
Nut, cylinder head	M6	9 Nm (6.6 lbf ft)	
Remaining engine screws	M6	10 Nm (7.4 lbf ft)	

Screw, camshaft bearing support	M6 – 10.9	10 Nm (7.4 lbf ft)	
Screw, clutch cover	M6	10 Nm (7.4 lbf ft)	
Screw, clutch spring	M6	12 Nm (8.9 lbf ft)	
Screw, engine case	M6x60	10 Nm (7.4 lbf ft)	
Screw, engine case	M6x80	10 Nm (7.4 lbf ft)	
Screw, engine case	M6x90	10 Nm (7.4 lbf ft)	
Screw, freewheel holder	M6	10 Nm (7.4 lbf ft)	Loctite®243™
Screw, locking lever	M6	10 Nm (7.4 lbf ft)	Loctite®243™
Screw, oil pump cover	M6	10 Nm (7.4 lbf ft)	Loctite®243™
Screw, shift drum locating	M6 – 12.9	18 Nm (13.3 lbf ft)	Loctite®243™
Screw, shift lever	M6	15 Nm (11.1 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, valve cover	M6	10 Nm (7.4 lbf ft)	
Screw, water pump cover	M6	10 Nm (7.4 lbf ft)	
Screw, water pump wheel	M6	10 Nm (7.4 lbf ft)	Loctite®243™
Stud, timing chain shaft	M6	8 Nm (5.9 lbf ft)	
Vacuum connection	M6	5 Nm (3.7 lbf ft)	Loctite®243™
Nozzle 100	M6x0.75	4 Nm (3 lbf ft)	Loctite®243™
Plug, crankshaft retainer	M8	15 Nm (11.1 lbf ft)	
Screw, camshaft bearing support	M8 – 10.9	Step 1 10 Nm (7.4 lbf ft) Step 2 18 Nm (13.3 lbf ft)	
Screw, camshaft bearing support	M8 – 10.9	Step 1 8.5 Nm (6.27 lbf ft) Step 2 14.5 Nm (10.7 lbf ft) Only applies when using: Hexagon socket bit (61229025000) (see p. 501)	
Screw, engine bearer	M8	20 Nm (14.8 lbf ft)	Loctite®243™
Screw, engine case	Expansion screw M8	18 Nm (13.3 lbf ft)	
Screw, heat exchanger	M8	15 Nm (11.1 lbf ft)	
Screw, timing chain guide rail	M8	15 Nm (11.1 lbf ft)	Loctite®243™
Screw, timing chain tensioning rail	M8	15 Nm (11.1 lbf ft)	Loctite®243™
Stud, exhaust flange	M8	10 Nm (7.4 lbf ft)	
Screw plug	M10	10 Nm (7.4 lbf ft)	

Screw, engine bearer	M10	45 Nm (33.2 lbf ft)
Oil pressure sensor	M10x1	10 Nm (7.4 lbf ft)
Plug, cam lever axis	M10x1	15 Nm (11.1 lbf ft)
Plug, clutch lubrication	M10x1	10 Nm (7.4 lbf ft)
Screw, conrod bearing	M10x1	Step 1 25 Nm (18.4 lbf ft) Step 2 30 Nm (22.1 lbf ft) Step 3 90°
Screw, timing chain tensioner release	M10x1	10 Nm (7.4 lbf ft)
Spark plug	M10x1	11 Nm (8.1 lbf ft)
Cylinder head screw	M11x1.5	Tightening sequence: Using a crisscross pattern Step 1 15 Nm (11.1 lbf ft) Step 2 30 Nm (22.1 lbf ft) Step 3 90° Step 4 90° Lubricated with engine oil
Coolant temperature sensor	M12x1.5	12 Nm (8.9 lbf ft)
Screw, rotor	Expansion screw M12x1.5	115 Nm (84.8 lbf ft)
Spark plug	M12x1.5	18 Nm (13.3 lbf ft)
Nut of engine sprocket	M20x1.5	100 Nm (73.8 lbf ft) Loctite®243™
Oil drain plug	M20x1.5	20 Nm (14.8 lbf ft)
Nut, inner clutch hub	M22x1.5	120 Nm (88.5 lbf ft) Loctite®243™
Plug, timing-chain tensioner	M24x1.5	25 Nm (18.4 lbf ft)
Screw plug, alternator cover	M24x1.5	8 Nm (5.9 lbf ft)
Nut, primary gear wheel	M33LHx1.5	130 Nm (95.9 lbf ft) Loctite®243™

28.4 Capacities

28.4.1 Engine oil

Engine oil Ambient temperature: ≥ 0 °C (≥ 32 °F)	3.60 l (3.8 qt.)	Engine oil (SAE 10W/50) (p. 488)
Engine oil Ambient temperature: < 0 °C (< 32 °F)		Engine oil (SAE 5W/40) (p. 489)

28.4.2 Coolant

Coolant	2.40 l (2.54 qt.)	Coolant (p. 488)
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28.4.3 Fuel

Fuel reserve, approx.	3.5 l (3.7 qt.)	
Total fuel tank capacity, approx.	23 l (6.1 US gal)	Super unleaded (ROZ 95/RON 95/PON 91) (見 p. 489)

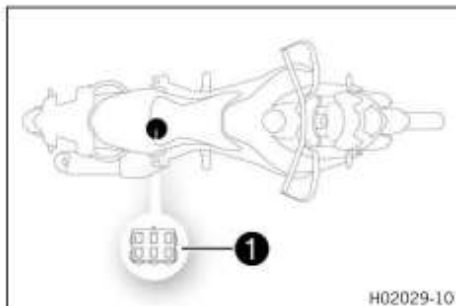
28.5 Chassis

Frame	Lattice frame made of chrome molybdenum steel tubing, powder-coated	
Fork	WP SuspensionSemi-active Suspension	
Shock absorber	WP SuspensionSemi-active Suspension	
Suspension travel		
front	200 mm (7.87 in)	
rear	200 mm (7.87 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	267 mm (10.51 in)	
Brake discs - wear limit		
front	4 mm (0.16 in)	
rear	4.5 mm (0.177 in)	
Tire pressure, solo / with passenger / full payload		
front: with cold tires	2.4 bar (35 psi)	
rear: with cold tires	2.9 bar (42 psi)	
Secondary drive ratio	17:42	
Chain	5/8 x 5/16" (525) X-ring	
Steering head angle	64°	
Wheelbase	1,560 ± 15 mm (61.42 ± 0.59 in)	
Seat height, unloaded	860/875 mm (860/875 in)	
Ground clearance, unloaded	220 mm (8.66 in)	
Weight without fuel, approx.	226.4 kg (499.1 lb.)	
Maximum permissible front axle load	175 kg (386 lb.)	
Maximum permissible rear axle load	300 kg (661 lb.)	
Maximum permissible total weight	460 kg (1,014 lb.)	

28.6 Electrical system

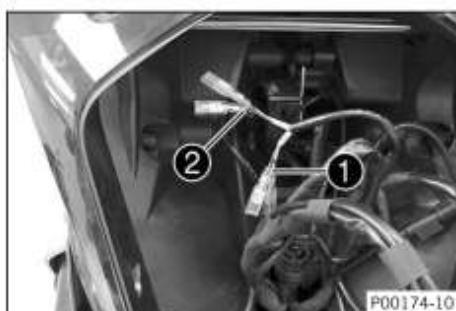
12-V battery	YTZ14S	Battery voltage: 12 V Nominal capacity: 11.2 Ah Maintenance-free
Race-on key battery	CR 2032	3 V
Fuse	58011109110	10 A
Fuse	58011109115	15 A
Fuse	58011109125	25 A
Fuse	58011109130	30 A
Low beam	LED	
High beam	LED	
Position light	LED	
Cornering light	LED	
Combination instrument lighting and indicator lamps	LED	
Turn signal (US)	RY10W / socket BAU15s	12 V 10 W
Turn signal (EU/JP/CN)	LED	
Tail light	LED	
Brake light	LED	
License plate lamp	LED	

28.6.1 Diagnostics connector



Diagnostics connector ❶ is located under the front rider's seat.

28.6.2 Front ACC1 and ACC2



Installation location

- The front power supplies ACC1 ❶ and ACC2 ❷ are located behind the headlight.

Info

The power supplies are protected by a fuse, however this fuse also protects other power consumers. The maximum continuous load is therefore significantly lower than the value of the fuse. Do not use a stronger fuse.

28.6.3 ACC1 and ACC2 rear



Installation location

- The rear power supplies ACC1 **1** and ACC2 **2** are located under the luggage rack plate.

i Info

The power supplies are protected by a fuse, however this fuse also protects other power consumers. The maximum continuous load is therefore significantly lower than the value of the fuse. Do not use a stronger fuse.

28.7 Tires

Front tire	Rear tire
120/70 ZR 19 M/C 60W TL Pirelli Scorpion Trail 2 K	170/60 ZR 17 M/C 72W TL Pirelli Scorpion Trail 2 K
The tires specified represent one of the possible series production tires. Additional information is available in the Service section under: http://www.ktm.com	

28.8 Fork

Fork article number	14.18.1Q.26	
Fork	WP SuspensionSemi-active Suspension	
Spring length with preload spacer(s)	443 mm (17.44 in)	
Spring rate		
Medium (standard)	12 N/mm (69 lb/in)	
Fork length	885 mm (34.84 in)	
Fork oil, fork leg, left	680 ml (22.99 fl. oz.)	Fork oil (SAE 4) (48601166S1) (p. 489)
Fork oil, fork leg, right	430 ml (14.54 fl. oz.)	Fork oil (SAE 4) (48601166S1) (p. 489)

28.9 Shock absorber

Shock absorber article number	01.18.1Q.26	
Shock absorber	WP SuspensionSemi-active Suspension	
Spring rate		
Medium (standard)	160 N/mm (914 lb/in)	
Spring length	198.5 mm (7.815 in)	
Static sag	25 mm (0.98 in)	

28.10 Chassis tightening torques

Screw, combination switch, left		5 Nm (3.7 lbf ft)	
Screw, headlight	EJOT ALtracs® 60x20	8 Nm (5.9 lbf ft)	
Screw, headlight bracket	EJOT ALtracs® 50x12	7 Nm (5.2 lbf ft)	
Screw, fixed grip, left	M4	2 Nm (1.5 lbf ft)	
Screw, side stand switch	M4	2 Nm (1.5 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, brake line holder on frame	M5	2 Nm (1.5 lbf ft)	
Screw, brake line holder on link fork	M5	5 Nm (3.7 lbf ft)	
Screw, cable channel	M5	5 Nm (3.7 lbf ft)	
Screw, chain sliding guard	M5	5 Nm (3.7 lbf ft)	
Screw, combination instrument	M5	4.5 Nm (3.32 lbf ft)	
Screw, combination switch, right	M5	3.5 Nm (2.58 lbf ft)	
Screw, cover part	M5	3.5 Nm (2.58 lbf ft)	
Screw, cover part	M5x12	3.5 Nm (2.58 lbf ft)	
Screw, cover part	M5x17	3.5 Nm (2.58 lbf ft)	
Screw, cross member for luggage support (EU/JP/CN)	M5	4 Nm (3 lbf ft)	
Screw, foot brake lever stub	M5	6 Nm (4.4 lbf ft)	Loctite®243™
Screw, fuel level sensor	M5	3 Nm (2.2 lbf ft)	
Screw, fuel tank filler cap	M5	3 Nm (2.2 lbf ft)	
Screw, heat guard on main silencer	M5	4 Nm (3 lbf ft)	
Screw, rear wheel speed sensor cable guide	M5	3 Nm (2.2 lbf ft)	
Screw, wind shield	M5	3.5 Nm (2.58 lbf ft)	
Ground fitting on frame	M6	6 Nm (4.4 lbf ft)	
Nut, ABS module fastening	M6	8 Nm (5.9 lbf ft)	
Remaining nuts, chassis	M6	10 Nm (7.4 lbf ft)	
Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)	
Screw, angle sensor	M6	6 Nm (4.4 lbf ft)	Loctite®243™
Screw, ball joint of push rod on foot brake cylinder	M6	10 Nm (7.4 lbf ft)	Loctite®243™
Screw, battery terminal	M6	4.5 Nm (3.32 lbf ft)	
Screw, bushing	M6	4 Nm (3 lbf ft)	
Screw, cable channel	M6	5 Nm (3.7 lbf ft)	
Screw, chain guide	M6	5 Nm (3.7 lbf ft)	
Screw, clutch assembly	M6	5 Nm (3.7 lbf ft)	
Screw, cooler retaining bracket	M6	7 Nm (5.2 lbf ft)	
Screw, cover part	M6	6 Nm (4.4 lbf ft)	
Screw, engine guard	M6	10 Nm (7.4 lbf ft)	
Screw, exhaust clamp	M6	8 Nm (5.9 lbf ft)	

Screw, foot brake cylinder	M6	10 Nm (7.4 lbf ft)	Loctite®243™
Screw, front brake disc	M6	14 Nm (10.3 lbf ft)	Loctite®243™
Screw, front wheel speed sensor	M6	10 Nm (7.4 lbf ft)	
Screw, fuel pump	M6	6 Nm (4.4 lbf ft)	
Screw, fuel tank	M6	10 Nm (7.4 lbf ft)	
Screw, fuel tap	M6	6 Nm (4.4 lbf ft)	
Screw, handlebar clamp hand guard	M6	5 Nm (3.7 lbf ft)	
Screw, lower rear panel	M6	6 Nm (4.4 lbf ft)	
Screw, magnetic holder on side stand	M6	6 Nm (4.4 lbf ft)	Loctite®243™
Screw, rear brake disc	M6	14 Nm (10.3 lbf ft)	Loctite®243™
Screw, rear wheel speed sensor	M6	10 Nm (7.4 lbf ft)	
Screw, retaining bracket, angle sensor	M6	10 Nm (7.4 lbf ft)	
Screw, voltage regulator	M6	6 Nm (4.4 lbf ft)	
Angled valve (EU/US/CN)	M8	6 Nm (4.4 lbf ft)	
Angled valve (JP)	M8	4 Nm (3 lbf ft)	
Remaining nuts, chassis	M8	25 Nm (18.4 lbf ft)	
Remaining screws, chassis	M8	25 Nm (18.4 lbf ft)	
Screw, bottom triple clamp	M8	12 Nm (8.9 lbf ft)	
Screw, exhaust clamp	M8	25 Nm (18.4 lbf ft)	
Screw, foot brake lever	M8	25 Nm (18.4 lbf ft)	Loctite®243™
Screw, fork stub	M8	15 Nm (11.1 lbf ft)	
Screw, front footrest bracket	M8	25 Nm (18.4 lbf ft)	Loctite®243™
Screw, fuel tank	M8	15 Nm (11.1 lbf ft)	
Screw, handle bar end hand guard	M8	25 Nm (18.4 lbf ft)	
Screw, handlebar clamp	M8	20 Nm (14.8 lbf ft)	
Screw, ignition lock (tamper-proof screw)	M8	25 Nm (18.4 lbf ft)	Loctite®243™
Screw, rail fitting (EU/JP/CN)	M8	20 Nm (14.8 lbf ft)	Loctite®243™
Screw, rear footrest bracket	M8	25 Nm (18.4 lbf ft)	Loctite®243™
Screw, steering damper	M8	25 Nm (18.4 lbf ft)	Loctite®243™
Screw, steering damper clamp	M8	12 Nm (8.9 lbf ft)	
Screw, steering stem	M8	20 Nm (14.8 lbf ft)	
Screw, suitcase hook	M8	20 Nm (14.8 lbf ft)	Loctite®243™
Screw, top triple clamp	M8	20 Nm (14.8 lbf ft)	
Engine carrying screw	M10	45 Nm (33.2 lbf ft)	
Remaining nuts, chassis	M10	45 Nm (33.2 lbf ft)	

Remaining screws, chassis	M10	45 Nm (33.2 lbf ft)	
Screw, front brake caliper	M10	45 Nm (33.2 lbf ft)	Loctite®243™
Screw, handlebar support	M10	40 Nm (29.5 lbf ft)	Loctite®243™
Screw, side stand	M10	35 Nm (25.8 lbf ft)	Loctite®243™
Screw, side stand bracket	M10	45 Nm (33.2 lbf ft)	Loctite®243™
Banjo bolt, brake line	M10x1	25 Nm (18.4 lbf ft)	
Nut, rear sprocket screw	M10x1.25	50 Nm (36.9 lbf ft)	Loctite®243™
Lambda sensor	M12x1.25	25 Nm (18.4 lbf ft)	
Screw, bottom shock absorber	M14x1.5	80 Nm (59 lbf ft)	Thread greased
Screw, top shock absorber	M14x1.5	80 Nm (59 lbf ft)	Thread greased
Nut, socket	M18x1	4 Nm (3 lbf ft)	
Nut, fork pivot	M19x1.5	130 Nm (95.9 lbf ft)	Thread greased
Screw, steering head, top	M22x1.5	18 Nm (13.3 lbf ft)	
Nut, rear wheel spindle	M25x1.5	90 Nm (66.4 lbf ft)	Thread 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

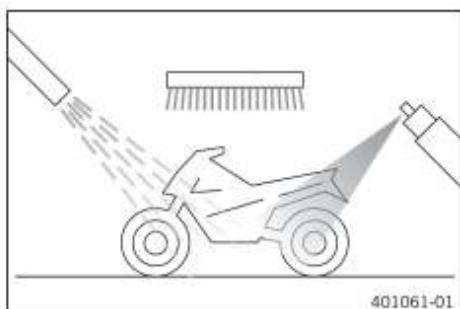
Environmental hazard Hazardous substances cause environmental damage.

- 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 the exhaust system to keep water from entering.
- Remove loose dirt first with a soft jet of water.
- Spray heavily soiled parts with a normal commercial motorcycle cleaner and then brush off with a soft brush.

Motorcycle cleaner (see p. 490)



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.

- Push back the protection caps of the handlebar controls to allow any water that has penetrated to evaporate.
- After the motorcycle has cooled down, lubricate all moving parts and pivot points.
- Clean the chain. (☞ p. 124)
- Treat bare metal (except for brake discs and the exhaust system) with a corrosion inhibitor.

Preserving materials for paints, metal and rubber (☞ p. 490)

- Treat the painted parts with a mild paint polish.

Perfect finish and high gloss polish for paints (☞ p. 490)



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. 491)

- Oil the ignition and steering lock, tank lock, and seat lock.

Universal oil spray (☞ p. 491)



29.2 Checks and maintenance steps for winter operation



Info

If you use the motorcycle in winter, you must expect salt on the roads. You should therefore take precautions against aggressive road salt.

If the vehicle has been used on salted roads, use cold water for cleaning after riding. Warm water enhances the corrosive effects of salt.



- Clean the motorcycle. (☞ p. 404)
- Clean the brakes.



Info

After **EVERY** trip on salted roads, thoroughly clean the brake calipers and brake linings, after they have cooled down and without removing them, with cold water and dry them carefully.

After riding on salted roads, thoroughly clean the motorcycle with cold water and dry it well.

- Treat the engine, the 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 into contact with the brake discs. This would severely lower the braking effect.

- Clean the chain. (🔗 p. 124)

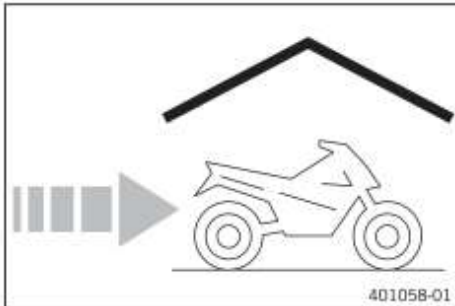


30.1 Storage

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 (see p. 490)

- Refuel.
- Clean the motorcycle. (see p. 404)
- Change the engine oil and oil filter, and clean the oil screens. (see p. 363)
- Check the coolant fill level and antifreeze. (see p. 330)
- Check tire pressure. (see p. 106)
- Remove the 12-V battery. (see p. 134)

Guideline

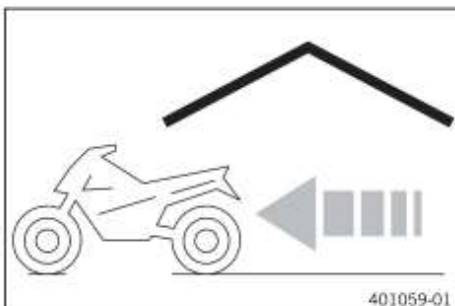
Storage temperature of the 12-V battery without direct sunlight	0 ... 35 °C (32 ... 95 °F)
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- Charge the 12-V battery.
- Store the vehicle in a dry location that is not subject to large fluctuations in temperature.
- Raise the vehicle with the center stand. (see p. 15)
- 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



- Remove the vehicle from the center stand. (see p. 15)
- Install the 12-V battery. (see p. 135)

i Info

If the 12-V battery was removed, the time and date must be set.

- Perform checks and maintenance measures when preparing for use.
- Take a test ride.

31.1 Additional information

Any further work that results from the required work or from the recommended work must be ordered separately and can be invoiced separately.

Different service intervals may apply in your country, depending on the local operating conditions.

Individual service intervals and scopes may change in the course of technical developments. The most up-to-date service schedule can always be found on KTM Dealer.net. Your authorized KTM dealer will be happy to advise you.

31.2 Required work

	Every two years				
	Every year				
	every 30,000 km (18,600 mi)				
	every 15,000 km (9,300 mi)				
	after 1,000 km (620 mi)				
Read out the fault memory using the KTM diagnostics tool.	○	●	●	●	●
Check that the electrical system is functioning properly.	○	●	●	●	●
Change the engine oil and oil filter, and clean the oil screens. (📖 p. 363)	○	●	●	●	●
Check the front brake linings. (📖 p. 145)	○	●	●	●	●
Check the rear brake linings. (📖 p. 151)	○	●	●	●	●
Check the brake discs. (📖 p. 113)	○	●	●	●	●
Check the brake lines for damage and leakage.	○	●	●	●	●
Change the front brake fluid. (📖 p. 149)					●
Change the rear brake fluid. (📖 p. 156)					●
Change the hydraulic clutch fluid. (📖 p. 316)					●
Check the front brake fluid level. (📖 p. 147)	○	●	●	●	
Check the rear brake fluid level. (📖 p. 154)	○	●	●	●	
Check/correct the fluid level of the hydraulic clutch. (📖 p. 315)		●	●	●	
Check the shock absorber and fork for leaks. Perform service as needed and depending on how the vehicle is used.	○	●	●	●	●
Clean the dust boots of the fork legs. (📖 p. 19)		●	●		
Check steering head bearing play. (📖 p. 30)	○	●	●	●	●
Check the tire condition. (📖 p. 106)	○	●	●	●	●
Check tire pressure. (📖 p. 106)	○	●	●	●	●
Check the chain, rear sprocket, and engine sprocket. (📖 p. 122)		●	●	●	●
Check the chain tension. (📖 p. 121)	○	●	●	●	●
Change the spark plugs (air filter removed). (📖 p. 374)			●		
Check the valve clearance (air filter and spark plugs removed). (📖 p. 352)			●		
Change the SAS membrane. (📖 p. 313)			●		
Check the cables for damage and routing without sharp bends. (fuel tank removed)		●	●	●	●
Check the coolant level in the compensating tank. (📖 p. 330)	○	●	●	●	●
Change the air filter, clean the air filter box. (📖 p. 73)		●	●		
Check the fuel pressure. (📖 p. 85)		●	●	●	●
Check the CO adjustment using the KTM diagnostics tool. (📖 p. 390)	○	●	●		
Check the headlight setting. (📖 p. 160)	○	●	●		
Check that the radiator fan is functioning properly.	○	●	●	●	●
Final check: Check the vehicle is roadworthy and take a test ride.	○	●	●	●	●

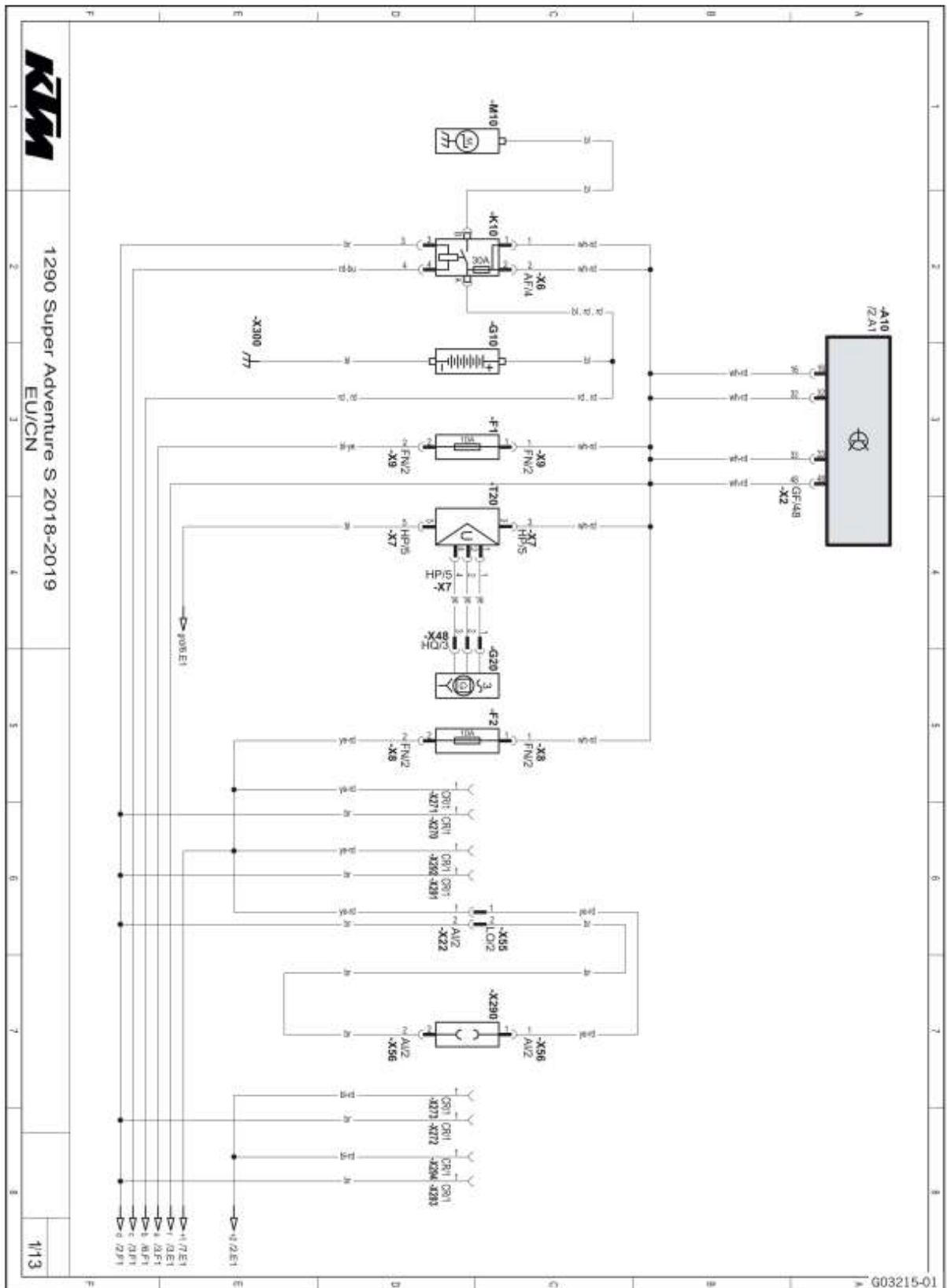
	Every two years	Every year	every 30,000 km (18,600 mi)	every 15,000 km (9,300 mi)	after 1,000 km (620 mi)
Read out the error memory after the test ride using the KTM diagnostics tool.	○	●	●	●	●
Set the service interval display. (📖 p. 177)	○	●	●	●	●
Make the service entry in KTM Dealer.net and in the Service & Manufacturer Warranty Booklet.	○	●	●	●	●

- One-time interval
- Periodic interval

31.3 Recommended work

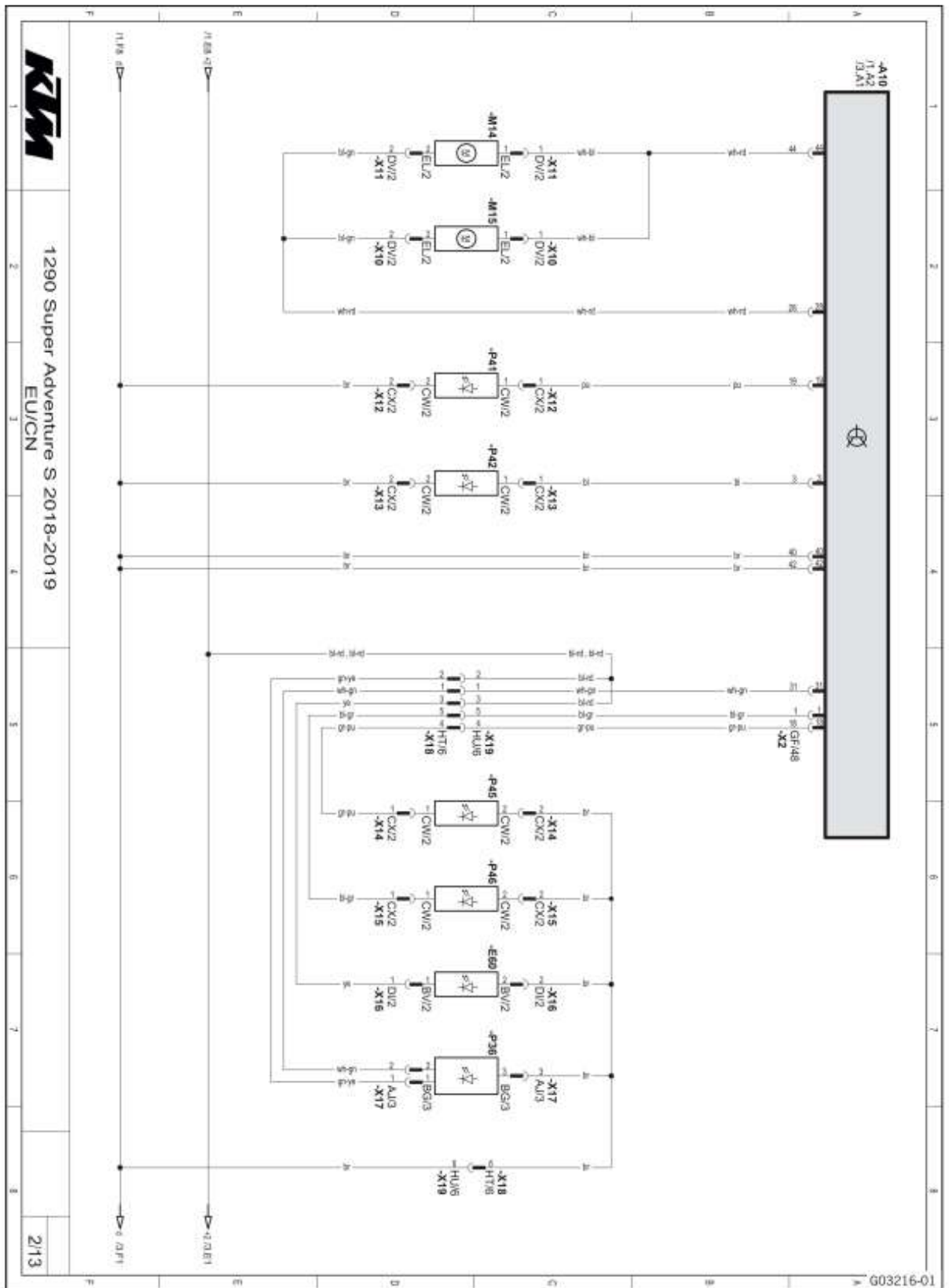
	Every four years	Every year	every 30,000 km (18,600 mi)	every 15,000 km (9,300 mi)	after 1,000 km (620 mi)
Check the frame. (📖 p. 47)		●			
Check the link fork. (📖 p. 57)		●			
Check/clean the oil nozzle for clutch lubrication. (📖 p. 369)	○	●	●		
Check the fork bearing for play. (📖 p. 58)		●	●		
Check the wheel bearing for play. (📖 p. 107)		●	●		
Grease all moving parts (e.g., side stand, hand lever, chain, ...) and check for smooth operation.	○	●	●	●	●
Empty the drainage hoses.	○	●	●	●	●
Check all hoses (e.g. fuel, cooling, bleeder, drainage, etc.) and sleeves for cracking, leaks, and incorrect routing.		●	●	●	●
Check the screws and nuts for tightness.	○	●	●	●	●
Check the antifreeze.	○	●	●	●	
Change the coolant. (📖 p. 334)					●

- One-time interval
- Periodic interval



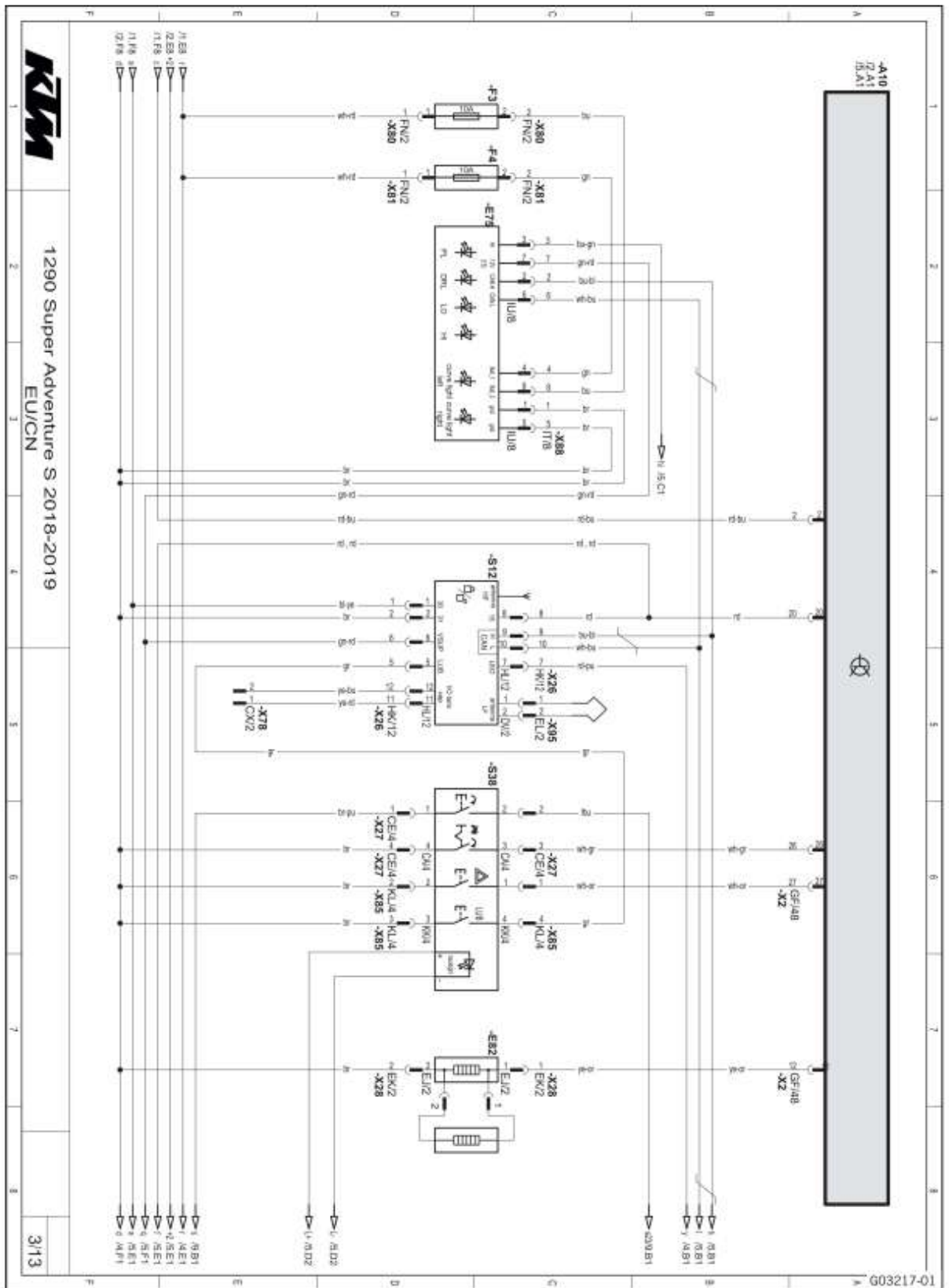
Components:

A10	Central electronics control unit
F1	Fuse
F2	Fuse
G10	12-V battery
G20	Alternator
K10	Starter relay with main fuse
M10	Electric starter system
T20	Voltage regulator
X270	Connector for accessory ground (terminal 31) ACC 1 (not assigned)
X271	Connector for accessory plus (terminal 30) ACC 1 (not assigned)
X272	Connector for accessory ground (terminal 31) ACC 2 (not assigned)
X273	Connector for accessory plus (terminal 15) ACC 2 (not assigned)
X290	Socket
X291	Connector for accessory ground (terminal 31) ACC 1
X292	Connector for accessory plus (terminal 30) ACC 1
X293	Connector for accessory ground (terminal 31) ACC 2 (not assigned)
X294	Connector for accessory plus (terminal 15) ACC 2 (not assigned)



Components:

A10	Central electronics control unit
E60	License plate lamp
M14	Radiator fan 1
M15	Radiator fan 2
P36	Brake/tail light
P41	Turn signal, front left
P42	Turn signal, front right
P45	Turn signal, rear left
P46	Turn signal, rear right

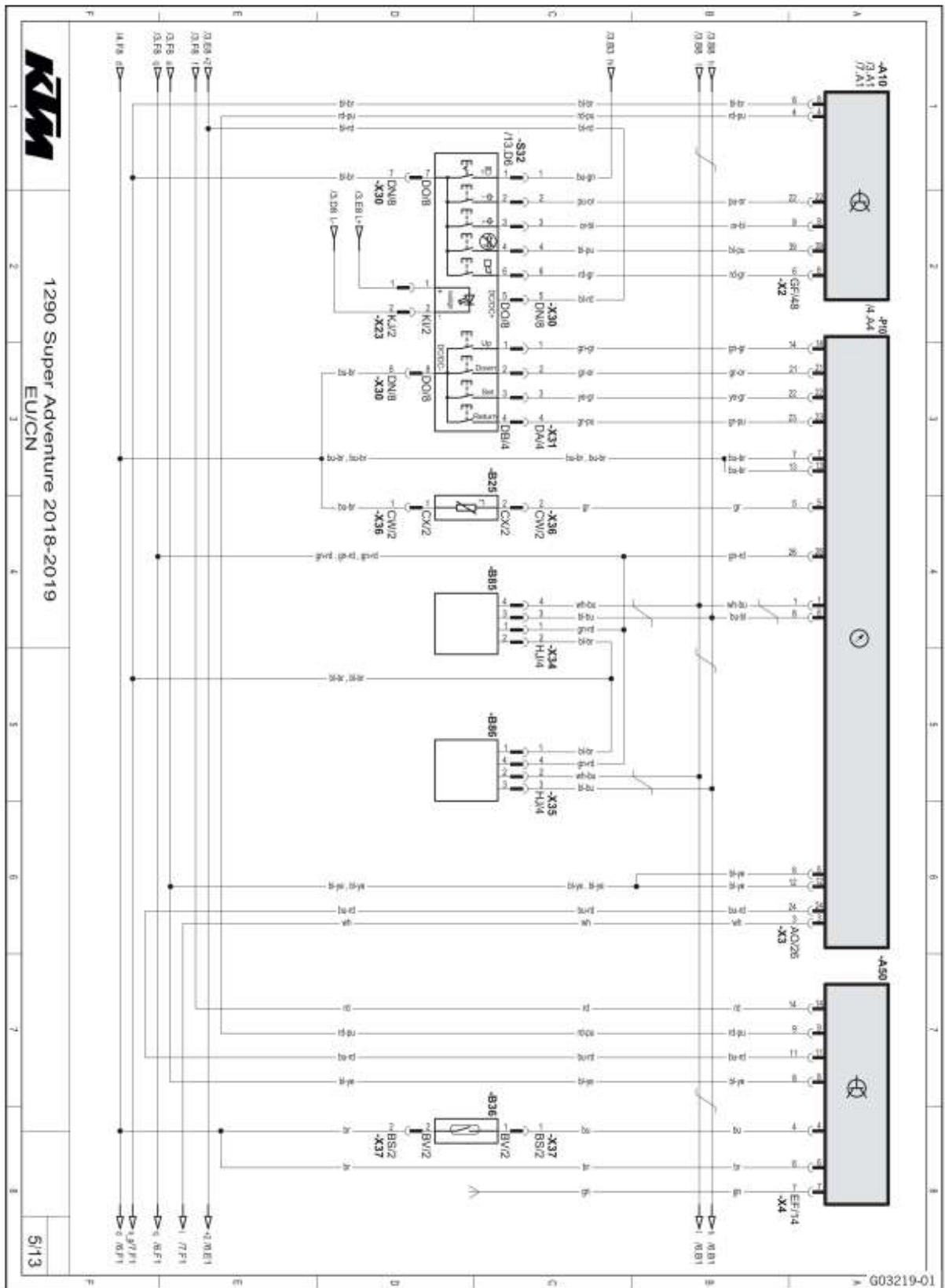


Components:

A10	Central electronics control unit
E75	Headlight unit
E82	Heated grip (optional)
F3	Fuse
F4	Fuse
S12	KTM RACE ON
S38	Emergency OFF switch, electric starter button, hazard warning flasher switch, Race-on tip switch

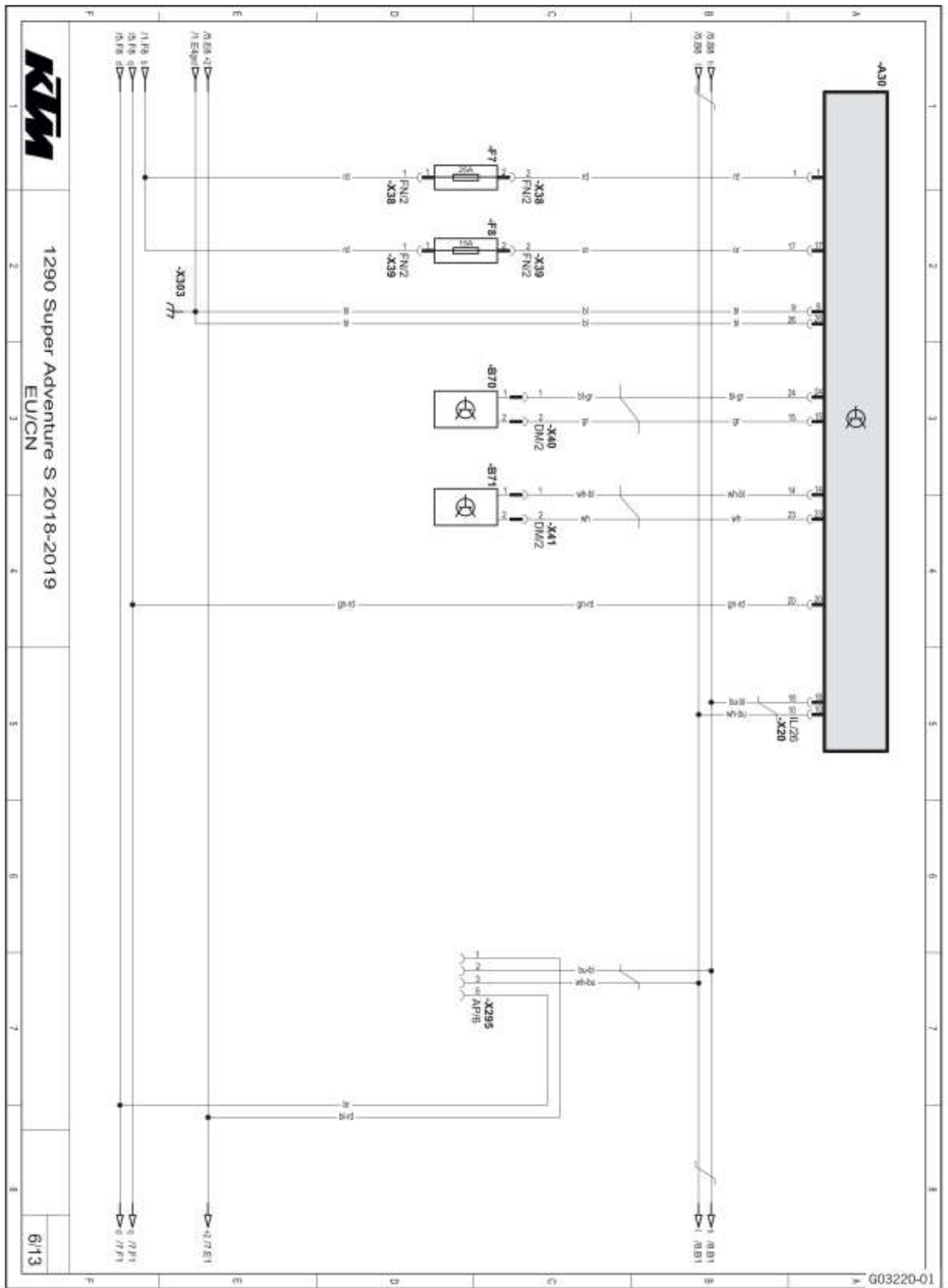
Components:

P10	Combination instrument
F5	Fuse
K30	Power relay
X297	USB programming connector



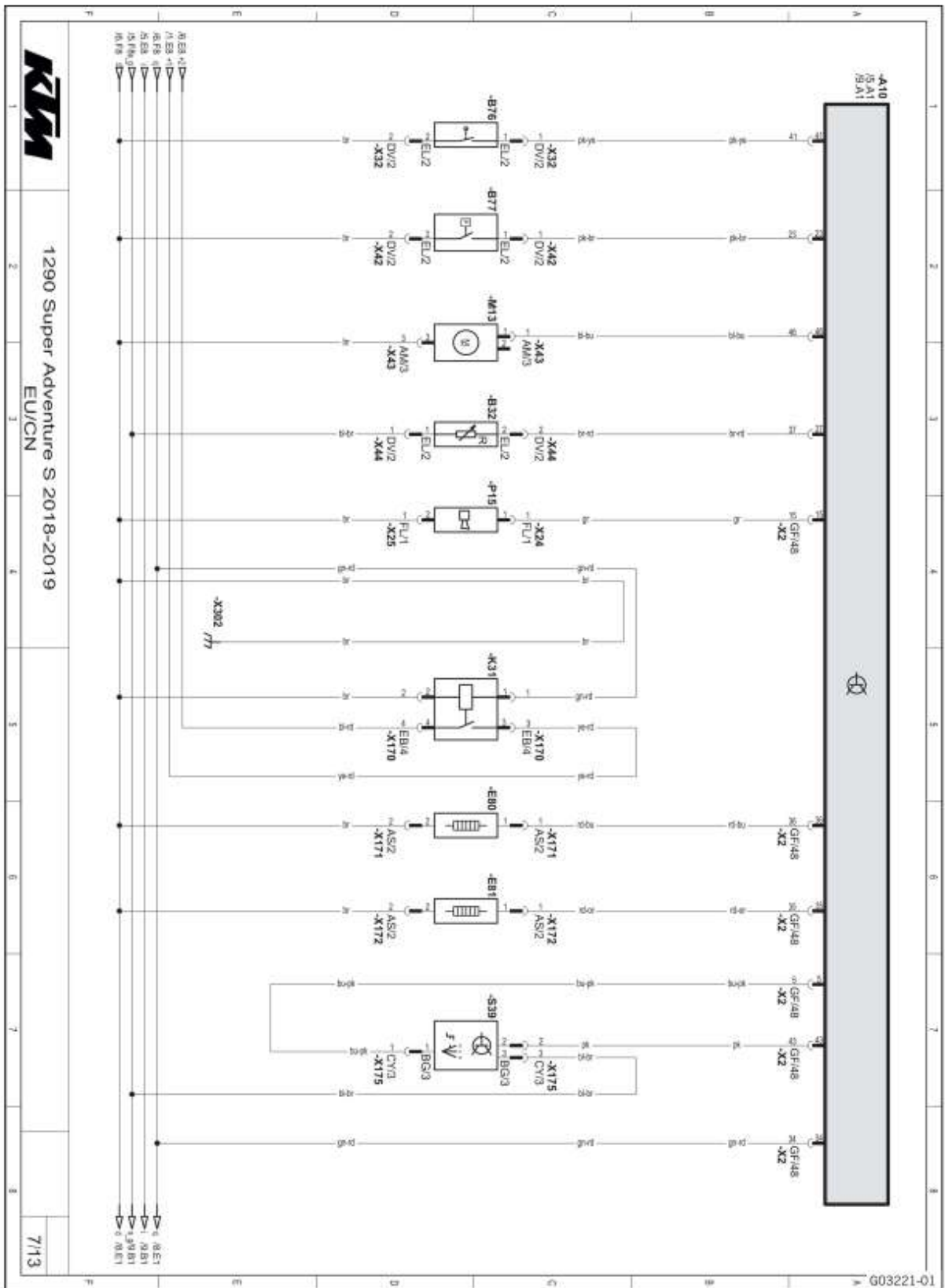
Components:

A10	Central electronics control unit
A50	Alarm system (optional)
B25	Air temperature sensor
B36	Alarm system switch (optional)
B85	Tire pressure sensor
B86	Angle sensor
P10	Combination instrument
S32	Combination switch



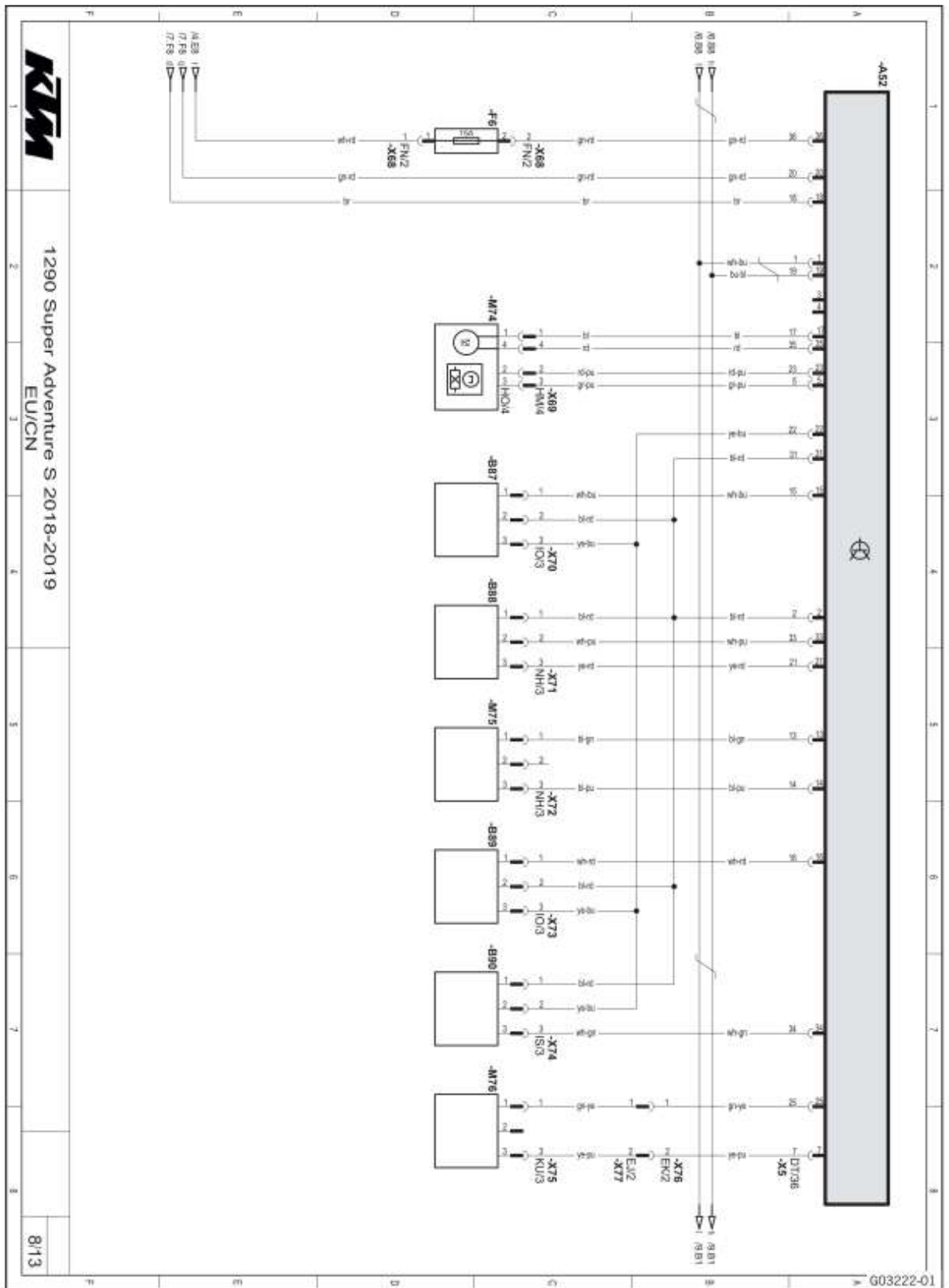
Components:

A30	ABS control unit
B70	Front wheel speed sensor
B71	Rear wheel speed sensor
F7	ABS return pump fuse
F8	ABS hydraulic unit fuse
X295	Diagnostics connector



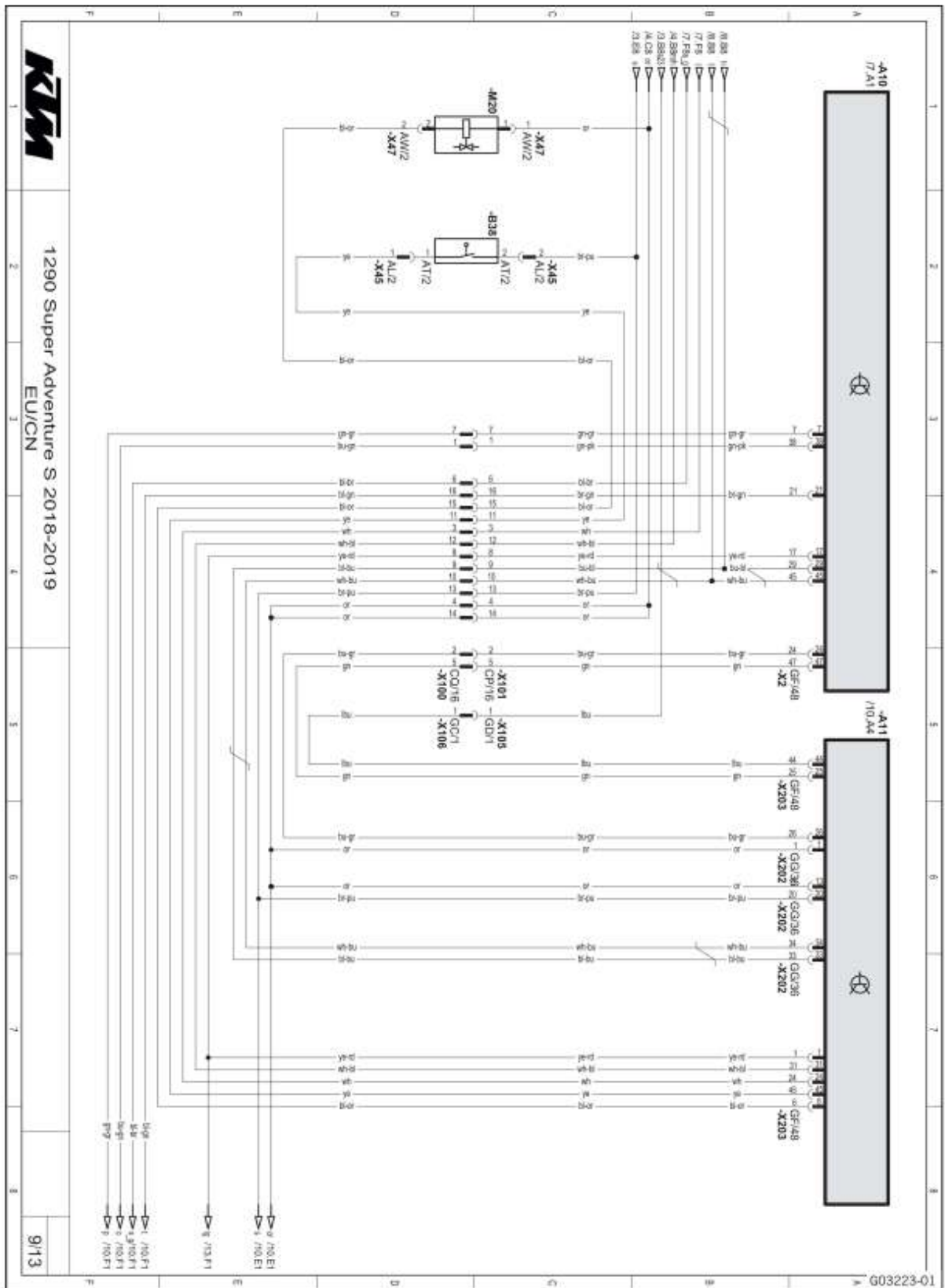
Components:

A10	Central electronics control unit
B32	Fuel level sensor
B76	Front brake light switch
B77	Rear brake light switch
E80	Front seat heating (optional)
E81	Rear seat heating (optional)
K31	Relay for auxiliary equipment
M13	Fuel pump
P15	Horn
S39	Rear seat heating switch (optional)



Components:

A52	Damping control unit
B87	Front acceleration sensor
B88	Front suspension travel sensor
B89	Rear acceleration sensor
B90	Swingarm position sensor
F6	Fuse
M74	Spring preload actuator with hall sensor
M75	Front damping valve
M76	Rear damping valve

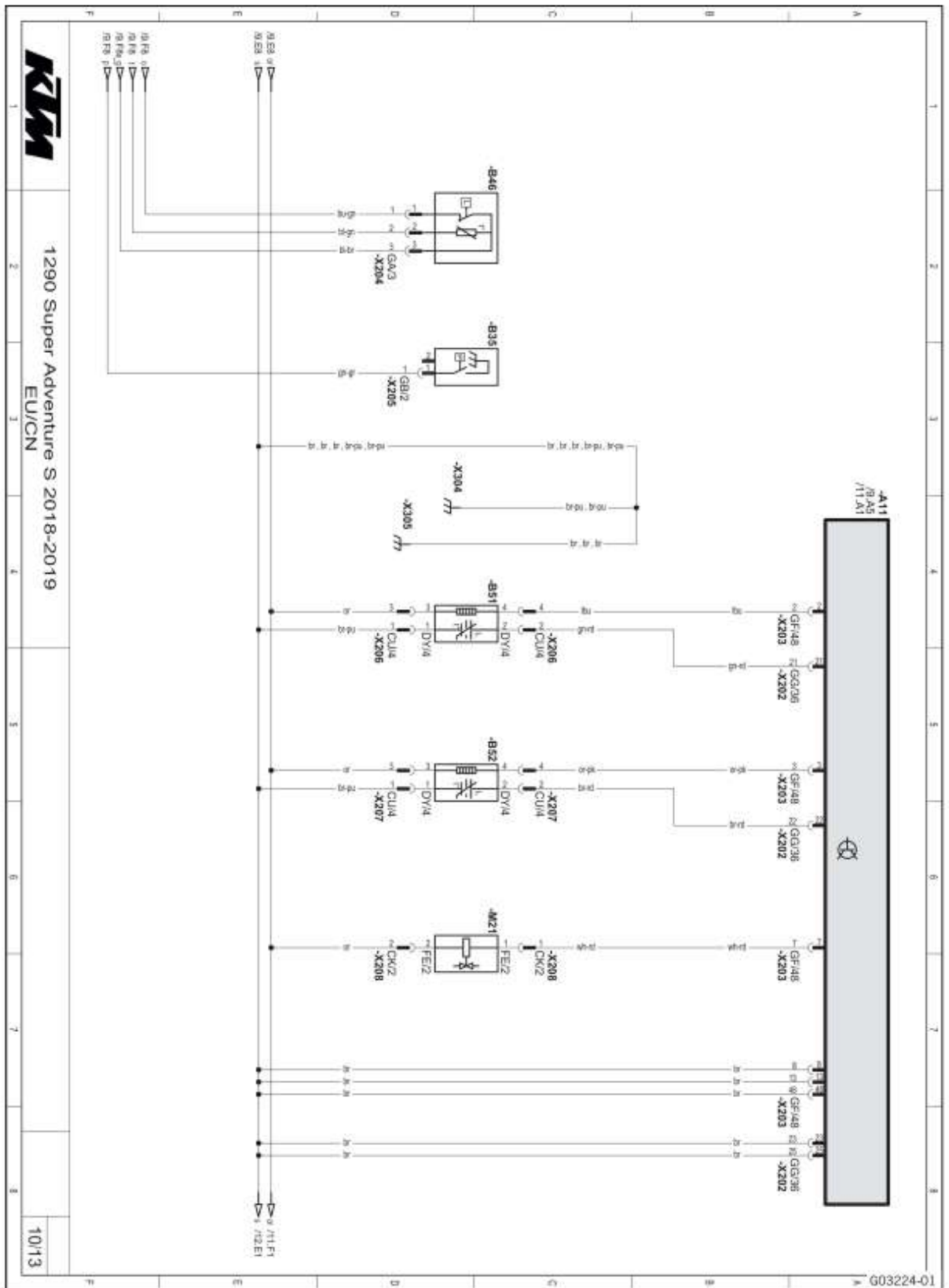


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EU/CN

9/13

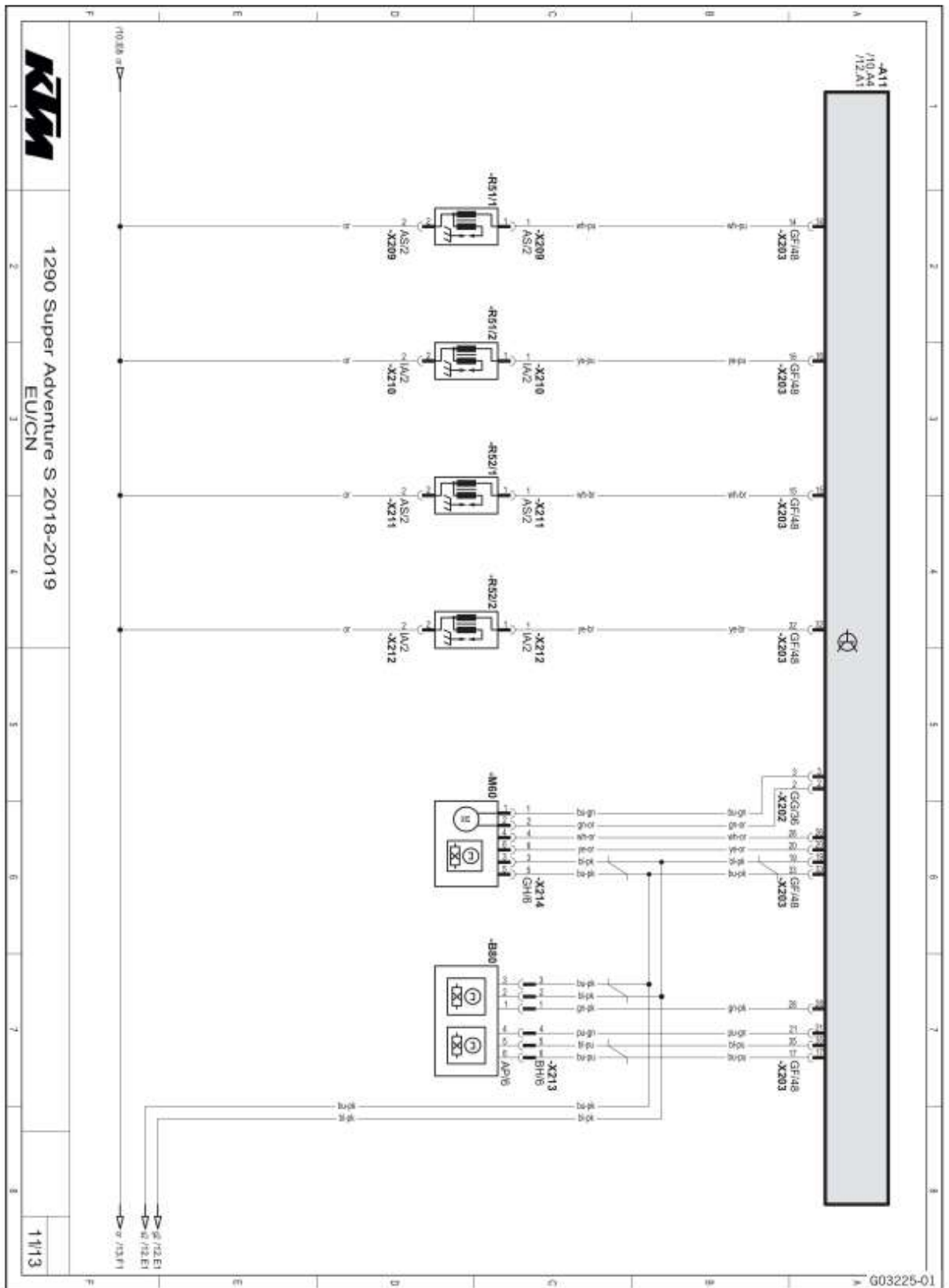
Components:

A10	Central electronics control unit
A11	Engine electronics control unit
B38	Clutch switch
M20	Evaporate emission control valve



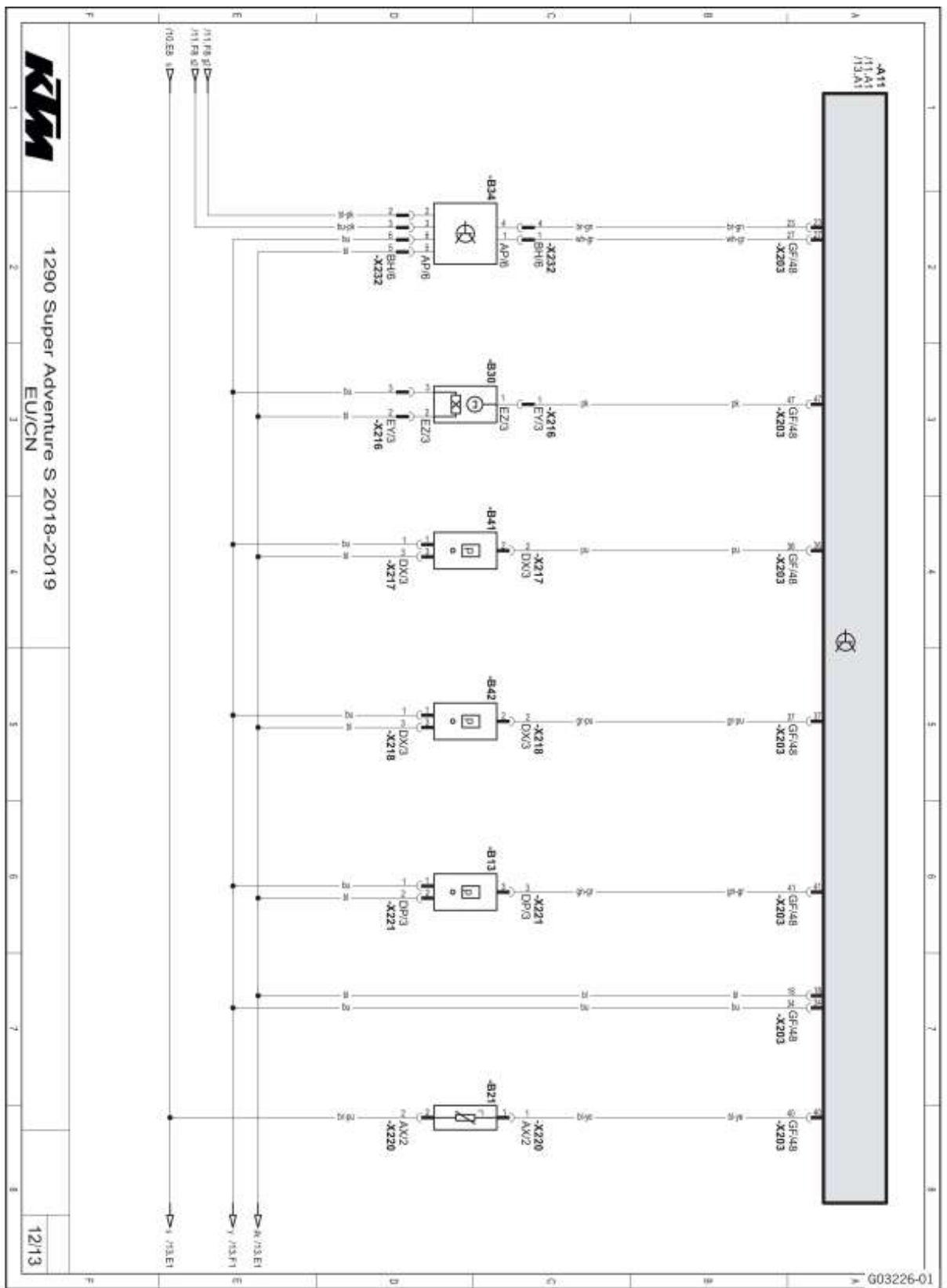
Components:

A11	Engine electronics control unit
B35	Oil pressure sensor
B46	Oil level and temperature sensor
B51	Cylinder 1 lambda sensor
B52	Cylinder 2 lambda sensor
M21	Secondary air system valve



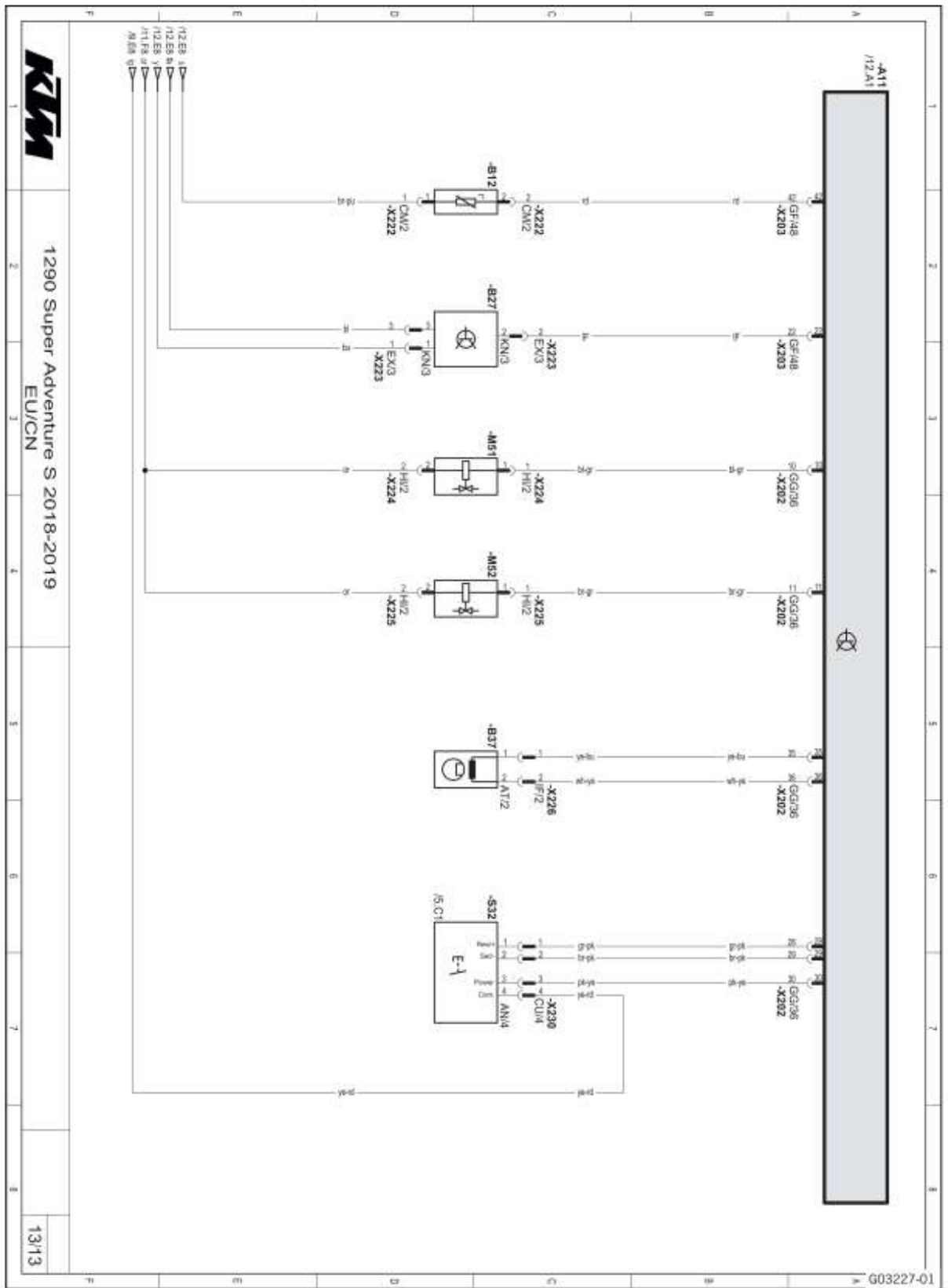
Components:

A11	Engine electronics control unit
B80	Throttle grip
M60	Throttle valve actuator and throttle valve position sensor
R51/1	Ignition coil 1, cylinder 1
R51/2	Ignition coil 2, cylinder 1
R52/1	Ignition coil 1, cylinder 2
R52/2	Ignition coil 2, cylinder 2



Components:

A11	Engine electronics control unit
B13	Ambient air pressure sensor
B21	Coolant temperature sensor cylinder 1
B30	Side stand sensor
B34	Gear position sensor
B41	Induction manifold pressure sensor cylinder 1
B42	Induction manifold pressure sensor cylinder 2

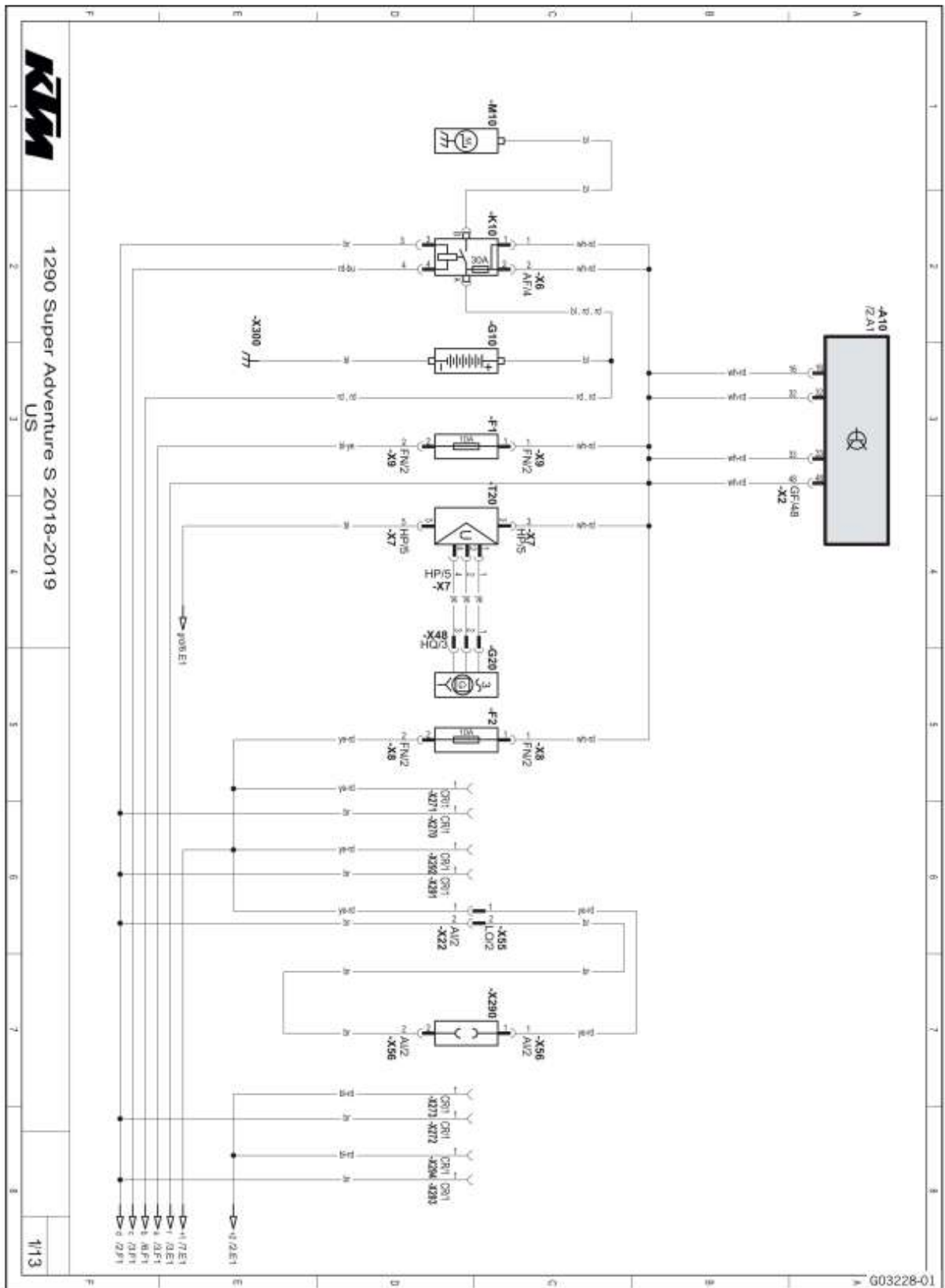


Components:

A11	Engine electronics control unit
B12	Intake air temperature sensor
B27	Shift shaft sensor
B37	Crankshaft speed sensor
M51	Injection valve, cylinder 1
M52	Injection valve, cylinder 2
S32	Combination switch

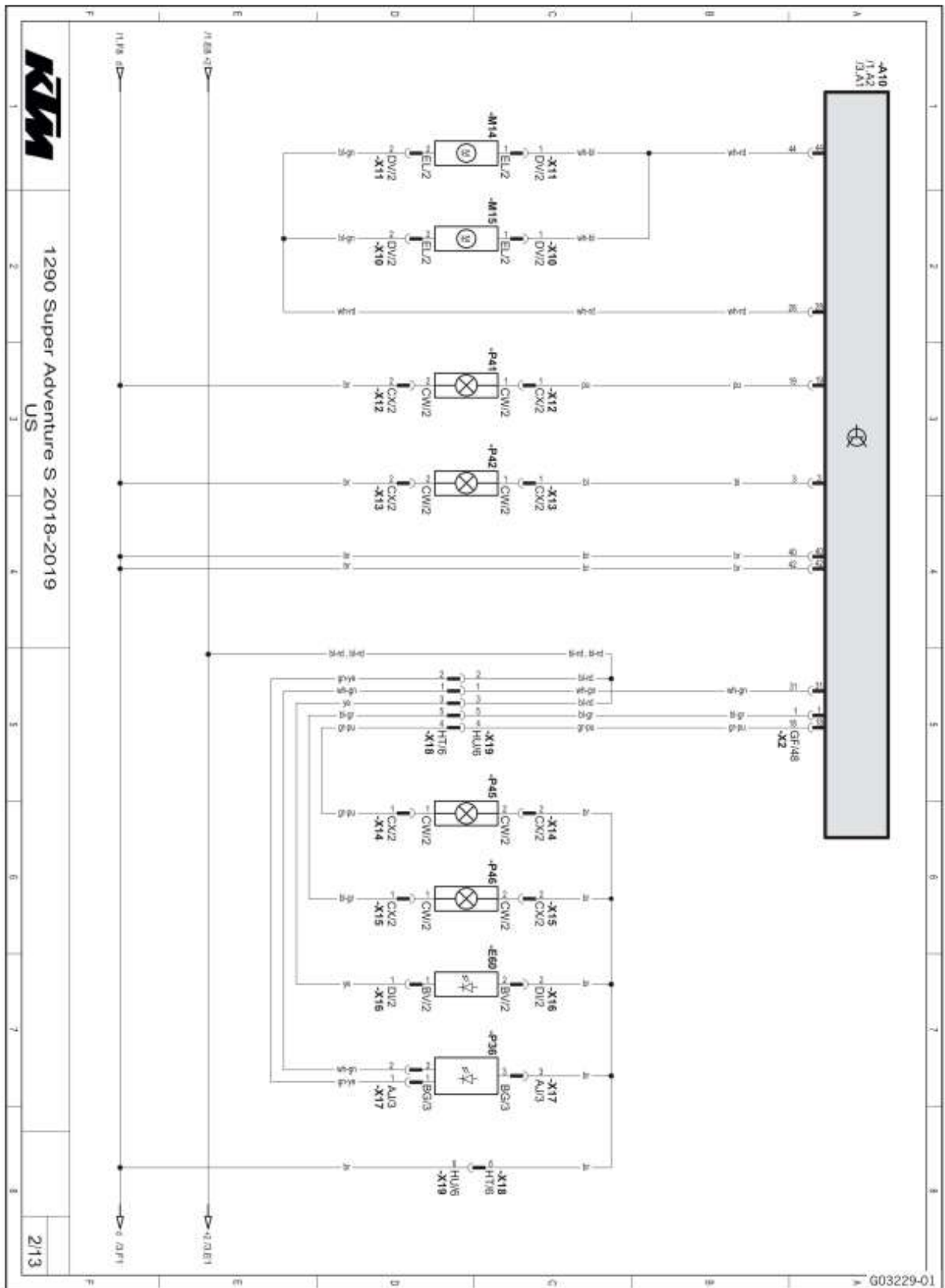
Cable colors:

bl	Black
br	Brown
bu	Blue
gn	Green
gr	Gray
lbu	Light blue
or	Orange
pk	Pink
pu	Violet
rd	Red
wh	White
ye	Yellow



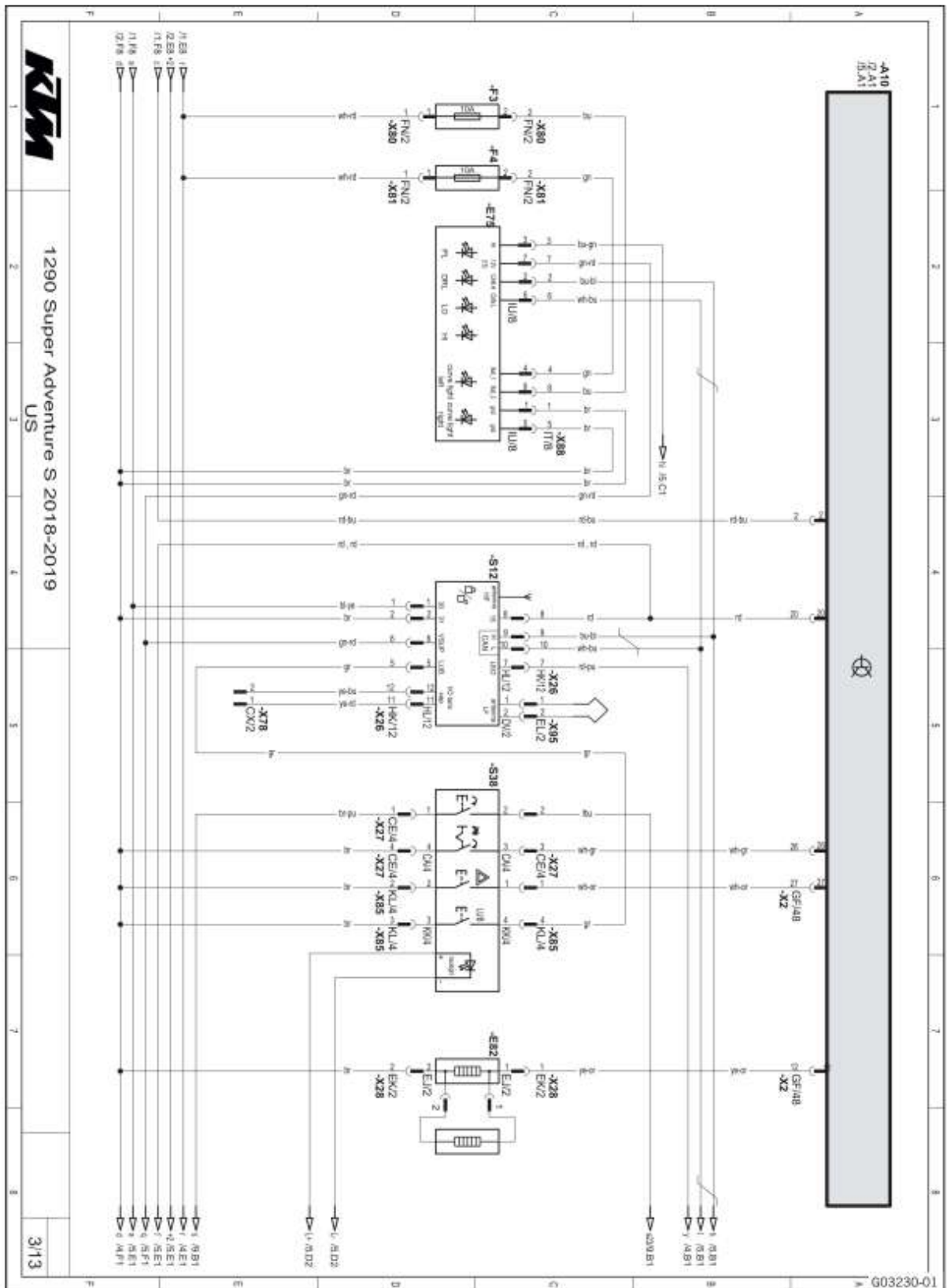
Components:

A10	Central electronics control unit
F1	Fuse
F2	Fuse
G10	12-V battery
G20	Alternator
K10	Starter relay with main fuse
M10	Electric starter system
T20	Voltage regulator
X270	Connector for accessory ground (terminal 31) ACC 1 (not assigned)
X271	Connector for accessory plus (terminal 30) ACC 1 (not assigned)
X272	Connector for accessory ground (terminal 31) ACC 2 (not assigned)
X273	Connector for accessory plus (terminal 15) ACC 2 (not assigned)
X290	Socket
X291	Connector for accessory ground (terminal 31) ACC 1
X292	Connector for accessory plus (terminal 30) ACC 1
X293	Connector for accessory ground (terminal 31) ACC 2 (not assigned)
X294	Connector for accessory plus (terminal 15) ACC 2 (not assigned)



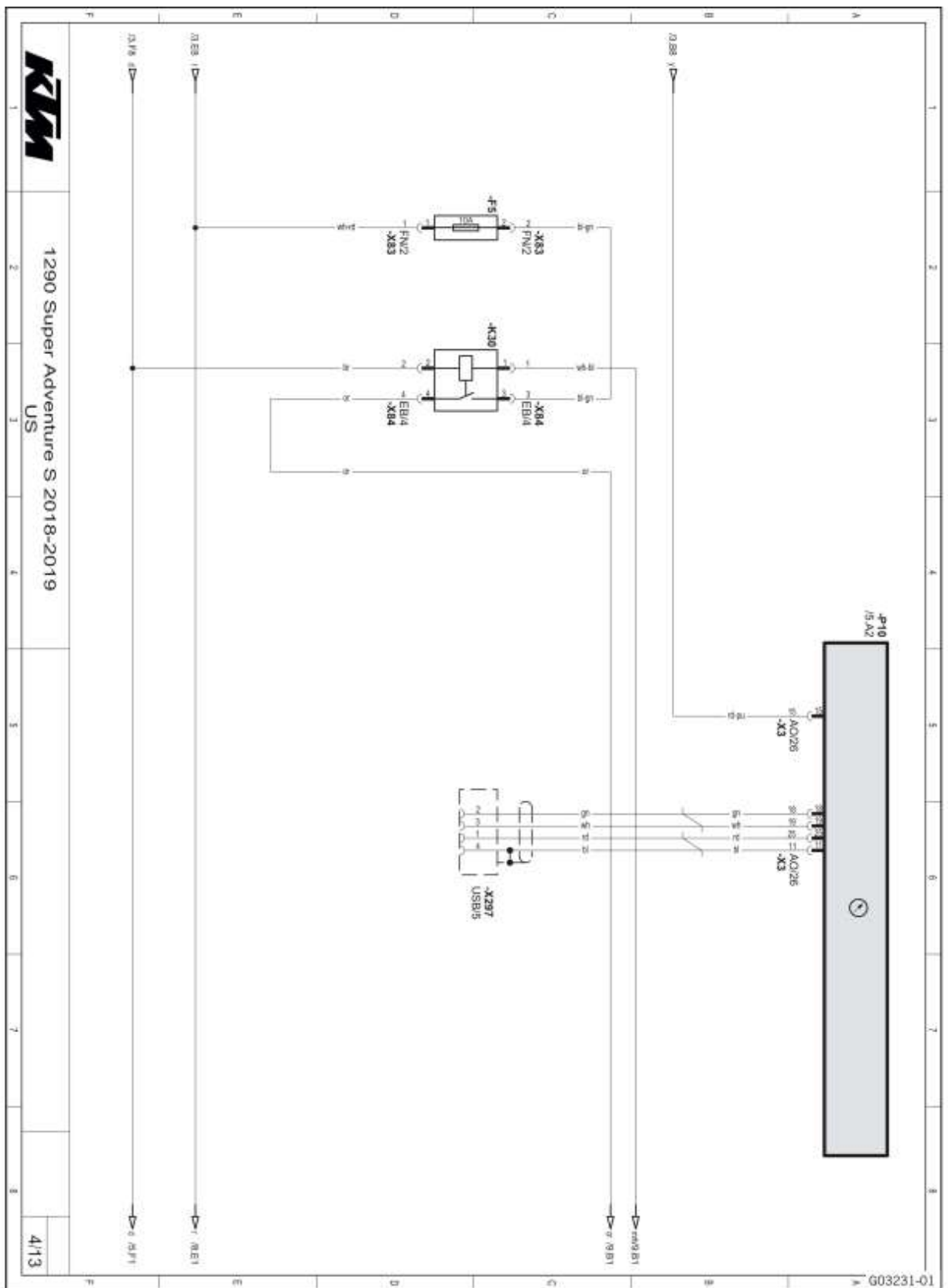
Components:

A10	Central electronics control unit
E60	License plate lamp
M14	Radiator fan 1
M15	Radiator fan 2
P36	Brake/tail light
P41	Turn signal, front left
P42	Turn signal, front right
P45	Turn signal, rear left
P46	Turn signal, rear right



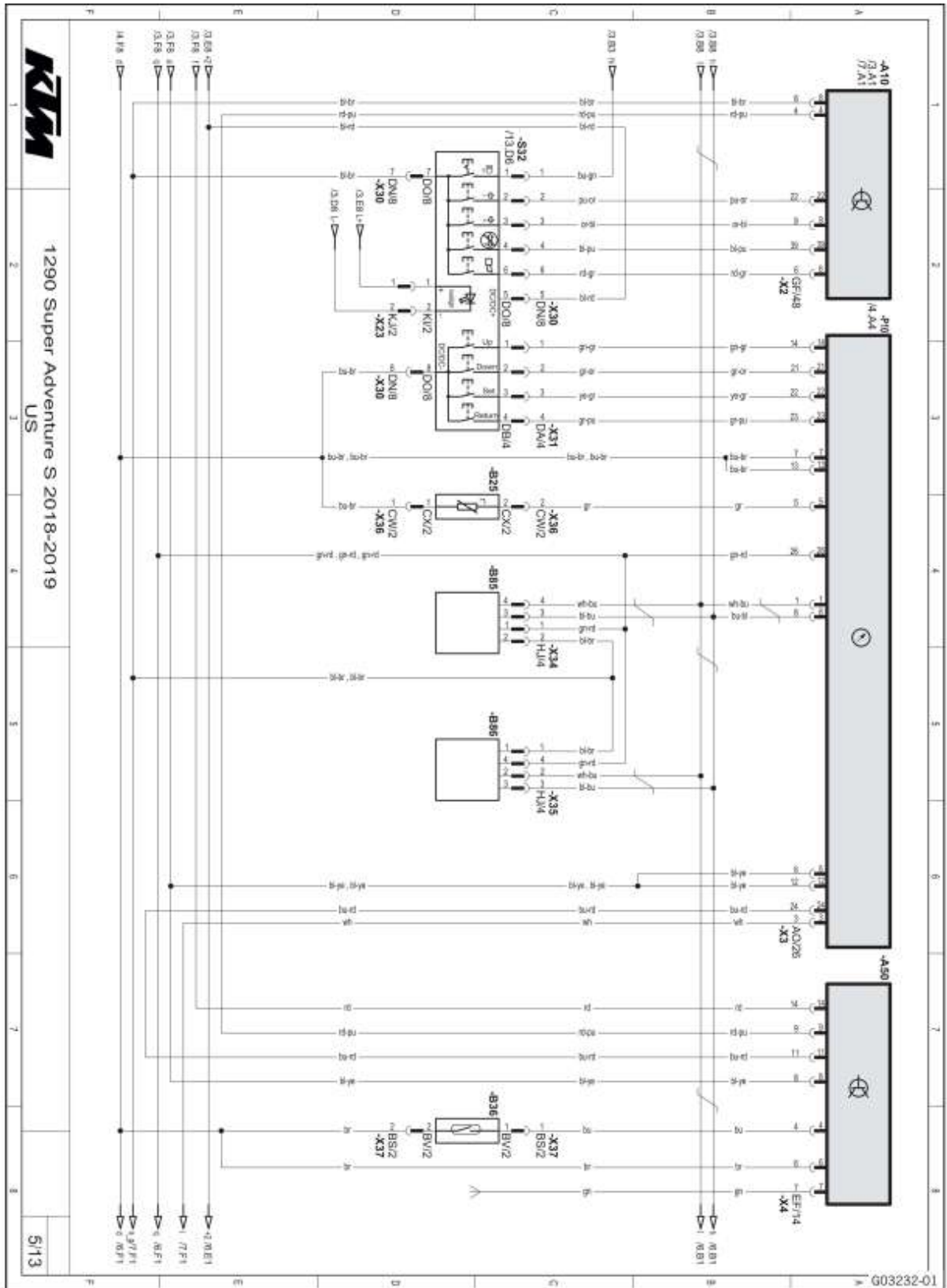
Components:

A10	Central electronics control unit
E75	Headlight unit
E82	Heated grip (optional)
F3	Fuse
F4	Fuse
S12	KTM RACE ON
S38	Emergency OFF switch, electric starter button, hazard warning flasher switch, Race-on tip switch



Components:

P10	Combination instrument
F5	Fuse
K30	Power relay
X297	USB programming connector

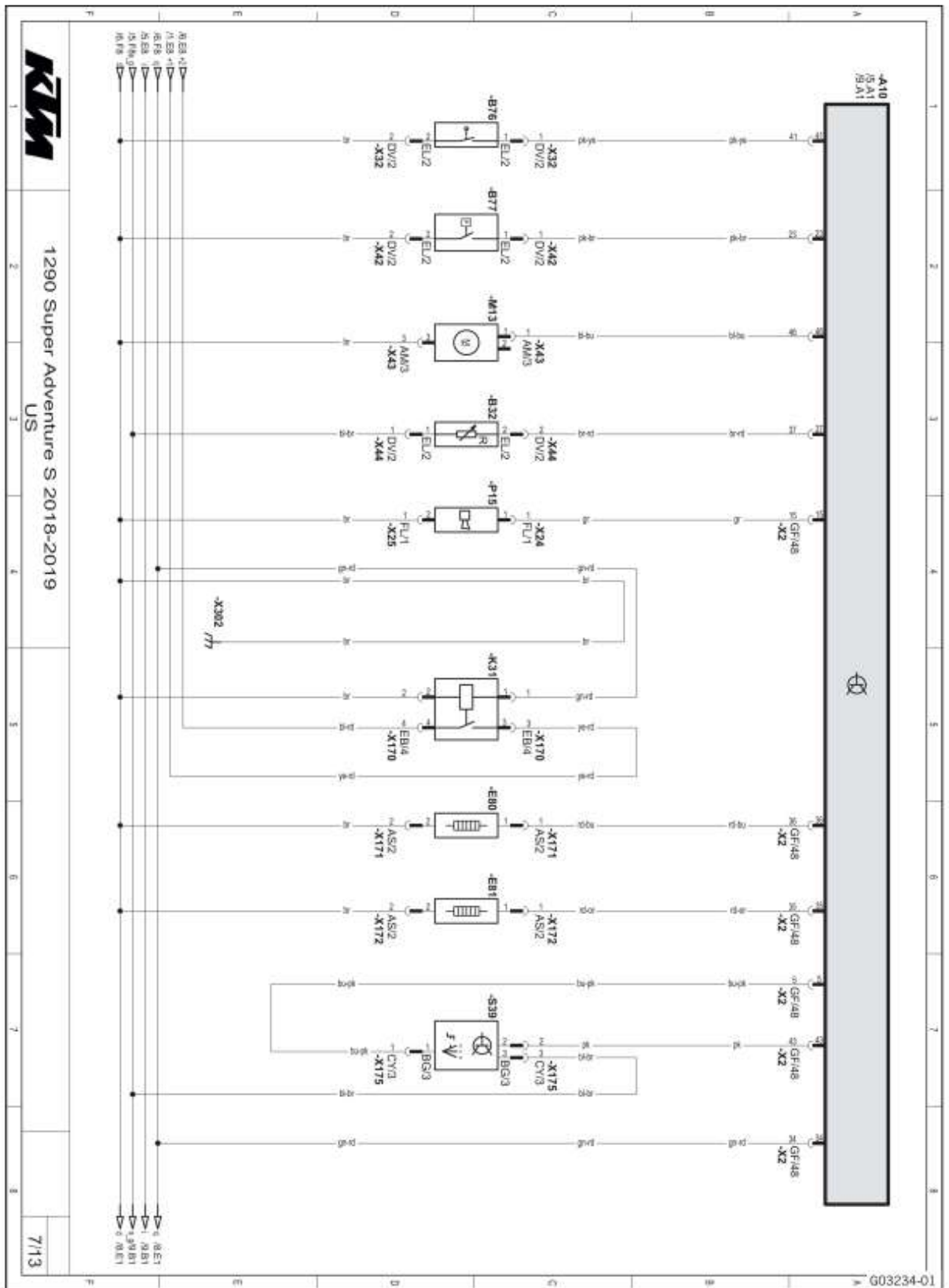


Components:

A10	Central electronics control unit
A50	Alarm system (optional)
B25	Air temperature sensor
B36	Alarm system switch (optional)
B85	Tire pressure sensor
B86	Angle sensor
P10	Combination instrument
S32	Combination switch

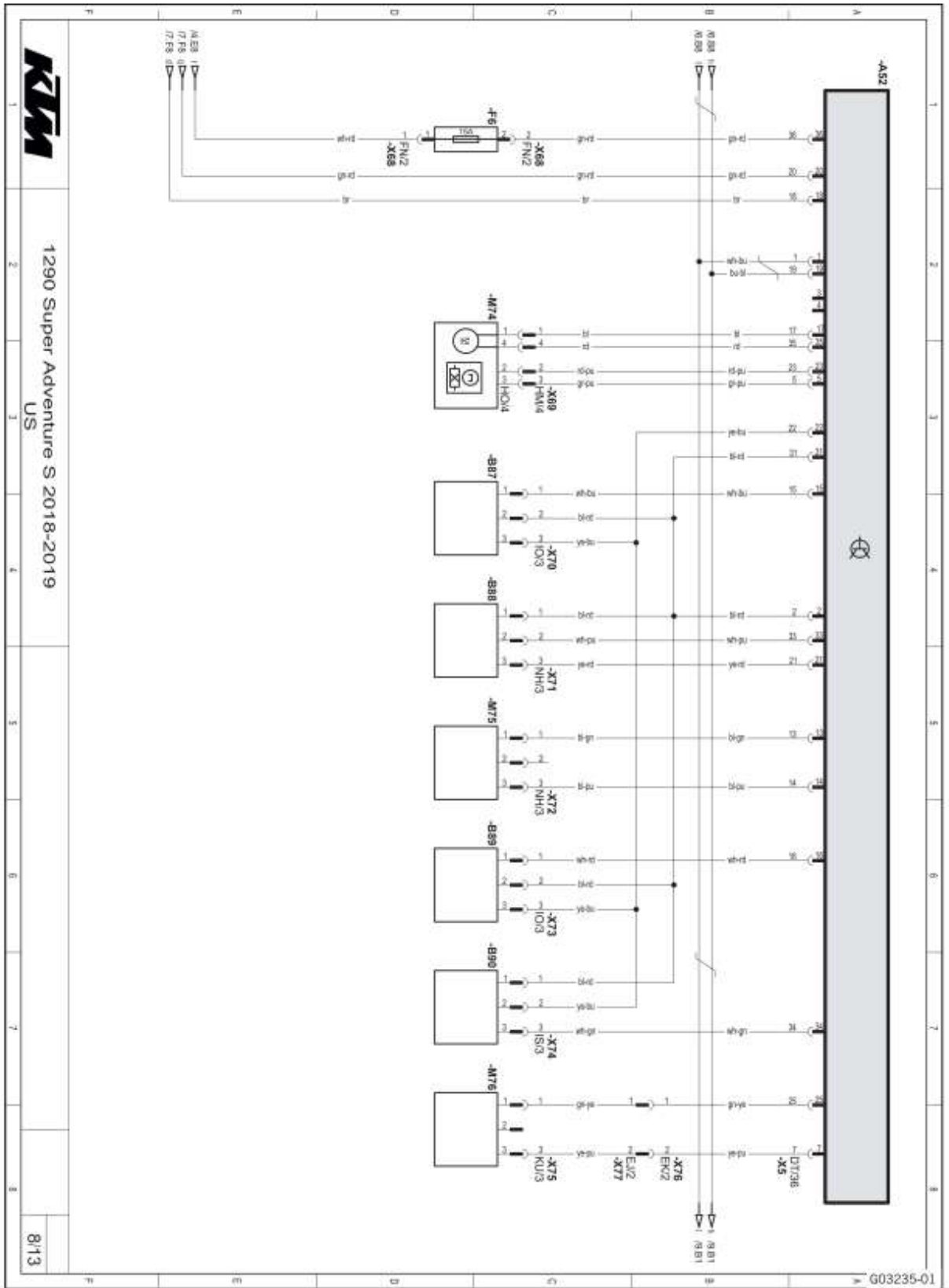
Components:

A30	ABS control unit
B70	Front wheel speed sensor
B71	Rear wheel speed sensor
F7	ABS return pump fuse
F8	ABS hydraulic unit fuse
X295	Diagnostics connector



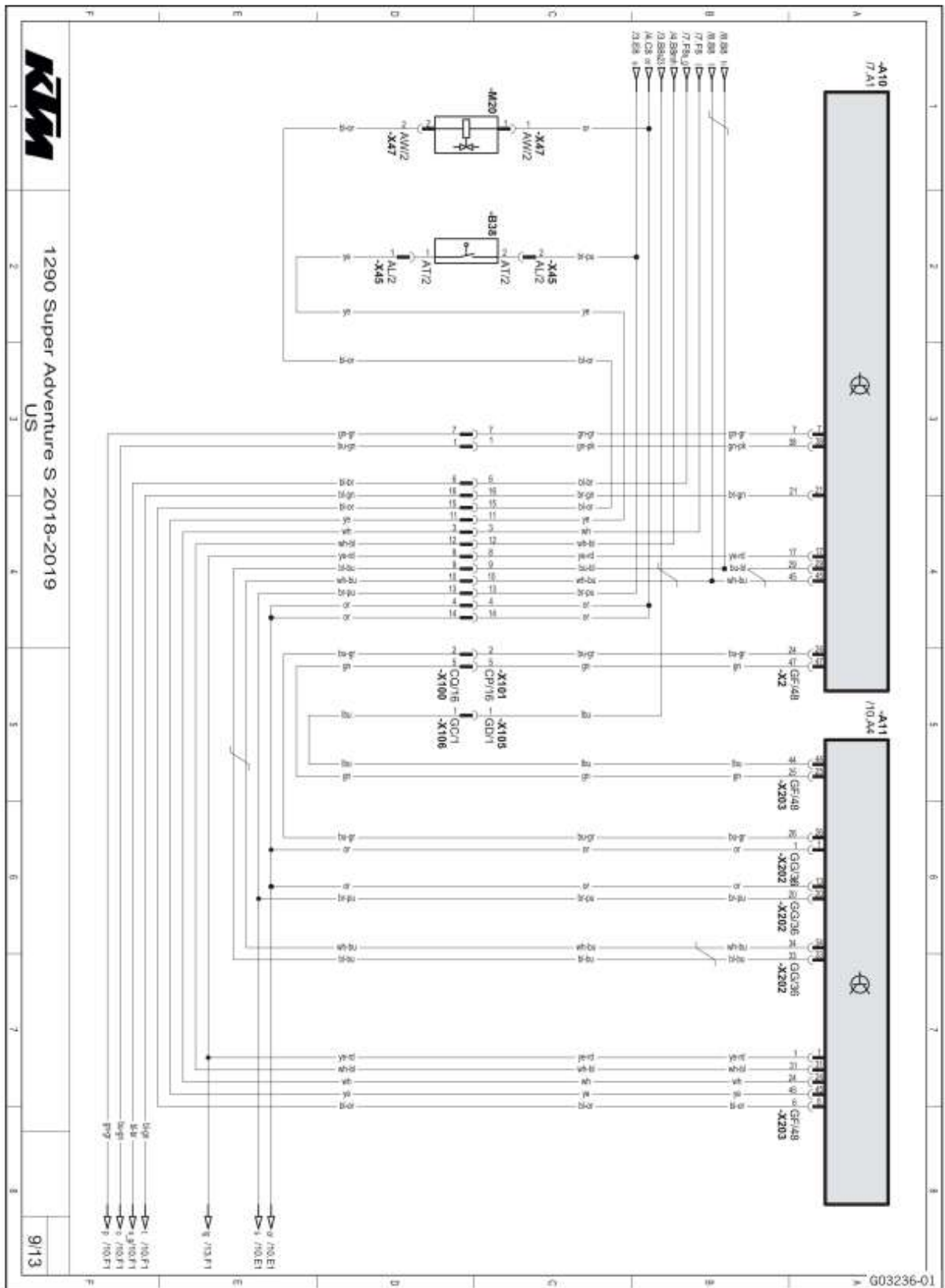
Components:

A10	Central electronics control unit
B32	Fuel level sensor
B76	Front brake light switch
B77	Rear brake light switch
E80	Front seat heating (optional)
E81	Rear seat heating (optional)
K31	Relay for auxiliary equipment
M13	Fuel pump
P15	Horn
S39	Rear seat heating switch (optional)



Components:

A52	Damping control unit
B87	Front acceleration sensor
B88	Front suspension travel sensor
B89	Rear acceleration sensor
B90	Swingarm position sensor
F6	Fuse
M74	Spring preload actuator with hall sensor
M75	Front damping valve
M76	Rear damping valve

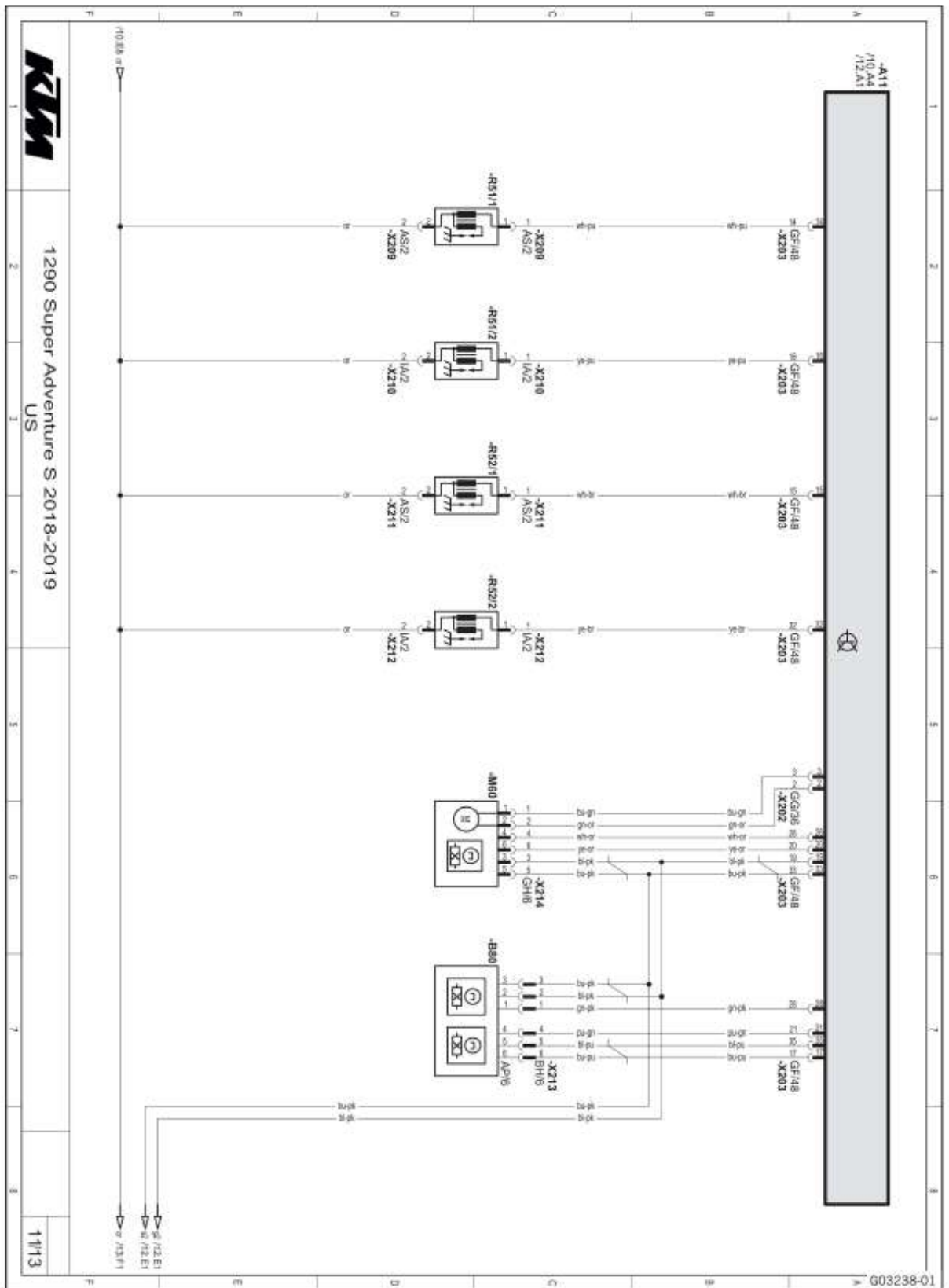


Components:

A10	Central electronics control unit
A11	Engine electronics control unit
B38	Clutch switch
M20	Evaporate emission control valve

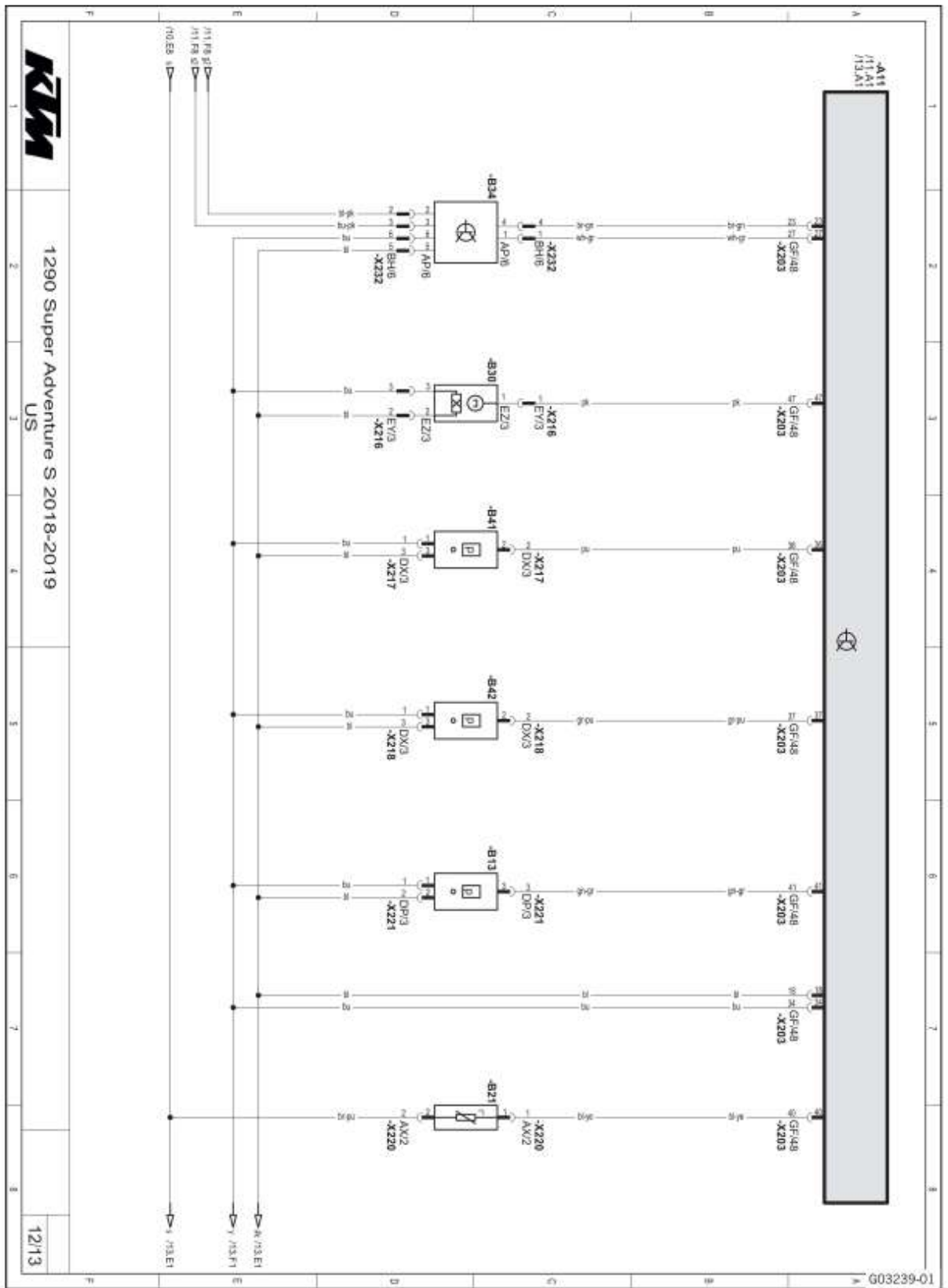
Components:

A11	Engine electronics control unit
B35	Oil pressure sensor
B46	Oil level and temperature sensor
B51	Cylinder 1 lambda sensor
B52	Cylinder 2 lambda sensor
M21	Secondary air system valve



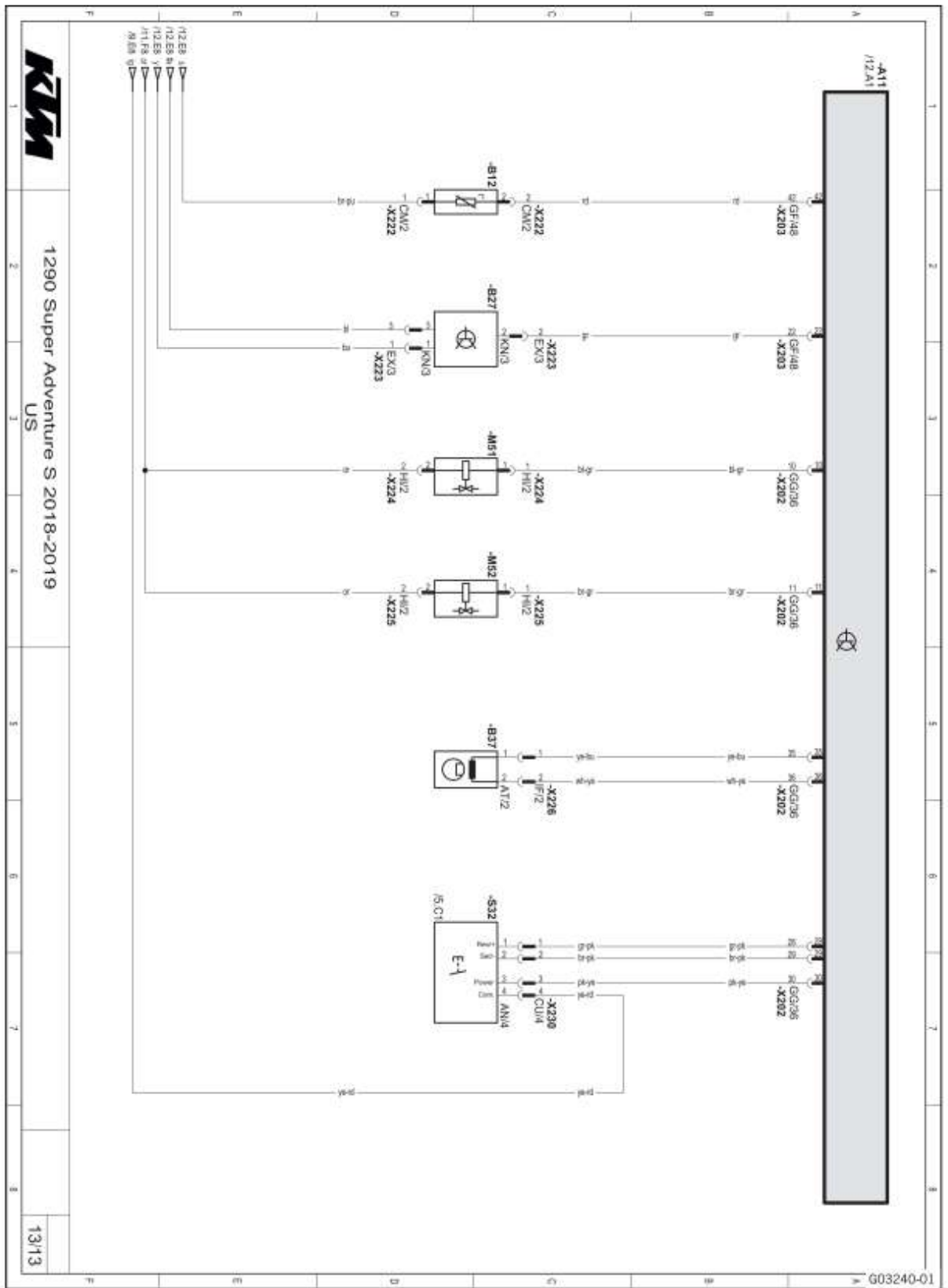
Components:

A11	Engine electronics control unit
B80	Throttle grip
M60	Throttle valve actuator and throttle valve position sensor
R51/1	Ignition coil 1, cylinder 1
R51/2	Ignition coil 2, cylinder 1
R52/1	Ignition coil 1, cylinder 2
R52/2	Ignition coil 2, cylinder 2



Components:

A11	Engine electronics control unit
B13	Ambient air pressure sensor
B21	Coolant temperature sensor cylinder 1
B30	Side stand sensor
B34	Gear position sensor
B41	Induction manifold pressure sensor cylinder 1
B42	Induction manifold pressure sensor cylinder 2



Components:

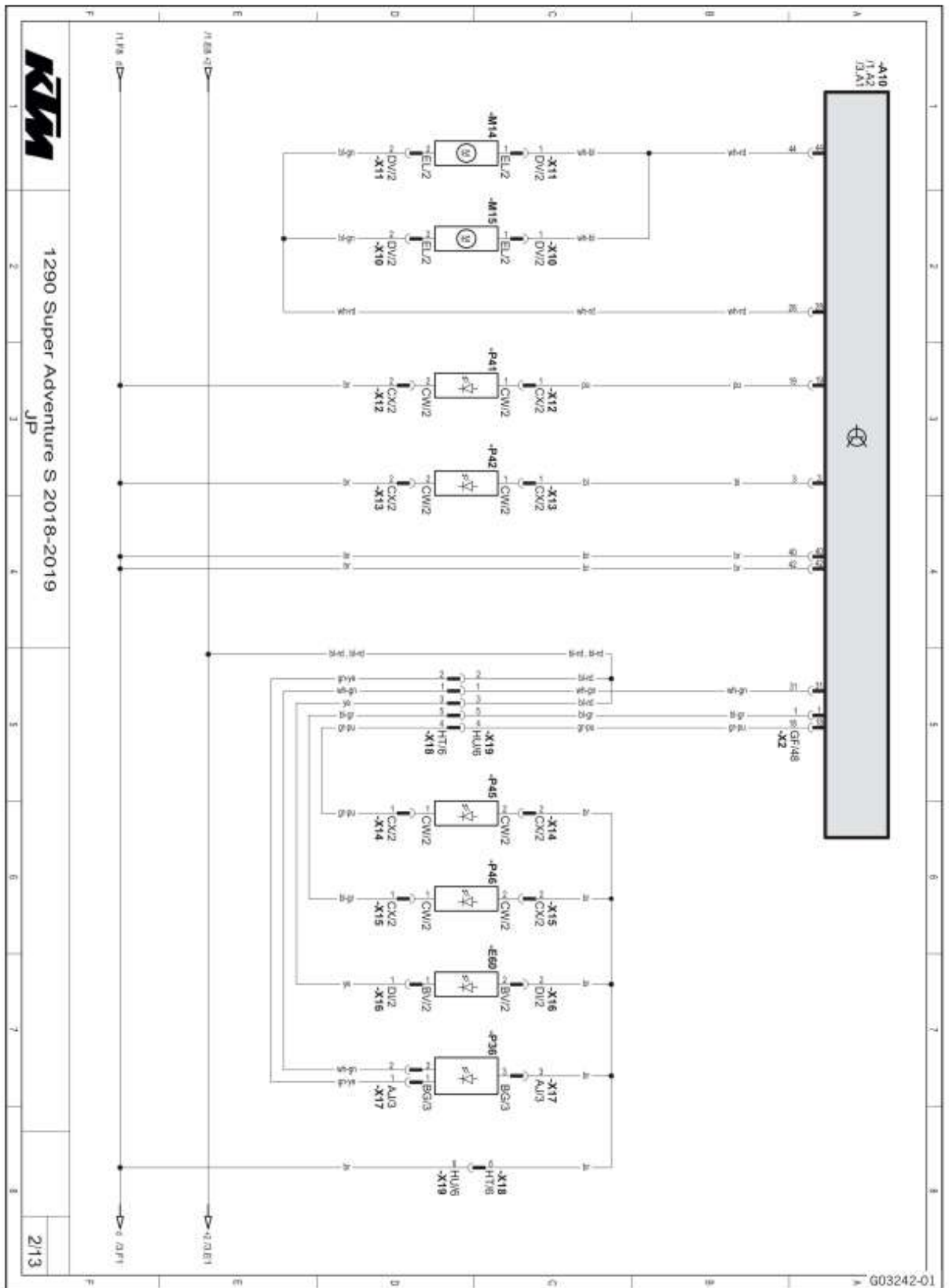
A11	Engine electronics control unit
B12	Intake air temperature sensor
B27	Shift shaft sensor
B37	Crankshaft speed sensor
M51	Injection valve, cylinder 1
M52	Injection valve, cylinder 2
S32	Combination switch

Cable colors:

bl	Black
br	Brown
bu	Blue
gn	Green
gr	Gray
lbu	Light blue
or	Orange
pk	Pink
pu	Violet
rd	Red
wh	White
ye	Yellow

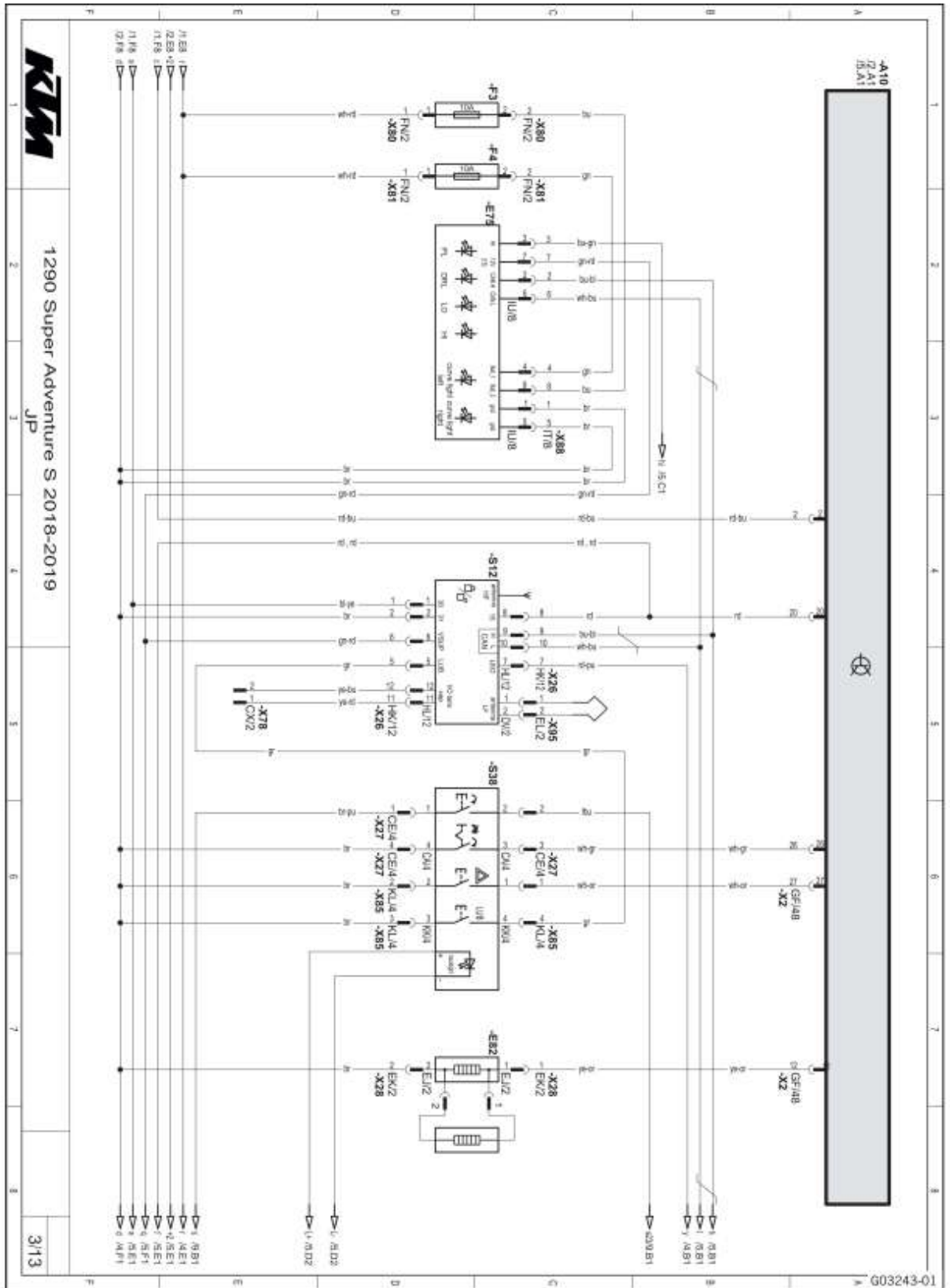
Components:

A10	Central electronics control unit
F1	Fuse
F2	Fuse
G10	12-V battery
G20	Alternator
K10	Starter relay with main fuse
M10	Electric starter system
T20	Voltage regulator
X270	Connector for accessory ground (terminal 31) ACC 1 (not assigned)
X271	Connector for accessory plus (terminal 30) ACC 1 (not assigned)
X272	Connector for accessory ground (terminal 31) ACC 2 (not assigned)
X273	Connector for accessory plus (terminal 15) ACC 2 (not assigned)
X290	Socket
X291	Connector for accessory ground (terminal 31) ACC 1
X292	Connector for accessory plus (terminal 30) ACC 1
X293	Connector for accessory ground (terminal 31) ACC 2 (not assigned)
X294	Connector for accessory plus (terminal 15) ACC 2 (not assigned)



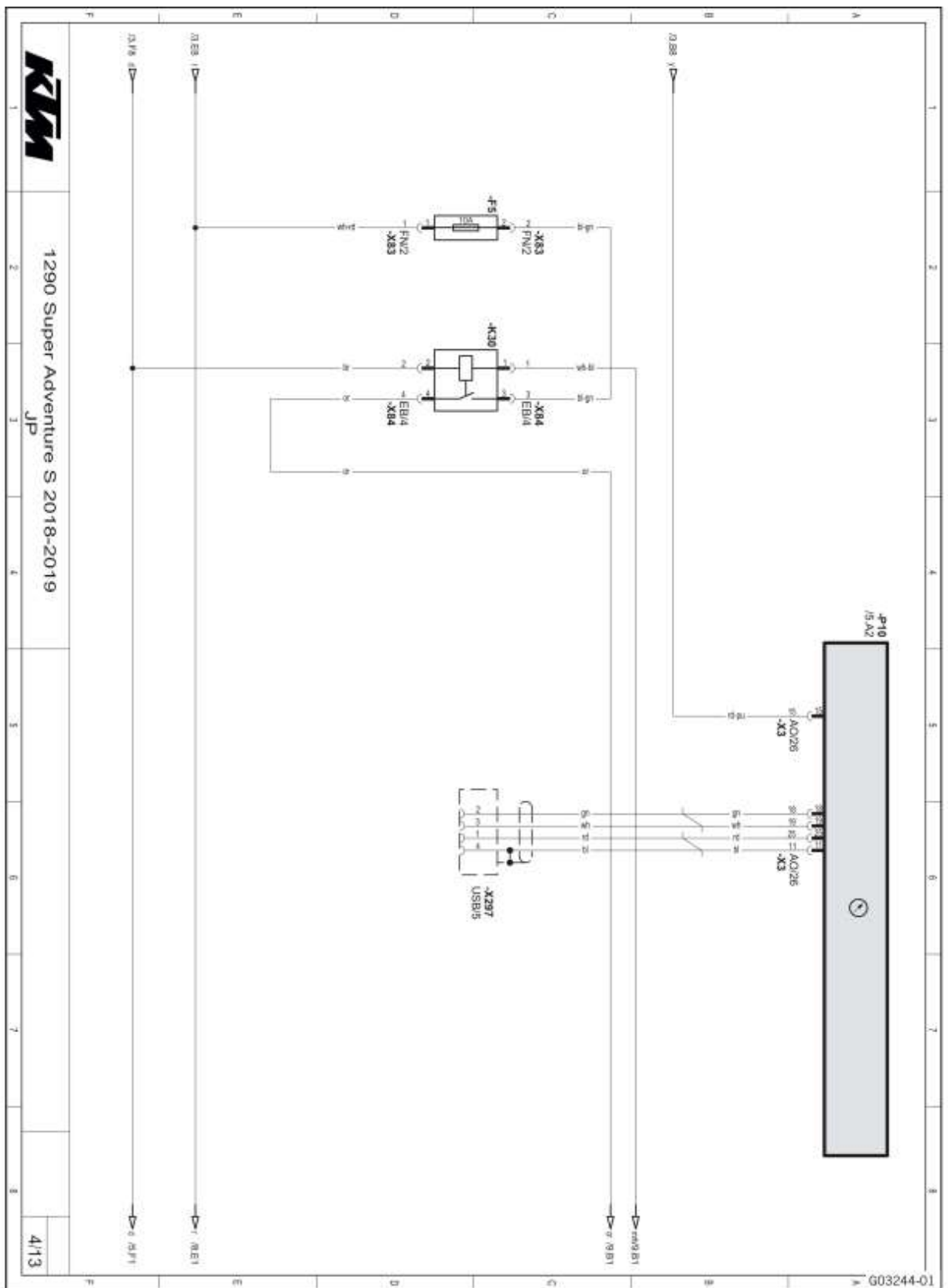
Components:

A10	Central electronics control unit
E60	License plate lamp
M14	Radiator fan 1
M15	Radiator fan 2
P36	Brake/tail light
P41	Turn signal, front left
P42	Turn signal, front right
P45	Turn signal, rear left
P46	Turn signal, rear right



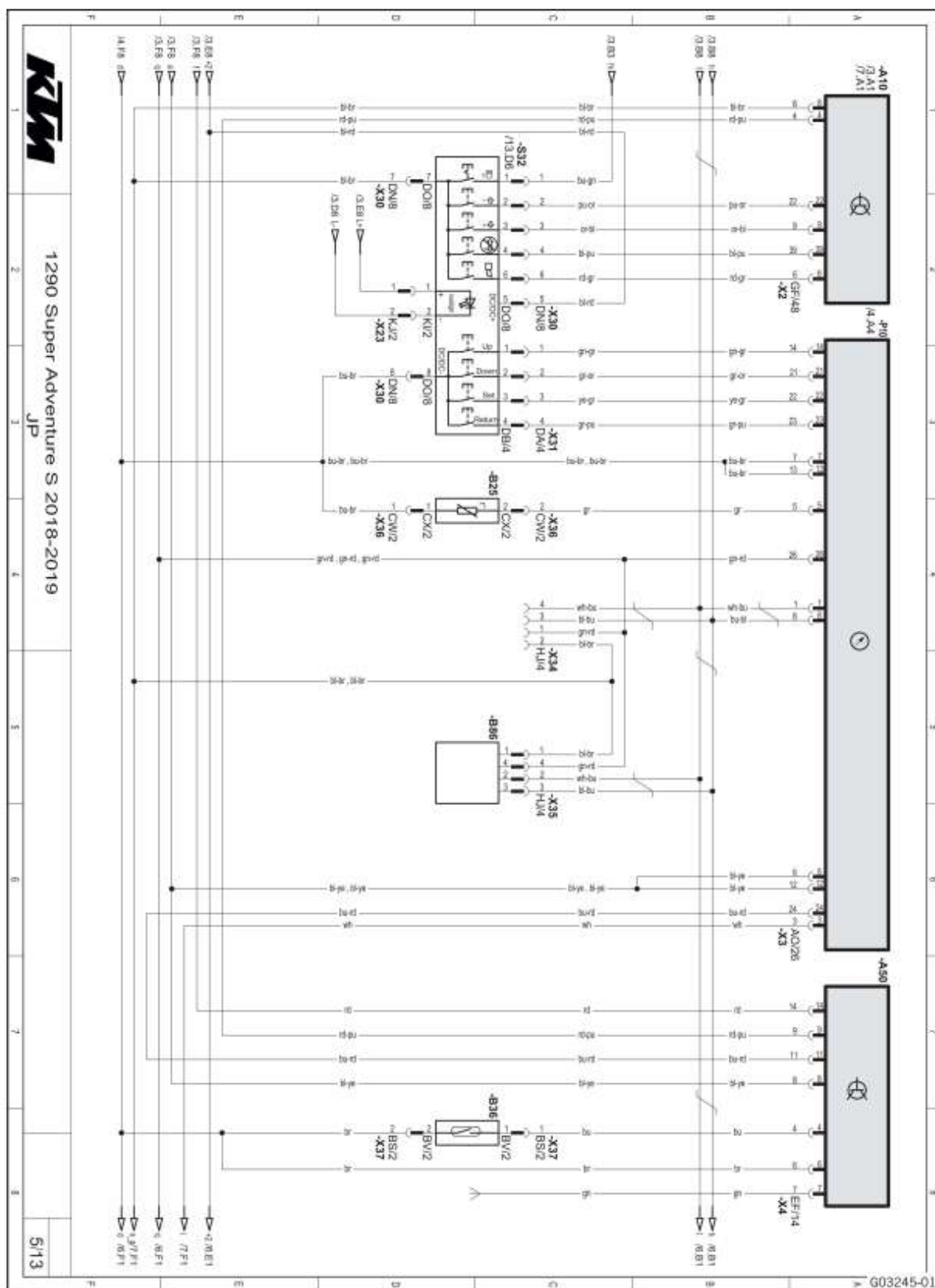
Components:

A10	Central electronics control unit
E75	Headlight unit
E82	Heated grip (optional)
F3	Fuse
F4	Fuse
S12	KTM RACE ON
S38	Emergency OFF switch, electric starter button, hazard warning flasher switch, Race-on tip switch



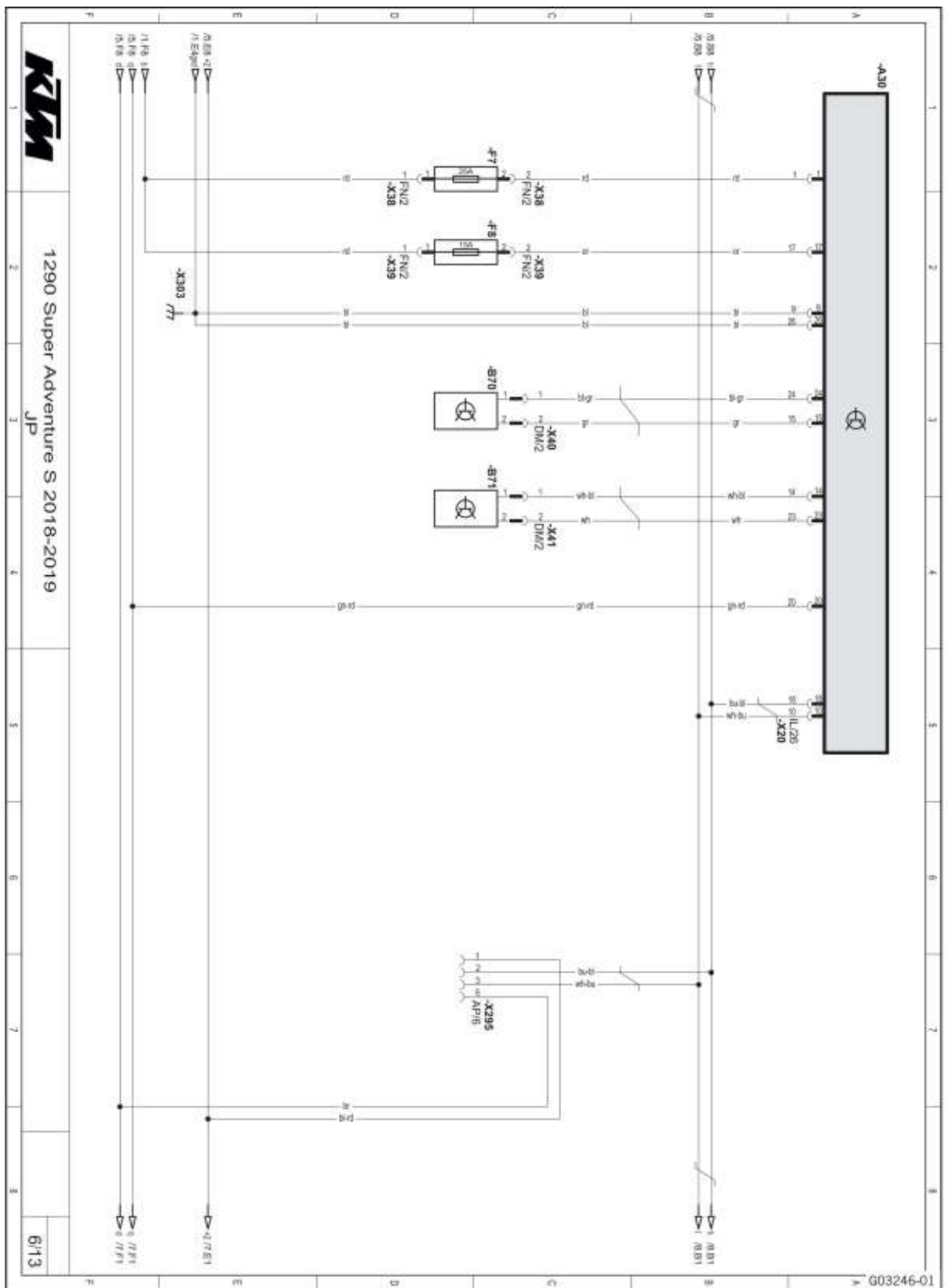
Components:

- P10 Combination instrument
- F5 Fuse
- K30 Power relay
- X297 USB programming connector



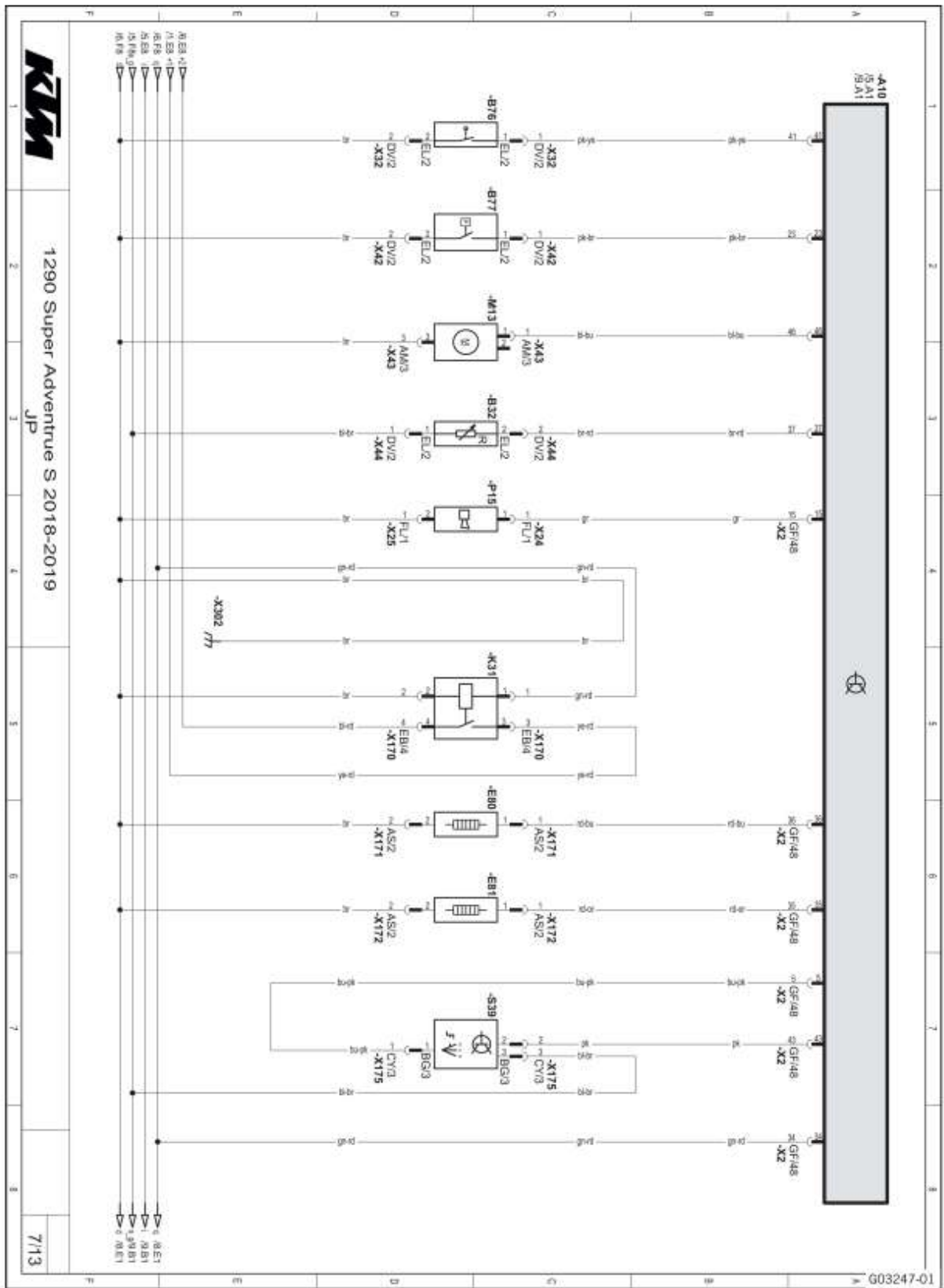
Components:

A10	Central electronics control unit
A50	Alarm system (optional)
B25	Air temperature sensor
B36	Alarm system switch (optional)
B86	Angle sensor
P10	Combination instrument
S32	Combination switch



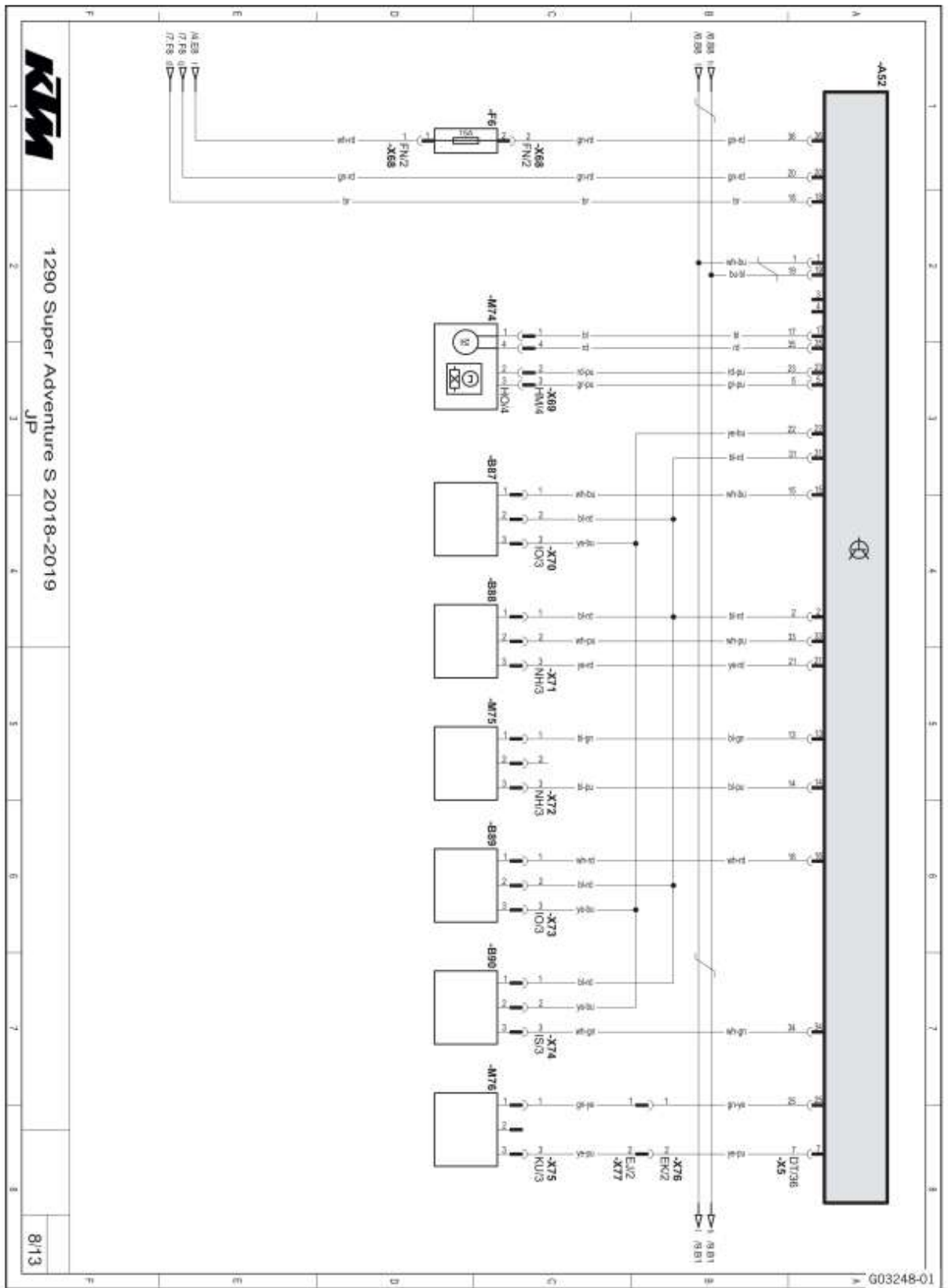
Components:

A30	ABS control unit
B70	Front wheel speed sensor
B71	Rear wheel speed sensor
F7	ABS return pump fuse
F8	ABS hydraulic unit fuse
X295	Diagnostics connector



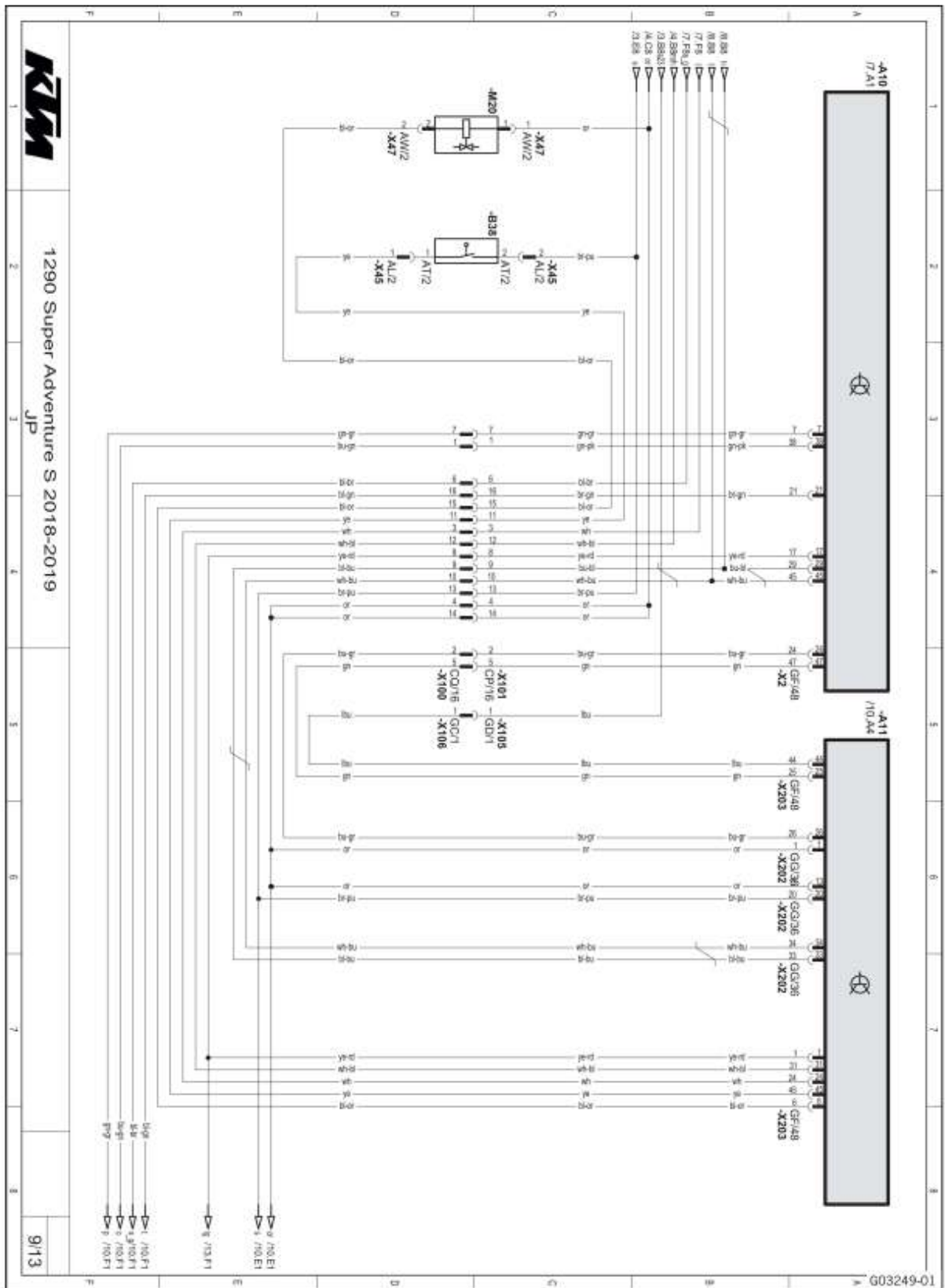
Components:

A10	Central electronics control unit
B32	Fuel level sensor
B76	Front brake light switch
B77	Rear brake light switch
E80	Front seat heating (optional)
E81	Rear seat heating (optional)
K31	Relay for auxiliary equipment
M13	Fuel pump
P15	Horn
S39	Rear seat heating switch (optional)



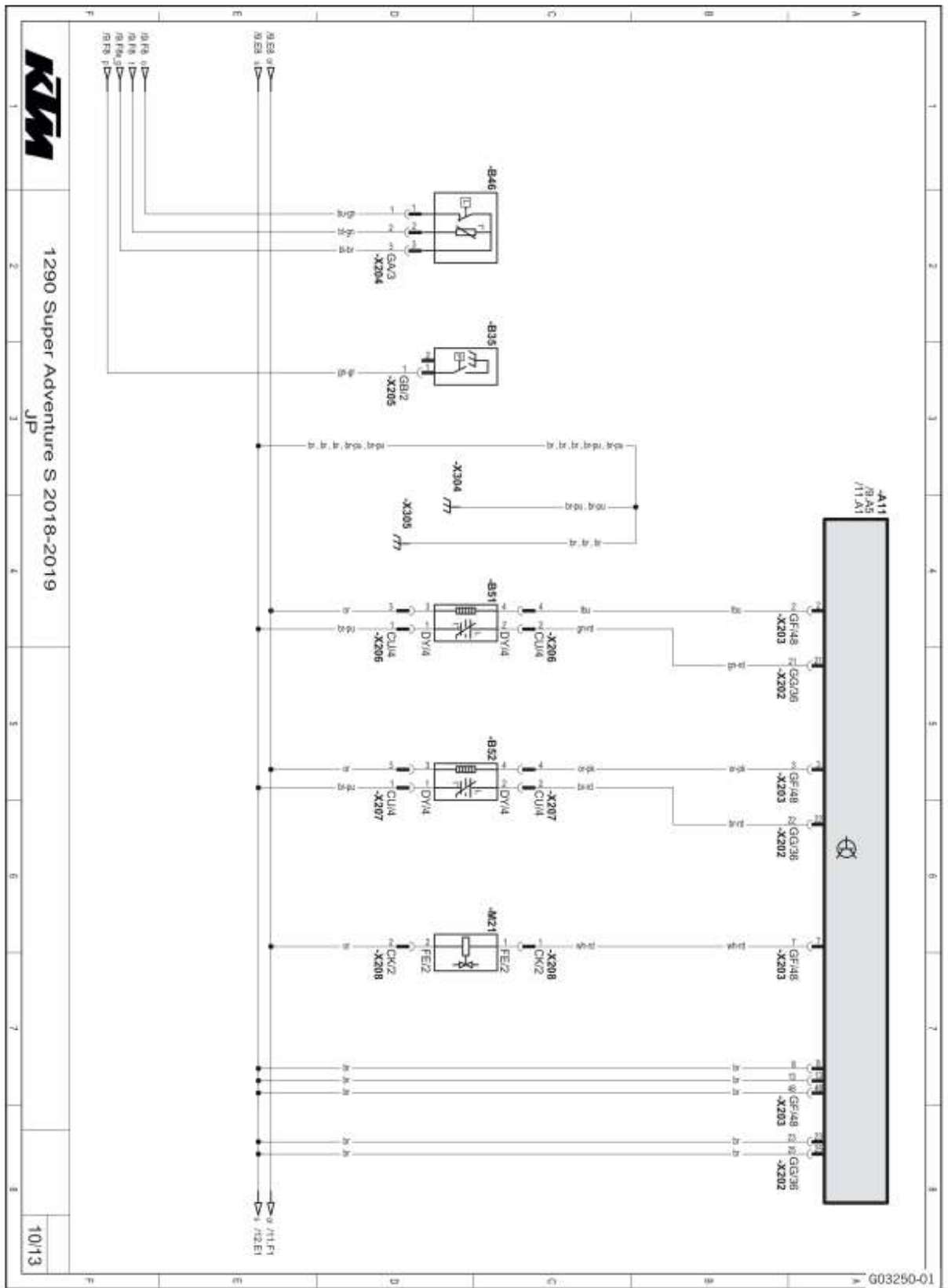
Components:

A52	Damping control unit
B87	Front acceleration sensor
B88	Front suspension travel sensor
B89	Rear acceleration sensor
B90	Swingarm position sensor
F6	Fuse
M74	Spring preload actuator with hall sensor
M75	Front damping valve
M76	Rear damping valve



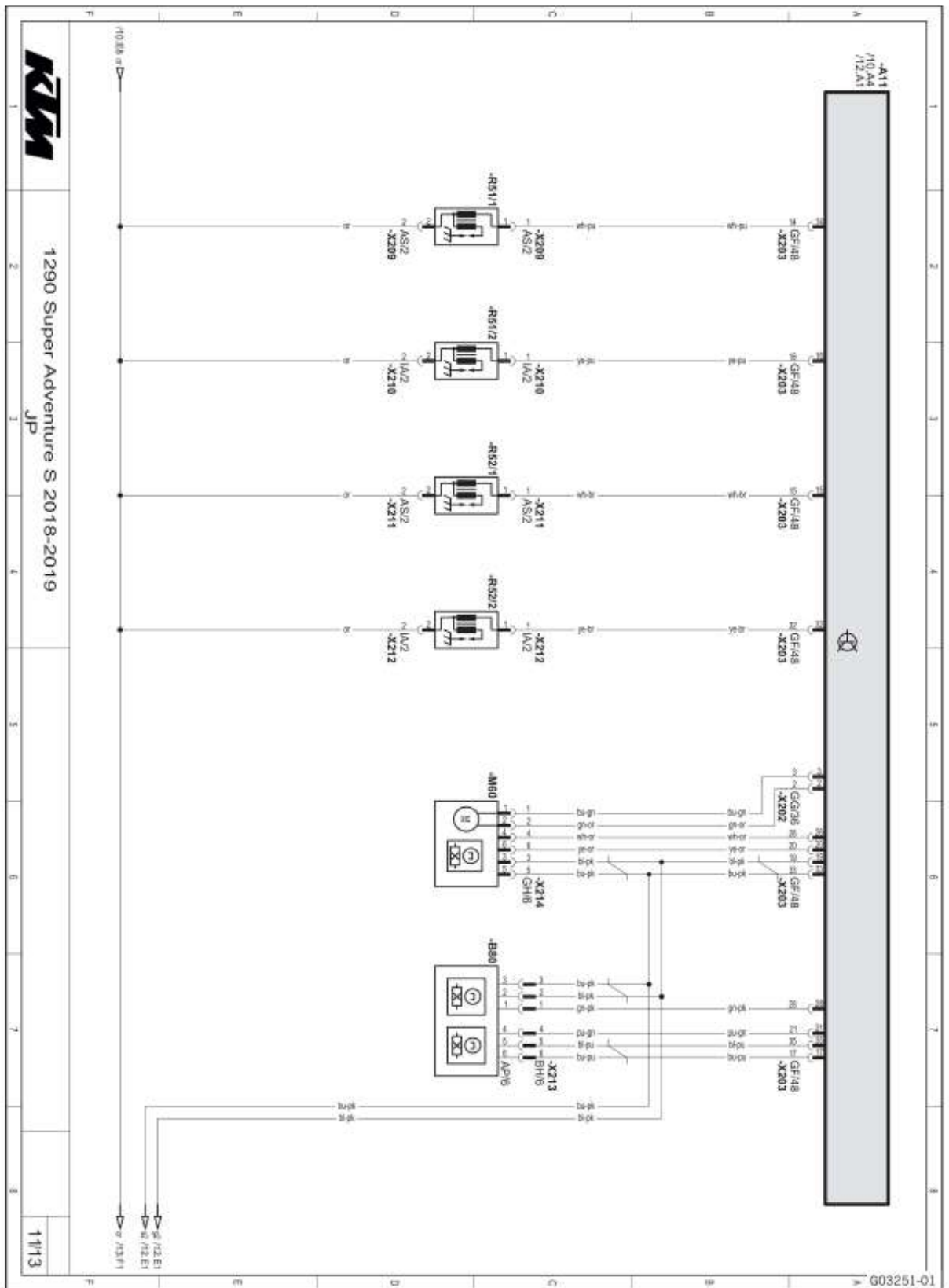
Components:

A10	Central electronics control unit
A11	Engine electronics control unit
B38	Clutch switch
M20	Evaporate emission control valve



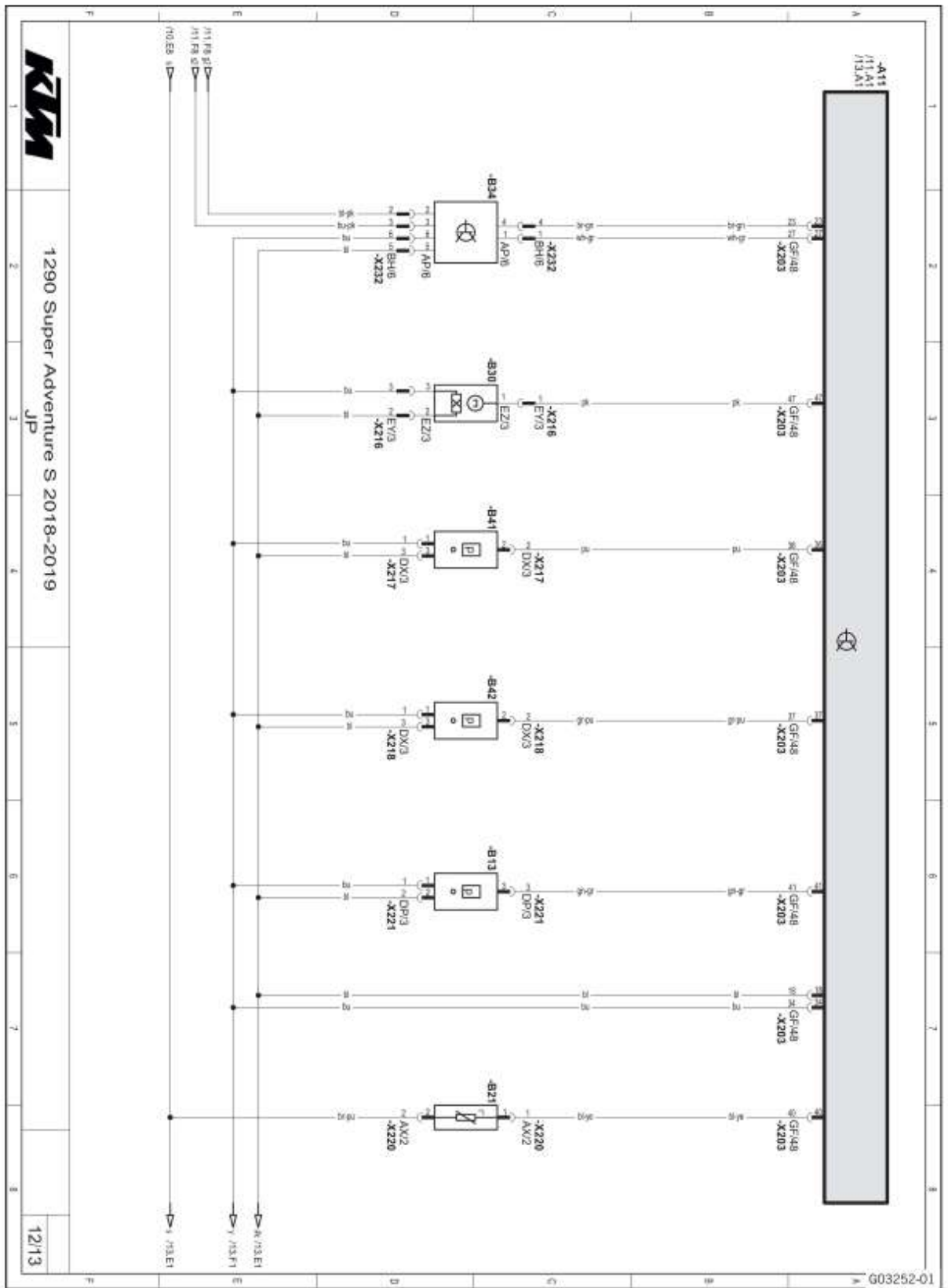
Components:

A11	Engine electronics control unit
B35	Oil pressure sensor
B46	Oil level and temperature sensor
B51	Cylinder 1 lambda sensor
B52	Cylinder 2 lambda sensor
M21	Secondary air system valve



Components:

A11	Engine electronics control unit
B80	Throttle grip
M60	Throttle valve actuator and throttle valve position sensor
R51/1	Ignition coil 1, cylinder 1
R51/2	Ignition coil 2, cylinder 1
R52/1	Ignition coil 1, cylinder 2
R52/2	Ignition coil 2, cylinder 2



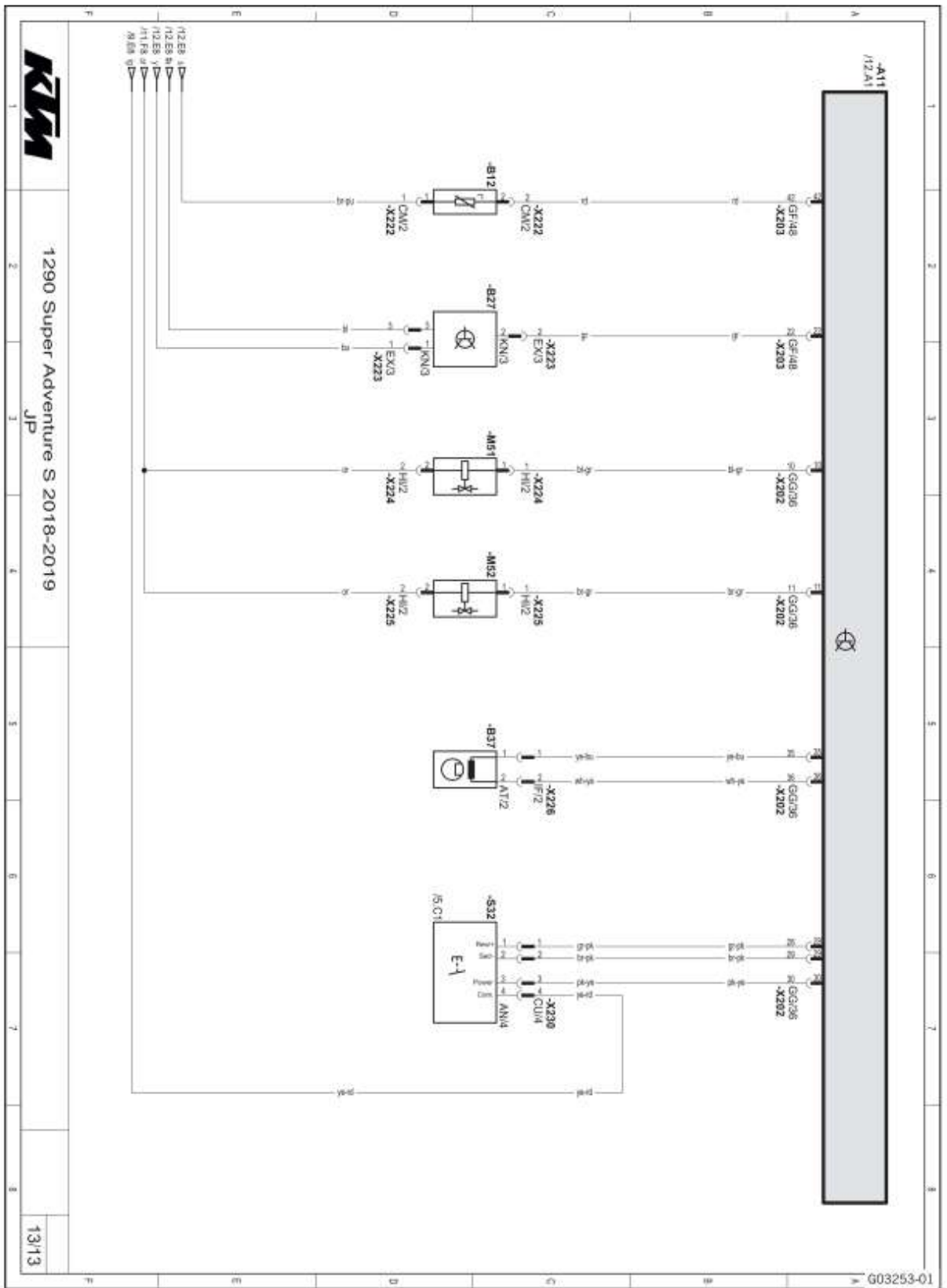
1290 Super Adventure S 2018-2019 JP

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G03252-01

Components:

A11	Engine electronics control unit
B13	Ambient air pressure sensor
B21	Coolant temperature sensor cylinder 1
B30	Side stand sensor
B34	Gear position sensor
B41	Induction manifold pressure sensor cylinder 1
B42	Induction manifold pressure sensor cylinder 2



1290 Super Adventure S 2018-2019

JP

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Components:

A11	Engine electronics control unit
B12	Intake air temperature sensor
B27	Shift shaft sensor
B37	Crankshaft speed sensor
M51	Injection valve, cylinder 1
M52	Injection valve, cylinder 2
S32	Combination switch

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 (see p. 510)
- SAE (see p. 510) (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

Engine oil (SAE 5W/40)**Standard/classification**

- JASO T903 MA2 (☞ p. 510)
- SAE (☞ p. 510) (SAE 5W/40)

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. 510) (SAE 4)

Guideline

- Use only oils that comply with the specified standards (see specifications on the container) and that exhibit the corresponding properties.

Super unleaded (ROZ 95/RON 95/PON 91)**Standard/classification**

- DIN EN 228 (ROZ 95/RON 95/PON 91)

Guideline

- Only use unleaded super fuel that matches or is equivalent to the specified fuel grade.
- Fuel with an ethanol content of up to 10 % (E10 fuel) is safe to use.

**Info**

Do **not** use fuel containing methanol (e. g. M15, M85, M100) or more than 10 % ethanol (e. g. E15, E25, E85, E100).

Chain cleaner

Recommended supplier
MOTOREX®
– Chain Clean

Fuel additive

Recommended supplier
MOTOREX®
– Fuel Stabilizer

High viscosity grease

Recommended supplier
SKF®
– LGHB 2

Long-life grease

Recommended supplier
MOTOREX®
– Bike Grease 2000

Lubricant (T14034)

Recommended supplier
WP Performance Systems
– WP Racing Grease IPR 2

Lubricant (T158)

Recommended supplier
Lubcon®
– Turmogrease® PP 300

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

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.: 00029013002

Bleeder cover



Art. no.: 00029013004

Bleeding device



Art. no.: 00029013100

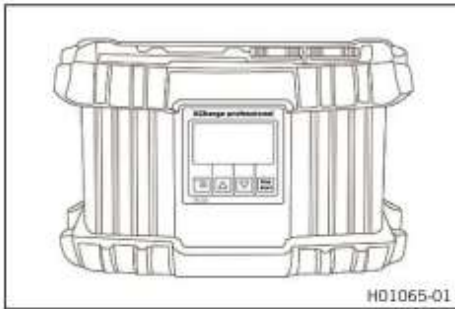
EU battery charger XCharge-professional



Art. no.: 00029095050

Feature

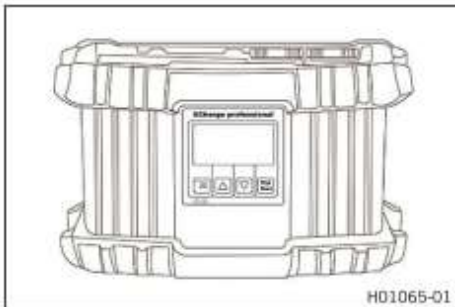
EU safety plug	
Nominal voltage	230 V
Mains fuse	16 A
Power cable length approx.	5 m (16 ft)
Charger cable length approx.	5 m (16 ft)

US battery charger XCharge-professional

Art. no.: 00029095051

Feature

US plug	
Nominal voltage	120 V
Mains fuse	32 A
Power cable length approx.	5 m (16 ft)
Charger cable length approx.	5 m (16 ft)

UK battery charger XCharge-professional

Art. no.: 00029095052

Feature

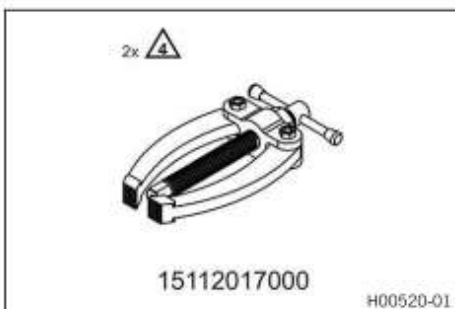
UK safety plug	
Nominal voltage	230 V
Mains fuse	16 A
Power cable length approx.	5 m (16 ft)
Charger cable length approx.	5 m (16 ft)

CH battery charger XCharge-professional

Art. no.: 00029095053

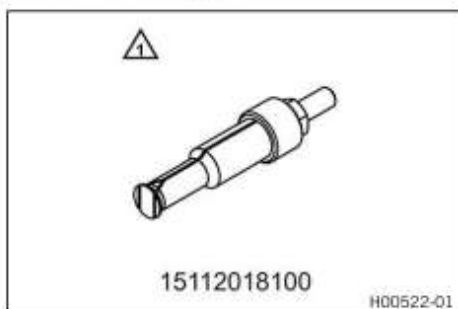
Feature

CH plug	
Nominal voltage	230 V
Mains fuse	16 A
Power cable length approx.	5 m (16 ft)
Charger cable length approx.	5 m (16 ft)

Bearing puller

Art. no.: 15112017000

Internal bearing puller



Art. no.: 15112018100

Feature

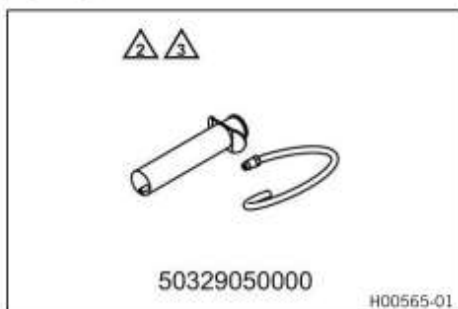
18 ... 23 mm (0.71 ... 0.91 in)

Holding wrench



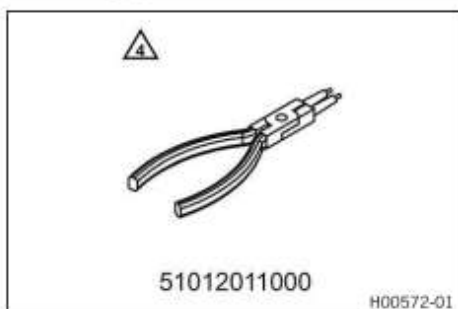
Art. no.: 45229050000

Syringe



Art. no.: 50329050000

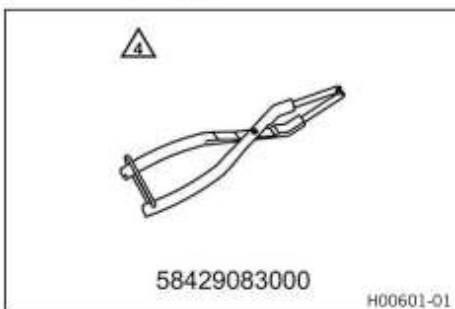
Lock ring plier



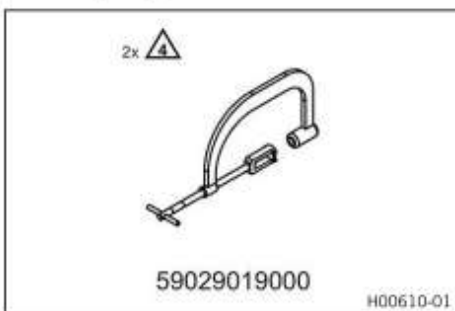
Art. no.: 51012011000

Holding wrench

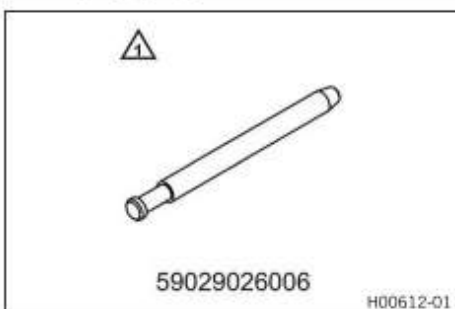
Art. no.: 51129003000

Footrest spring plier

Art. no.: 58429083000

Valve spring moulder

Art. no.: 59029019000

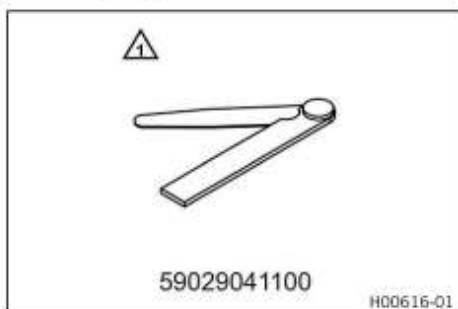
Limit plug gauge

Art. no.: 59029026006

Feature

Diameter	6.05 mm (0.2382 in)
----------	---------------------

Feeler gauge

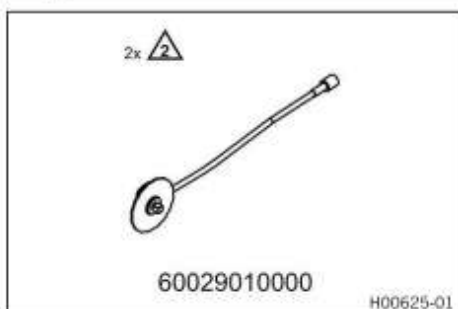


Art. no.: 59029041100

Feature

5 piece	0.10 ... 0.25 mm (0.0039 ... 0.0098 in)
---------	---

Angle disc

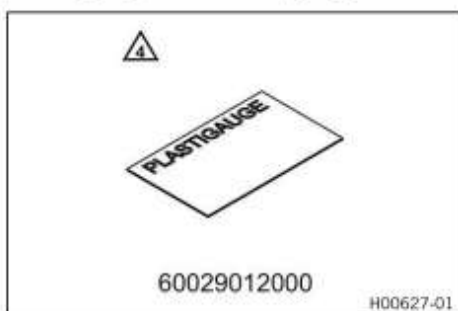


Art. no.: 60029010000

Feature

Driver system / tip	1/2 in
---------------------	--------

Plastigauge clearance gauge

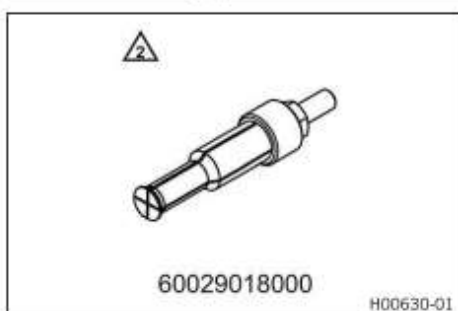


Art. no.: 60029012000

Feature

0.025 ... 0.175 mm (0.00098 ... 0.00689 in)

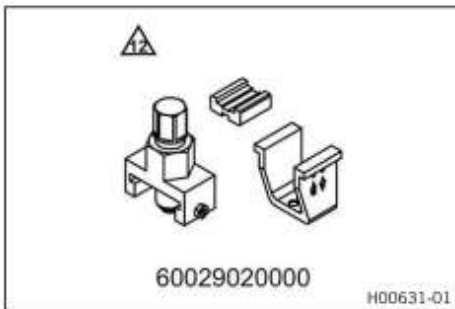
Internal bearing puller



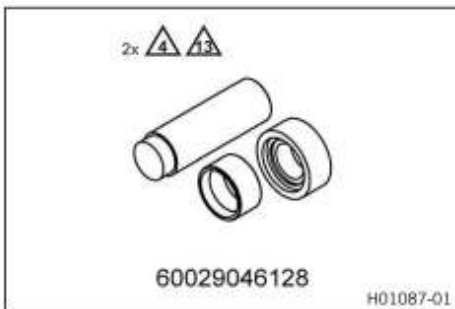
Art. no.: 60029018000

Feature

23 ... 28 mm (0.91 ... 1.1 in)

Chain rivet tool

Art. no.: 60029020000

Pressing tool

Art. no.: 60029046128

Spring band clamps plier

Art. no.: 60029057100

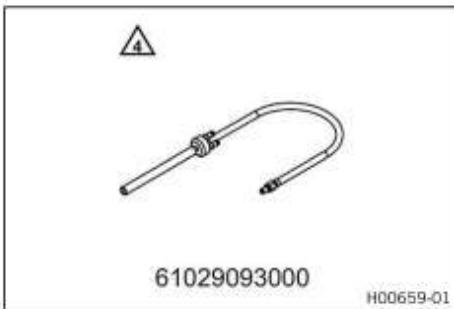
Multi-tooth wrench socket

Art. no.: 60029075000

Feature

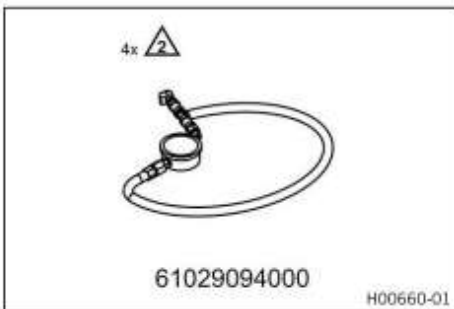
Drive	1/2 in
Diameter	10 mm (0.39 in)

Testing hose



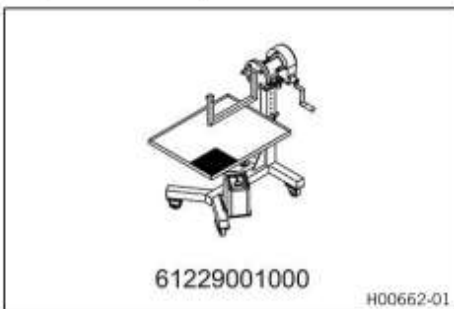
Art. no.: 61029093000

Pressure testing tool



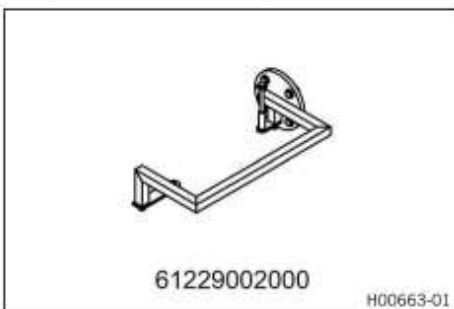
Art. no.: 61029094000

Engine assembly stand



Art. no.: 61229001000

Engine bracket for engine work stand



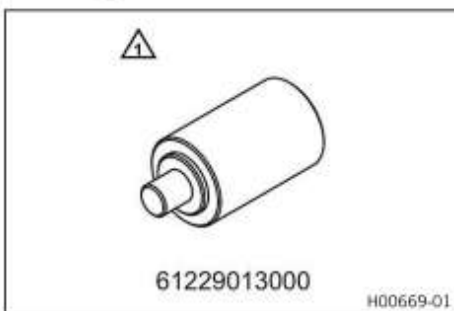
Art. no.: 61229002000

Pressing tool

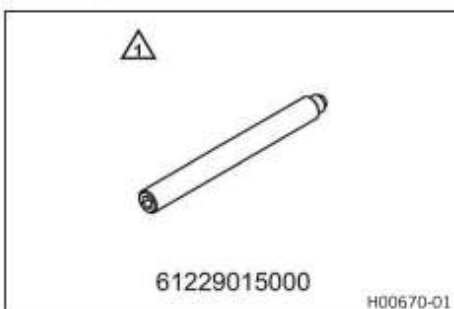
Art. no.: 61229008100

Puller

Art. no.: 61229010000

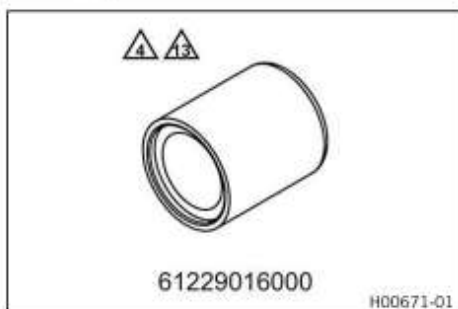
Pressing tool

Art. no.: 61229013000

Locking screw

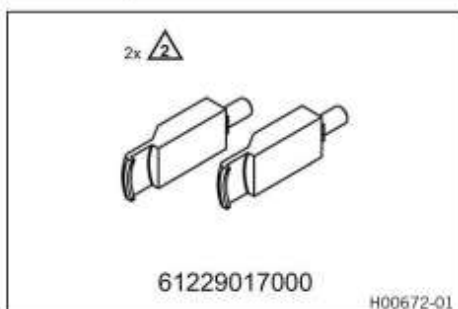
Art. no.: 61229015000

Pressing tool



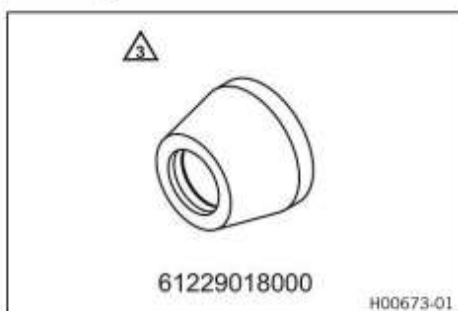
Art. no.: 61229016000

Arms for puller



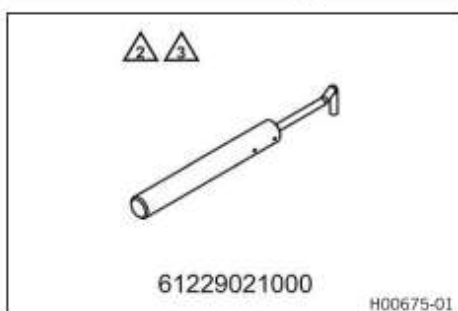
Art. no.: 61229017000

Pressing tool

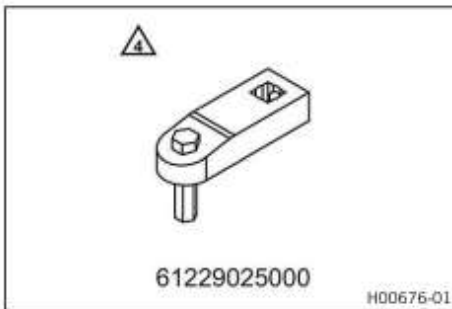


Art. no.: 61229018000

Release device for timing chain tensioner



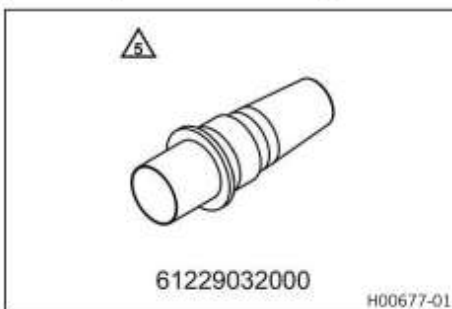
Art. no.: 61229021000

Hexagon socket bit

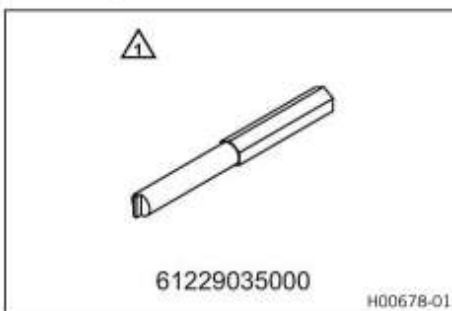
Art. no.: 61229025000

Feature

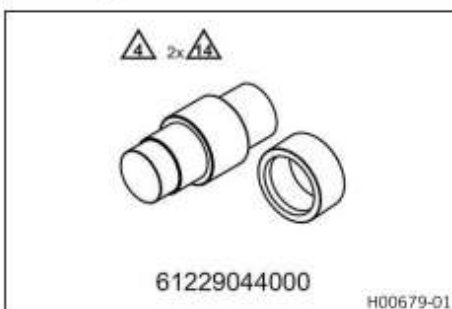
Hexagon socket	5 mm (0.2 in)
Drive	1/4 in

Mounting tool for lock ring

Art. no.: 61229032000

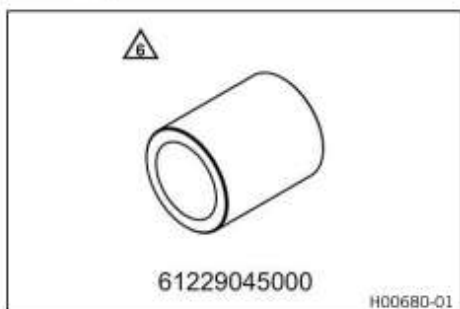
Mounting tool

Art. no.: 61229035000

Pressing tool

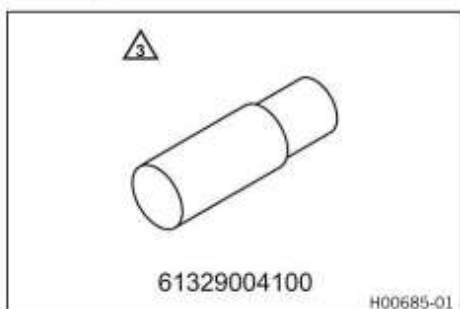
Art. no.: 61229044000

Pressing tool



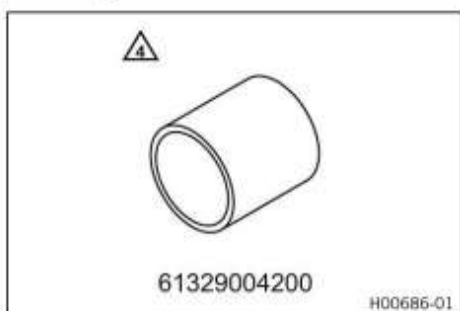
Art. no.: 61229045000

Pressing tool



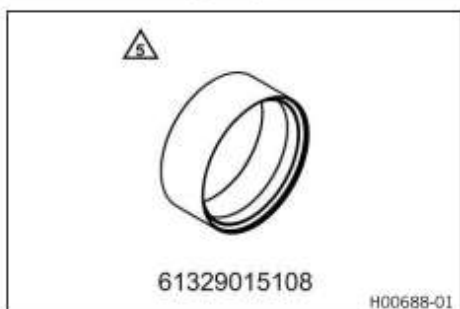
Art. no.: 61329004100

Pressing tool



Art. no.: 61329004200

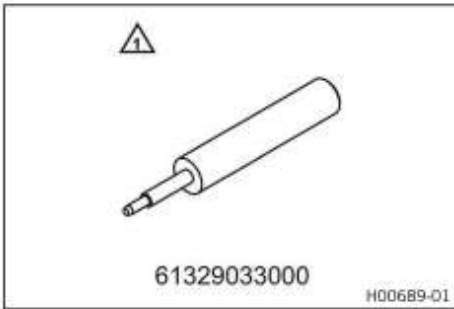
Piston assembly ring



Art. no.: 61329015108

Feature

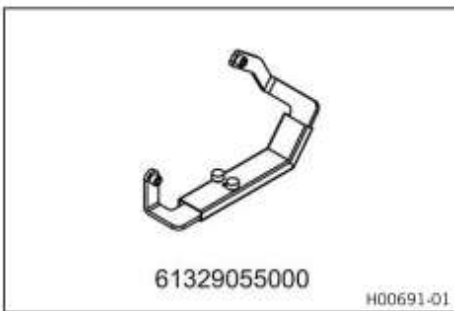
Height	48 mm (1.89 in)
Diameter	108 mm (4.25 in)

Locking pin

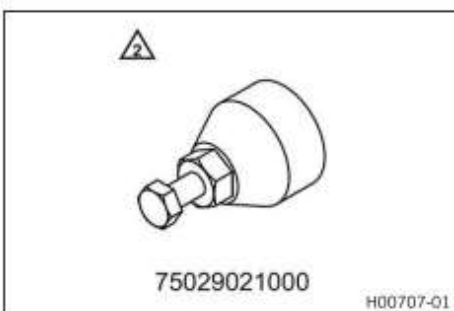
Art. no.: 61329033000

Spread transmission fixture

Art. no.: 61329035000

Floor jack attachment

Art. no.: 61329055000

Puller

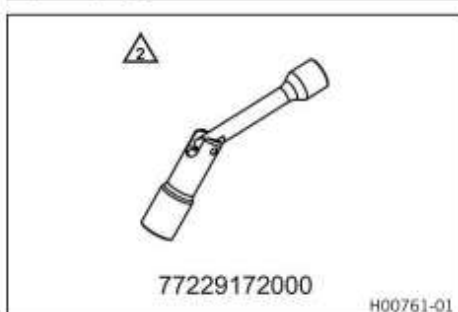
Art. no.: 75029021000

Insertion for piston ring lock



Art. no.: 75029035000

Spark plug wrench with link

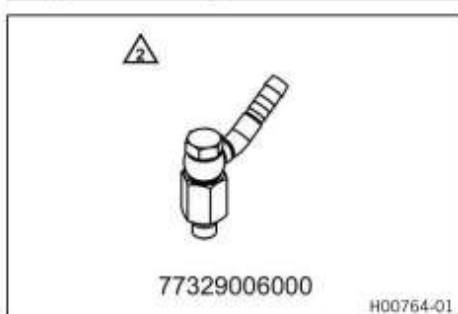


Art. no.: 77229172000

Feature

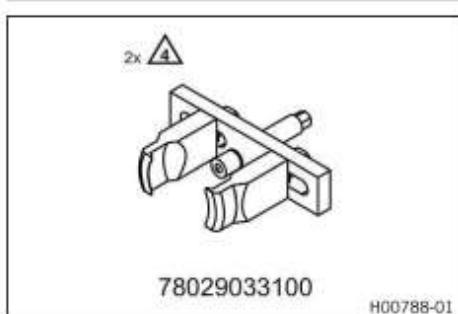
Drive	3/8 in
Hexagonal part	14 mm (0.55 in)
Length	130 mm (5.12 in)

Oil pressure adapter

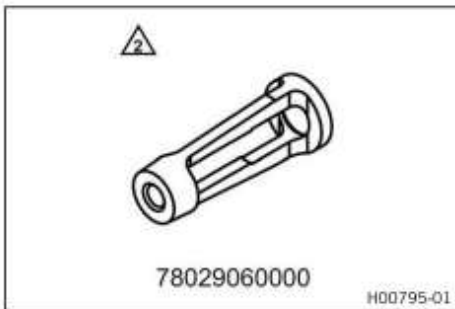


Art. no.: 77329006000

Puller



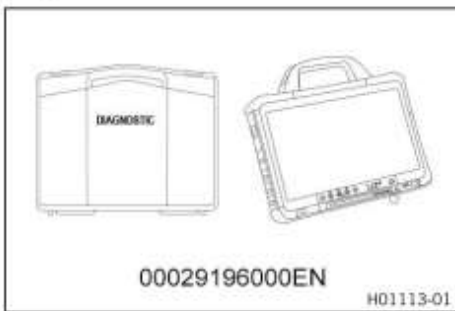
Art. no.: 78029033100

Insert for valve spring lever

Art. no.: 78029060000

XC_1 NG DE

Art. no.: 00029196000DE

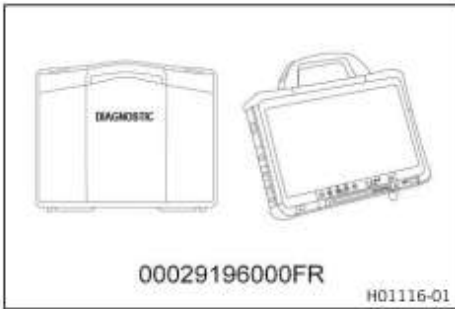
XC_1 NG EN

Art. no.: 00029196000EN

XC_1 NG ES

Art. no.: 00029196000ES

XC_1 NG FR



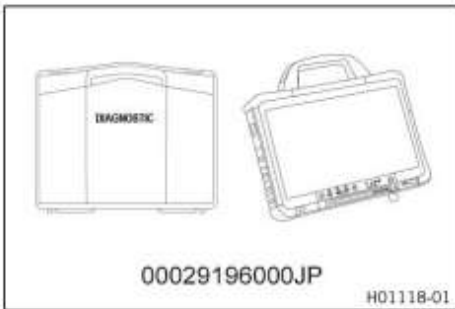
Art. no.: 00029196000FR

XC_1 NG IT



Art. no.: 00029196000IT

XC_1 NG JP

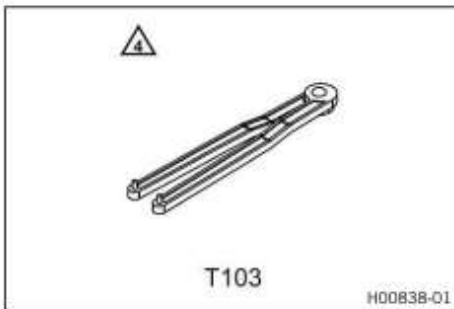


Art. no.: 00029196000JP

XC_1 NG US



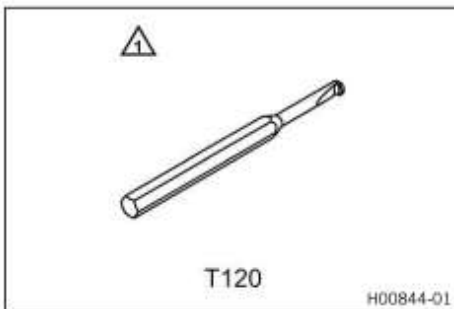
Art. no.: 00029196000US

Pin wrench

Art. no.: T103

Feature

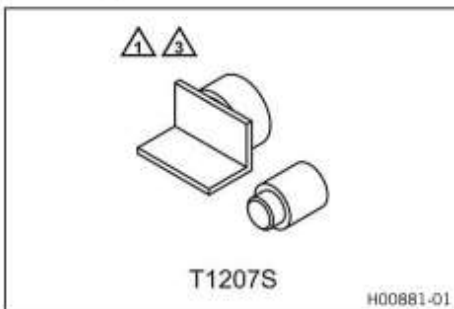
adjustable	
Diameter	4 mm (0.16 in)

Drift

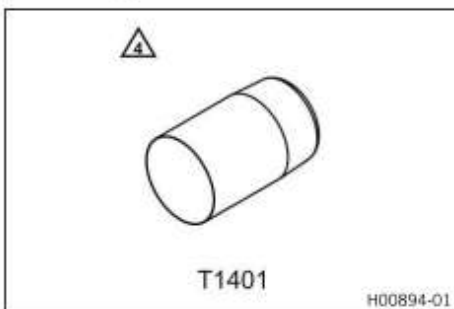
Art. no.: T120

Feature

Diameter	8 mm (0.31 in)
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Pressing tool

Art. no.: T1207S

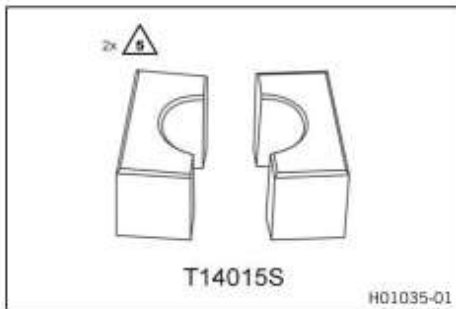
Protecting sleeve

Art. no.: T1401

Feature

Diameter	48 mm (1.89 in)
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Clamping stand

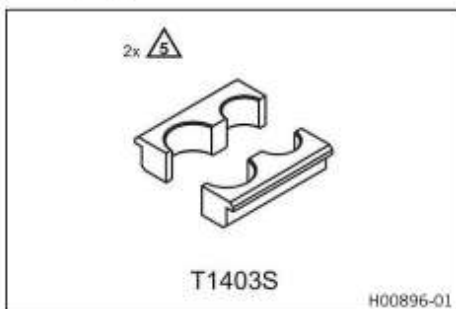


Art. no.: T14015S

Feature

Diameter	27 mm (1.06 in)
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Clamping stand



Art. no.: T1403S

Feature

Diameter	48 mm (1.89 in)
Diameter	60 mm (2.36 in)

Mounting tool

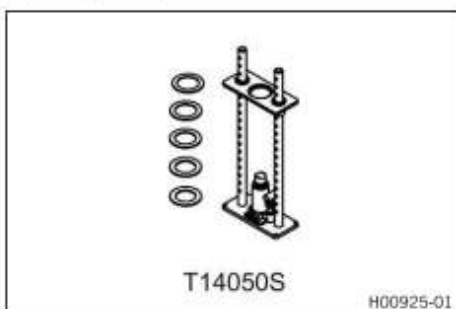


Art. no.: T14040S

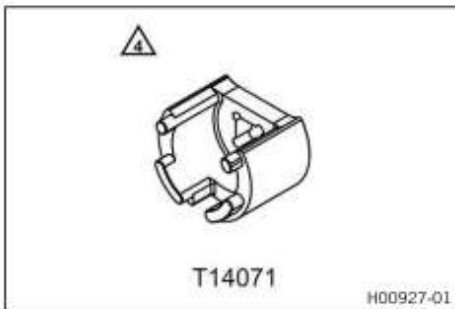
Feature

Diameter	48 mm (1.89 in)
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Spring compressor



Art. no.: T14050S

Groove nut wrench

Art. no.: T14071

Feature

Drive	1/2 in
Diameter	33 mm (1.3 in)

JASO T903 MA2

Different technical development directions required a separate specification for motorcycles – the **JASO T903 MA2** standard.

Earlier, engine oils from the automobile industry were used for motorcycles because there was no separate motorcycle specification.

Whereas long service intervals are demanded for automobile engines, the focus for motorcycle engines is on high performance at high engine speeds.

In most motorcycle engines, the transmission and clutch are lubricated with the same oil.

The **JASO T903 MA2** standard meets these special requirements.

SAE

The SAE viscosity classes were defined by the Society of Automotive Engineers and are used for classifying oils according to their viscosity. The viscosity describes only one property of oil and says nothing about quality.


ABS	Anti-lock braking system	Safety system that prevents locking of the wheels when driving straight ahead without the influence of lateral forces
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
TPMS	Tire pressure monitoring system	A safety system that monitors the tire pressure with the assistance of sensors in the tires and displays it to the rider

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.

	Race-on indicator lamp lights up/flashs yellow/orange/red – Status or error messages relating to Race-on system/alarm system.
	The general warning lamp lights up yellow – A note/warning note on operating safety has been detected. This is also shown in the display.
	The ABS warning lamp lights up yellow – Status or error messages relating to ABS. The ABS warning lamp flashes if the ABS mode Offroad is enabled.
	TC indicator lamp lights up/flashs yellow – The MTC is not enabled or is currently intervening. The TC indicator lamp also lights up if an error is detected. Contact an authorized KTM workshop. The TC indicator lamp flashes if TC actively engages or if the HHC (optional) is activated.
	The cruise control system indicator lamp lights up yellow – The cruise control system function is switched on, but the speed control is not active.
	Malfunction indicator lamp lights up yellow – The OBD has detected an emission- or safety-critical fault.

39.3 Green and blue symbols

Green and blue symbols reflect information.

	The left turn signal indicator lamp flashes green with a steady rhythmic flash – The left turn signal is switched on.
	The high beam indicator lamp lights up blue – The high beam is switched on.
	The idle indicator lamp lights up green – The transmission is in neutral.
	The cruise control system indicator lamp lights up green – The cruise control system function is switched on and the speed control is active.
	The right turn signal indicator lamp flashes green with a steady rhythmic flash – The right turn signal is switched on.

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KTM Sportmotorcycle GmbH
5230 Mattighofen/Austria
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