

450 EXC-F
450 EXC-F Six Days
500 EXC-F
500 EXC-F Six Days

Art. no. 3206275en



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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Issued by: TÜV Management Service

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KTM Sportmotorcycle GmbH
5230 Mattighofen, Austria

This document is valid for the following models:

- 450 EXC-F EU (F8403Q9)
- 450 EXC-F AU (F8460Q9)
- 450 EXC-F Six Days EU (F8403Q2)
- 450 EXC-F Six Days US (F8475Q2)
- 500 EXC-F EU (F8503Q9)
- 500 EXC-F AU (F8560Q9)
- 500 EXC-F US (F8575Q9)
- 500 EXC-F Six Days EU (F8503Q2)



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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.



Denotes a voltage measurement.



Denotes a current measurement.



Denotes a resistance measurement.

1.2 Formats used

The typographical formats used in this document are explained below.

Proprietary name	Identifies a proprietary name.
Name[®]	Identifies a protected name.
Brand[™]	Identifies a trademark.
<u>Underlined terms</u>	Refer to technical details of the vehicle or indicate technical terms, which are explained in the glossary.

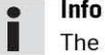
2.1 Repair Manual

Read this Repair Manual carefully and thoroughly before beginning work. It contains useful information and tips that will help you repair and maintain 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 vehicle safely. Therefore, read this manual carefully. The safety instructions are highlighted in the text and are referred to at the relevant passages.



Info

The vehicle has various information and warning labels at prominent locations. Do not remove information/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

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



Warning

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



Caution

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

Note

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



Warning

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 contained in the vehicle but can be ordered under the number in parentheses. E.g.: bearing puller (15112017000)

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.

In some instances, a thread locker (e.g. **Loctite**[®]) is required. The manufacturer instructions for use must be followed.

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

After you complete the repair or service work, check the operating safety of the vehicle.

3.1 Manufacturer and implied warranty

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

3.2 Operating and auxiliary substances



Warning

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) as 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.

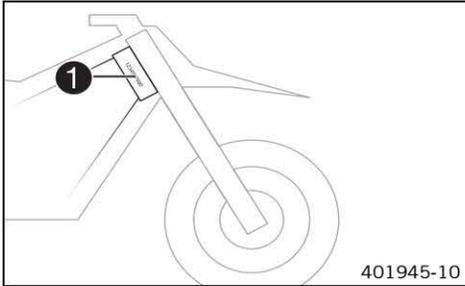
The current **KTM PowerParts** for your vehicle can be found on the KTM website.
International KTM Website: <http://www.ktm.com>

3.4 Figures

The figures contained in the manual may depict special equipment.

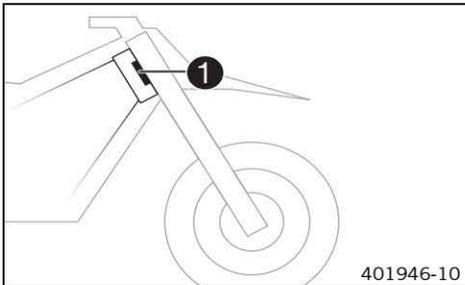
In the interest of clarity, some components may be shown disassembled or may not be shown at all. It is not always necessary to disassemble the component to perform the activity in question. Please follow the instructions in the text.

4.1 Chassis number



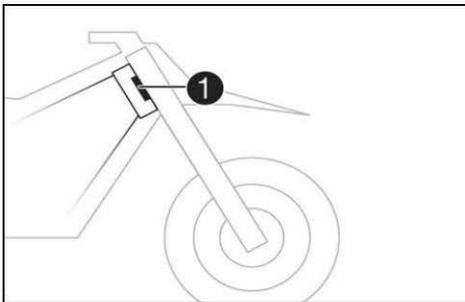
The chassis number ❶ is stamped on the steering head on the right.

4.2 Type label



(EXC-F EU/AU, EXC-F Six Days EU)

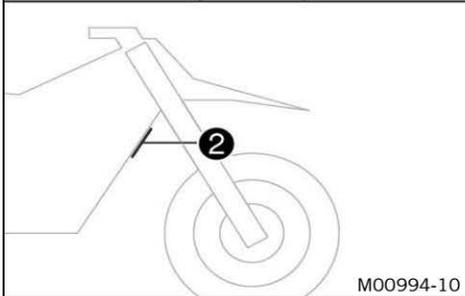
The type label ❶ is fixed to the front of the steering head.



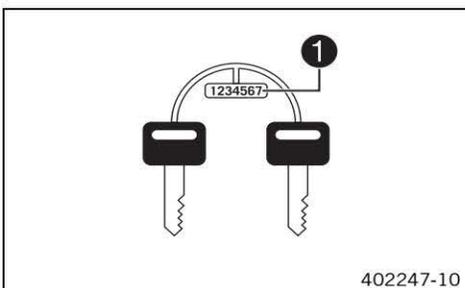
(All US models)

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

The additional type label for Canada ❷ is fixed to the front of the front pipe.

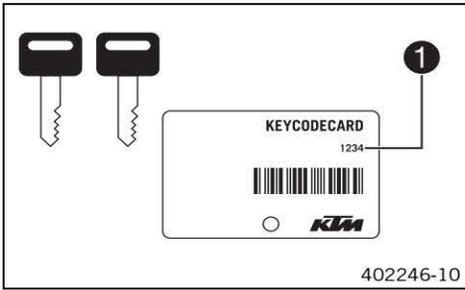


4.3 Key number



(EXC-F EU/AU, EXC-F Six Days EU)

The key number ❶ for the steering lock is stamped onto the key connector.



(All US models)

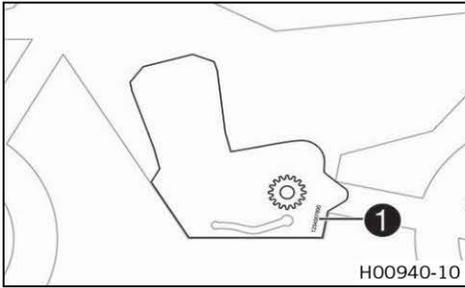
Key number ❶ for the ignition and steering lock is indicated on the **KEYCODECARD**.



Info

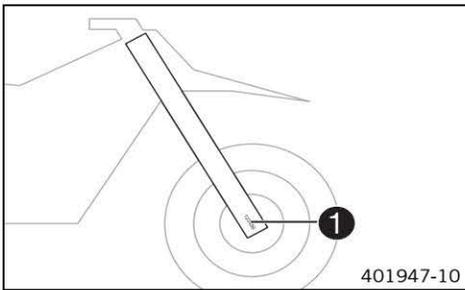
You need the key number to order a replacement key. Keep the **KEYCODECARD** in a safe place.

4.4 Engine number



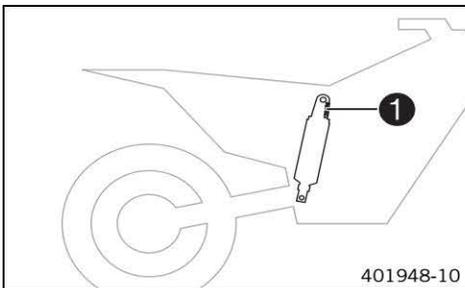
Engine number ❶ is embossed on the left side of the engine behind the shift lever.

4.5 Fork part number



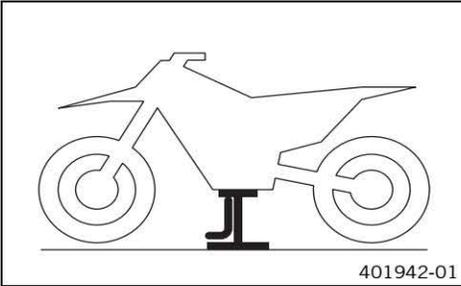
The fork part number ❶ is stamped on the inner side of the fork stub.

4.6 Shock absorber article number



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

5.1 Raising the motorcycle with the lift stand



Note

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

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

Lift stand (78129955100) (📖 p. 368)

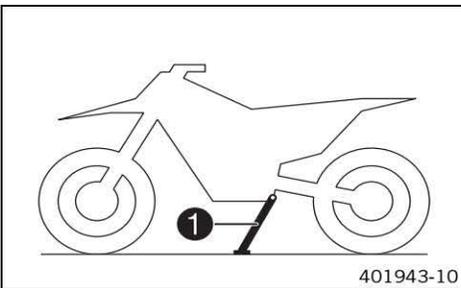
- ✓ Neither wheel is in contact with the ground.
- Secure the motorcycle against falling over.

5.2 Removing the motorcycle from the lift stand

Note

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

- Park the vehicle on a firm and level surface.



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

i Info

While riding, the side stand must be folded up and secured with the rubber band.

5.3 Starting

! Danger

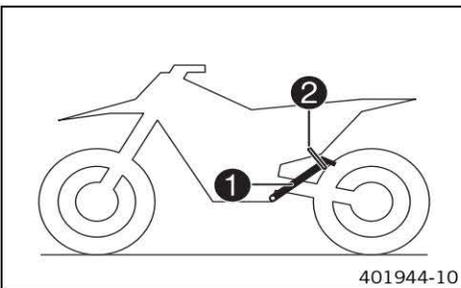
Danger of poisoning Exhaust gases are toxic and inhaling them may result in unconsciousness and death.

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

Note

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

- Always run the engine warm at a low speed.



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

(All US models)

- Turn the key in the ignition lock to the position .
- Turn the emergency OFF switch to the position .

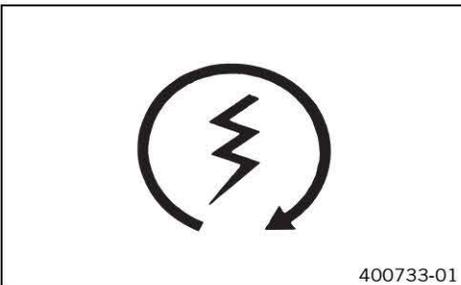
Condition

Ambient temperature: < 20 °C (< 68 °F)

- Push the cold start button in all the way.
- Press the electric starter button.

i Info

Press the electric starter button for a maximum of 5 seconds. Wait for 30 seconds before a further attempt at starting.
At temperatures below 15 °C (60 °F), several attempts at starting may be necessary to warm-up the lithium-ion battery and thereby increase the starting power.
During the starting process, the malfunction indicator lamp lights up.



5.4 Starting the motorcycle for a check



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



Info

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

- Shift transmission to neutral.

(All US models)

- Turn the key in the ignition lock to the position .
- Turn the emergency OFF switch to the position .

(EXC-F AU)

- Turn the emergency OFF switch to the position .
- Press the electric starter button or press the kickstarter robustly through its full range.

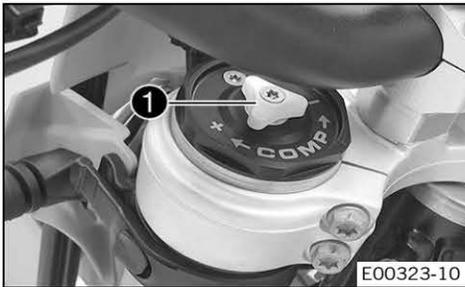


Info

Do not open the throttle.

6.1 Adjusting the compression damping of the fork

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



(EXC-F EU/AU/US)

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

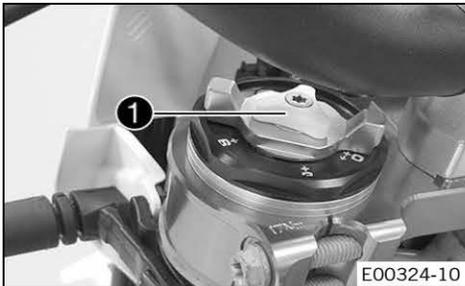
i Info
Adjusting screw **1** is located at the upper end of the left fork leg. The compression damping is located in left fork leg **COMP** (white adjusting screw). The rebound damping is located in right fork leg **REB** (red adjusting screw).

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

Guideline

Compression damping	
Comfort	18 clicks
Standard	15 clicks
Sport	12 clicks

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



(All EXC-F Six Days)

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

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

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

Guideline

Compression damping	
Comfort	18 clicks
Standard	15 clicks
Sport	12 clicks

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

6.2 Adjusting the rebound damping of the fork

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



(EXC-F EU/AU/US)

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

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

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

Guideline

Rebound damping	
Comfort	18 clicks
Standard	15 clicks
Sport	12 clicks

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



(All EXC-F Six Days)

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

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

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

Guideline

Rebound damping	
Comfort	18 clicks
Standard	15 clicks
Sport	12 clicks

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

6.3 Adjusting the spring preload of the fork (All EXC-F Six Days)

Preparatory work

- Raise the motorcycle with the lift stand. (🗨 p. 11)

Main work

- Turn the adjusting wings ① counterclockwise all the way.
- ✓ The marking **+0** aligns with the right wing.

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

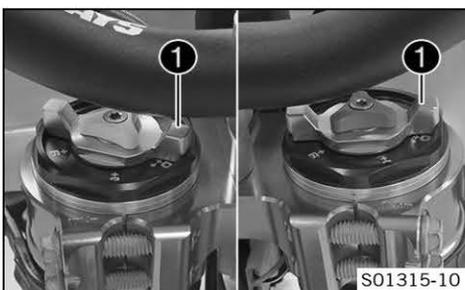
- Turn the adjusting wings clockwise.

Guideline

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

- ✓ The adjusting wings engage noticeably at the numerical values.

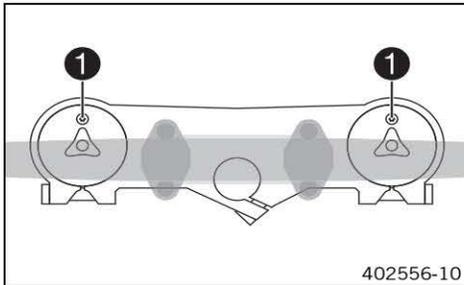
i Info
Adjust the spring preload to the numerical values only as the preload will not engage between the numerical values. Turn clockwise to increase the spring preload; turn counterclockwise to reduce the spring preload. Adjusting the spring preload has no influence on the absorption setting of the rebound damping. Basically, however, you should set the rebound damping higher with a higher spring preload.



Finishing work

- Remove the motorcycle from the lift stand. (📖 p. 11)

6.4 Bleeding the fork legs



Preparatory work

- Raise the motorcycle with the lift stand. (📖 p. 11)

Main work

- Release bleeder screws ❶.
- ✓ Any excess pressure escapes from the interior of the fork.
- Tighten the bleeder screws.

Finishing work

- Remove the motorcycle from the lift stand. (📖 p. 11)

6.5 Cleaning the dust boots of the fork legs



Preparatory work

- Raise the motorcycle with the lift stand. (📖 p. 11)
- Remove the fork protector. (📖 p. 17)

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.

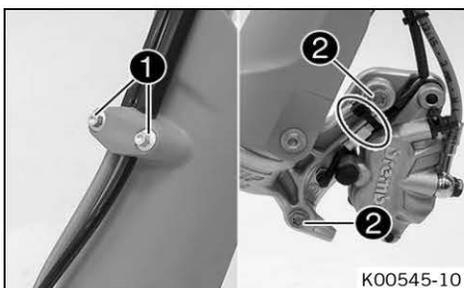
Universal oil spray (📖 p. 359)

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

Finishing work

- Install the fork protector. (📖 p. 17)
- Remove the motorcycle from the lift stand. (📖 p. 11)

6.6 Removing the fork legs

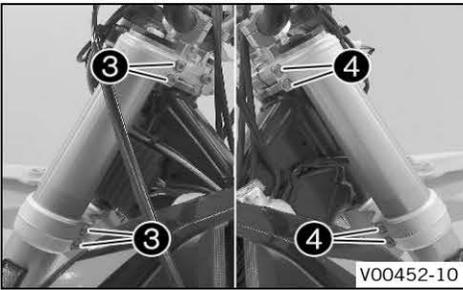


Preparatory work

- Remove the headlight mask with the headlight. (📖 p. 114)
- Raise the motorcycle with the lift stand. (📖 p. 11)
- Remove the front wheel. (📖 p. 120)

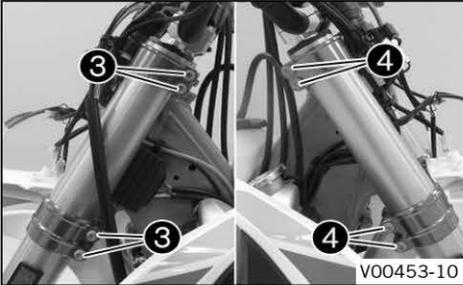
Main work

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



(EXC-F EU/AU/US)

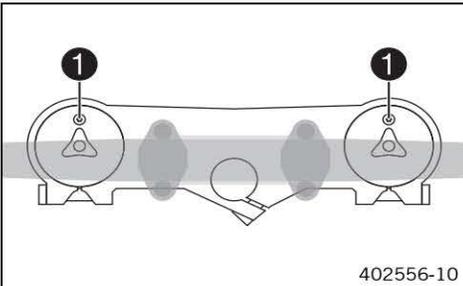
- Loosen screws **3**. Take out the left fork leg.
- Loosen screws **4**. Take out the right fork leg.



(All EXC-F Six Days)

- Loosen screws **3**. Take out the left fork leg.
- Loosen screws **4**. Take out the right fork leg.

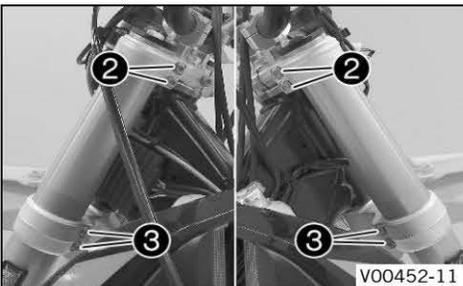
6.7 Installing the fork legs



**Main work
(EXC-F EU/AU/US)**

- Position the fork legs.
- ✓ Bleeder screws **1** are positioned toward the front.

i Info
The rebound damping is located in right fork leg **REB** (red adjusting screw). The compression damping is located in left fork leg **COMP** (white adjusting screw).
Grooves are milled into the side of the upper end of the fork legs. The second milled groove (from the top) must be flush with the top edge of the upper triple clamp.



- Tighten screws **2**.

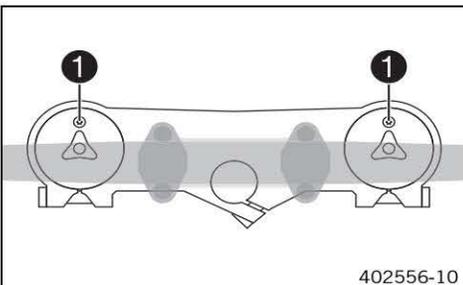
Guideline

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

- Tighten screws **3**.

Guideline

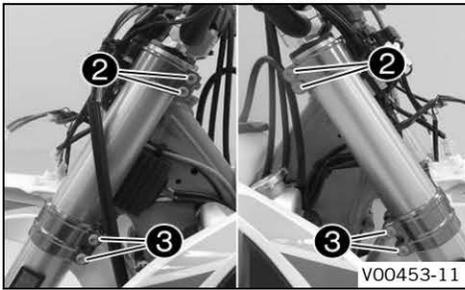
Screw, bottom triple clamp	M8	15 Nm (11.1 lbf ft)
----------------------------	----	------------------------



(All EXC-F Six Days)

- Position the fork legs.
- ✓ Bleeder screws **1** are positioned toward the front.

i Info
The rebound damping is located in right fork leg **REB** (red adjusting screw). The compression damping is located in left fork leg **COM** (white adjusting screw).
Grooves are milled into the side of the upper end of the fork legs. The second milled groove (from the top) must be flush with the top edge of the upper triple clamp.



- Tighten screws ②.

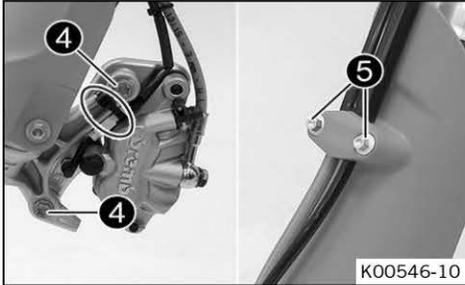
Guideline

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

- Tighten screws ③.

Guideline

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



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

Guideline

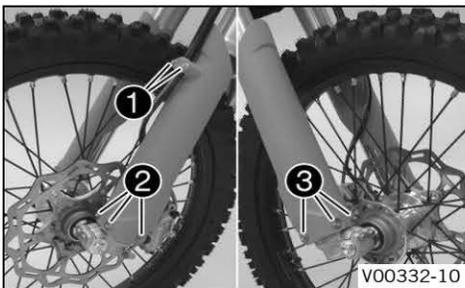
Screw, front brake caliper	M8	25 Nm (18.4 lbf ft)	Loctite® 243™
----------------------------	----	------------------------	---------------

- Mount the cable tie(s).
- Position the brake line, wiring harness, and clamp. Mount and tighten screws ⑤.

Finishing work

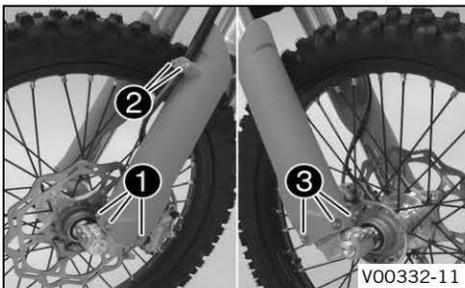
- Install the front wheel. (📖 p. 120)
- Install the headlight mask with the headlight. (📖 p. 115)
- Check the headlight setting. (📖 p. 151)

6.8 Removing the fork protector



- Remove screws ① and take off the clamp.
- Remove screws ② on the left fork leg and take off the left fork protector.
- Remove screws ③ on the right fork leg and take off the right fork protector.

6.9 Installing the fork protector



- Position the fork protector on the left fork leg. Mount and tighten screws ①.

Guideline

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

- Position the brake line, wiring harness, and clamp. Mount and tighten screws ②.
- Position the fork protector on the right fork leg. Mount and tighten screws ③.

Guideline

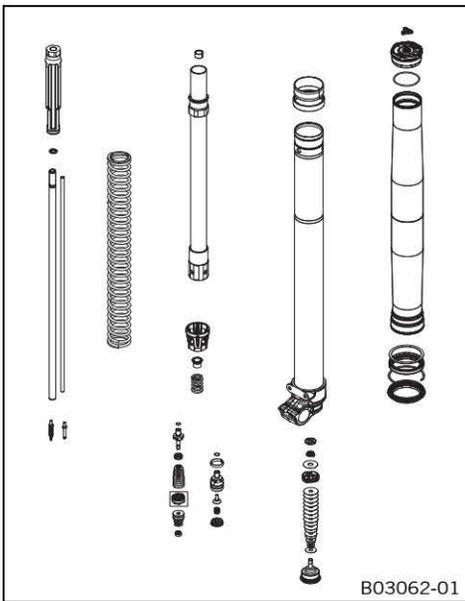
Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
---------------------------	----	--------------------

6.10 EXC-F EU/AU/US

6.10.1 Servicing the fork

Condition

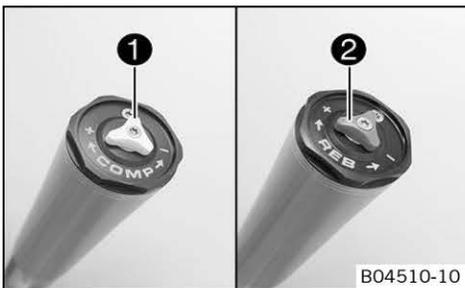
The fork legs have been removed.



- Disassemble the fork legs. (📖 p. 18)
- Disassemble the cartridge. (📖 p. 20)
- Check the fork legs. (📖 p. 23)
- Assemble the cartridge. (📖 p. 25)
- Assemble the fork legs. (📖 p. 28)

6.10.2 Disassembling the fork legs

i Info
The procedures are the same on both fork legs.



Condition

The fork legs have been removed.

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



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

Clamping stand (T1403S) (📖 p. 373)

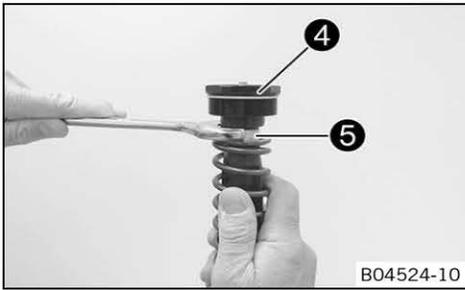
- Remove screw **3**. Remove adjuster.



- Loosen the screw cover **4**.

Ring wrench (T14017) (📖 p. 372)

i Info
The screw cover cannot be removed yet.

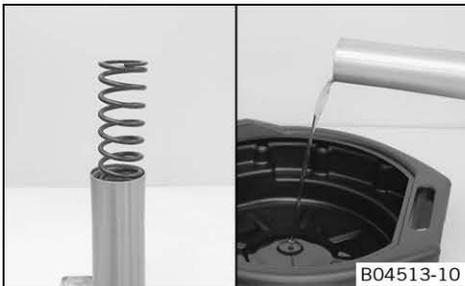


- Extract the fork leg and push the outer tube downward.
- Pull the spring downward and push the open end wrench onto hexagonal part 5.
- Hold the hexagonal part and loosen screw cap 4, but do not take it off yet.

Ring wrench (T14017) (p. 372)



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

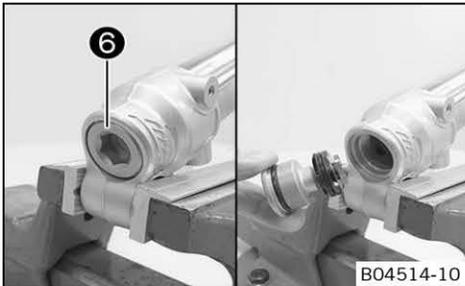


- Remove the spring.
- Drain the fork oil.



Info

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



- Clamp the fork leg with the axle clamp.

Guideline

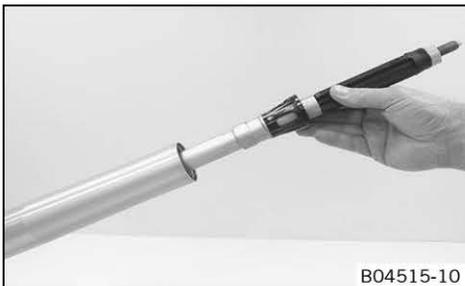
Use soft jaws.

- Unscrew and remove compression holder 6.

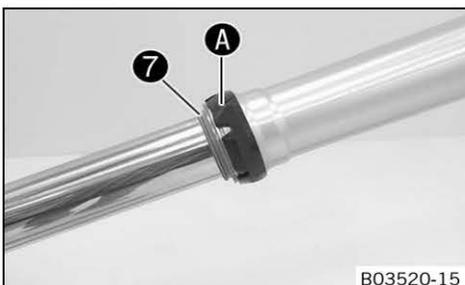


Info

Place a container underneath as oil runs out in most cases.



- Remove the cartridge.

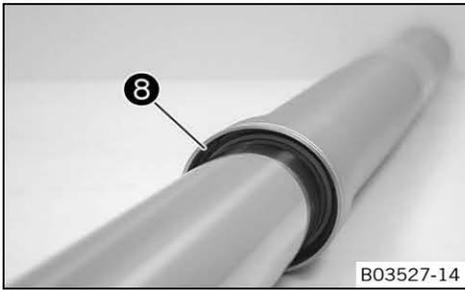


- Remove dust boot 7.
- Remove fork protector ring A.



Info

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

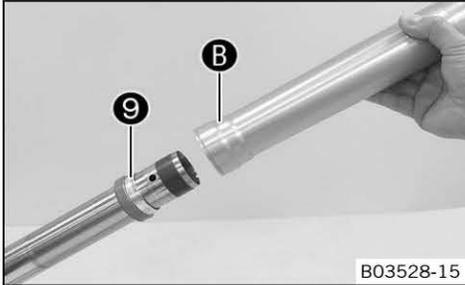


- Remove lock ring **8**.



Info

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



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

Guideline

50 °C (122 °F)

- Pull the outer tube from the inner tube with a jerk.



Info

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



- Remove upper sliding bushing **10**.



Info

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

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

6.10.3 Disassembling the cartridge

Preparatory work

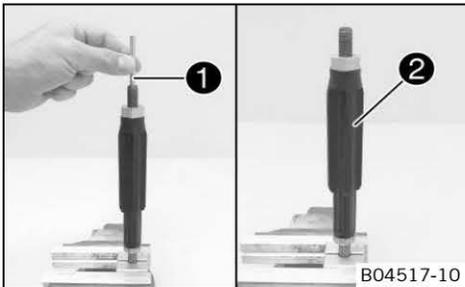
- Disassemble the fork legs. (圖 p. 18)

Right cartridge

- Clamp the piston rod with the special tool.

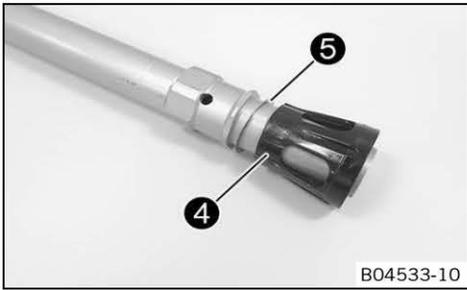
Clamping stand (T14016S) (圖 p. 372)

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

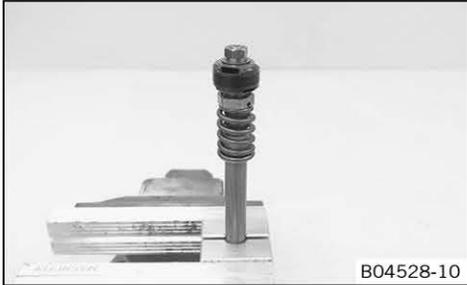


- Take piston rod **3** out of the cartridge.

6 FORK, TRIPLE CLAMP

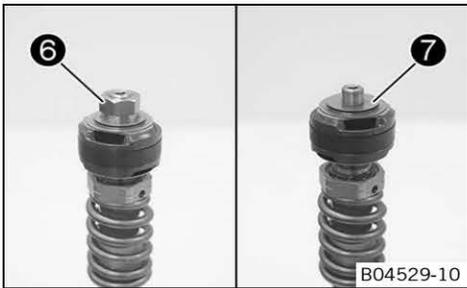


- Take spring seat ④ and washer ⑤ off of the cartridge.



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

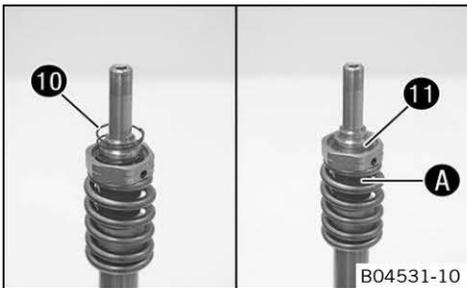
Clamping stand (T14016S) (📖 p. 372)



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



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

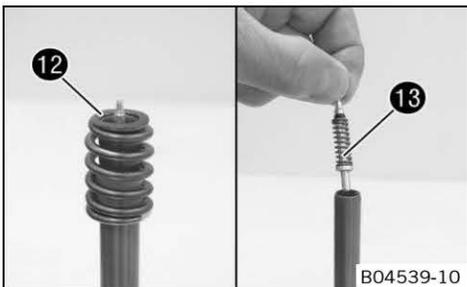


- Remove spring ⑩.
- Warm up the piston rod in area A.

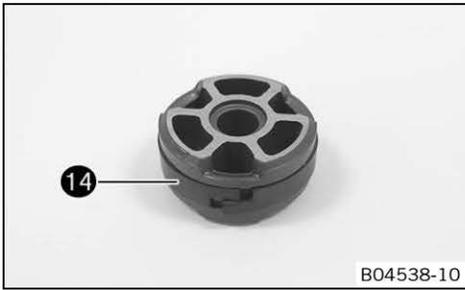
Guideline

50 °C (122 °F)

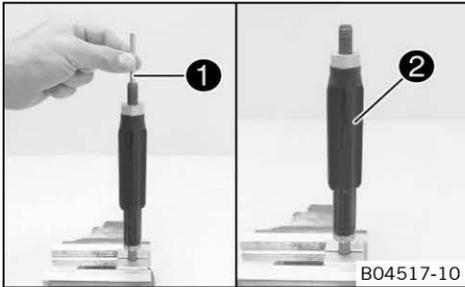
- Remove tap rebound ⑪.



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

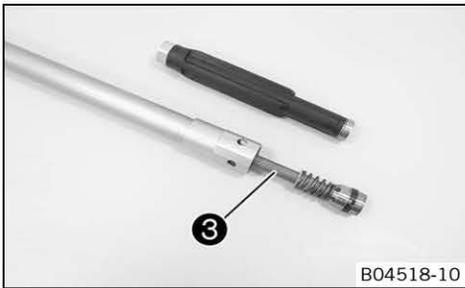


- Remove piston ring **14**.

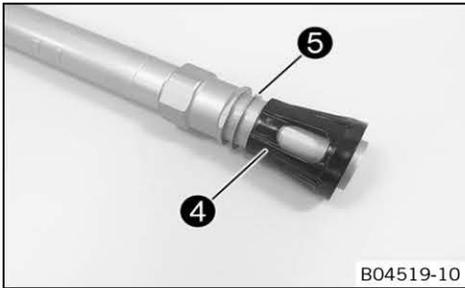


Left cartridge

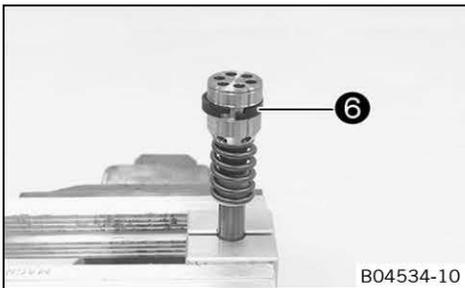
- Clamp the piston rod with the special tool.
Clamping stand (T14016S) (見 p. 372)
- Remove adjusting tube **1**.
- Remove fluid barrier **2** from the piston rod.



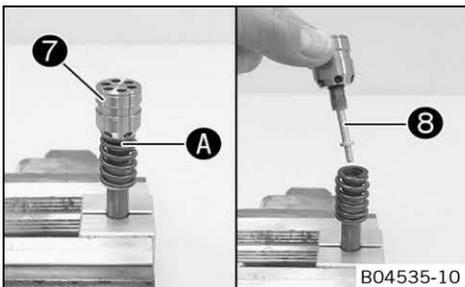
- Take piston rod **3** out of the cartridge.



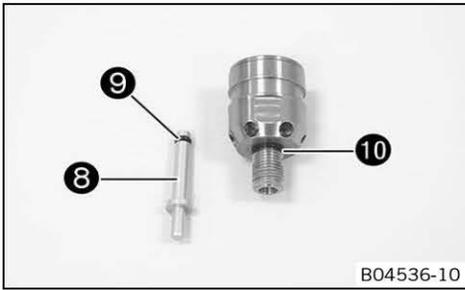
- Take spring seat **4** and washer **5** off of the cartridge.



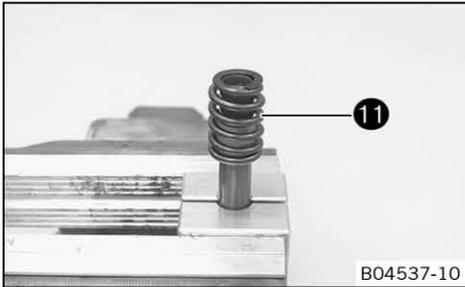
- Degrease the piston rod.
- Clamp the piston rod with the special tool.
Clamping stand (T14016S) (見 p. 372)
- Remove piston ring **6**.



- Warm up the piston rod in area **A**.
Guideline
50 °C (122 °F)
- Remove piston **7** with setting needle **8**.



- Pull setting needle **8** out of the piston.
- Remove O-rings **9** and **10**.



- Remove spring **11**.
- Unclamp the piston rod.

6.10.4 Disassembling the tap compression



Info

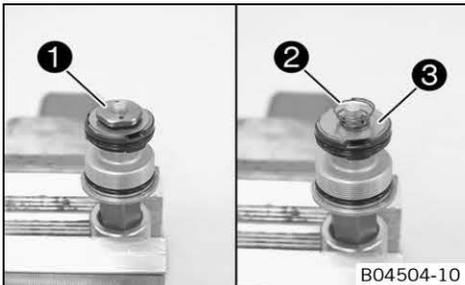
The procedures are the same on both fork legs.

Preparatory work

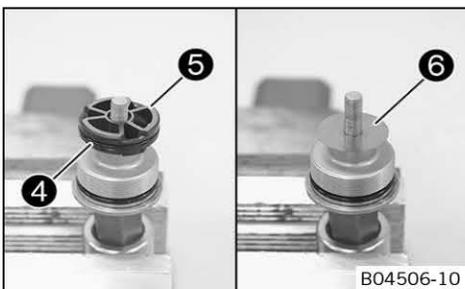
- Disassemble the fork legs. (📖 p. 18)

Main work

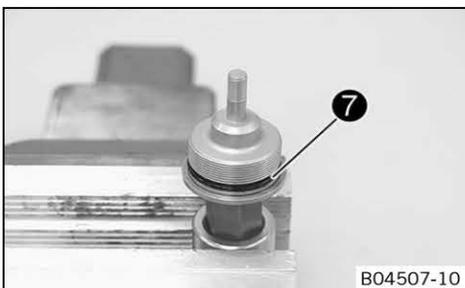
- Mount the tap compression on a suitable hexagon socket and clamp into a vise.
- Remove nut **1**.
- Remove spring **2**.
- Remove washer **3**.



- Remove O-ring **4**.
- Remove piston **5**.
- Remove shim stack **6**.



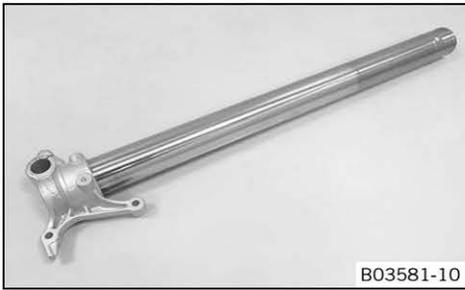
- Remove O-ring **7** from the tap compression.
- Extract the tap compression.



6.10.5 Checking the fork legs

Condition

The fork legs have been disassembled.



B03581-10

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

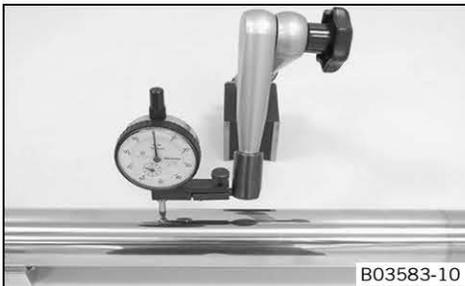


B03582-10

- Measure the outside diameter of the inner tube in several places.

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

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

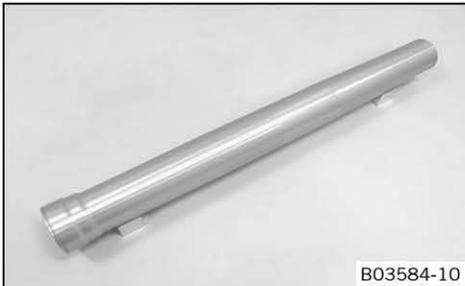


B03583-10

- Measure the run-out of the inner tube.

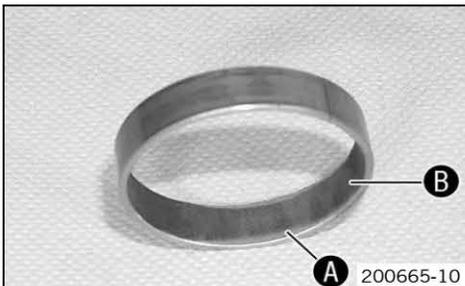
Inner tub run-out	≤ 0.20 mm (≤ 0.0079 in)
-------------------	-------------------------

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



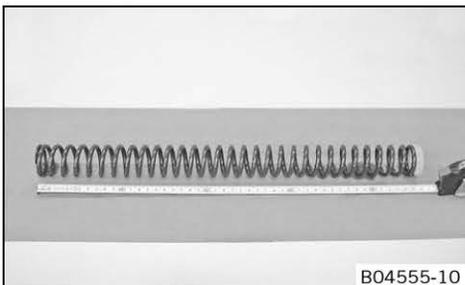
B03584-10

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



200665-10

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



B04555-10

- Check the spring length.

Guideline

Spring length with preload spacer(s)	474 mm (18.66 in)
--------------------------------------	-------------------

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



Info

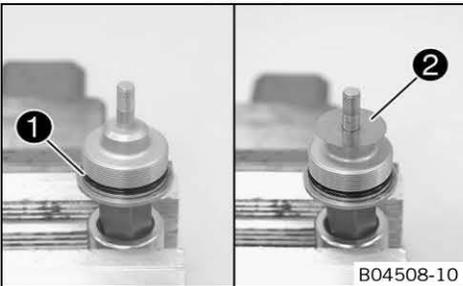
There may only be one preload spacer installed, or none at all.

6.10.6 Assembling the tap compression



Info

The procedures are the same on both fork legs.



- Mount the tap compression on a suitable hexagon socket and clamp into a vise.
- Mount O-ring ①.
- Grease O-ring.

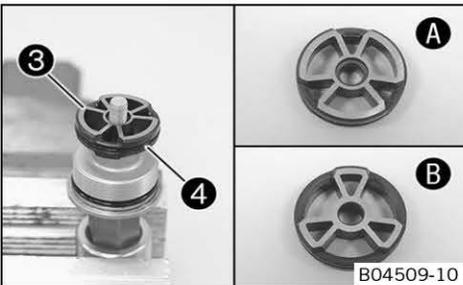
Lubricant (T158) (📖 p. 358)

- Mount shim stack ②.



Info

Mount the smaller shims below.



- Mount piston ③.

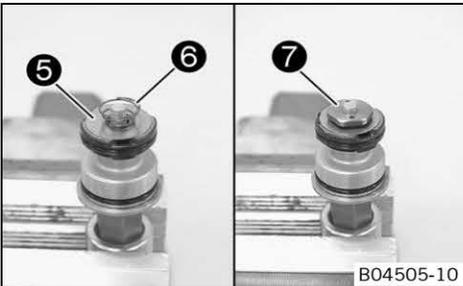
Guideline

View A of piston from above

View B of piston from below

- Mount O-ring ④.
- Grease the piston O-ring.

Fork oil (SAE 4) (48601166S1) (📖 p. 356)



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

Guideline

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

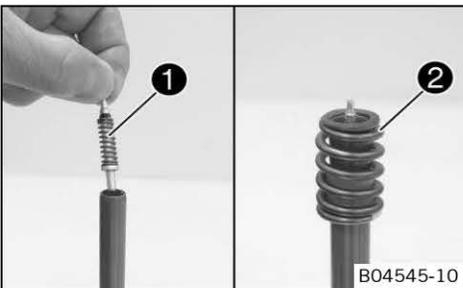


Info

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

- Extract the tap compression.

6.10.7 Assembling the cartridge



Right cartridge

- Clamp in the piston rod.

Clamping stand (T14016S) (📖 p. 372)

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

Lubricant (T158) (📖 p. 358)

- Mount spring ②.

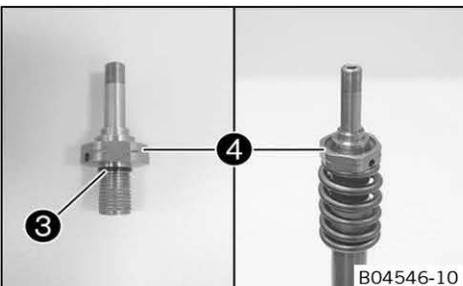
- Mount and grease O-ring ③ in tap rebound ④.

Lubricant (T158) (📖 p. 358)

- Mount and tighten the tap rebound.

Guideline

Tap rebound	M9x1	18 Nm (13.3 lbf ft)	Loctite® 2701™
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6 FORK, TRIPLE CLAMP

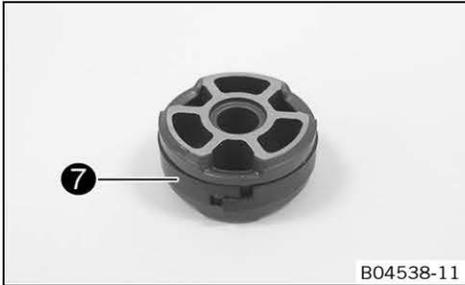


- Position spring 5.
- Mount shim stack 6.

i Info
Mount the smaller shims below.

- Press the shim stack downward against the spring force.

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



- Mount and lubricate piston ring 7.

Fork oil (SAE 4) (48601166S1) (見 p. 356)
--



- Mount piston 8 with the piston ring.

Guideline

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



- Mount shim stack 9.

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

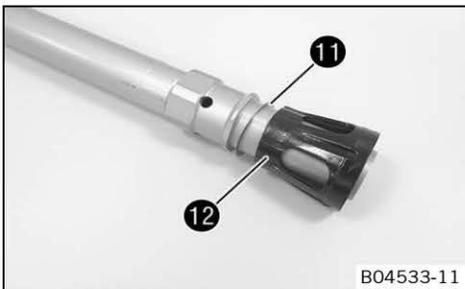
- Mount and tighten nut 10.

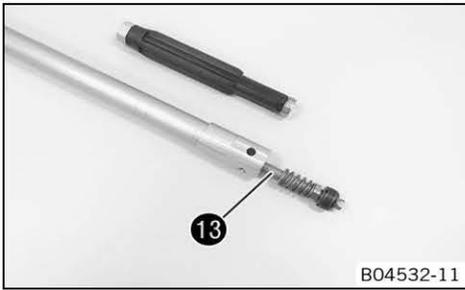
Guideline

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

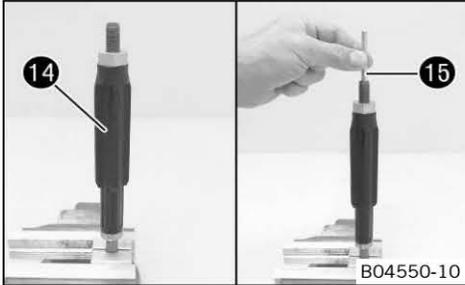
i Info
Mount the nut with the collar facing downward.

- Lock the nut by center punching it.
- Mount washer 11 and spring seat 12.





- Slide piston rod 13 into the cartridge.



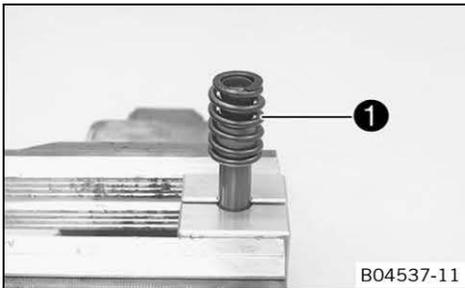
- Screw on fluid barrier 14 as far as it will go.



Info

The fluid barrier must be tightened as much as possible. Do not use a tool.

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

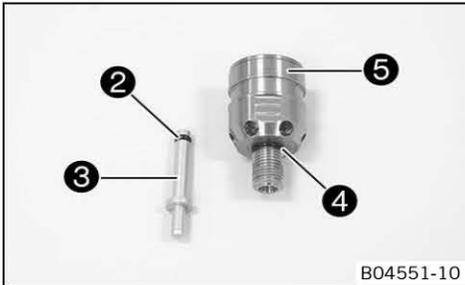


Left cartridge

- Clamp in the piston rod.

Clamping stand (T14016S) (📖 p. 372)

- Mount spring 1.

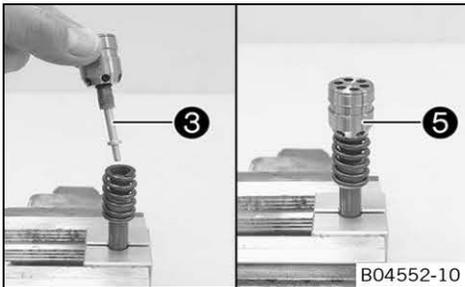


- Mount and lubricate O-ring 2 for setting needle 3.

Lubricant (T158) (📖 p. 358)

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

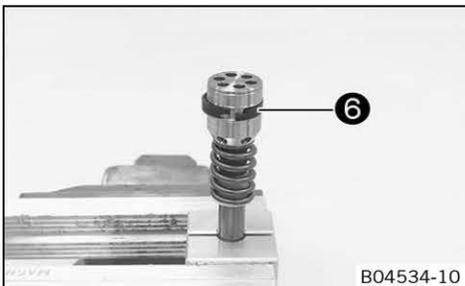
Lubricant (T158) (📖 p. 358)



- Insert setting needle 3 in the piston.
- Mount and tighten piston 5.

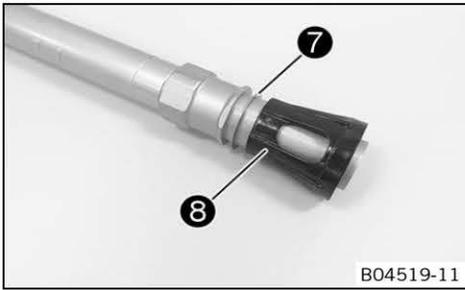
Guideline

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

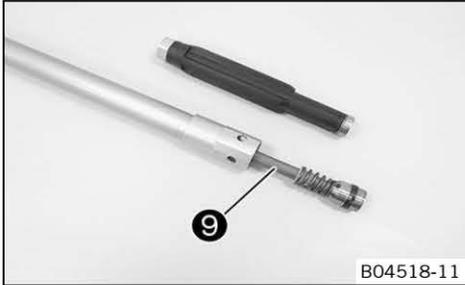


- Mount and lubricate piston ring 6.

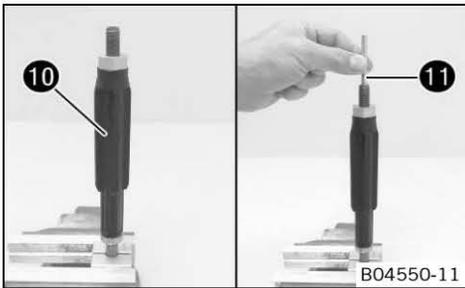
Fork oil (SAE 4) (48601166S1) (📖 p. 356)



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



- Slide piston rod **9** into the cartridge.



- Screw on fluid barrier **10** as far as it will go.



Info

The fluid barrier must be tightened as much as possible. Do not use a tool.

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

6.10.8 Assembling the fork legs



Info

The procedures are the same on both fork legs.

Preparatory work

- Check the fork legs. (p. 23)
- Assemble the cartridge. (p. 25)
- Assemble the tap compression. (p. 25)

Main work

- Clamp the inner tube with the axle clamp.

Guideline

Use soft jaws.

- Mount the special tool.

Protecting sleeve (T1401) (p. 372)

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

Lubricant (T511) (p. 358)

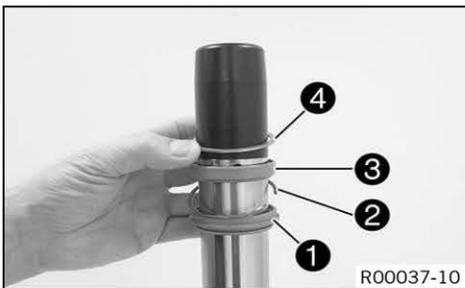


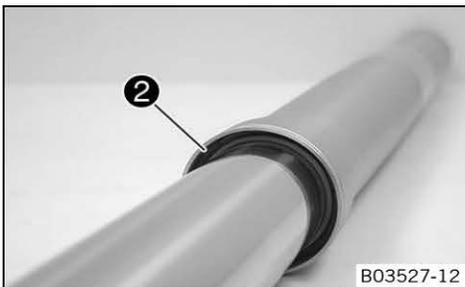
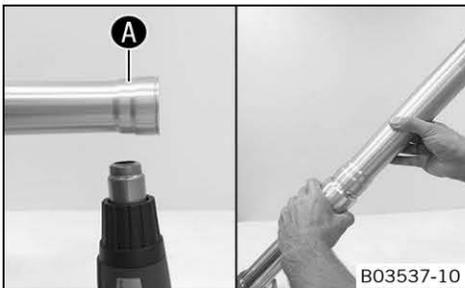
Info

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

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

Lubricant (T511) (p. 358)





Info

Sealing lip downward, open side upward.

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

Fork oil (SAE 4) (48601166S1) (📖 p. 356)

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



Info

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

- Warm up outer tube in area A of the lower sliding bushing.

Guideline

50 °C (122 °F)

- Push on the outer tube.
- Hold the lower sliding bushing with the longer side of the special tool.

Mounting tool (T14040S) (📖 p. 373)

- Press the outer tube all the way in.

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

Mounting tool (T14040S) (📖 p. 373)

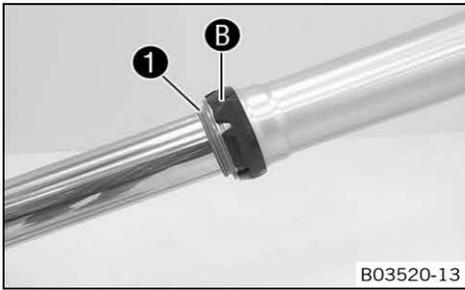
- Press the outer tube all the way in.

- Mount lock ring ②.

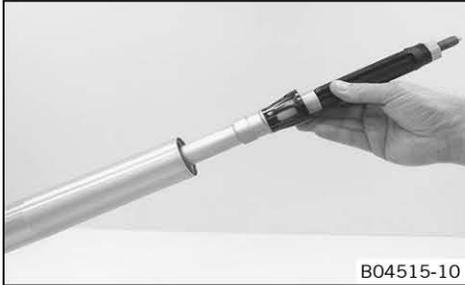


Info

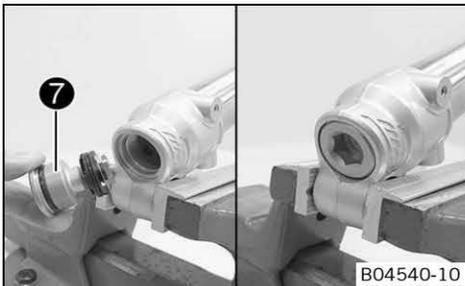
The lock ring must engage audibly.



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



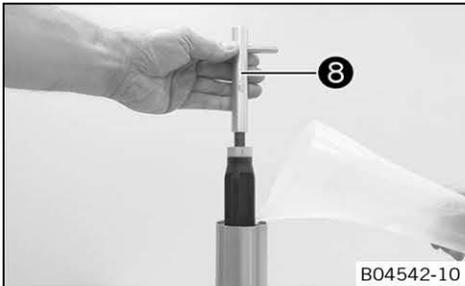
- Slide the cartridge all the way into the inner tube.



- Mount and tighten tap compression **7**.

Guideline

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



- Mount special tool **8** on the piston rod.

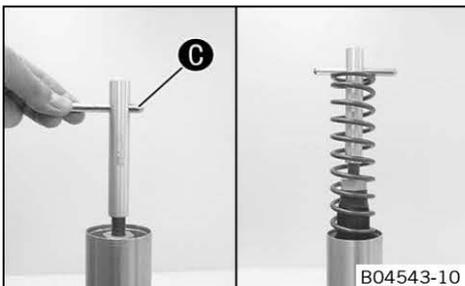
Gripping tool (T14026S1) (📖 p. 373)

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

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

Fork oil per fork leg	600 ml (20.29 fl. oz.)	Fork oil (SAE 4) (48601166S1) (📖 p. 356)
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i Info
Pull out the piston rod and push back in a number of times to bleed the cartridge.



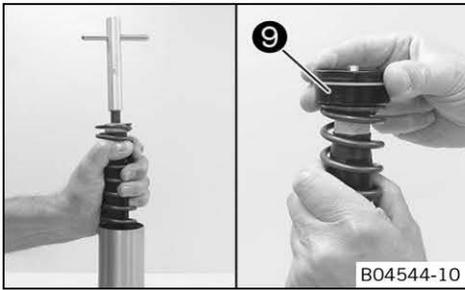
- Remove pin **C** of the special tool.

Gripping tool (T14026S1) (📖 p. 373)

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

Guideline

Spring rate	
Weight of rider: 65... 75 kg (143... 165 lb.)	4.4 N/mm (25.1 lb/in)
Weight of rider: 75... 85 kg (165... 187 lb.)	4.6 N/mm (26.3 lb/in)
Weight of rider: 85... 95 kg (187... 209 lb.)	4.8 N/mm (27.4 lb/in)



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

Gripping tool (T14026S1) (📖 p. 373)

- Screw on screw cap 9 all the way.



Info

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



- Pull the spring downwards.
- Mount the open end wrench on the hexagonal part.
- Hold the open end wrench. Tighten the screw cover.

Guideline

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

Ring wrench (T14017) (📖 p. 372)



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

Clamping stand (T1403S) (📖 p. 373)

- Grease the O-ring of the screw cover.

Lubricant (T158) (📖 p. 358)

- Screw on and tighten screw cap 9.

Guideline

Screw cap on outer tube	M51x1.5	40 Nm (29.5 lbf ft)
-------------------------	---------	------------------------

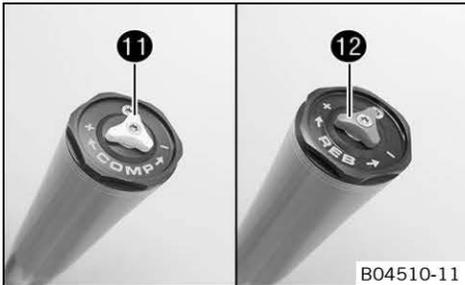
Ring wrench (T14017) (📖 p. 372)



- Mount the adjuster.
- Mount and tighten screw 10.

Guideline

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



Alternative 1

- Turn compression adjuster 11 and rebound adjuster 12 clockwise all the way.
- Turn counterclockwise by the number of clicks corresponding to the fork type.

Guideline

Rebound damping	
Comfort	18 clicks
Standard	15 clicks
Sport	12 clicks
Compression damping	
Comfort	18 clicks
Standard	15 clicks
Sport	12 clicks

Alternative 2



Warning

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

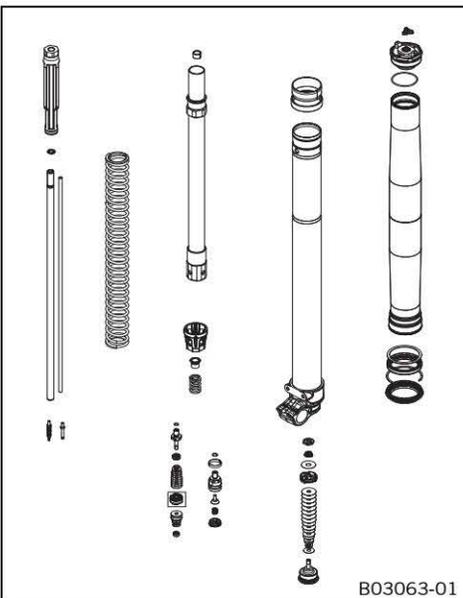
Extreme modifications to the suspension setting may cause a serious deterioration in the handling characteristic and overload components.

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

- Set the adjusters to the positions determined upon removal.

6.11 All EXC-F Six Days

6.11.1 Servicing the fork



Condition

The fork legs have been removed.

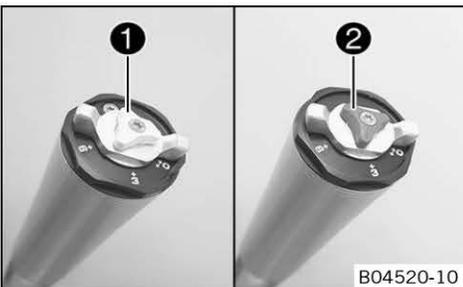
- Disassemble the fork legs. (📖 p. 32)
- Disassemble the cartridge. (📖 p. 34)
- Check the fork legs. (📖 p. 38)
- Assemble the cartridge. (📖 p. 40)
- Assemble the fork legs. (📖 p. 43)

6.11.2 Disassembling the fork legs



Info

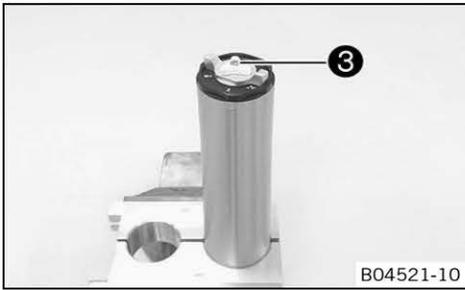
The procedures are the same on both fork legs.



Condition

The fork legs have been removed.

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



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

Clamping stand (T1403S) (📖 p. 373)

- Remove screw ③. Remove adjuster.



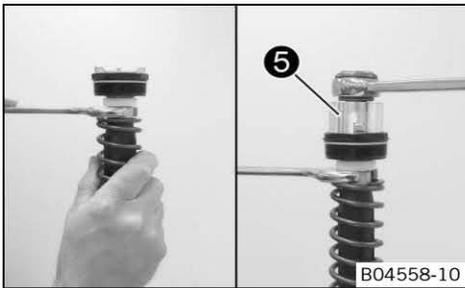
- Loosen the screw cover ④.

Ring wrench (T14017) (📖 p. 372)



Info

The screw cover cannot be removed yet.

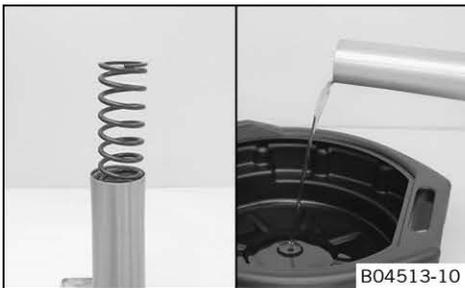


- Extract the fork leg and push the outer tube downward.
- Pull the spring downward and push the open end wrench onto the hexagonal part.
- Hold the hexagonal part and loosen Preload Adjuster with special tool ⑤, but do not take it off yet.

Special socket (T14087) (📖 p. 373)



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

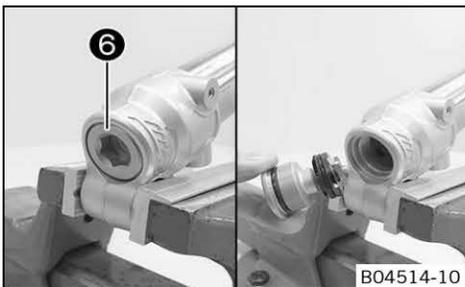


- Remove the spring.
- Drain the fork oil.



Info

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



- Clamp the fork leg with the axle clamp.

Guideline

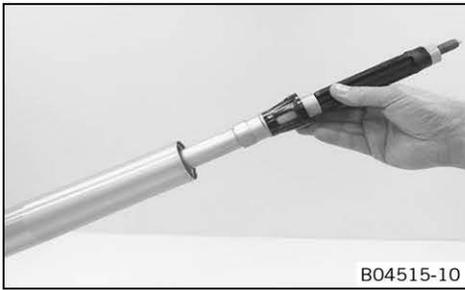
Use soft jaws.

- Unscrew and remove compression holder ⑥.

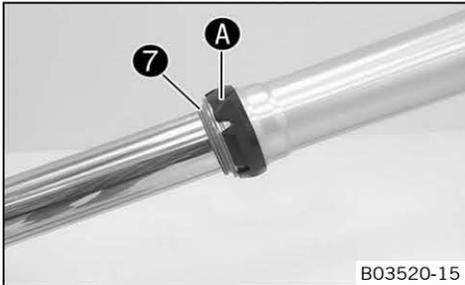


Info

Place a container underneath as oil runs out in most cases.



- Remove the cartridge.

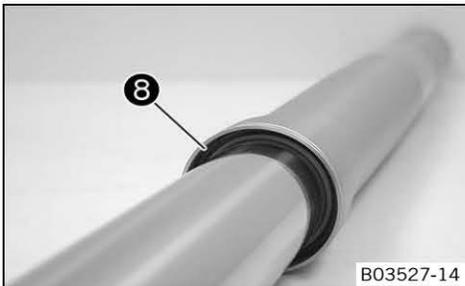


- Remove dust boot **7**.
- Remove fork protector ring **A**.



Info

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

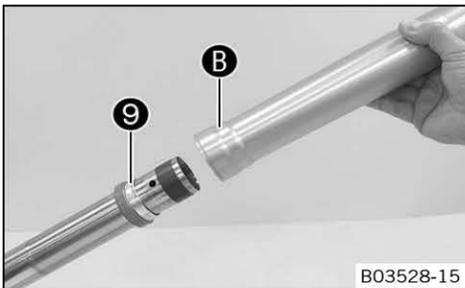


- Remove lock ring **8**.



Info

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



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

Guideline

50 °C (122 °F)

- Pull the outer tube from the inner tube with a jerk.



Info

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



- Remove upper sliding bushing **10**.



Info

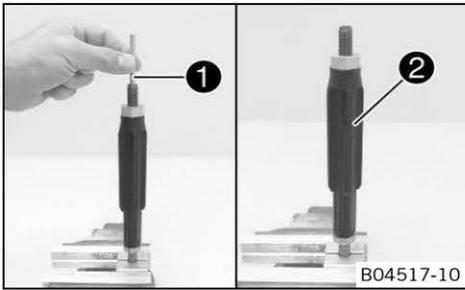
Without using a tool, pull the stack slightly apart by hand.

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

6.11.3 Disassembling the cartridge

Preparatory work

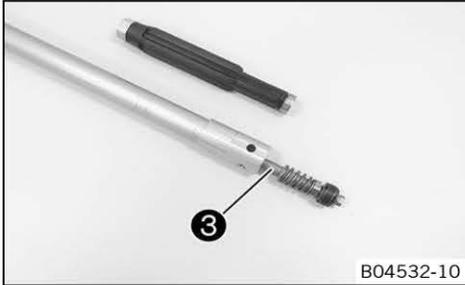
- Disassemble the fork legs. (📖 p. 32)



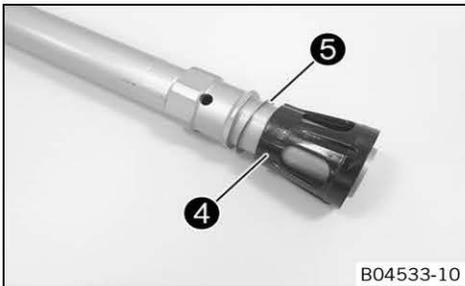
Right cartridge

- Clamp the piston rod with the special tool.

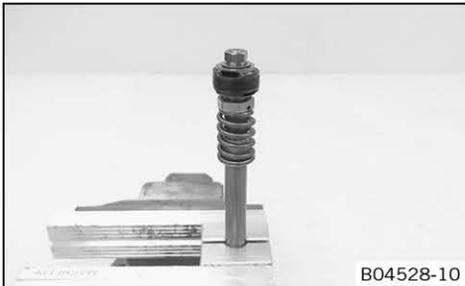
Clamping stand (T14016S) (頁 p. 372)
- Remove adjusting tube ①.
- Remove fluid barrier ② from the piston rod.



- Take piston rod ③ out of the cartridge.



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



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

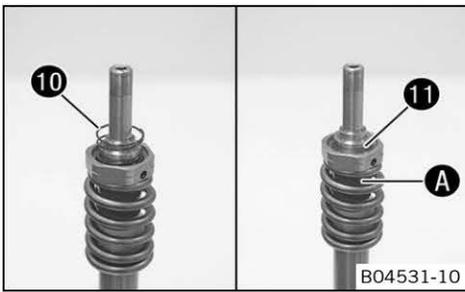
Clamping stand (T14016S) (頁 p. 372)



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



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



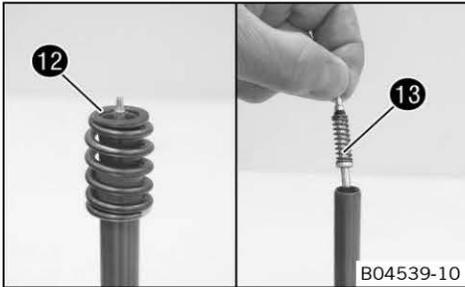
B04531-10

- Remove spring 10.
- Warm up the piston rod in area A.

Guideline

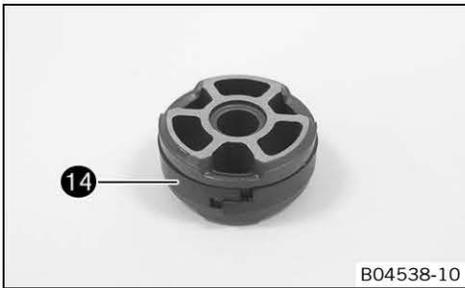
50 °C (122 °F)

- Remove tap rebound 11.



B04539-10

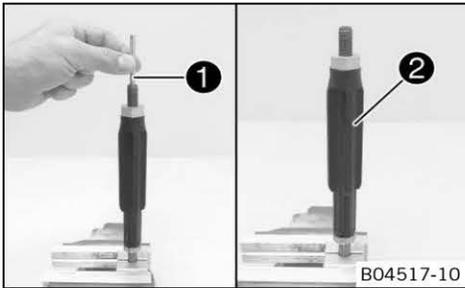
- Remove spring 12.
- Remove valve 13 of the rebound damping with the spring.
- Unclamp the piston rod.



B04538-10

- Remove piston ring 14.

Left cartridge

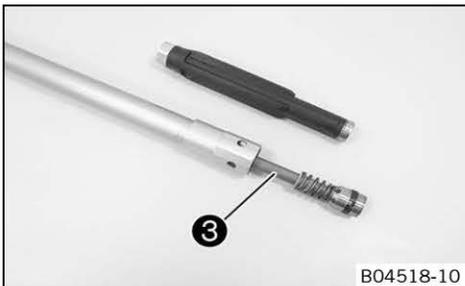


B04517-10

- Clamp the piston rod with the special tool.

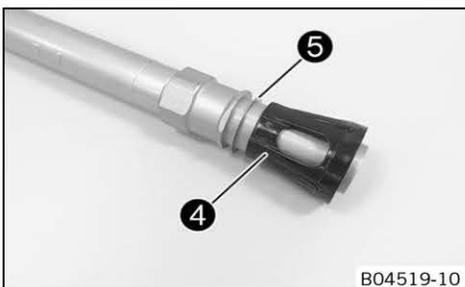
Clamping stand (T14016S) (p. 372)

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



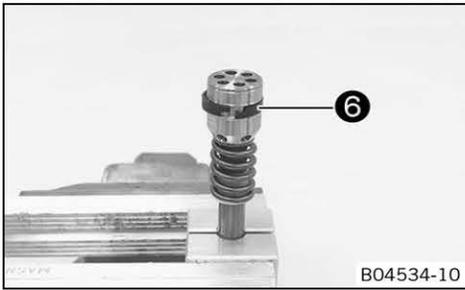
B04518-10

- Take piston rod 3 out of the cartridge.

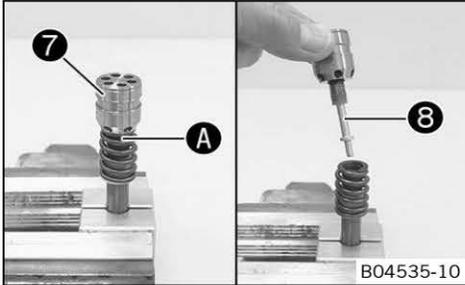


B04519-10

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



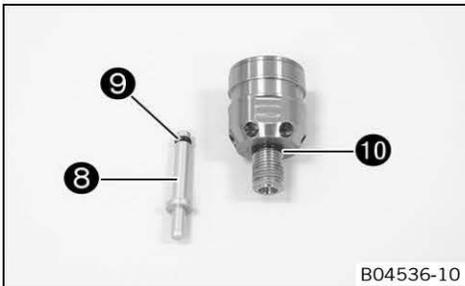
- Degrease the piston rod.
 - Clamp the piston rod with the special tool.
- Clamping stand (T14016S) (📖 p. 372)
- Remove piston ring 6.



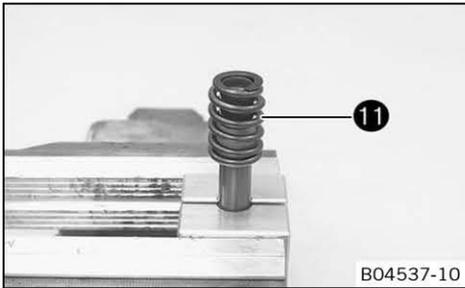
- Warm up the piston rod in area A.
- Guideline

50 °C (122 °F)

- Remove piston 7 with setting needle 8.



- Pull setting needle 8 out of the piston.
- Remove O-rings 9 and 10.



- Remove spring 11.
- Unclamp the piston rod.

6.11.4 Disassembling the tap compression



Info

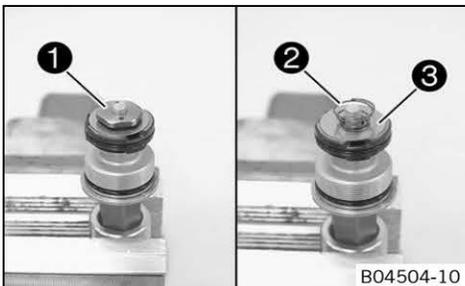
The procedures are the same on both fork legs.

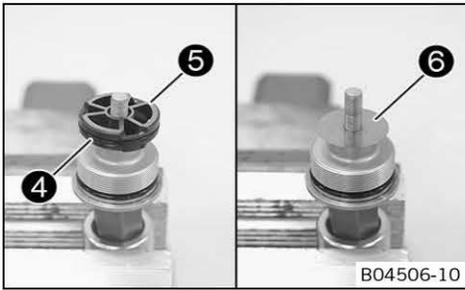
Preparatory work

- Disassemble the fork legs. (📖 p. 32)

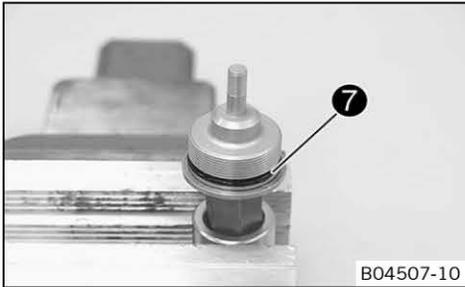
Main work

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





- Remove O-ring ④.
- Remove piston ⑤.
- Remove shim stack ⑥.

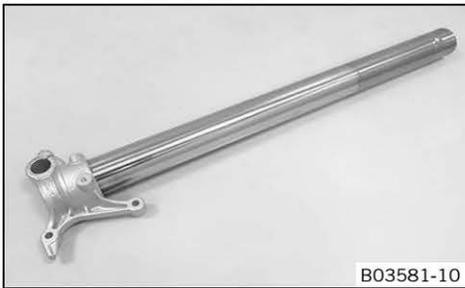


- Remove O-ring ⑦ from the tap compression.
- Extract the tap compression.

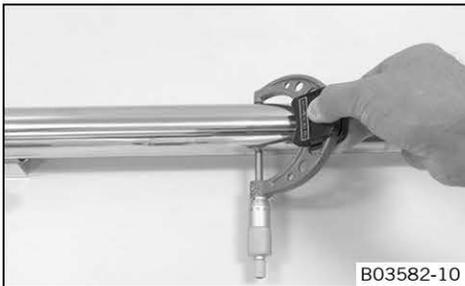
6.11.5 Checking the fork legs

Condition

The fork legs have been disassembled.



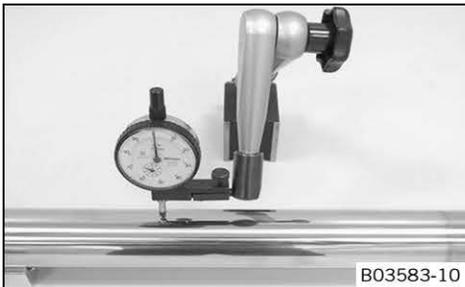
- Check the inner tube and the axle clamp for damage.
 - » If damage is found:
 - Change the inner tube.



- Measure the outside diameter of the inner tube in several places.

Outside diameter of the inner tube	47.975... 48.005 mm (1.88878... 1.88996 in)
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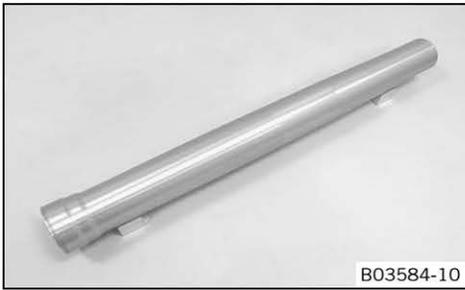
- » If the measured value is less than the specified value:
 - Change the inner tube.



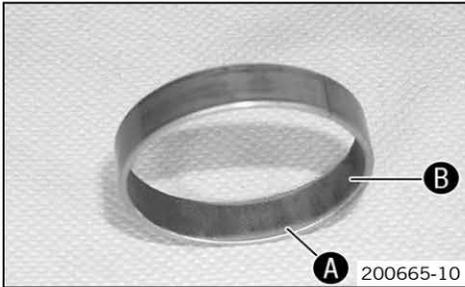
- Measure the run-out of the inner tube.

Inner tub run-out	≤ 0.20 mm (≤ 0.0079 in)
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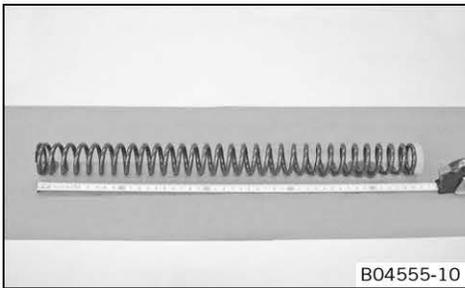
- » If the measured value is greater than the specified value:
 - Change the inner tube.



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



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



- Check the spring length.

Guideline

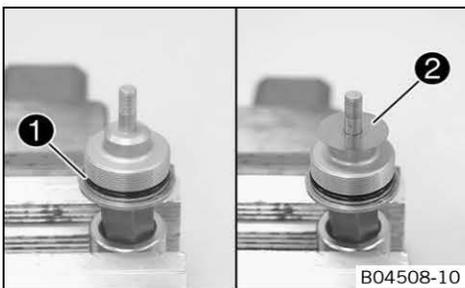
Spring length with preload spacer(s)	
Weight of rider: 65... 75 kg (143... 165 lb.)	477 mm (18.78 in)
Weight of rider: 75... 85 kg (165... 187 lb.)	475 mm (18.7 in)
Weight of rider: 85... 95 kg (187... 209 lb.)	477 mm (18.78 in)

- » 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.

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

6.11.6 Assembling the tap compression

i Info
The procedures are the same on both fork legs.

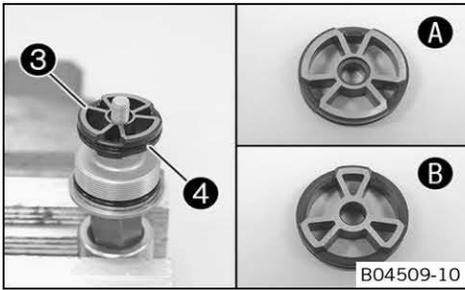


- Mount the tap compression on a suitable hexagon socket and clamp into a vise.
- Mount O-ring **1**.
- Grease O-ring.

Lubricant (T158) (📖 p. 358)

- Mount shim stack **2**.

i Info
Mount the smaller shims below.



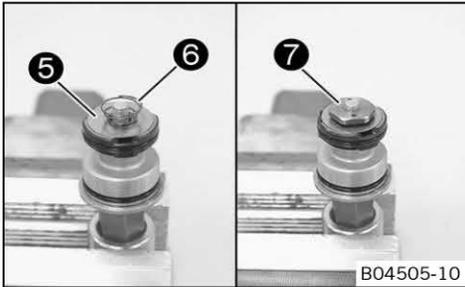
- Mount piston ③.

Guideline

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

- Mount O-ring ④.
- Grease the piston O-ring.

Fork oil (SAE 4) (48601166S1) (📖 p. 356)



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

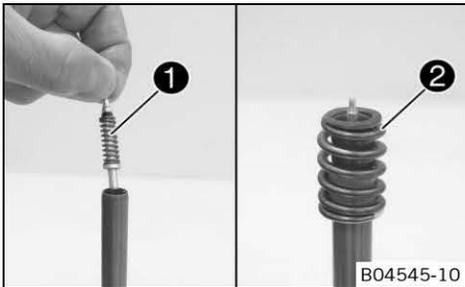
Guideline

Nut, tap compression	M6x0.5	5 Nm (3.7 lbf ft)
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i Info
Washer ⑤ must be free to move against the spring force.

- Extract the tap compression.

6.11.7 cartridge, assembling



Right cartridge

- Clamp in the piston rod.

Clamping stand (T14016S) (📖 p. 372)

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

Lubricant (T158) (📖 p. 358)

- Mount spring ②.

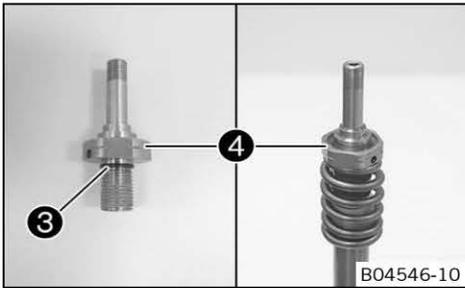
- Mount and grease O-ring ③ in tap rebound ④.

Lubricant (T158) (📖 p. 358)

- Mount and tighten the tap rebound.

Guideline

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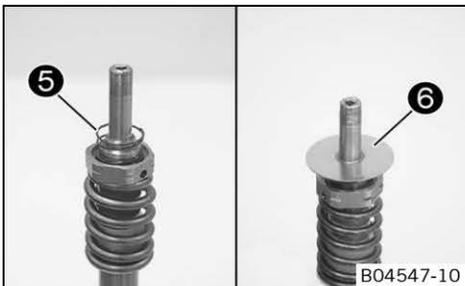


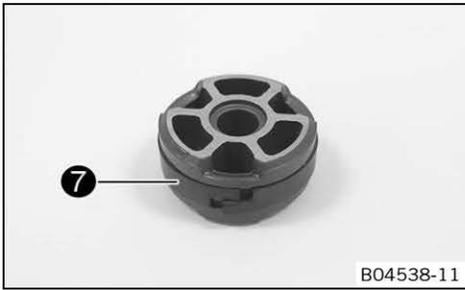
- Position spring ⑤.
- Mount shim stack ⑥.

i Info
Mount the smaller shims below.

- Press the shim stack downward against the spring force.

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





- Mount and lubricate piston ring 7.

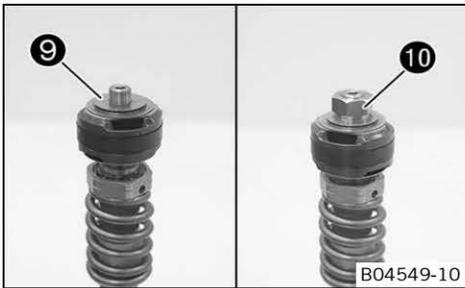
Fork oil (SAE 4) (48601166S1) (📖 p. 356)
--



- Mount piston 8 with the piston ring.

Guideline

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



- Mount shim stack 9.

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

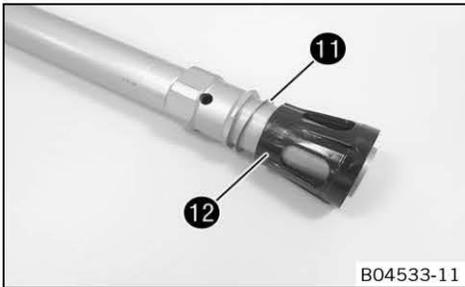
- Mount and tighten nut 10.

Guideline

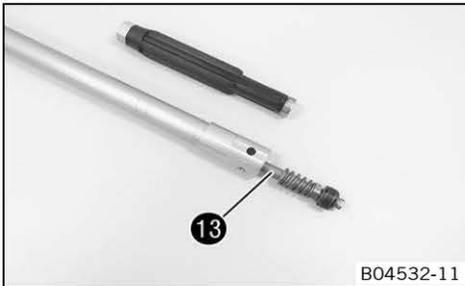
Tap rebound nut	M6x0.5	5 Nm (3.7 lbf ft)
-----------------	--------	-------------------

i Info
Mount the nut with the collar facing downward.

- Lock the nut by center punching it.
- Mount washer 11 and spring seat 12.



- Slide piston rod 13 into the cartridge.

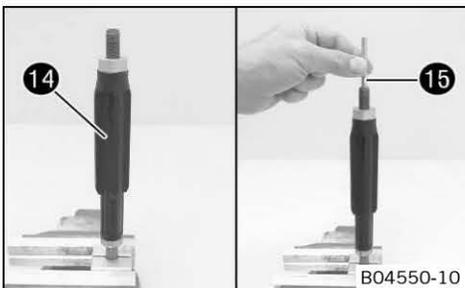


- Screw on fluid barrier 14 as far as it will go.

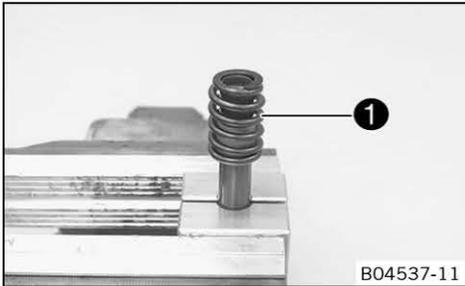
i Info
The fluid barrier must be tightened as much as possible. Do not use a tool.

- Mount adjusting tube 15 of the rebound damping in the cartridge.

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



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



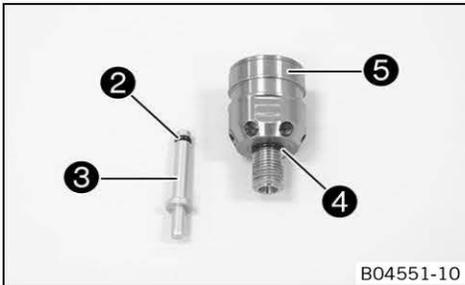
B04537-11

Left cartridge

- Clamp in the piston rod.

Clamping stand (T14016S) (圖 p. 372)

- Mount spring 1.



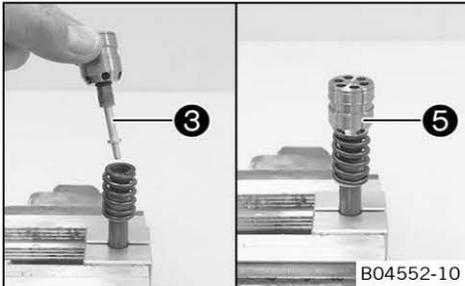
B04551-10

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

Lubricant (T158) (圖 p. 358)

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

Lubricant (T158) (圖 p. 358)

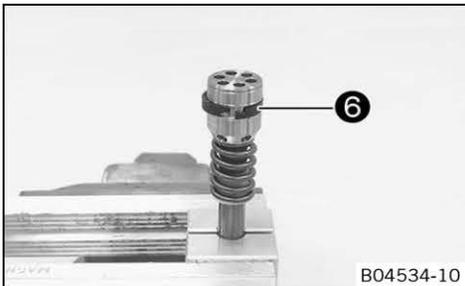


B04552-10

- Insert setting needle 3 in the piston.
- Mount and tighten piston 5.

Guideline

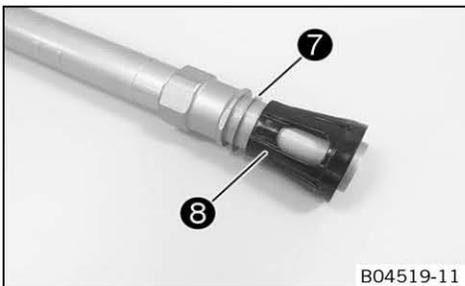
Rebound piston	M9x1	18 Nm (13.3 lbf ft)	Loctite® 2701™
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B04534-10

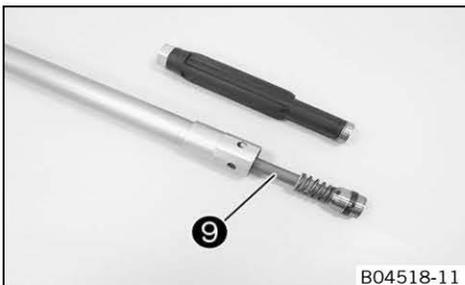
- Mount and lubricate piston ring 6.

Fork oil (SAE 4) (48601166S1) (圖 p. 356)



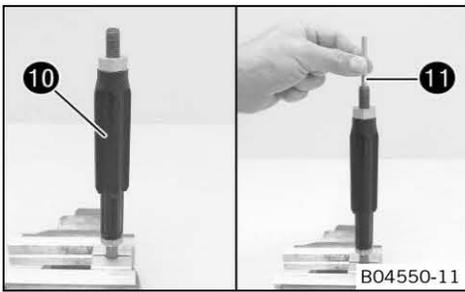
B04519-11

- Mount washer 7 and spring seat 8.



B04518-11

- Slide piston rod 9 into the cartridge.



- Screw on fluid barrier **10** as far as it will go.

i Info
The fluid barrier must be tightened as much as possible. Do not use a tool.

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

6.11.8 Assembling the fork legs

i Info
The procedures are the same on both fork legs.

Preparatory work

- Check the fork legs. (📖 p. 38)
- Assemble the cartridge. (📖 p. 40)
- Assemble the tap compression. (📖 p. 39)

Main work

- Clamp the inner tube with the axle clamp.

Guideline

Use soft jaws.

- Mount the special tool.

Protecting sleeve (T1401) (📖 p. 372)

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

Lubricant (T511) (📖 p. 358)

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

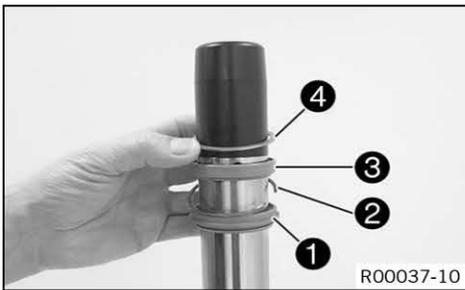
- Push on lock ring **2**.
- Grease and push on seal ring **3**.

Lubricant (T511) (📖 p. 358)

i Info
Sealing lip downward, open side upward.

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

Fork oil (SAE 4) (48601166S1) (📖 p. 356)



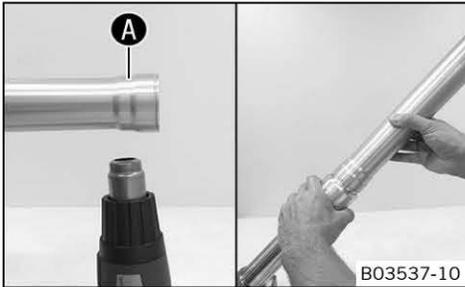


- Push on lower sliding bushing **5**.
- Mount upper sliding bushing **6**.



Info

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



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

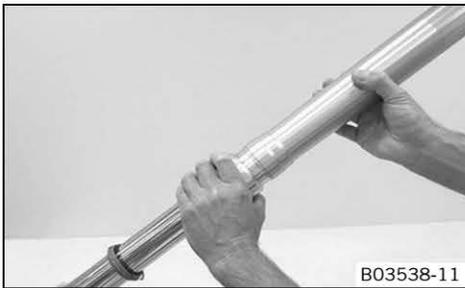
Guideline

50 °C (122 °F)

- Push on the outer tube.
- Hold the lower sliding bushing with the longer side of the special tool.

Mounting tool (T14040S) (📖 p. 373)

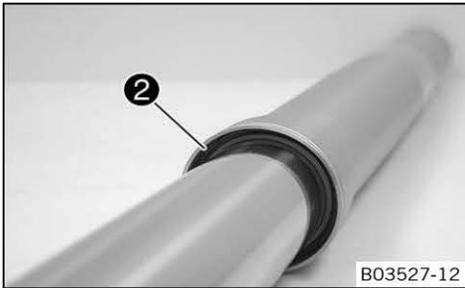
- Press the outer tube all the way in.



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

Mounting tool (T14040S) (📖 p. 373)

- Press the outer tube all the way in.

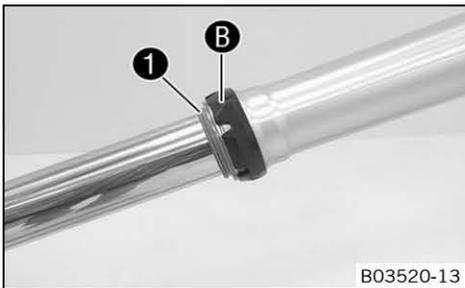


- Mount lock ring **2**.



Info

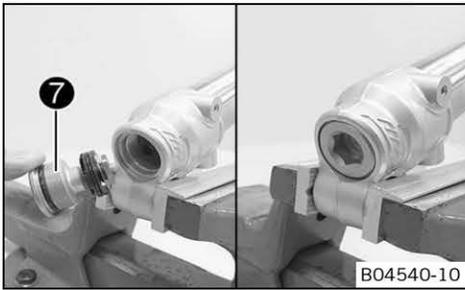
The lock ring must engage audibly.



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



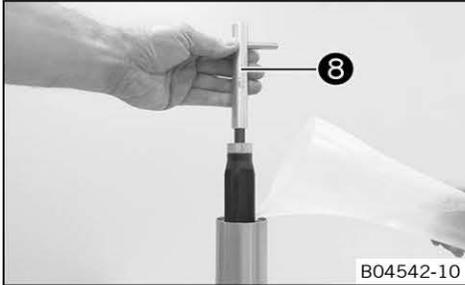
- Slide the cartridge all the way into the inner tube.



- Mount and tighten tap compression 7.

Guideline

Compression damping fitting	M29x1	35 Nm (25.8 lbf ft)
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- Mount special tool 8 on the piston rod.

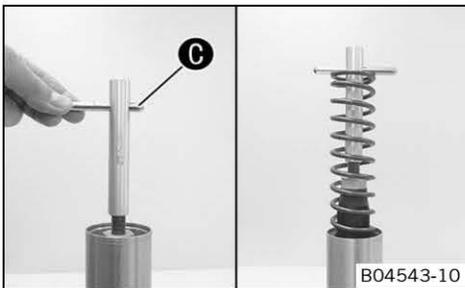
Gripping tool (T14026S1) (p. 373)

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

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

Fork oil per fork leg	610 ml (20.62 fl. oz.)	Fork oil (SAE 4) (48601166S1) (p. 356)
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i Info
Pull out the piston rod and push back in a number of times to bleed the cartridge.



- Remove pin C of the special tool.

Gripping tool (T14026S1) (p. 373)

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

Guideline

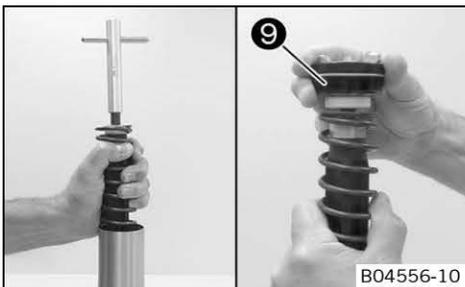
Spring rate	
Weight of rider: 65... 75 kg (143... 165 lb.)	4.4 N/mm (25.1 lb/in)
Weight of rider: 75... 85 kg (165... 187 lb.)	4.6 N/mm (26.3 lb/in)
Weight of rider: 85... 95 kg (187... 209 lb.)	4.8 N/mm (27.4 lb/in)

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

Gripping tool (T14026S1) (p. 373)

- Screw on screw cap 9 all the way.

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

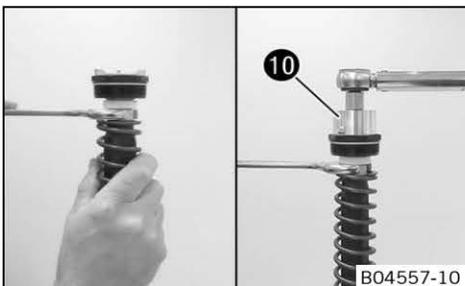


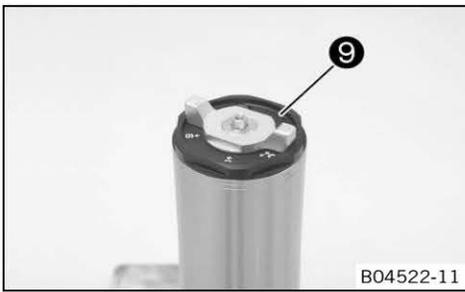
- Pull the spring downwards.
- Mount the open end wrench on the hexagonal part.
- Hold the open end wrench. Tighten Preload Adjuster with special tool 10.

Guideline

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

Special socket (T14087) (p. 373)





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

Clamping stand (T1403S) (🔧 p. 373)

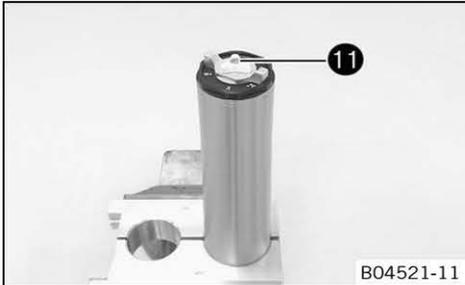
- Grease the O-ring of the screw cover.
- Screw on and tighten screw cap 9.

Lubricant (T158) (🔧 p. 358)

Guideline

Screw cap on outer tube	M51x1.5	40 Nm (29.5 lbf ft)
-------------------------	---------	------------------------

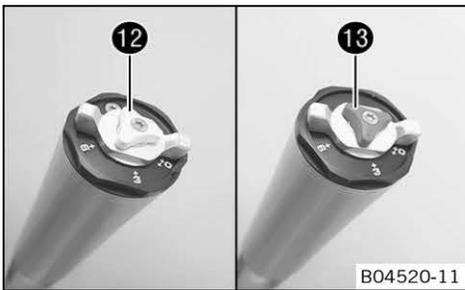
Ring wrench (T14017) (🔧 p. 372)



- Mount the adjuster.
- Mount and tighten screw 11.

Guideline

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



Alternative 1

- Turn compression adjuster 12 and rebound adjuster 13 clockwise all the way.
- Turn counterclockwise by the number of clicks corresponding to the fork type.

Guideline

Rebound damping	
Comfort	18 clicks
Standard	15 clicks
Sport	12 clicks
Compression damping	
Comfort	18 clicks
Standard	15 clicks
Sport	12 clicks

- Set the spring preload according to the fork type.

Guideline

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

Alternative 2



Warning

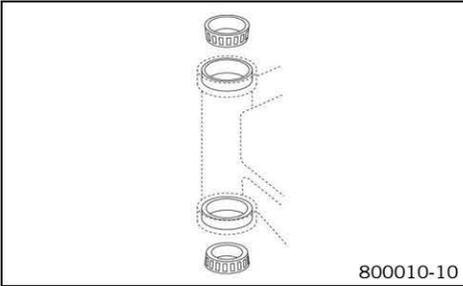
Danger of accident Modifications to the suspension setting may seriously alter the handling characteristic.

Extreme modifications to the suspension setting may cause a serious deterioration in the handling characteristic and overload components.

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

- Set the adjusters to the positions determined upon removal.

6.12 Lubricating the steering head bearing



(EXC-F EU/AU/US)

- Remove the lower triple clamp. (📖 p. 47)
- Install the lower triple clamp. (📖 p. 48)

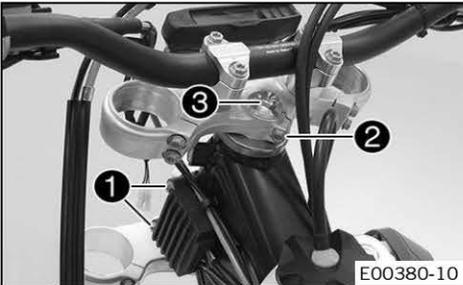
(All EXC-F Six Days)

- Remove the lower triple clamp. (📖 p. 49)
- Install the lower triple clamp. (📖 p. 50)

6.13 Removing the lower triple clamp (EXC-F EU/AU/US)

Preparatory work

- Remove the headlight mask with the headlight. (📖 p. 114)
- Raise the motorcycle with the lift stand. (📖 p. 11)
- Remove the front wheel. (📖 p. 120)
- Remove the fork legs. (📖 p. 15)
- Remove the front fender. (📖 p. 113)
- Remove the handlebar cushion.

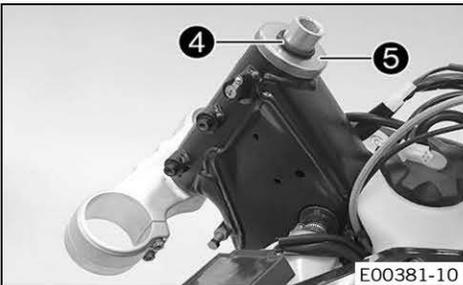


Main work

- Open the cable holder in front of the right radiator and detach the wiring harness.
- Remove screws ❶ and hang the voltage regulator to the side.
- Open the cable holder in front of the left radiator and detach the wiring harness.
- Loosen screw ❷.
- Remove screw ❸.
- Take off the upper triple clamp with the handlebar and set it aside.

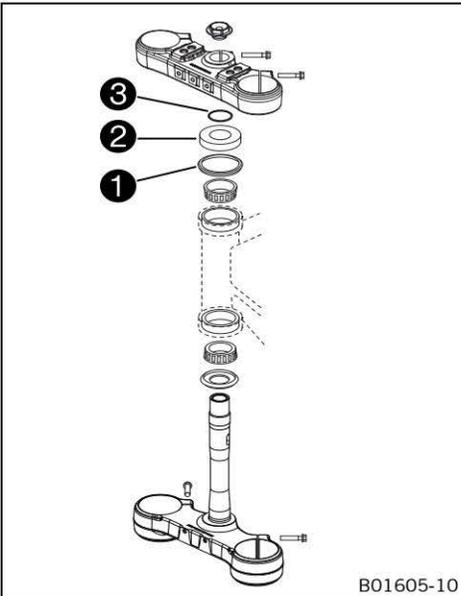
Info

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



- Remove O-ring ❹ and protective ring ❺.
- Take off the lower triple clamp with the steering stem.
- Remove the upper steering head bearing.

6.14 Installing the lower triple clamp (EXC-F EU/AU/US)

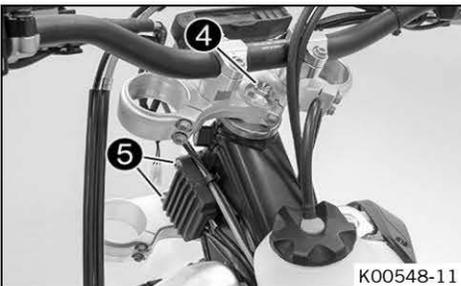


Main work

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

High viscosity grease (🗨️ p. 358)

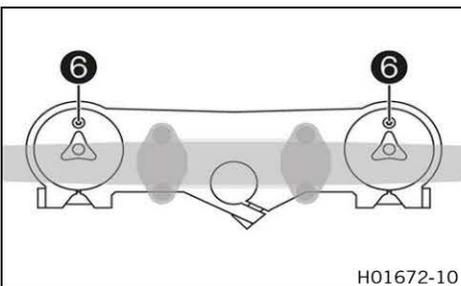
- Insert the lower triple clamp with the steering stem. Mount the upper steering head bearing.
- Check whether upper steering head seal **1** is correctly positioned.
- Slide on protective ring **2** and O-ring **3**.



- Position the upper triple clamp with the handlebar.
- Mount screw **4** but do not tighten yet.
- Secure wiring harness and clutch line with cable holder.
- Position the voltage regulator, and mount and tighten screws **5**.

Guideline

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



- Position the fork legs.
- ✓ Bleeder screws **6** are positioned toward the front.

Info

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



- Tighten screw **4**.

Guideline

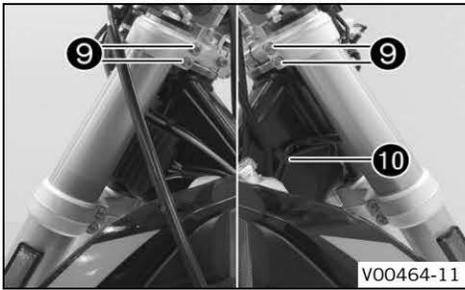
Screw, top steering head	M20x1.5	12 Nm (8.9 lbf ft)
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- Tighten screw **8**.

Guideline

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



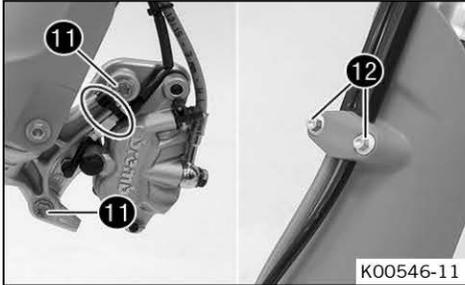
V00464-11

- Tighten screws 9.

Guideline

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

- Secure the wiring harness with cable holder 10.



K00546-11

- Position the brake caliper, and mount and tighten screws 11.

Guideline

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

- Mount the cable tie(s).
- Position the brake line, wiring harness, and clamp. Mount and tighten screws 12.

Finishing work

- Mount the handlebar cushion.
- Install the front fender. (📖 p. 113)
- Install the front wheel. (📖 p. 120)
- Install the headlight mask with the headlight. (📖 p. 115)
- Check that the wiring harness, throttle cables, and brake and clutch lines can move freely and are routed correctly.
- Check the play of the steering head bearing. (📖 p. 54)
- Remove the motorcycle from the lift stand. (📖 p. 11)
- Check the headlight setting. (📖 p. 151)

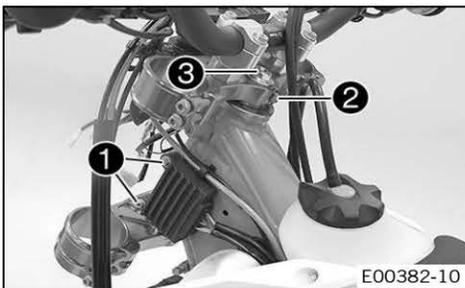
6.15 Removing the lower triple clamp (All EXC-F Six Days)

Preparatory work

- Remove the headlight mask with the headlight. (📖 p. 114)
- Raise the motorcycle with the lift stand. (📖 p. 11)
- Remove the front wheel. (📖 p. 120)
- Remove the fork legs. (📖 p. 15)
- Remove the front fender. (📖 p. 113)
- Remove the handlebar cushion.

Main work

- Open the cable holder in front of the right radiator and detach the wiring harness.
- Remove screws 1 and hang the voltage regulator to the side.
- Open the cable holder in front of the left radiator and detach the wiring harness.
- Remove screw 2.
- Remove screw 3.
- Take off the upper triple clamp with the handlebar and set it aside.

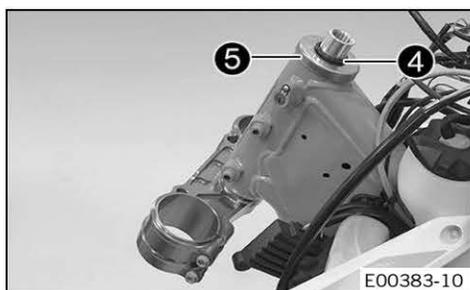


E00382-10



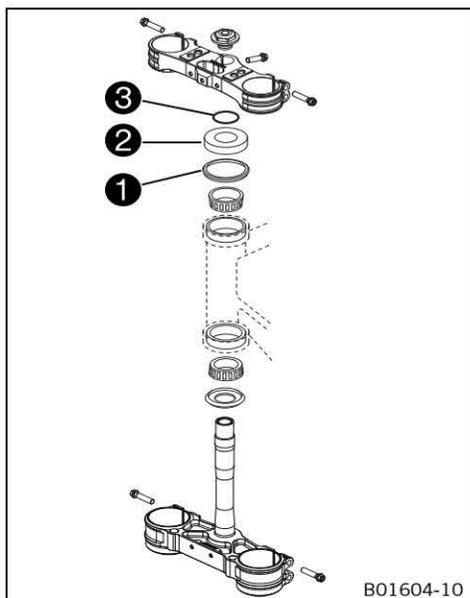
Info

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



- Remove O-ring ④ and protective ring ⑤.
- Take off the lower triple clamp with the steering stem.
- Remove the upper steering head bearing.

6.16 Installing the lower triple clamp (All EXC-F Six Days)

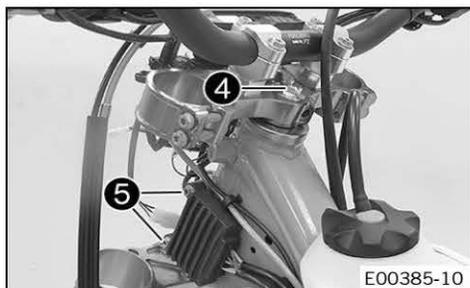


Main work

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

High viscosity grease (🗨️ p. 358)

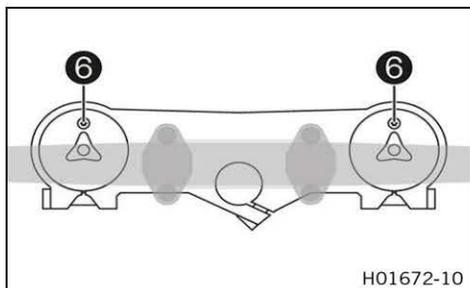
- Position the lower triple clamp with the steering stem. Mount the upper steering head bearing.
- Check whether upper steering head seal ① is correctly positioned.
- Mount protective ring ② and O-ring ③.



- Position the upper triple clamp with the handlebar.
- Mount screw ④ but do not tighten yet.
- Secure wiring harness and clutch line with cable holder.
- Position the voltage regulator, and mount and tighten screws ⑤.

Guideline

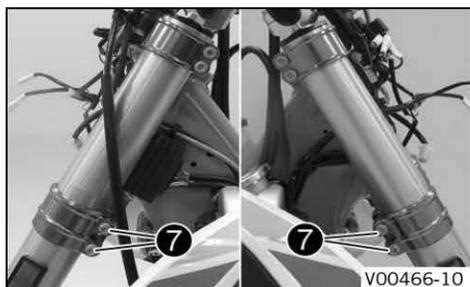
Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
---------------------------	----	--------------------



- Position the fork legs.
- ✓ Bleeder screws ⑥ are positioned toward the front.

Info

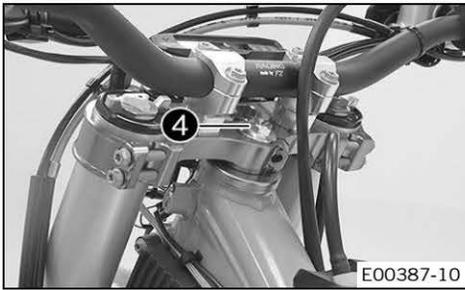
The rebound damping is located in right fork leg **REB** (red adjusting screw). The compression damping is located in left fork leg **COM** (white adjusting screw). Grooves are milled into the side of the upper end of the fork legs. The second milled groove (from the top) must be flush with the top edge of the upper triple clamp.



- Tighten screws ⑦.

Guideline

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



- Tighten screw 4.

Guideline

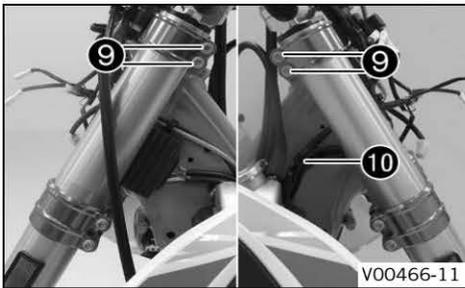
Screw, top steering head	M20x1.5	12 Nm (8.9 lbf ft)
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- Mount and tighten screw 8.

Guideline

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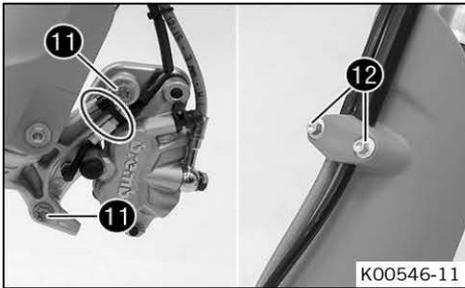


- Tighten screws 9.

Guideline

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

- Secure the wiring harness with cable holder 10.



- Position the brake caliper, and mount and tighten screws 11.

Guideline

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

- Mount the cable tie(s).
- Position the brake line, wiring harness, and clamp. Mount and tighten screws 12.

Finishing work

- Mount the handlebar cushion.
- Install the front fender. (📖 p. 113)
- Install the front wheel. (📖 p. 120)
- Install the headlight mask with the headlight. (📖 p. 115)
- Check that the wiring harness, throttle cables, and brake and clutch lines can move freely and are routed correctly.
- Check the play of the steering head bearing. (📖 p. 54)
- Remove the motorcycle from the lift stand. (📖 p. 11)
- Check the headlight setting. (📖 p. 151)

6.17 Changing the steering head bearing (EXC-F EU/AU/US)

Preparatory work

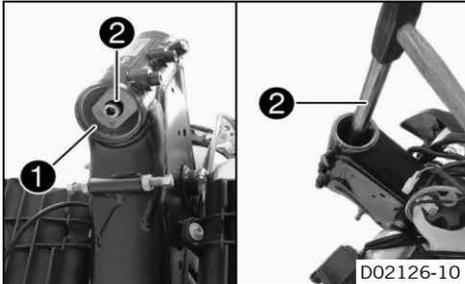
- Remove the headlight mask with the headlight. (📖 p. 114)
- Raise the motorcycle with the lift stand. (📖 p. 11)
- Remove the front wheel. (📖 p. 120)
- Remove the fork legs. (📖 p. 15)
- Remove the front fender. (📖 p. 113)
- Remove the handlebar cushion.
- Remove the lower triple clamp. (📖 p. 47)

Main work

- Remove lower bearing ring ❶ with special tool ❷.

Tool bracket (58429089000) (📖 p. 363)

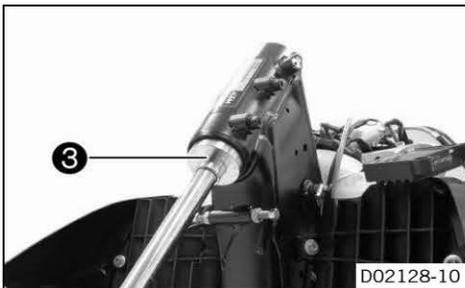
Press-out tool (58429092000) (📖 p. 363)



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

Tool bracket (58429089000) (📖 p. 363)

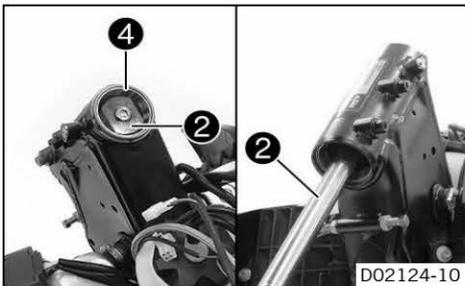
Press-in tool (58429091000) (📖 p. 363)
--



- Remove upper bearing ring ❹ with special tool ❷.

Tool bracket (58429089000) (📖 p. 363)

Press-out tool (58429092000) (📖 p. 363)

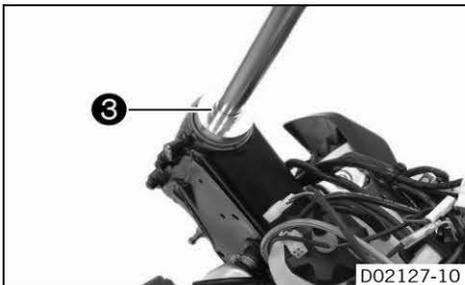


- Remove the seal ring.

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

Tool bracket (58429089000) (📖 p. 363)

Press-in tool (58429091000) (📖 p. 363)
--



- Grease and mount the new seal ring.

- Remove lower steering head bearing ❺.

- Remove the seal ring retainer.

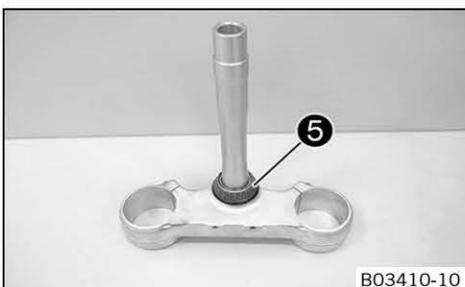
- Remove the O-ring.

- Grease the new O-ring and mount with the seal ring retainer.

- Press on the new bearing with a suitable tube as far as it will go.

i Info

Only press the bearing in via the inner ring.



Finishing work

- Install the lower triple clamp. (📖 p. 48)

- Mount the handlebar cushion.
- Install the front fender. (📖 p. 113)
- Install the front wheel. (📖 p. 120)
- Install the headlight mask with the headlight. (📖 p. 115)
- Check that the wiring harness, throttle cables, and brake and clutch lines can move freely and are routed correctly.
- Check the play of the steering head bearing. (📖 p. 54)
- Remove the motorcycle from the lift stand. (📖 p. 11)
- Check the headlight setting. (📖 p. 151)

6.18 Changing the steering head bearing (All EXC-F Six Days)

Preparatory work

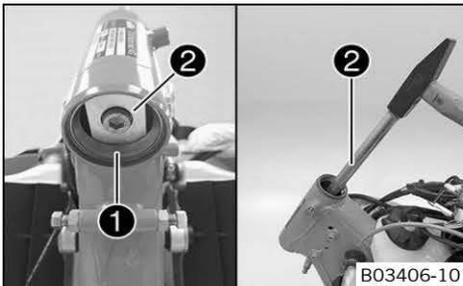
- Remove the headlight mask with the headlight. (📖 p. 114)
- Raise the motorcycle with the lift stand. (📖 p. 11)
- Remove the front wheel. (📖 p. 120)
- Remove the fork legs. (📖 p. 15)
- Remove the front fender. (📖 p. 113)
- Remove the handlebar cushion.
- Remove the lower triple clamp. (📖 p. 49)

Main work

- Remove lower bearing ring ❶ with special tool ❷.

Tool bracket (58429089000) (📖 p. 363)

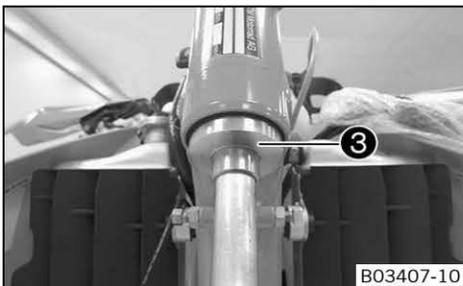
Press-out tool (58429092000) (📖 p. 363)



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

Tool bracket (58429089000) (📖 p. 363)

Press-in tool (58429091000) (📖 p. 363)
--

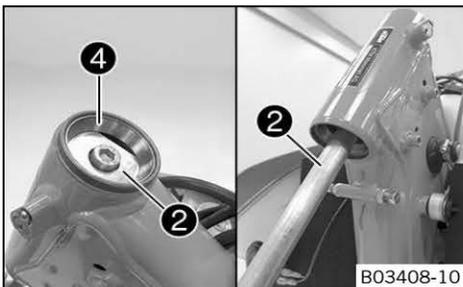


- Remove upper bearing ring ❹ with special tool ❷.

Tool bracket (58429089000) (📖 p. 363)

Press-out tool (58429092000) (📖 p. 363)

- Remove the seal ring.

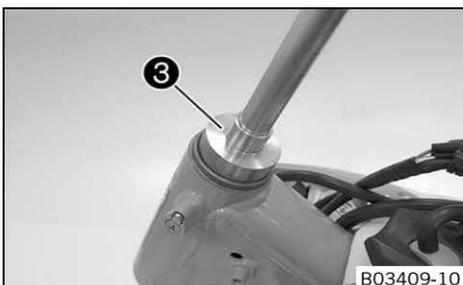


- Press the new bearing ring up to the stop with special tool ❸.

Tool bracket (58429089000) (📖 p. 363)

Press-in tool (58429091000) (📖 p. 363)
--

- Grease and mount the new seal ring.





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

i Info
Only press the bearing in via the inner ring.

Finishing work

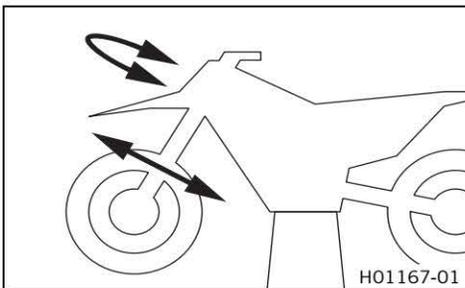
- Install the lower triple clamp. (📖 p. 50)
- Mount the handlebar cushion.
- Install the front fender. (📖 p. 113)
- Install the front wheel. (📖 p. 120)
- Install the headlight mask with the headlight. (📖 p. 115)
- Check that the wiring harness, throttle cables, and brake and clutch lines can move freely and are routed correctly.
- Check the play of the steering head bearing. (📖 p. 54)
- Remove the motorcycle from the lift stand. (📖 p. 11)
- Check the headlight setting. (📖 p. 151)

6.19 Checking the play of the steering head bearing

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

- Correct incorrect steering head bearing play immediately.

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



Preparatory work

- Raise the motorcycle with the lift stand. (📖 p. 11)

Main work

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

Play should not be detectable on the steering head bearing.

- » If there is detectable play:
 - (EXC-F EU/AU/US)**
 - Adjust the steering head bearing play. (📖 p. 55)
 - (All EXC-F Six Days)**
 - Adjust the steering head bearing play. (📖 p. 55)
- Move the handlebar to and fro over the entire steering range.

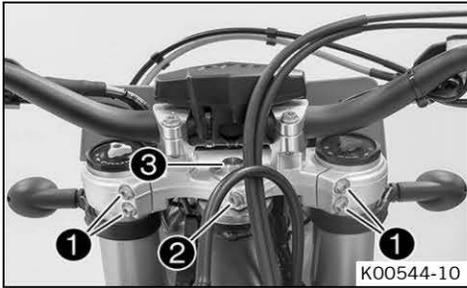
It must be possible to move the handlebar easily over the entire steering range. There should be no detectable detent positions.

- » If detent positions are detected:
 - (EXC-F EU/AU/US)**
 - Adjust the steering head bearing play. (📖 p. 55)
 - (All EXC-F Six Days)**
 - Adjust the steering head bearing play. (📖 p. 55)
 - Check the steering head bearing and replace if necessary.

Finishing work

- Remove the motorcycle from the lift stand. (📖 p. 11)

6.20 Adjusting the steering head bearing play (EXC-F EU/AU/US)



Preparatory work

- Raise the motorcycle with the lift stand. (📖 p. 11)

Main work (EXC-F EU/AU)

- Loosen screws ① and ②.
- Loosen and retighten screw ③.

Guideline

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

- Using a plastic hammer, tap lightly on the upper triple clamp to avoid stresses.
- Tighten screws ①.

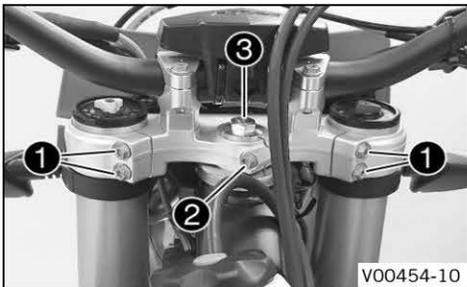
Guideline

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

- Tighten screw ②.

Guideline

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



(EXC-F US)

- Loosen screws ① and ②.
- Loosen and retighten screw ③.

Guideline

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

- Using a plastic hammer, tap lightly on the upper triple clamp to avoid stresses.
- Tighten screws ①.

Guideline

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

- Tighten screw ②.

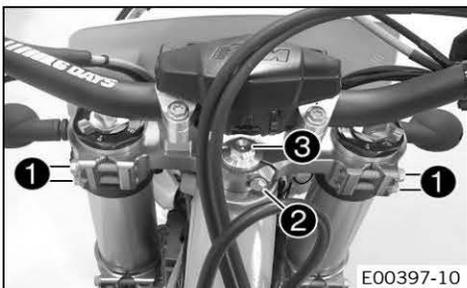
Guideline

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

Finishing work

- Check the play of the steering head bearing. (📖 p. 54)
- Remove the motorcycle from the lift stand. (📖 p. 11)

6.21 Adjusting the steering head bearing play (All EXC-F Six Days)



Preparatory work

- Raise the motorcycle with the lift stand. (📖 p. 11)

Main work (EXC-F Six Days EU)

- Loosen screws ①.
- Remove screw ②.
- Loosen and retighten screw ③.

Guideline

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

- Using a plastic hammer, tap lightly on the upper triple clamp to avoid stresses.
- Tighten screws ①.

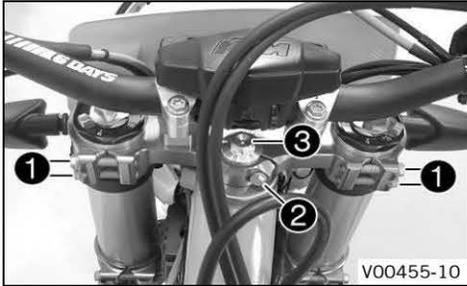
Guideline

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

- Mount and tighten screw ②.

Guideline

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



(EXC-F Six Days US)

- Loosen screws ①.
- Remove screw ②.
- Loosen and retighten screw ③.

Guideline

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

- Using a plastic hammer, tap lightly on the upper triple clamp to avoid stresses.
- Tighten screws ①.

Guideline

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

- Mount and tighten screw ②.

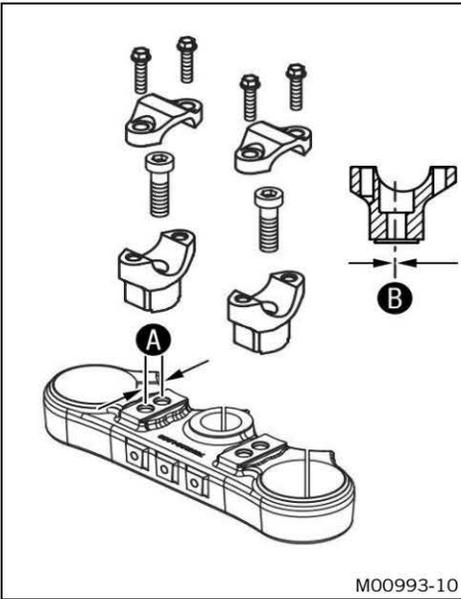
Guideline

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

Finishing work

- Check the play of the steering head bearing. (📖 p. 54)
- Remove the motorcycle from the lift stand. (📖 p. 11)

7.1 Handlebar position



(EXC-F EU/AU/US)

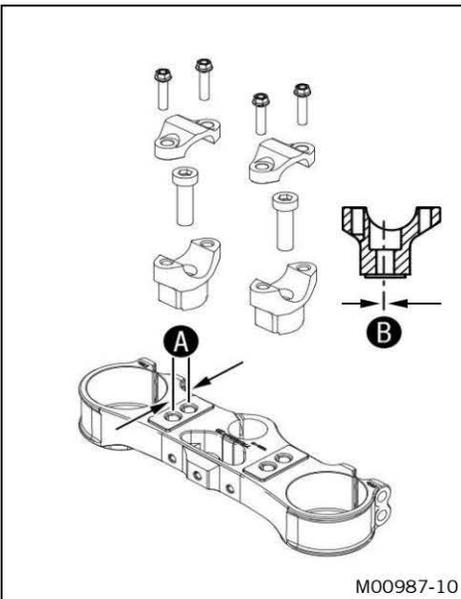
On the upper triple clamp, there are 2 holes at a distance of **A** to each other.

Hole distance A	15 mm (0.59 in)
------------------------	-----------------

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

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

The handlebar holders can be mounted in four different positions.



(All EXC-F Six Days)

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

Hole distance A	15 mm (0.59 in)
------------------------	-----------------

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

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

The handlebar holders can be mounted in four different positions.

7.2 Adjusting the handlebar position

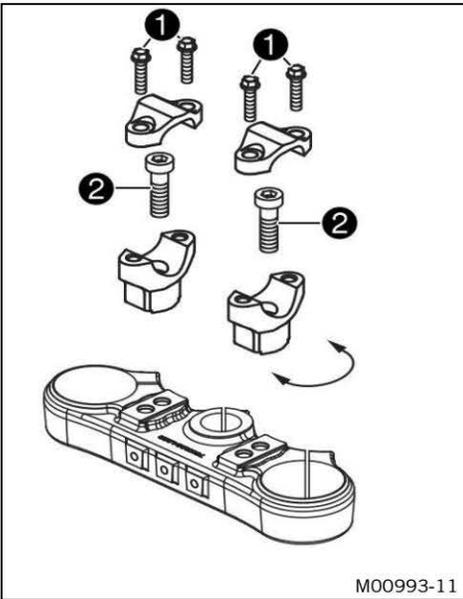


Warning

Danger of accidents A repaired handlebar poses a safety risk.

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

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



M00993-11

(EXC-F EU/AU/US)

- Remove screws **1**. Take off the 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.

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

Guideline

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

i Info
Position the left and right handlebar supports evenly.

- Position the handlebar.

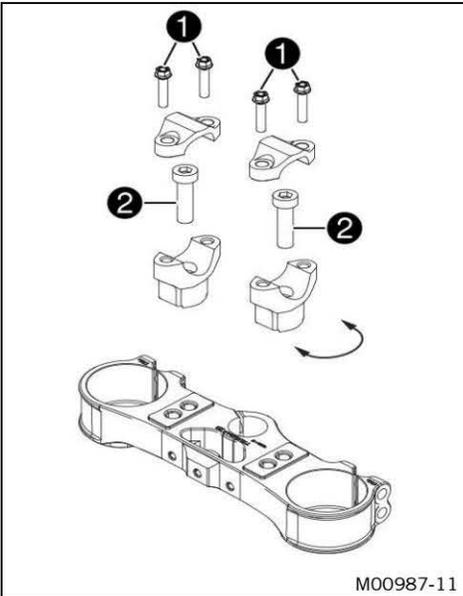
i Info
Make sure the cables and wiring are positioned correctly.

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

Guideline

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

i Info
Make sure the gap widths are even.



M00987-11

(All EXC-F Six Days)

- Remove screws **1**. Take off the 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.

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

Guideline

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

i Info
Position the left and right handlebar supports evenly.

- Position the handlebar.

i Info
Make sure the cables and wiring are positioned correctly.

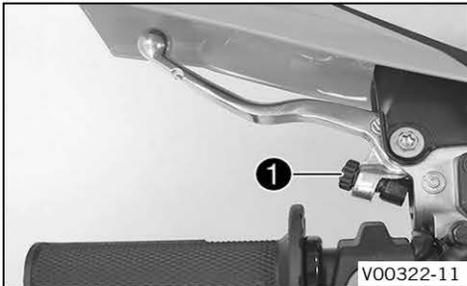
- Position the handlebar clamps. Mount screws **1** and tighten evenly.

Guideline

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

i Info
Make sure the gap widths are even.

7.3 Adjusting the basic position of the clutch lever



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



Info

Turn the adjusting screw clockwise to increase the distance between the clutch lever and the handlebar.
 Turn the adjusting screw counterclockwise to decrease the distance between the clutch lever and the handlebar.
 The range of adjustment is limited.
 Turn the adjusting screw by hand only, and do not apply any force.
 Do not make any adjustments while riding!

7.4 Checking throttle cable routing



Preparatory work

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

Main work

(EXC-F EU/AU, EXC-F Six Days EU)

- Check throttle cable routing.

Both throttle cables must be routed, side by side, on the back of the handlebars and above the fuel tank bracket, to the throttle valve body. Both throttle cables must be secured behind the fuel tank contact area rubber band.

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



(All US models)

- Check throttle cable routing.

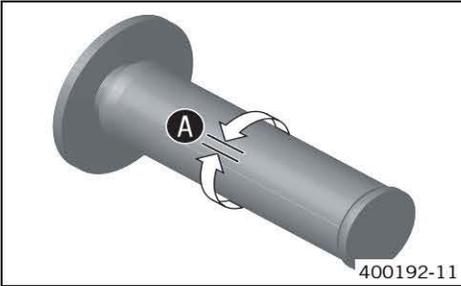
Both throttle cables must be routed, side by side, on the back of the handlebars and above the fuel tank bracket, to the throttle valve body. Both throttle cables must be secured behind the fuel tank contact area rubber band.

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

Finishing work

- Install the fuel tank. (📖 p. 104)
- Mount the seat. (📖 p. 102)

7.5 Checking the play in the throttle cable



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

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

- » If the throttle cable play does not meet the specified value:
 - Adjust the play in the throttle cable. (📖 p. 60)

- Push the cold start button in all the way.

When the throttle grip is turned forward, the cold start button returns to its original position.

- » If the cold start button does not return to its original position:
 - Adjust the play in the throttle cable. (📖 p. 60)



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

- Start the engine and let it run idle. Move the handlebar to and fro over the entire steering range.

The idle speed must not change.

- » If the idle speed changes:
 - Adjust the play in the throttle cable. (📖 p. 60)

7.6 Adjusting the play in the throttle cable

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

Preparatory work

- Remove the seat. (📖 p. 101)
- Remove the fuel tank. (📖 p. 102)
- Check throttle cable routing. (📖 p. 59)

Main work

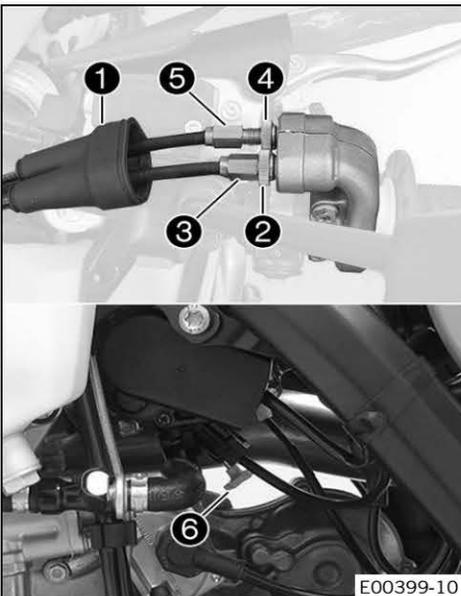
(EXC-F EU/AU, EXC-F Six Days EU)

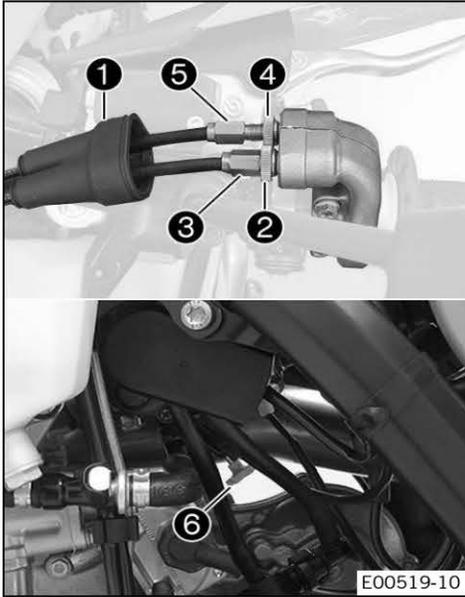
- Move the handlebar to the straight-ahead position.
- Push back sleeve **1**.
- Loosen nut **2**.
- Turn adjusting screw **3** in as far as possible.
- Loosen nut **4**.
- Push cold start button **6** all the way to the stop.
- Turn adjusting screw **5** so that the cold start button moves to the basic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

Guideline

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

- Tighten nut **2**.
- Slide on sleeve **1**.





- Check the throttle grip for smooth operation.

(All US models)

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

Guideline

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

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

Finishing work

- Check the play in the throttle cable. (📖 p. 60)

8.1 Checking the frame



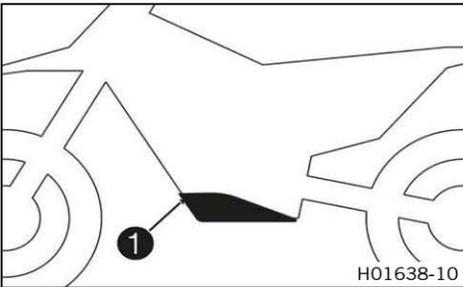
- Check the frame for cracking and deformation.
 - » If the frame exhibits cracking or deformation due to a mechanical impact:
 - Change the frame.



Info

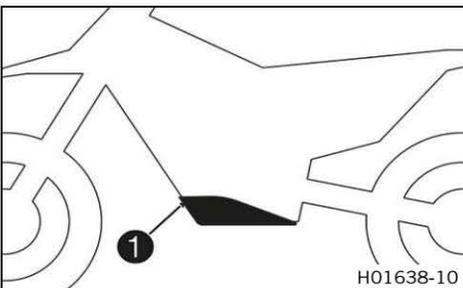
Always replace a frame that has been damaged due to a mechanical impact. Repair of the frame is not authorized by KTM.

8.2 Removing the engine guard (All EXC-F Six Days, EXC-F AU)



- Remove screws **1** and engine guard.

8.3 Installing the engine guard (All EXC-F Six Days, EXC-F AU)

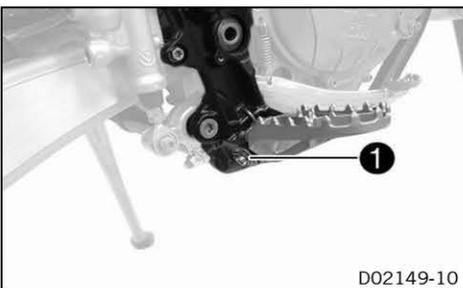


- Attach the engine guard on the frame at the rear and swing up at the front.
- Mount and tighten screws **1**.

Guideline

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

8.4 Changing the footrests

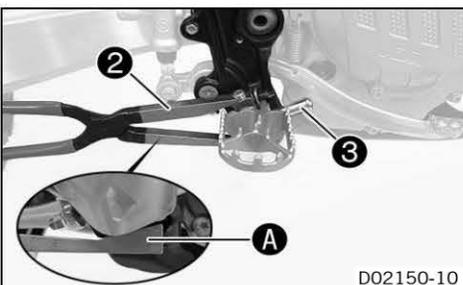


Condition

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

Right footrest

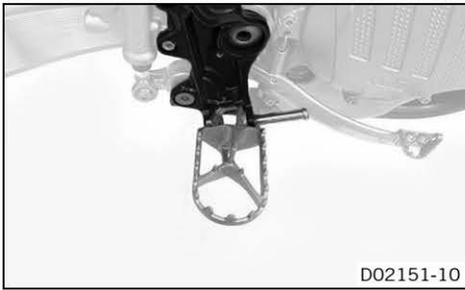
- Remove split pin **1** and take off the washer.



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

Pliers for footrest spring (79029083000) (📖 p. 368)

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

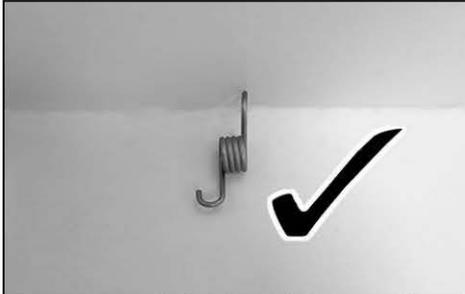


- Position the new footrest and pin.

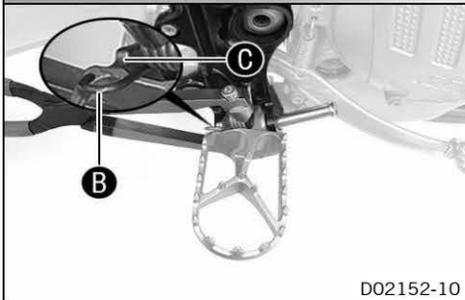


Info

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



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

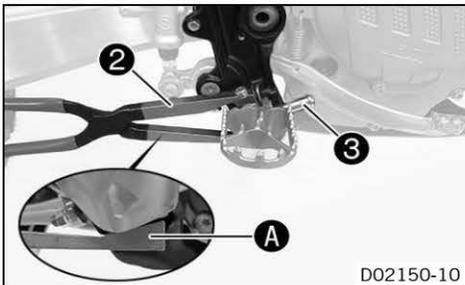


- Press the spring with special tool **2**.

Pliers for footrest spring (79029083000) (📖 p. 368)

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

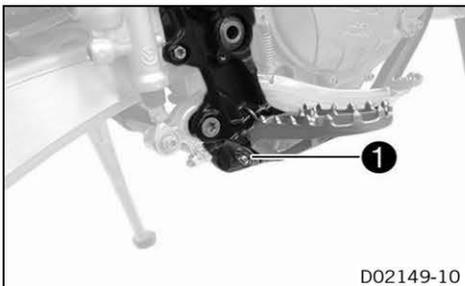
- Mount pin **3**.



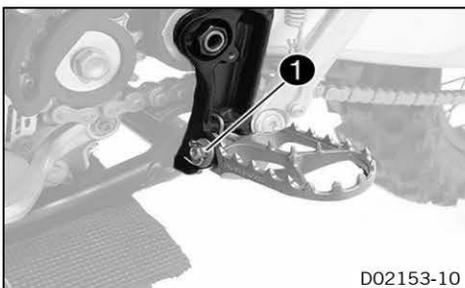
- Mount the washer and split pin **1**.

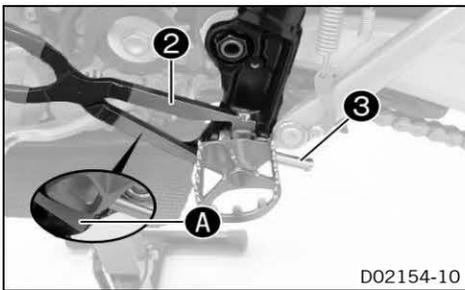
Left footrest

- Raise the motorcycle with the lift stand. (📖 p. 11)



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





- Press the spring with special tool ②.

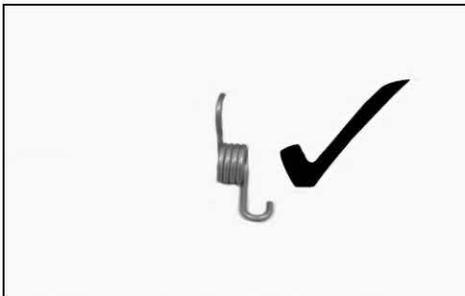
Pliers for footrest spring (79029083000) (📖 p. 368)

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

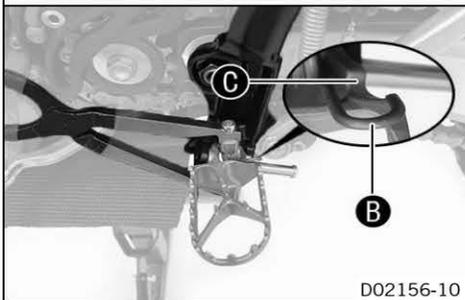


- Position the new footrest and pin.

i Info
Only insert the pins to the extent that the spring can still be mounted.



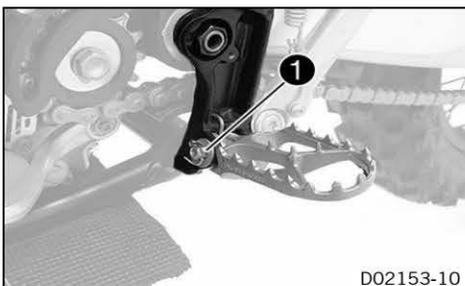
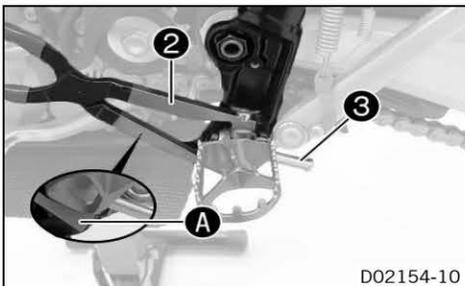
- Position spring as shown.
- ✓ Spring B engages in area C.



- Press the spring with special tool ②.

Pliers for footrest spring (79029083000) (📖 p. 368)

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

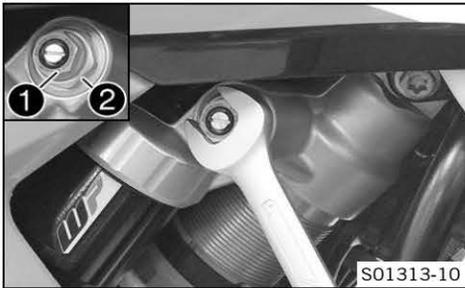


- Mount the washer and split pin ①.
- Remove the motorcycle from the lift stand. (📖 p. 11)

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

- Caution**
Risk of injury Parts of the shock absorber will fly off if the shock absorber is disassembled incorrectly. The shock absorber is filled with highly compressed nitrogen.
- Please follow the description provided.

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



- Using an open end wrench, turn adjusting screw **1** clockwise all the way.

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

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

Guideline

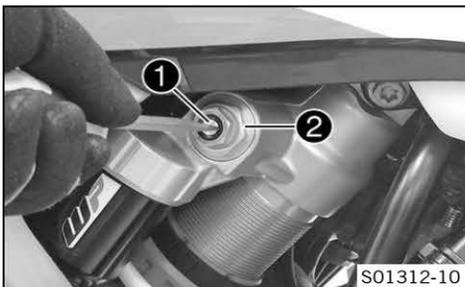
Compression damping, high-speed	
Comfort	2.5 turns
Standard	2 turns
Sport	1 turn

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

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

- Caution**
Risk of injury Parts of the shock absorber will fly off if the shock absorber is disassembled incorrectly. The shock absorber is filled with highly compressed nitrogen.
- Please follow the description provided.

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



- Turn adjusting screw **1** clockwise with a screwdriver up to the last perceptible click.

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

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

Guideline

Compression damping, low-speed	
Comfort	18 clicks
Standard	15 clicks
Sport	12 clicks

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

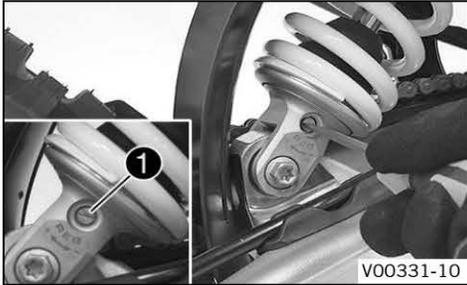
9.3 Adjusting the rebound damping of the shock absorber



Caution

Risk of injury Parts of the shock absorber will fly off if the shock absorber is disassembled incorrectly. The shock absorber is filled with highly compressed nitrogen.

- Please follow the description provided.



- Turn adjusting screw **1** clockwise up to the last perceptible click.



Info

Do not loosen fitting **2**!

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

Guideline

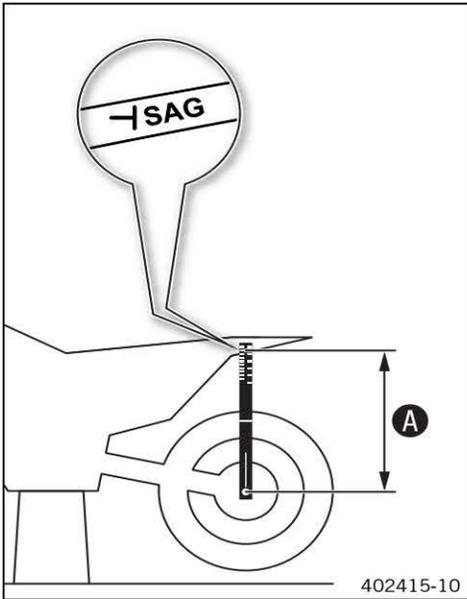
Rebound damping	
Comfort	18 clicks
Standard	15 clicks
Sport	12 clicks



Info

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

9.4 Measuring the rear wheel dimension unloaded



Preparatory work

- Raise the motorcycle with the lift stand. (📖 p. 11)

Main work

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

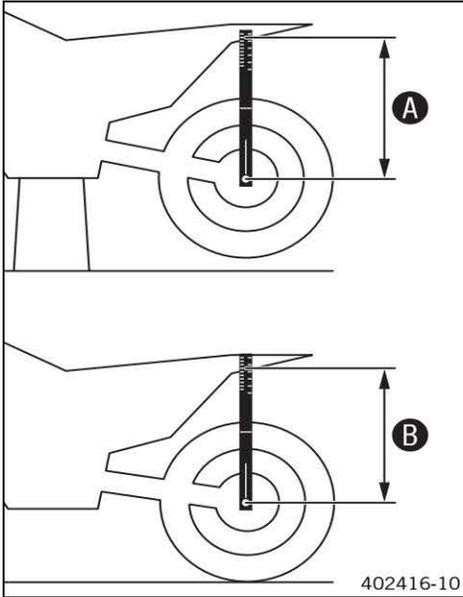
Sag gauge (00029090100)
Pin for sag gauge (00029990010)

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

Finishing work

- Remove the motorcycle from the lift stand. (📖 p. 11)

9.5 Checking the static sag of the shock absorber



- Measure dimension **A** of rear wheel unloaded. (📖 p. 66)
- Hold the motorcycle upright with the aid of an assistant.
- Again measure the distance between the rear axle and marking **SAG** on the rear fender using the sag gauge.
- Note down the value as dimension **B**.

i Info

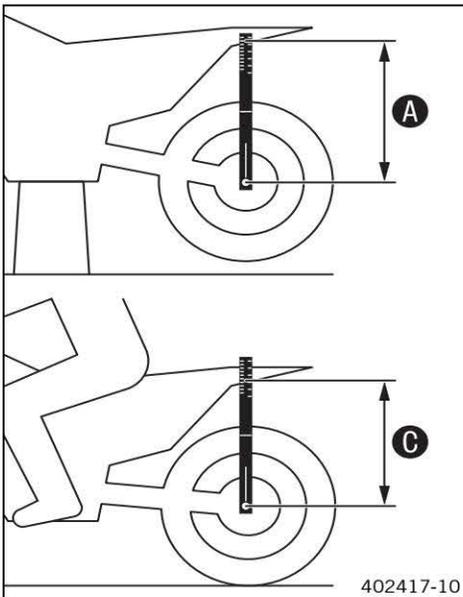
The static sag is the difference between measurements **A** and **B**.

- Check the static sag.

Static sag	35 mm (1.38 in)
------------	-----------------

- » If the static sag is less or more than the specified value:
 - Adjust the spring preload of the shock absorber. (📖 p. 67)

9.6 Checking the riding sag of the shock absorber



- Measure dimension **A** of rear wheel unloaded. (📖 p. 66)
- With another person holding the motorcycle, the rider, wearing full protective clothing, sits on the seat in a normal sitting position (feet on footrests) and bounces up and down a few times.
 - ✓ The rear wheel suspension levels out.
- Another person again measures the distance between the rear axle and marking **SAG** on the rear fender using the sag gauge.
- Note down the value as dimension **C**.

i Info

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

- Check the riding sag.

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

- » If the riding sag differs from the specified measurement:
 - Adjust the riding sag. (📖 p. 68)

9.7 Adjusting the spring preload of the shock absorber

⚠ Caution

Risk of injury Parts of the shock absorber will fly off if the shock absorber is disassembled incorrectly. The shock absorber is filled with highly compressed nitrogen.

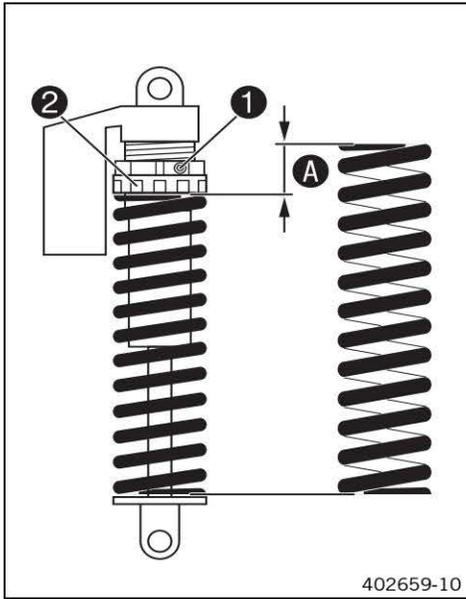
- Please follow the description provided.

i Info

Before changing the spring preload, make a note of the present setting, e.g., by measuring the length of the spring.

Preparatory work

- Raise the motorcycle with the lift stand. (📖 p. 11)
- Remove shock absorber. (📖 p. 69)



- After removing the shock absorber, clean it thoroughly.

Main work

- Loosen screw ①.
- Turn adjusting ring ② until the spring is no longer under tension.

Hook wrench (90129051000) (📖 p. 370)

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

Guideline

Spring preload	
Comfort	8 mm (0.31 in)
Standard	8 mm (0.31 in)
Sport	8 mm (0.31 in)



Info

Depending on the static sag and/or the riding sag, it may be necessary to increase or decrease the spring preload.

- Tighten screw ①.

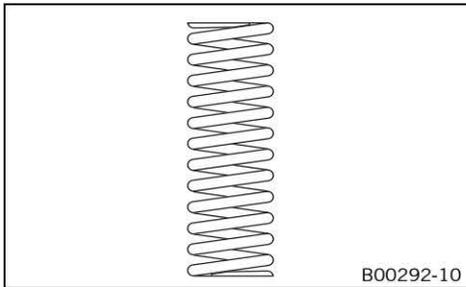
Guideline

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

Finishing work

- Install the shock absorber. (📖 p. 69)
- Remove the motorcycle from the lift stand. (📖 p. 11)

9.8 Adjusting the riding sag



Preparatory work

- Raise the motorcycle with the lift stand. (📖 p. 11)
- Remove shock absorber. (📖 p. 69)
- After removing the shock absorber, clean it thoroughly.

Main work

- Choose and mount a suitable spring.

Guideline

Spring rate	
Weight of rider: 65... 75 kg (143... 165 lb.)	63 N/mm (360 lb/in)
Weight of rider: 75... 85 kg (165... 187 lb.)	66 N/mm (377 lb/in)
Weight of rider: 85... 95 kg (187... 209 lb.)	69 N/mm (394 lb/in)



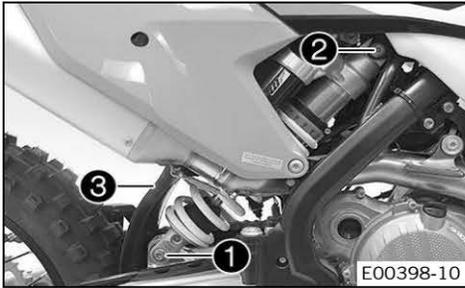
Info

The spring rate is shown on the outside of the spring. Smaller weight differences can be compensated by changing the spring preload.

Finishing work

- Install the shock absorber. (📖 p. 69)
- Remove the motorcycle from the lift stand. (📖 p. 11)
- Check the static sag of the shock absorber. (📖 p. 67)
- Check the riding sag of the shock absorber. (📖 p. 67)
- Adjust the rebound damping of the shock absorber. (📖 p. 66)

9.9 Removing the shock absorber



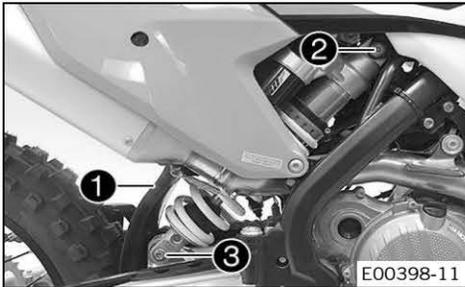
Preparatory work

- Raise the motorcycle with the lift stand. (📖 p. 11)

Main work

- Remove screw ❶ and lower the rear wheel with the swingarm as far as possible without blocking the rear wheel. Fix the rear wheel in this position.
- Remove screw ❷, push splash protector ❸ to the side, and remove the shock absorber.

9.10 Installing the shock absorber



Main work

- Push splash protector ❶ to the side and position the shock absorber. Mount and tighten screw ❷.

Guideline

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

- Mount and tighten screw ❸.

Guideline

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

Info

The heim joint for the shock absorber at the swingarm is Teflon-coated. It must not be greased with grease or with other lubricants. Lubricants dissolve the Teflon coating, thereby drastically reducing the service life.

Finishing work

- Remove the motorcycle from the lift stand. (📖 p. 11)

9.11 Servicing the shock absorber



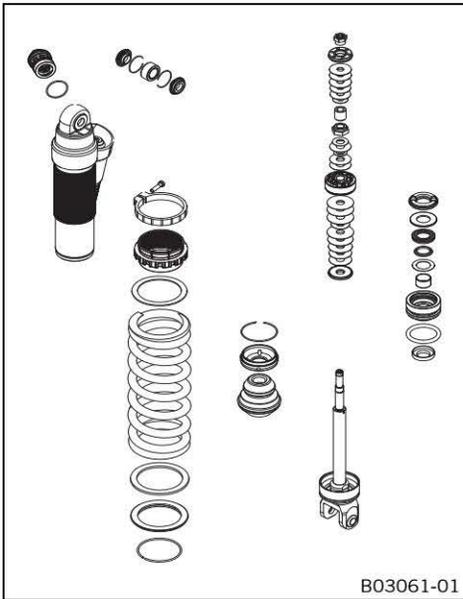
Caution

Risk of injury Parts of the shock absorber will fly off if the shock absorber is disassembled incorrectly. The shock absorber is filled with highly compressed nitrogen.

- Please follow the description provided.

Condition

The shock absorber has been removed.



- Remove the spring. (📖 p. 70)
- Disassemble the damper. (📖 p. 71)
- Disassemble the piston rod. (📖 p. 72)
- Disassemble the seal ring retainer. (📖 p. 73)
- Check the damper. (📖 p. 75)
- Remove the heim joint. (📖 p. 75)
- Install the heim joint. (📖 p. 76)
- Assemble the seal ring retainer. (📖 p. 77)
- Assemble the piston rod. (📖 p. 77)
- Assemble the damper. (📖 p. 79)
- Install the spring. (📖 p. 84)

9.12 Removing the spring

Condition

The shock absorber has been removed.

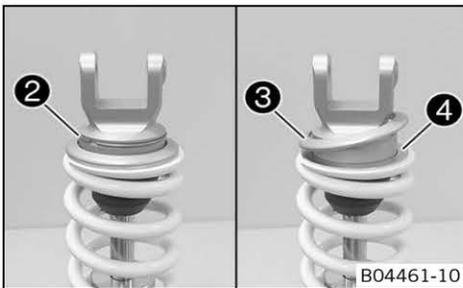
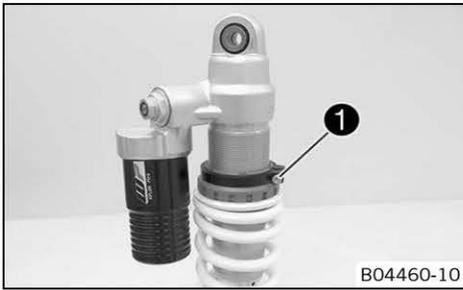
- Clamp the shock absorber into the vise.

Guideline

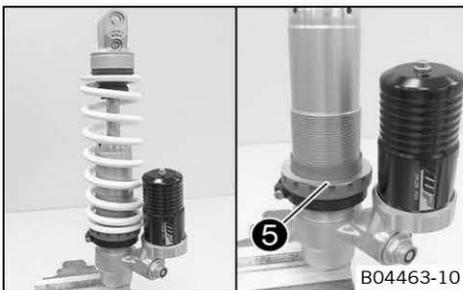
Use soft jaws.

- Measure and note down the spring length in the preloaded condition.
- Loosen screw ❶.
- Turn the adjusting ring until the spring is completely without tension.

Hook wrench (90129051000) (📖 p. 370)

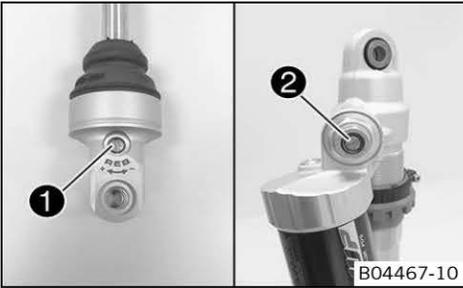


- Remove lock ring ❷.
- Remove spring retainer ❸.
- Remove washer ❹.

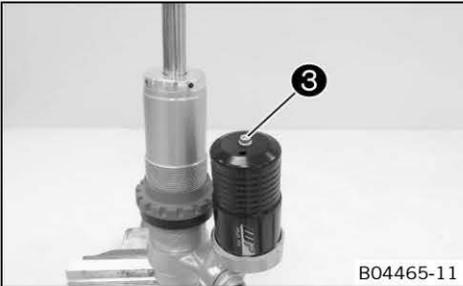


- Remove the spring.
- Remove washer ❺.

9.13 Disassembling the damper



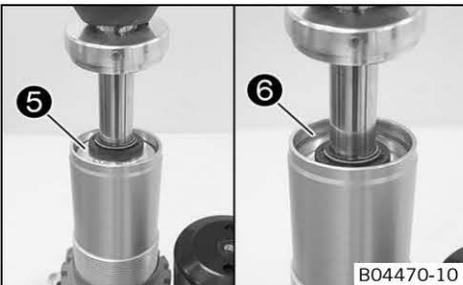
B04467-10



B04465-11



B04469-10



B04470-10



B04471-10

Preparatory work

- Remove the spring. (📖 p. 70)

Main work

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

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

- Remove locking cap ❹.

- Push in seal ring retainer ❺.
- Remove lock ring ❻.



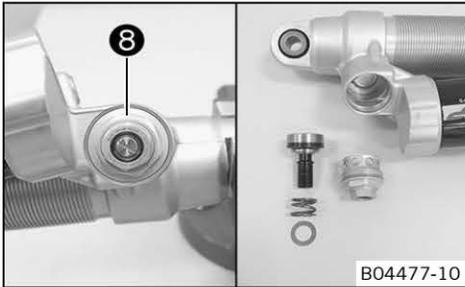
Info

Check inner surface; do not scratch. Remove any burrs with sandpaper if needed.

- Remove the piston rod.



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



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

9.14 Disassembling the piston rod

Preparatory work

- Remove the spring. (📖 p. 70)
- Disassemble the damper. (📖 p. 71)

Main work

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

Guideline

Use soft jaws.



- Remove nut 1.
- Remove piston 2.



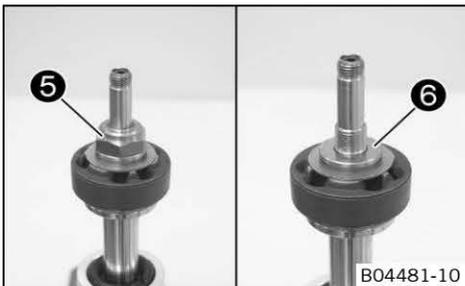
- Remove compression shim stack 3.



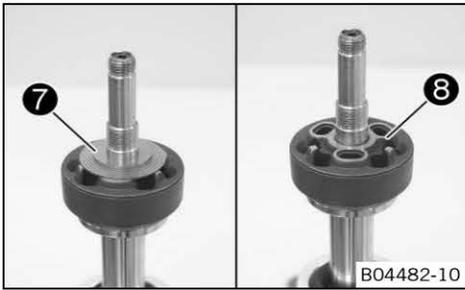
Info

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

- Remove bushing 4.



- Remove nut 5.
- Remove washer 6.



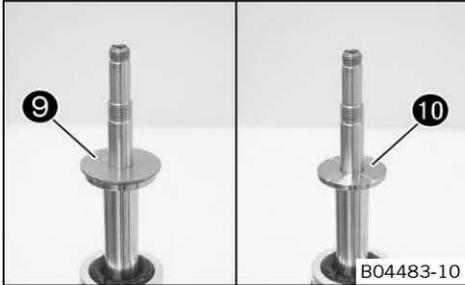
- Remove rebound shim stack 7.



Info

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

- Remove piston 8.



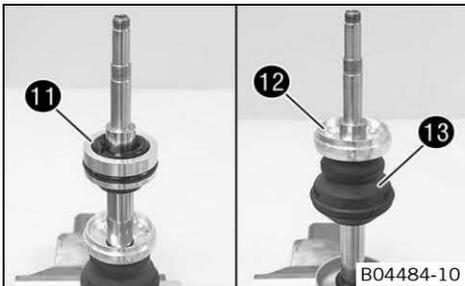
- Remove compression shim stack 9.



Info

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

- Remove rebound washer 10.



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

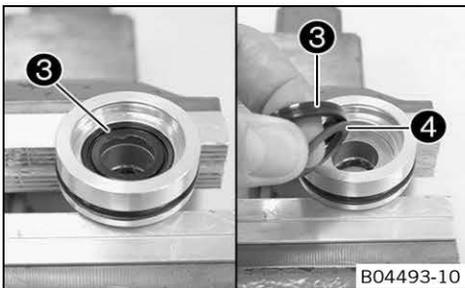
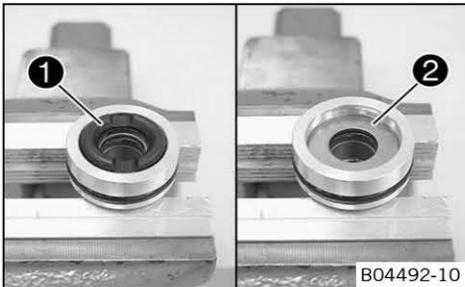
9.15 Disassembling the seal ring retainer

Preparatory work

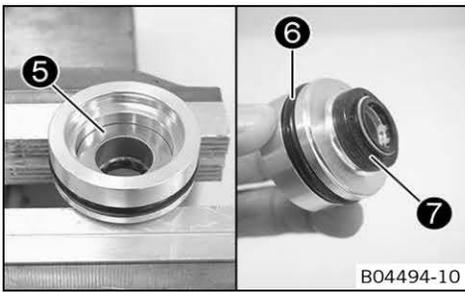
- Remove the spring. (p. 70)
- Disassemble the damper. (p. 71)
- Disassemble the piston rod. (p. 72)

Main work

- Remove rebound rubber 1.
- Remove washer 2.



- Remove seal ring 3.
- Remove washer 4 from seal ring 3.



- Remove washer **5**.
- Remove O-ring **6**.
- Remove dust boot **7**.

9.16 Replacing the pilot bushing

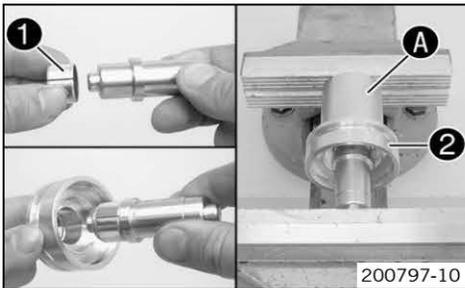
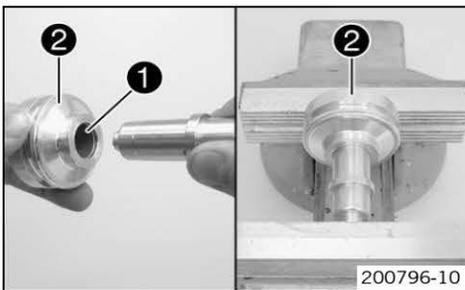
Preparatory work

- Remove the spring. (📖 p. 70)
- Disassemble the damper. (📖 p. 71)
- Disassemble the piston rod. (📖 p. 72)
- Disassemble the seal ring retainer. (📖 p. 73)

Main work

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

Press drift (T1504) (📖 p. 373)



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

Press drift (T1504) (📖 p. 373)

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

Press drift (T1504) (📖 p. 373)

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

Assembly tool (T150S) (📖 p. 374)

- Lubricate the special tool.

Shock absorber fluid (SAE 2.5) (50180751S1) (📖 p. 356)

Calibration pin (T1205) (📖 p. 371)

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

Assembly tool (T150S) (📖 p. 374)

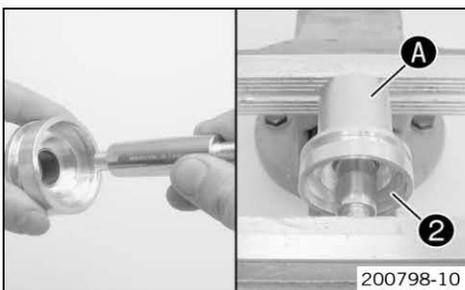
- Press the special tool through the new pilot bushing.

Calibration pin (T1205) (📖 p. 371)

✓ The pilot bushing is to be calibrated.

Finishing work

- Assemble the seal ring retainer. (📖 p. 77)



9.17 Checking the damper



Condition

The damper has been disassembled.

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

Damper cartridge	
Diameter	46.10 mm (1.815 in)

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

- Replace the damper cartridge.

- Check the damper cartridge for damage and wear.

- » If there is damage or wear:

- Replace the damper cartridge.

- Check the heim joint for damage and wear.

- » If there is damage or wear:

- Replace the heim joint.

- Measure the diameter of the piston rod.

Piston rod	
Diameter	17.95 mm (0.7067 in)

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

- Replace the piston rod.

- Measure the run-out of the piston rod.

Piston rod	
Run-out	0.02 mm (0.0008 in)

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

- Replace the piston rod.

- Check the piston rod for damage and wear.

- » If there is damage or wear:

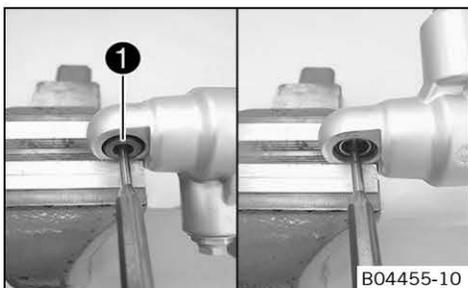
- Replace the piston rod.

- Check the piston rings for damage and wear.

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

- Replace the piston rings.

9.18 Removing the heim joint



Condition

The shock absorber has been removed.

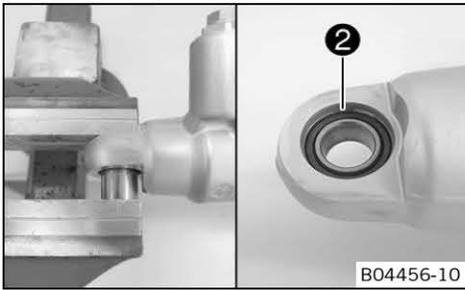
- Clamp the shock absorber into the vise.

Guideline

Use soft jaws.

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

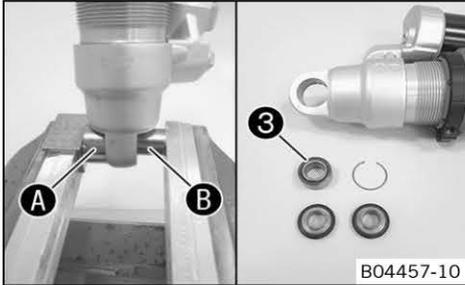
Pin (T120) (📄 p. 371)



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

Pressing tool (T1207S) (📖 p. 371)

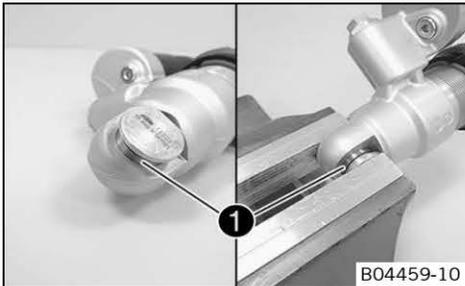
- Remove second lock ring 2.



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

Pressing tool (T1207S) (📖 p. 371)

9.19 Installing the heim joint



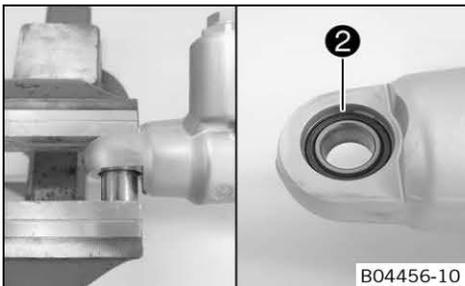
- Position the new heim joint 1 and the special tool in the bench vise.

Guideline

Use soft jaws.

Pressing tool (T1206) (📖 p. 371)

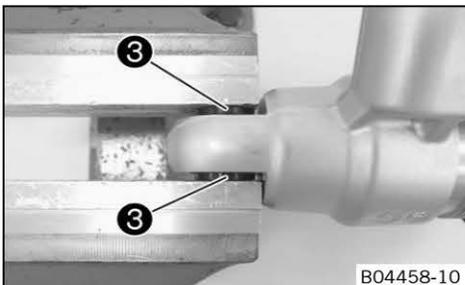
- Press the heim joint all the way in.



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

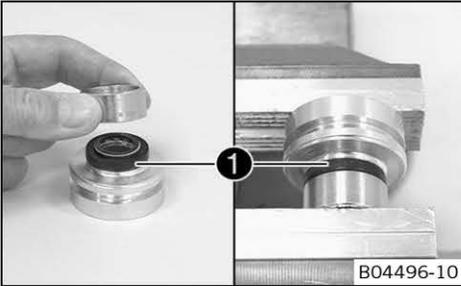
Pressing tool (T1207S) (📖 p. 371)

- Mount second lock ring 2.



- Position both collar bushings 3 and press in.

9.20 Assembling seal ring retainer

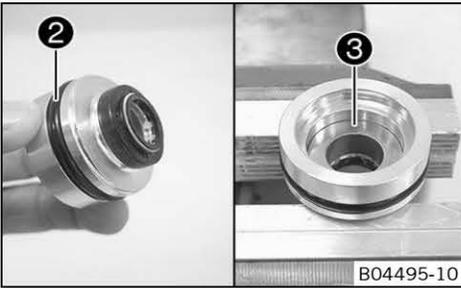


- Mount dust boot **1** with the special tool.

Mounting sleeve (T1204) (📖 p. 371)

- Grease the sealing lip of the dust boot.

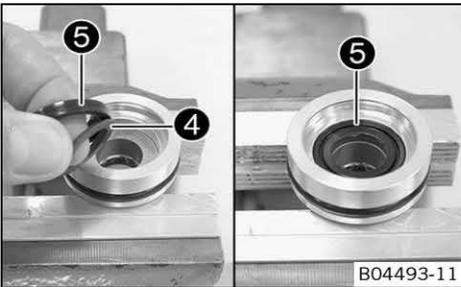
Lubricant (T625) (📖 p. 358)



- Grease the O-ring groove.

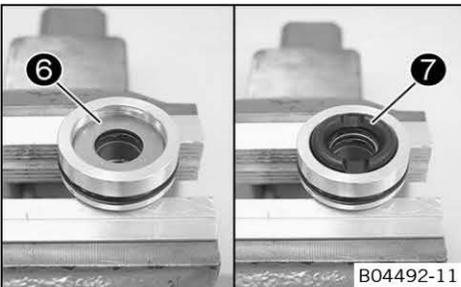
Lubricant (T158) (📖 p. 358)

- Mount O-ring **2**.
- Mount washer **3**.



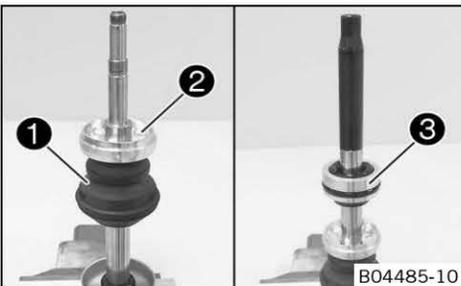
- Position washer **4** on seal ring **5**.
- Grease the seal ring and mount with the washer facing downward.

Lubricant (T511) (📖 p. 358)



- Mount washer **6**.
- Mount rebound rubber **7**.

9.21 Assembling the piston rod



Preparatory work

- Assemble the seal ring retainer. (📖 p. 77)

Main work

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

Guideline

Use soft jaws.

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

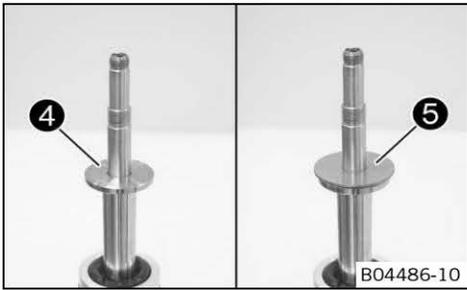
Mounting sleeve (T1554) (📖 p. 374)

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

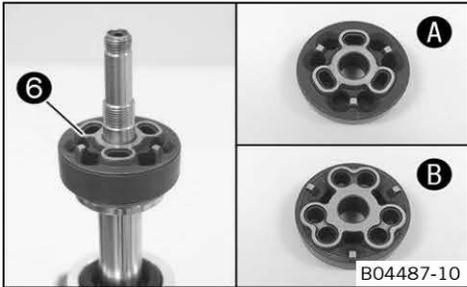
Lubricant (T625) (📖 p. 358)

- Remove the special tool.

9 SHOCK ABSORBER, SWINGARM



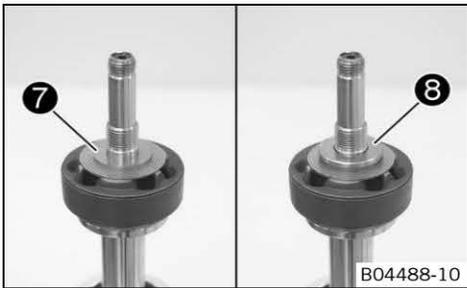
- Mount rebound washer 4.
- Mount compression shim stack 5 with the smaller shims facing downward.



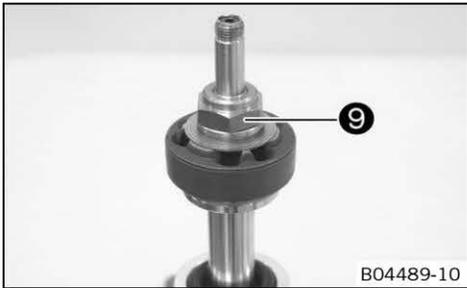
- Sand down piston 6 on both sides on a surface plate using 1200 grit sandpaper.
- Clean the piston.
- Mount the piston.

Guideline

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



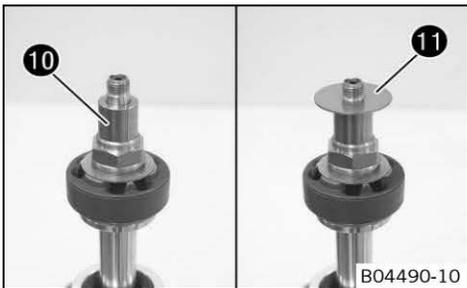
- Mount rebound shim stack 7 with the smaller shims facing upward.
- Mount washer 8.



- Mount and tighten nut 9 with the collar facing upward.

Guideline

Nut, damper piston	M12x1	40 Nm (29.5 lbf ft)
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- Mount bushing 10.
- Mount compression shim stack 11 with the smaller shims facing downward.

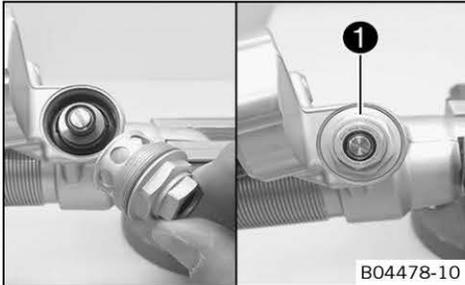


- Position piston 12 with the groove facing upward.
- Mount and tighten nut 13.

Guideline

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

9.22 Assembling the damper



Preparatory work

- Assemble the seal ring retainer. (📖 p. 77)
- Assemble the piston rod. (📖 p. 77)

Main work

- Lubricate the O-rings of the compression adjuster.

Lubricant (T158) (📖 p. 358)

- Lubricate the thread.

Lubricant (T159) (📖 p. 358)

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

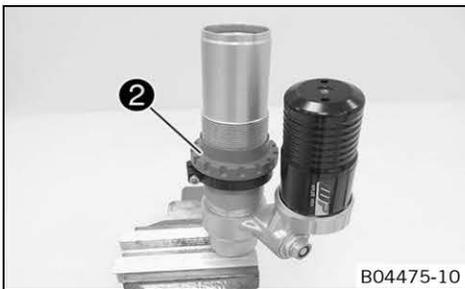
Guideline

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

- Mount adjusting ring ② with the clamping ring.

Info

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



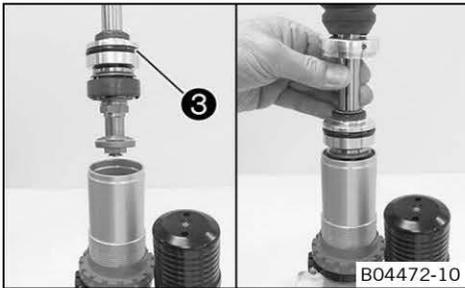
- Fill the damper cartridge about half full.

Shock absorber fluid (SAE 2.5) (50180751S1) (📖 p. 356)

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

Lubricant (T158) (📖 p. 358)

- Mount the piston rod carefully.

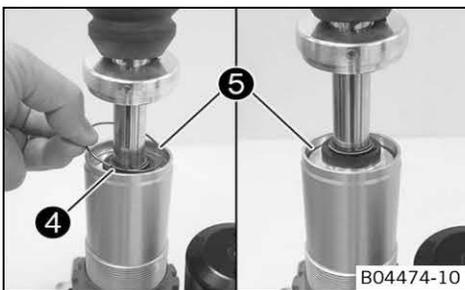


- Mount seal ring retainer ④ and slide it under the ring groove.
- Mount lock ring ⑤.

Info

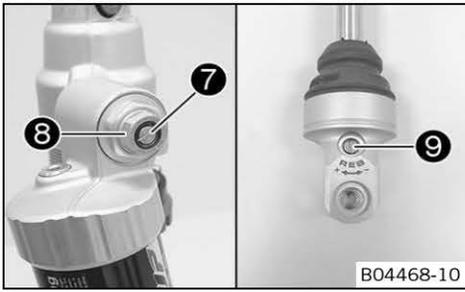
Do not scratch the inside surface.

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



- Mount locking cap ⑥ of the damper cartridge.
- Bleed and fill the damper. (📖 p. 80)
- Fill the damper with nitrogen. (📖 p. 83)





Alternative 1

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

Guideline

Compression damping, low-speed	
Comfort	18 clicks
Standard	15 clicks
Sport	12 clicks

- Using an open end wrench, turn adjusting screw 8 clockwise all the way.
- Turn counterclockwise by the number of turns corresponding to the shock absorber type.

Guideline

Compression damping, high-speed	
Comfort	2.5 turns
Standard	2 turns
Sport	1 turn

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

Guideline

Rebound damping	
Comfort	18 clicks
Standard	15 clicks
Sport	12 clicks

Alternative 2



Warning

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

Extreme modifications to the suspension setting may cause a serious deterioration in the handling characteristic and overload components.

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

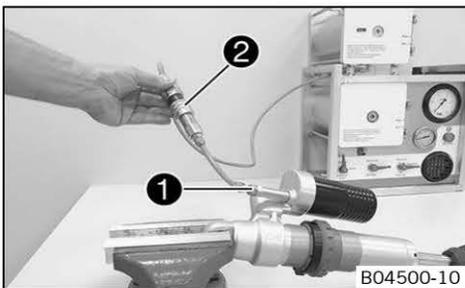
- Position adjusting screws 7, 8, and 9 in the location determined during disassembly.

9.23 Bleeding and filling the damper



Info

Before working with the vacuum pump, carefully read the operating manual included with the vacuum pump. Open the adjusters of the rebound and compression damping completely.



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



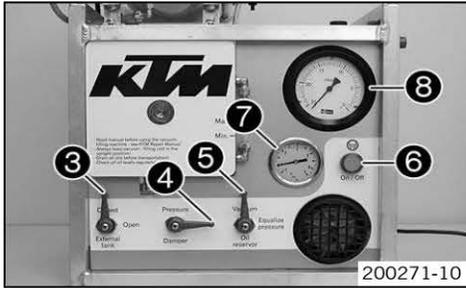
Info

Hand-tighten only without using a tool.

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

Vacuum pump (T1240S) (p. 372)

- Clamp the damper with soft jaws or hold it as shown in the photo.



Info

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

- Position the control lever as shown in the photo.
 - ✓ Control lever **External tank 3** is set to **Closed**, **Damper 4** is set to **Vacuum** and **Oil reservoir 5** is set to **Vacuum**.

- Activate **On/Off switch 6**.
 - ✓ The suction process begins.
 - ✓ Pressure gauge **7** drops to the required value.

< 0 bar

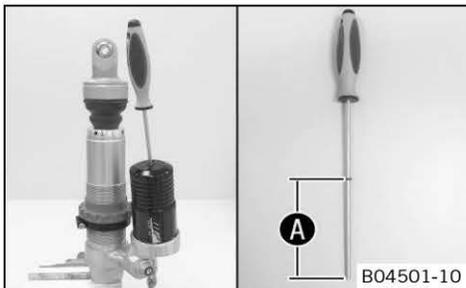
- ✓ Vacuum gauge **8** drops to the required value.

4 mbar

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

Depth micrometer (T107S) (📖 p. 370)

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



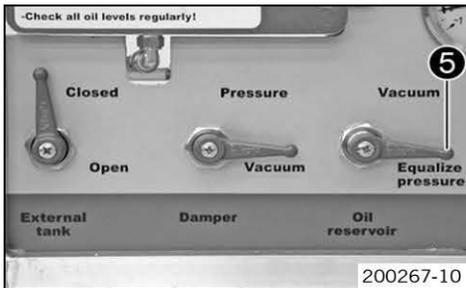
- When the vacuum gauge reaches the required value, turn control lever **Oil reservoir 5** to **Equalize pressure**.

Guideline

4 mbar

- ✓ The pressure gauge increases to the required value.

0 bar



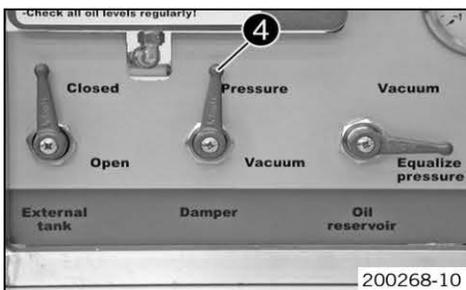
- When the pressure gauge reaches the required value, turn control lever **Damper 4** to **Pressure**.

Guideline

0 bar

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

3 bar



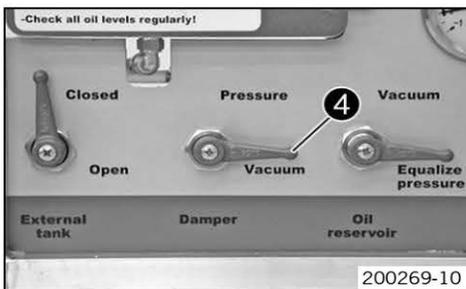
- When the pressure gauge reaches the required value, turn control lever **Damper 4** to **Vacuum**.

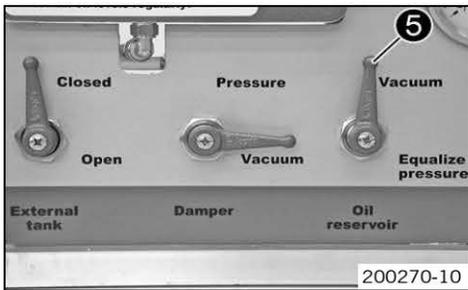
Guideline

3 bar

- ✓ The pressure gauge drops to the required value.

0 bar





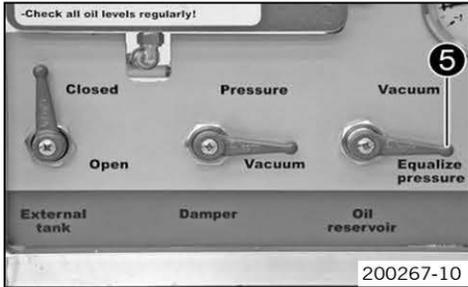
- When the pressure gauge reaches the required value, turn control lever **Oil reservoir 5** to **Vacuum**.

Guideline

0 bar

- ✓ The vacuum gauge drops to the required value.

8 mbar



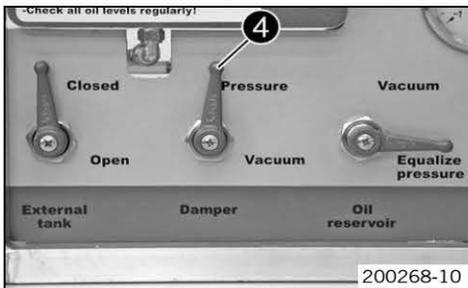
- When the vacuum gauge reaches the required value, turn control lever **Oil reservoir 5** to **Equalize Pressure**.

Guideline

8 mbar

- ✓ The pressure gauge drops to the required value.

0 bar



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

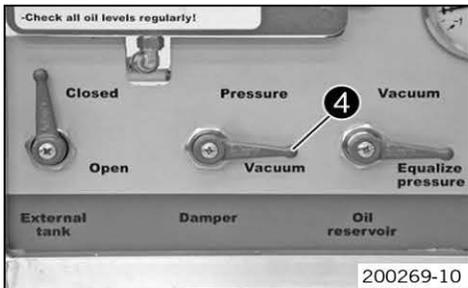
Guideline

0 bar

- ✓ Oil is pumped into the damper.

- ✓ The pressure gauge increases to the required value.

3 bar



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

Guideline

3 bar

- ✓ The pressure gauge drops to the required value.

0 bar

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

Guideline

0 bar

- ✓ The vacuum pump is switched off.

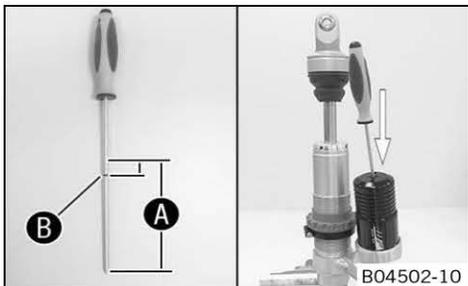
- Slide O-ring **B** to the end of the special tool by the specified value (distance **A** minus specified value).

Guideline

5 mm

Depth micrometer (T107S) (📖 p. 370)

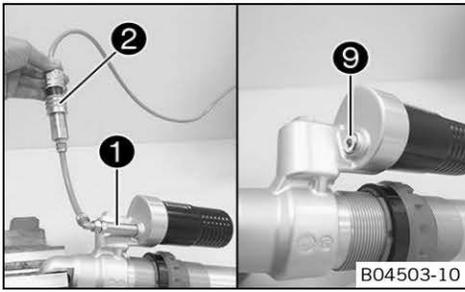
- Slide the floating piston into the reservoir to the shortened position using the special tool.



i Info

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

- Remove the special tool.



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



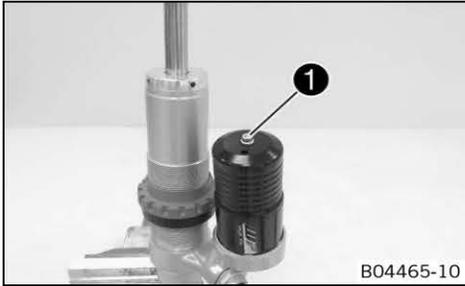
Info
Hold the damper so that the filling port is at the highest point.

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

Guideline

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

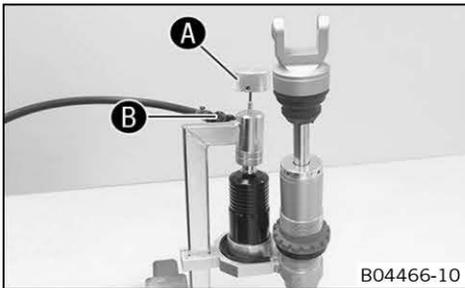
9.24 Filling damper with nitrogen



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



Info
The piston rod is fully extended.



- Fix the special tool in the vise.

Nitrogen filling tool (T170S1) (📖 p. 374)

Filling adapter (T1296) (📖 p. 372)

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

Filling gas - nitrogen

- Adjust the pressure regulator.

Guideline

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

- Position the damper in the special tool.

✓ The hexagonal part of tap handle ① engages in the hexagon socket of the filling port screw.

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

Guideline

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



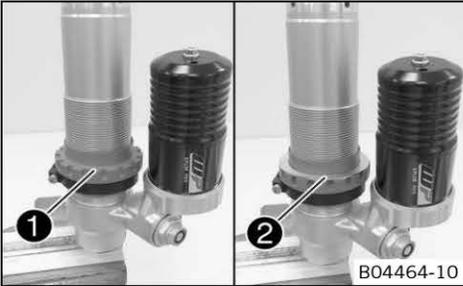
Info
Watch the pressure regulator dial.
Ensure that the damper is filled to the specified pressure.

- Screw the filling port shut with tap handle ①.
- Close filler tap ② and remove the damper from the special tool.
- Tighten the filling port screw.

Guideline

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

9.25 Installing the spring

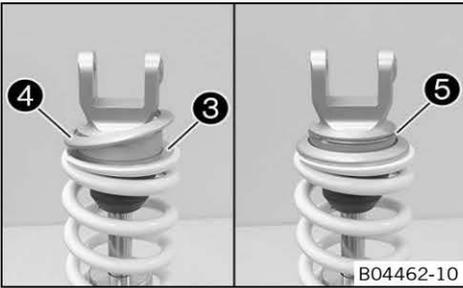


- Clamp the shock absorber into the vise.

Guideline

Use soft jaws.

- Ensure that adjusting ring 1 is screwed on with the clamping ring.
- Mount washer 2.



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

Guideline

Spring rate	
Weight of rider: 65... 75 kg (143... 165 lb.)	63 N/mm (360 lb/in)
Weight of rider: 75... 85 kg (165... 187 lb.)	66 N/mm (377 lb/in)
Weight of rider: 85... 95 kg (187... 209 lb.)	69 N/mm (394 lb/in)

- Mount washer 3.
- Mount spring retainer 4.
- Mount lock ring 5.

Alternative 1

- Tension the spring by turning the adjusting ring to the prescribed value.

Guideline

Spring preload	
Comfort	8 mm (0.31 in)
Standard	8 mm (0.31 in)
Sport	8 mm (0.31 in)

Hook wrench (90129051000) (📖 p. 370)

Alternative 2



Warning

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

Extreme modifications to the suspension setting may cause a serious deterioration in the handling characteristic and overload components.

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

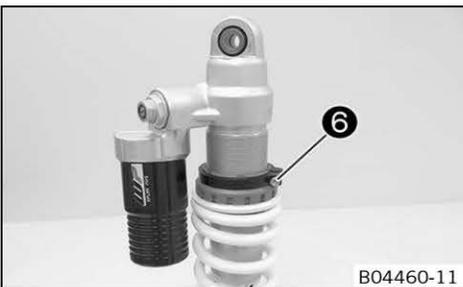
- Tension the spring to the length measured during disassembly by turning the adjusting ring.

Hook wrench (90129051000) (📖 p. 370)

- Tighten screw 6.

Guideline

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



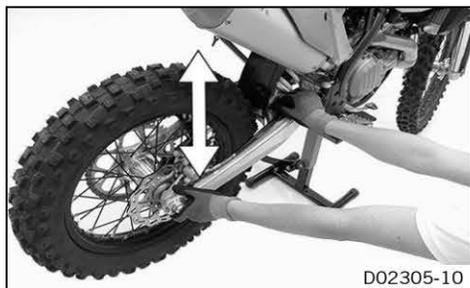
9.26 Checking the heim joint for play

Preparatory work

- Raise the motorcycle with the lift stand. (📖 p. 11)
- Place a load on the front of the vehicle.
- ✓ The rear wheel is not in contact with the ground.

Main work

- Check the upper heim joint.
- Move the swingarm up and down.
 - » If there is detectable play:
 - Change the shock absorber heim joint. (📖 p. 85)



- Check the lower heim joint.
- Move the swingarm up and down.
 - » If there is detectable play:
 - Change the swingarm heim joint. (📖 p. 86)

Finishing work

- Place a load on the front of the vehicle.
- Remove the motorcycle from the lift stand. (📖 p. 11)

9.27 Changing the shock absorber heim joint

Preparatory work

- Raise the motorcycle with the lift stand. (📖 p. 11)
- Remove shock absorber. (📖 p. 69)

Main work

- Clamp the shock absorber into the vise.

Guideline

Use soft jaws.

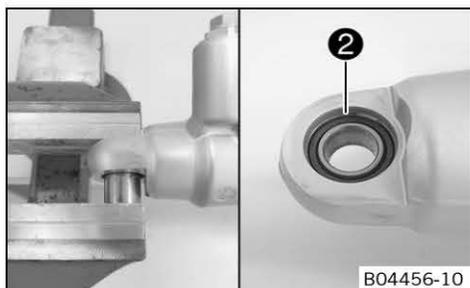
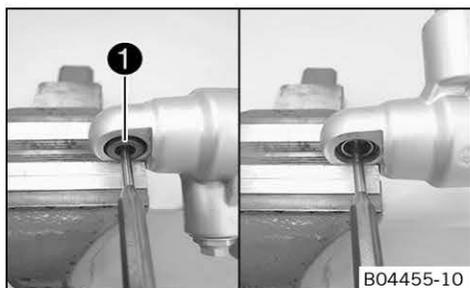
- Remove both collar bushings ❶ of the heim joint with a special tool.

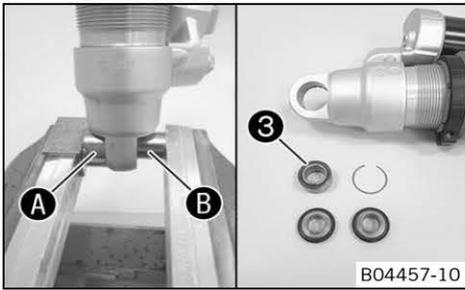
Pin (T120) (📖 p. 371)

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

Pressing tool (T1207S) (📖 p. 371)

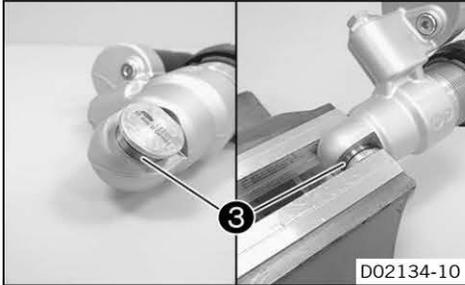
- Remove second lock ring ❷.





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

Pressing tool (T1207S) (📖 p. 371)

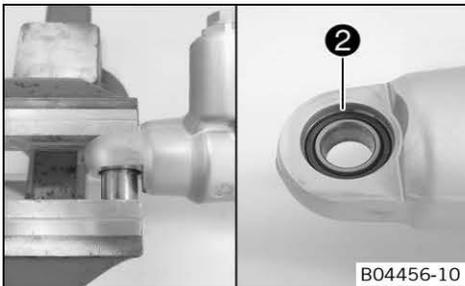


- Position new heim joint **3** and the special tool in the bench vise.
Guideline

Use soft jaws.

Pressing tool (T1206) (📖 p. 371)

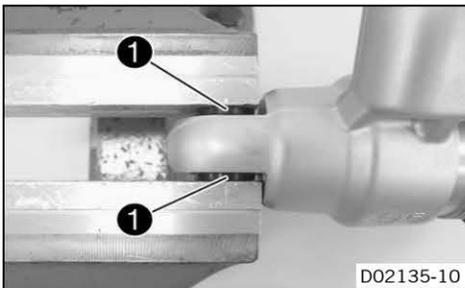
- Press the heim joint all the way in.



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

Pressing tool (T1207S) (📖 p. 371)

- Mount second lock ring **2**.

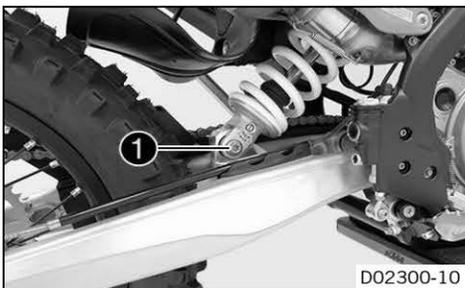


- Position both collar bushings **1** and press in.

Finishing work

- Install the shock absorber. (📖 p. 69)
- Remove the motorcycle from the lift stand. (📖 p. 11)

9.28 Changing the swingarm heim joint



Preparatory work

- Raise the motorcycle with the lift stand. (📖 p. 11)

Main work

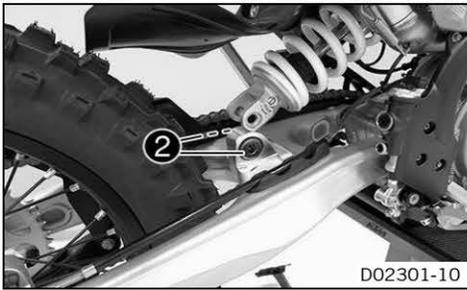
- Remove screw **1** and lower the rear wheel with the swingarm as far as possible without blocking the rear wheel. Secure the rear wheel in this position.



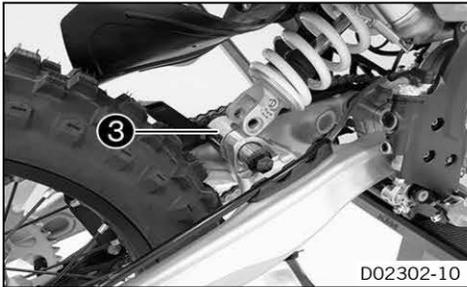
Info

Raise the wheel slightly to make it easier to remove the screw.

- Swing the shock absorber to the rear.



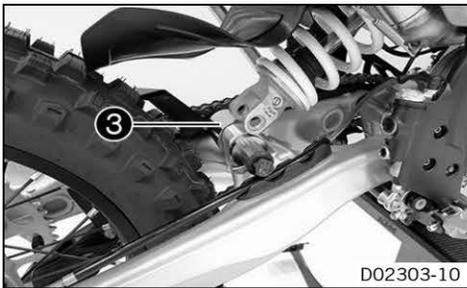
- Remove spacers **2** on both sides.



- Mount special tool **3**.

Mounting tool, heim joint (79629000044) (📖 p. 370)

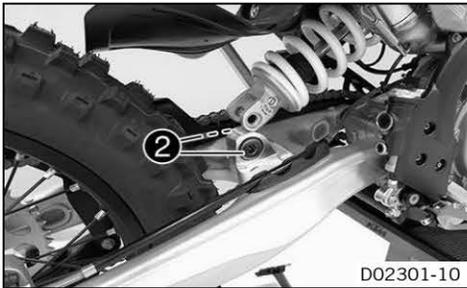
- Press out the heim joint by screwing in the screw.



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

Mounting tool, heim joint (79629000044) (📖 p. 370)

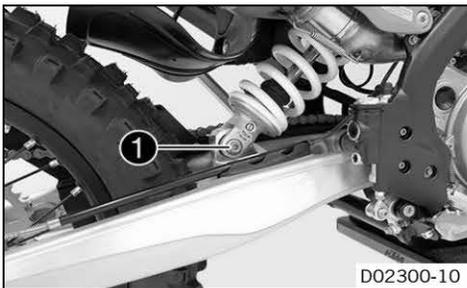
- Press in the heim joint by screwing in the screw.



- Mount spacers **2** on both sides.

i Info

The heim joint for the shock absorber at the swingarm is Teflon-coated. It must not be greased with grease or with other lubricants. Lubricants dissolve the Teflon coating, thereby drastically reducing the service life.



- Position the shock absorber.
- Mount and tighten screw **1**.

Guideline

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

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

Finishing work

- Remove the motorcycle from the lift stand. (📖 p. 11)

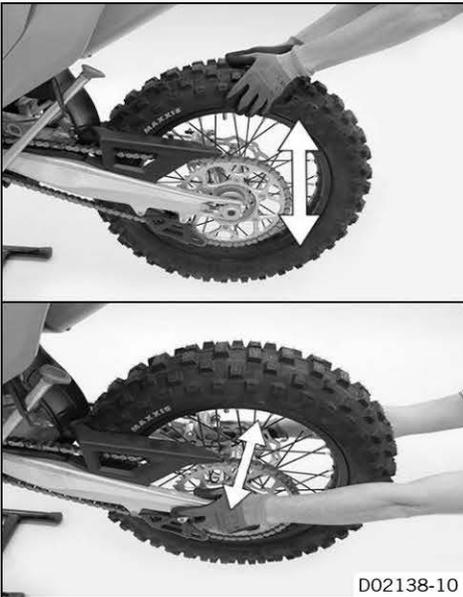
9.29 Checking the swingarm bearing for play

Preparatory work

- Raise the motorcycle with the lift stand. (📖 p. 11)
- Place a load on the front of the vehicle.
 - ✓ The rear wheel is not in contact with the ground.

Main work

- Move the swingarm up and down.
 - » If there is detectable play:
 - Change the swingarm bearing. (📖 p. 91)
- Move the swingarm from one side to the other.
 - » If there is detectable play:
 - Change the swingarm bearing. (📖 p. 91)



Finishing work

- Remove the motorcycle from the lift stand. (📖 p. 11)

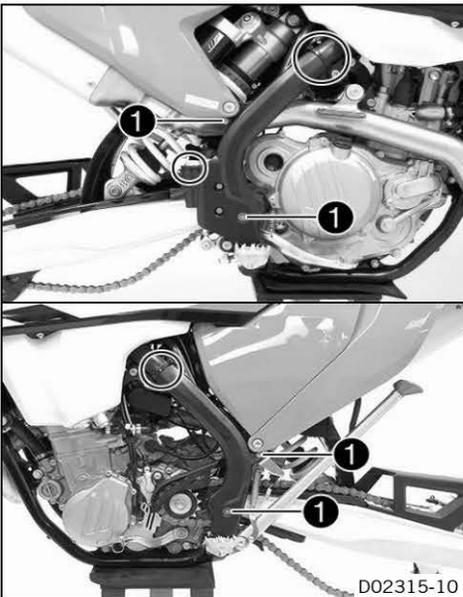
9.30 Removing the swingarm

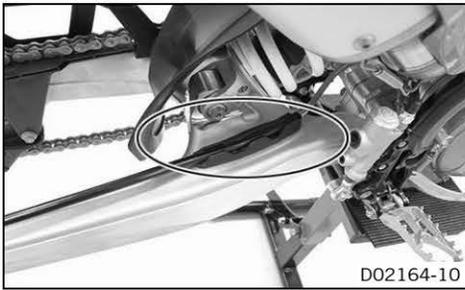
Preparatory work

- Raise the motorcycle with the lift stand. (📖 p. 11)
- Remove the rear wheel. (📖 p. 123)

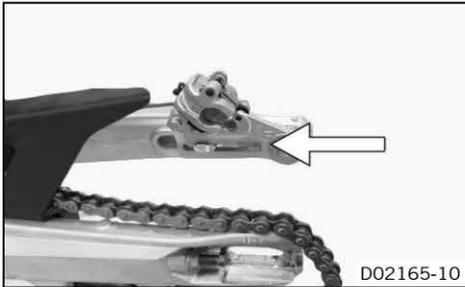
Main work

- Remove screws ① with washer.
- Remove the cable ties.
- Take off the frame protectors on both sides.

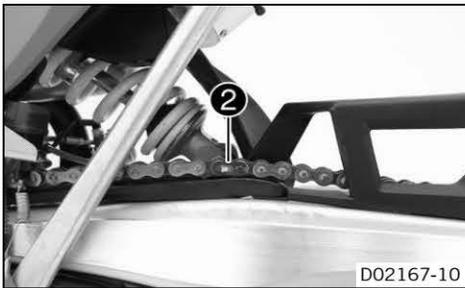




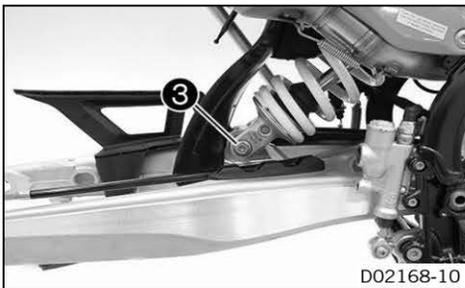
- Take the brake line out of the guide.



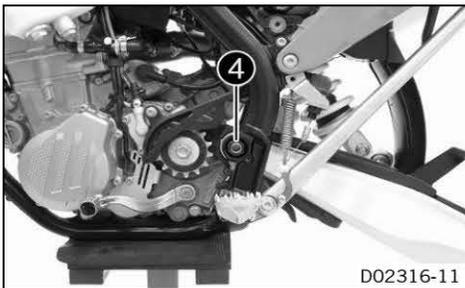
- Push the brake caliper forward, remove it, and hang it to the side.



- Remove connecting link ② of the chain.
- Take off the chain.

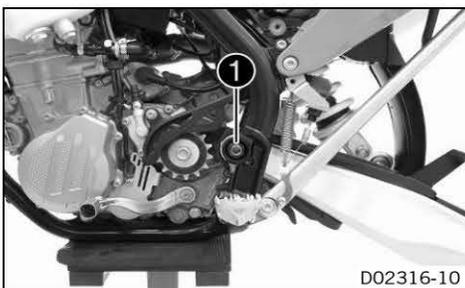


- Remove screw ③.
- Push the swingarm down and away from the shock absorber.



- Remove nut ④.
- Remove the swingarm pivot. Take off the swingarm.

9.31 Installing the swingarm

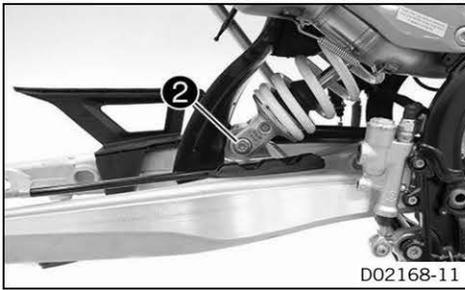


Main work

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

Guideline

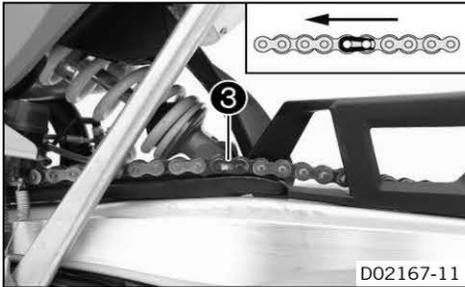
Nut, swingarm pivot	M16x1.5	100 Nm (73.8 lbf ft)
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- Lift the swingarm and position the shock absorber.
- Mount and tighten screw ②.

Guideline

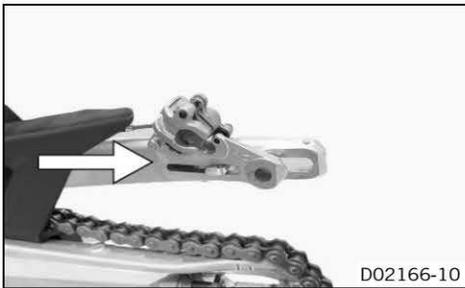
Screw, bottom shock absorber	M12	80 Nm (59 lbf ft)	Loctite® 2701™
------------------------------	-----	----------------------	----------------



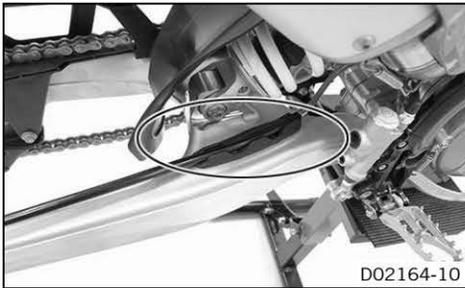
- Mount the chain.
- Connect the chain with connecting piece ③.

Guideline

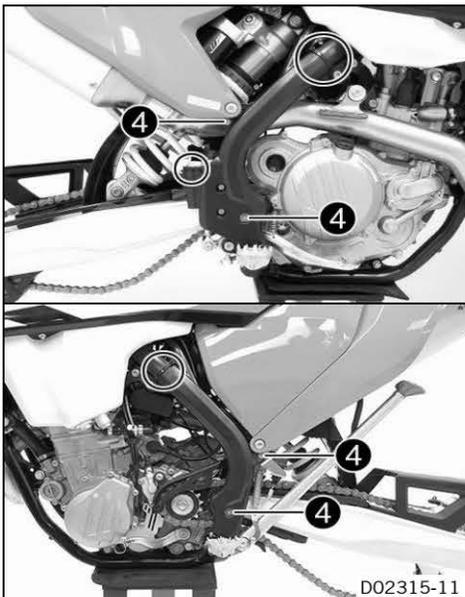
The closed side of the chain joint lock must face in the direction of travel.



- Position the brake caliper.



- Position the brake line in the guide.



- Position the frame protectors on the left and right.
- Mount and tighten screws ④ with the washers.

Guideline

Remaining screws, chassis	M5	5 Nm (3.7 lbf ft)
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- Mount the cable ties.

Finishing work

- Install the rear wheel. (📖 p. 123)

- Check the chain tension. (📖 p. 126)
- Remove the motorcycle from the lift stand. (📖 p. 11)

9.32 Changing the swingarm bearing

i Info

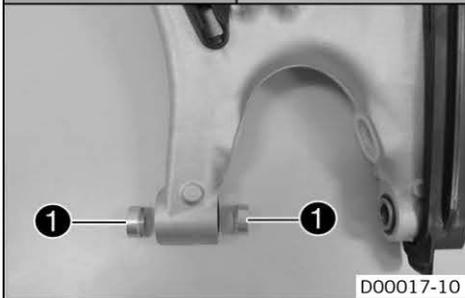
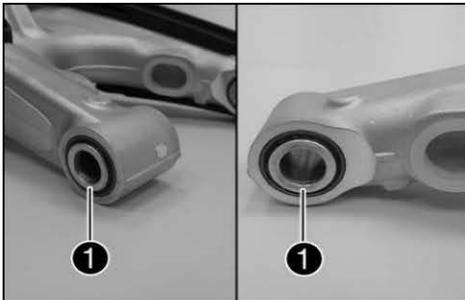
These operations are the same on both swingarm bearings.

Preparatory work

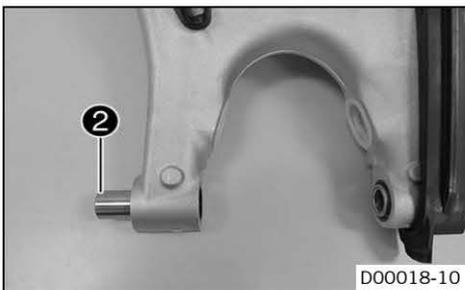
- Raise the motorcycle with the lift stand. (📖 p. 11)
- Remove the rear wheel. (📖 p. 123)
- Remove the swingarm. (📖 p. 88)

Main work

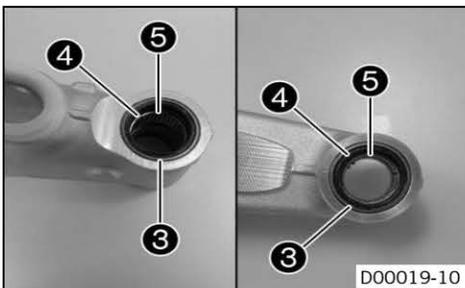
- Remove collar bushings **1**.



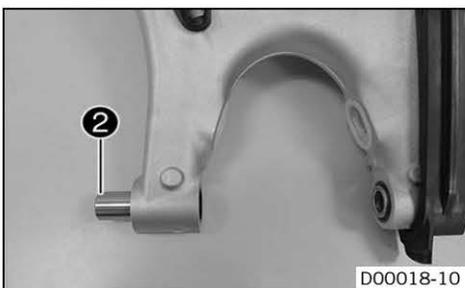
- Remove bushing **2**.

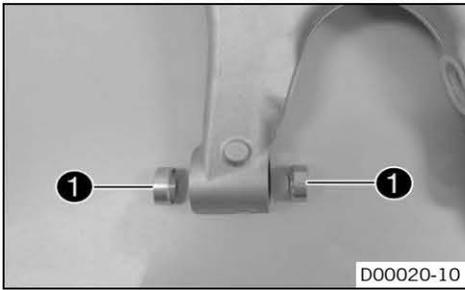


- Remove shaft seal rings **3** using a suitable tool.
- Remove stop disks **4**.
- Press out bearing **5** using a suitable tool.
- Using a suitable tool, press in new bearing **5**.
- Position stop disks **4**.
- Press in shaft seal rings **3**.



- Mount bushing **2**.





- Grease the shaft seal rings.

Long-life grease (📖 p. 358)

- Position collar bushings ❶ with the shoulder facing inward.

Finishing work

- Install the swingarm. (📖 p. 89)
- Install the rear wheel. (📖 p. 123)
- Check the chain tension. (📖 p. 126)
- Remove the motorcycle from the lift stand. (📖 p. 11)

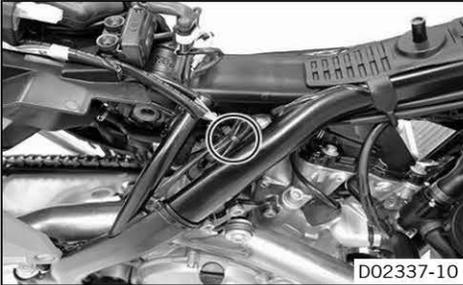
10.1 Removing the manifold

Preparatory work

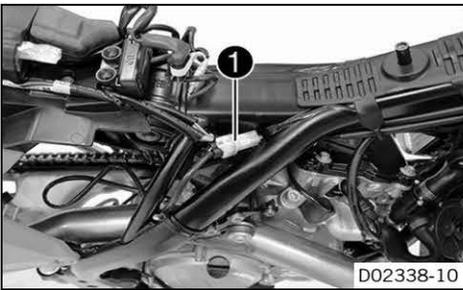
- Raise the motorcycle with the lift stand. (📖 p. 11)
- Remove shock absorber. (📖 p. 69)
- Remove the main silencer. (📖 p. 94)
- Remove the seat. (📖 p. 101)
- Remove the fuel tank. (📖 p. 102)

Main work

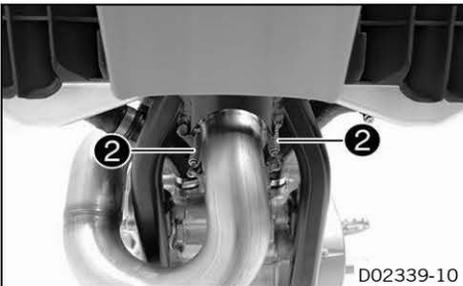
- Remove the cable tie(s) and expose the cable.



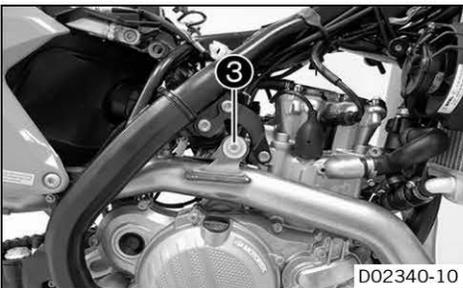
- Disconnect plug-in connector **1** of the lambda sensor.



- Remove springs **2**.



- Remove screw **3** and take off the manifold.

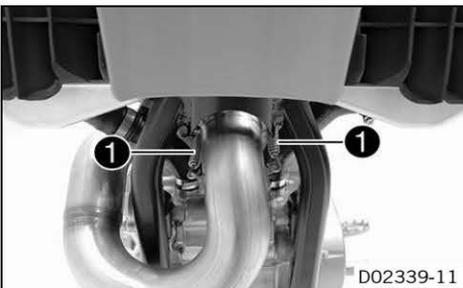


10.2 Installing the manifold

Main work

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

Spring hook (50305017000) (📖 p. 362)

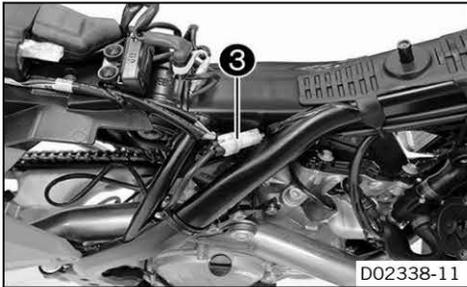




- Mount and tighten screw ②.

Guideline

Screw, manifold	M8	15 Nm (11.1 lbf ft)
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- Connect plug-in connector ③ of the lambda sensor.



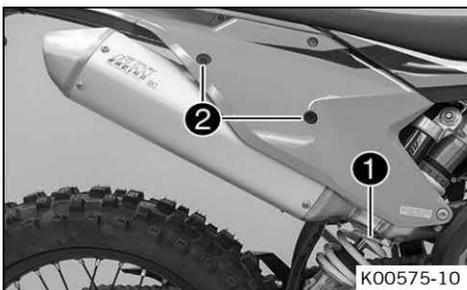
- Route the cable without tension and secure with cable tie(s).

Finishing work

- Install the fuel tank. (📖 p. 104)
- Mount the seat. (📖 p. 102)
- Install the main silencer. (📖 p. 95)
- Install the shock absorber. (📖 p. 69)
- Remove the motorcycle from the lift stand. (📖 p. 11)

10.3 Removing main silencer

Warning
Danger of burns The exhaust system gets very hot when the vehicle is driven.
 - Allow the exhaust system to cool down before performing any work on the vehicle.

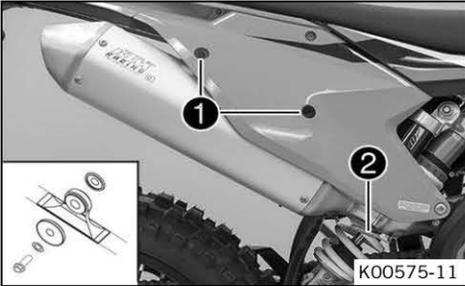


- Disconnect spring ①.

Spring hook (50305017000) (📖 p. 362)

- Remove screws ② and take off main silencer.

10.4 Installing the main silencer



- Position the main silencer. Mount screws **1**, but do not tighten yet.
- Reconnect spring **2**.

Spring hook (50305017000) (📖 p. 362)

- Tighten screws **1**.

Guideline

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

10.5 Changing the glass fiber yarn filling in the main silencer



Warning

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

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



Info

Over time, the fibers of the glass fiber yarn escape and the damper "burns" out. Not only is the noise level higher, the performance characteristic changes.

Preparatory work

- Remove the main silencer. (📖 p. 94)

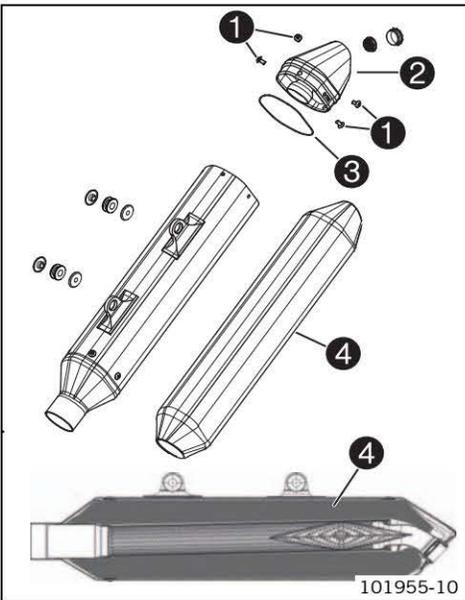
Main work

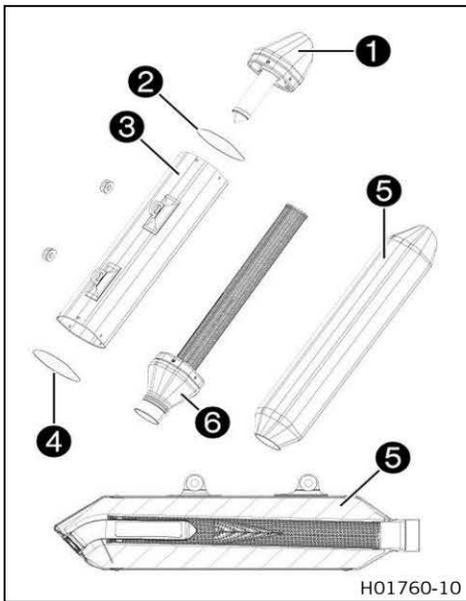
(EXC-F EU/AU, EXC-F Six Days EU)

- Remove screws **1**.
- Take off silencer cap **2** with O-ring **3**.
- Remove old glass fiber yarn filling.
- Clean the parts that need to be reinstalled and check for damage.
- Fit new glass fiber yarn filling **4** into the main silencer.
- Mount the O-ring on the silencer cap.
- Position the silencer cap.
- Mount and tighten all of the screws.

Guideline

Screws on the main silencer	M5	7 Nm (5.2 lbf ft)
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(All US models)

- Remove all screws on the main silencer.
- Take off silencer cap 1 with filter and O-ring 2.
- Take off outer tube 3 and O-ring 4.
- Remove glass fiber yarn filling 5 from inner tube with connecting cap 6.
- Clean the parts that need to be reinstalled and check for damage.
- Mount the new glass fiber yarn filling with connecting cap onto the inner tube.
- Position inner tube with connecting cap, glass fiber yarn and new O-ring 4 in the outer tube.
- Position new O-ring 2 and the silencer cap with the filter in the outer tube.
- Mount and tighten all of the screws.

Guideline

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

Finishing work

- Install the main silencer. (📖 p. 95)

10.6 Cleaning the spark arrester (All US models)

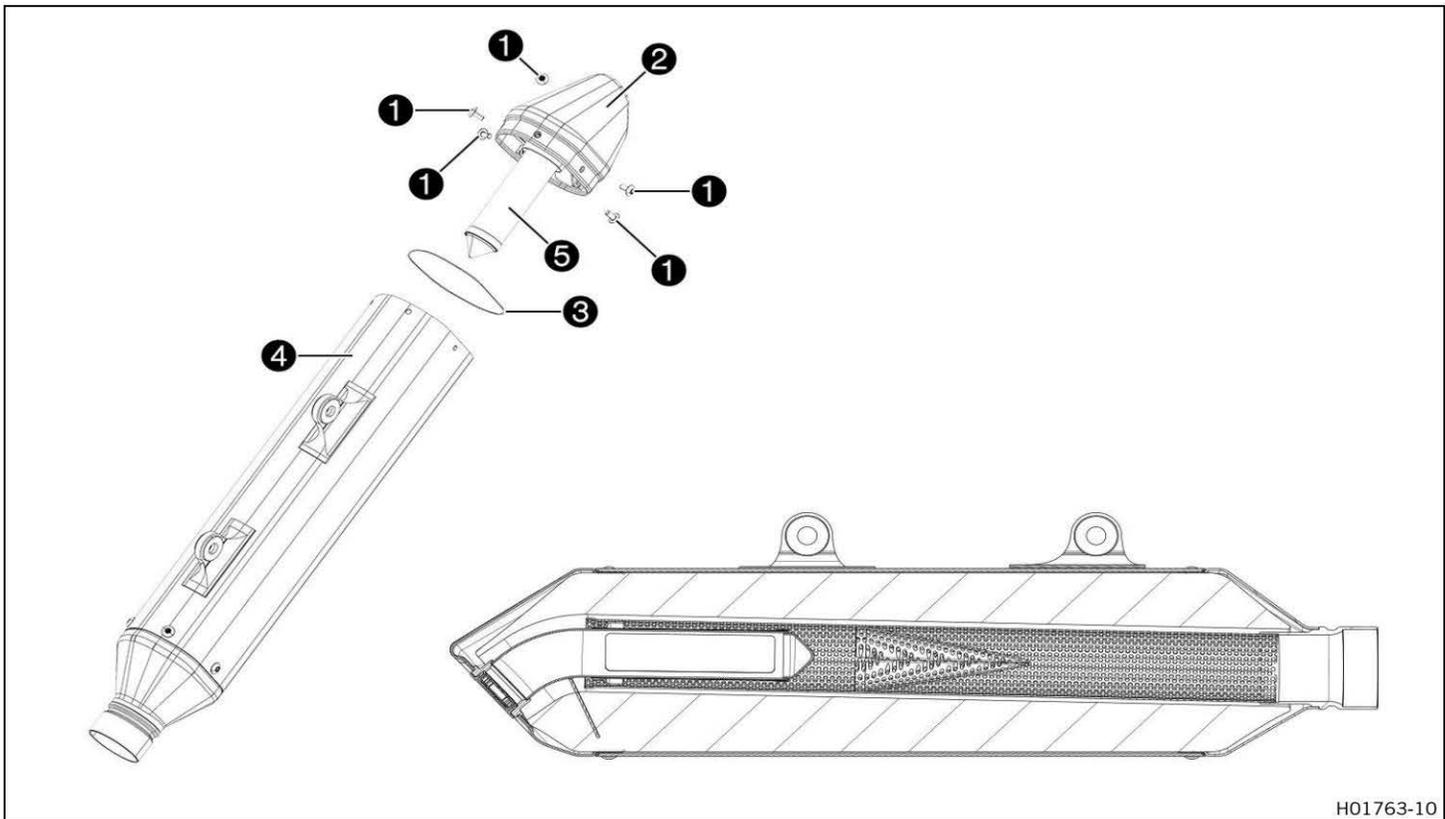
Warning
Danger of burns The exhaust system gets very hot when the vehicle is driven.

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

Info
 Soot particles accumulate on the screen of the spark arrester over time. This changes the performance characteristics.

Preparatory work

- Remove the main silencer. (📖 p. 94)



H01763-10

Main work

- Remove screws ① and take off silencer cap ② with O-ring ③.



Info

Do not remove the glass fiber yarn filling.



Warning

Danger to health Soot particles irritate the eyes and mucuous membranes.

- Wear suitable breathing and eye protection when cleaning the main silencer and carbon screen.

- Clean main silencer housing ④ and screen ⑤ of the spark arrestor with compressed air.
- Mount new O-ring ③ on silencer cap ②.
- Position silencer cap ②. Mount and tighten screws ①.

Guideline

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

Finishing work

- Install the main silencer. (📖 p. 95)

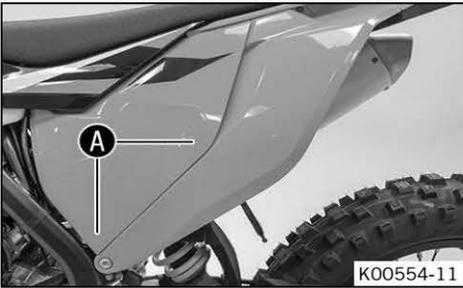
11.1 Removing the air filter box cover



Condition

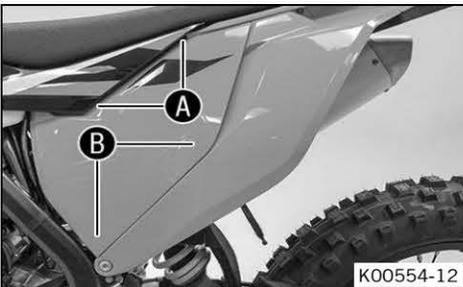
The air filter box cover is secured.

- Remove screw 1.



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

11.2 Installing the air filter box cover



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



Condition

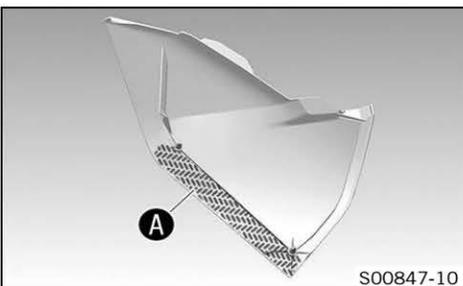
The air filter box cover is secured.

- Mount and tighten screw 1.

Guideline

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

11.3 Sealing the air filter box



Preparatory work

- Remove the air filter box cover. (📖 p. 98)

Main work

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

Finishing work

- Install the air filter box cover. (📖 p. 98)

11.4 Removing the air filter

Note

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

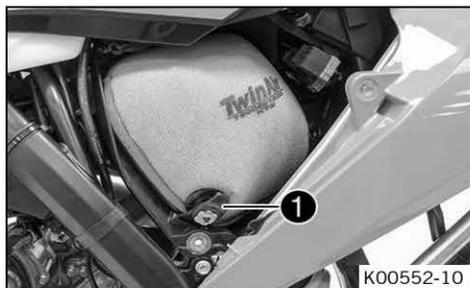
- Never start to use the vehicle without an air filter.



Warning

Environmental hazard Hazardous substances cause environmental damage.

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



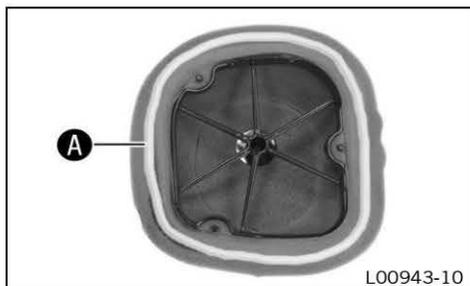
Preparatory work

- Remove the air filter box cover. (📖 p. 98)

Main work

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

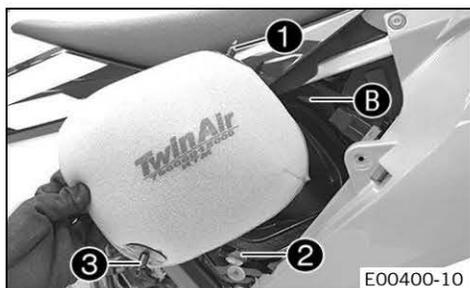
11.5 Installing the air filter



Main work

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

Long-life grease (📖 p. 358)



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



Info

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

Finishing work

- Install the air filter box cover. (📖 p. 98)

11.6 Cleaning the air filter and air filter box



Warning

Environmental hazard Hazardous substances cause environmental damage.

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



Info

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



Preparatory work

- Remove the air filter box cover. (📖 p. 98)
- Remove the air filter. (📖 p. 99)

Main work

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

Air filter cleaner (📖 p. 358)



Info

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

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

Oil for foam air filter (📖 p. 359)

- Clean the air filter box.
- Check the intake flange for damage and firm seating.

Finishing work

- Install the air filter. (📖 p. 99)
- Install the air filter box cover. (📖 p. 98)

11.7 Checking the inlet membrane (All US models)



Info

For purposes of illustration, the following operations are shown with the inlet sleeve deinstalled. Removal is not necessary.



Preparatory work

- Remove the air filter box cover. (📖 p. 98)
- Remove the air filter. (📖 p. 99)

Main work

- Check membrane body and membrane for damage and wear.
 - » If there is damage or wear:
 - Change inlet sleeve.



Info

The membrane body is attached to the inlet sleeve and cannot be removed.

Finishing work

- Install the air filter. (📖 p. 99)
- Install the air filter box cover. (📖 p. 98)

12.1 Opening the filler cap



Danger

Fire hazard Fuel is highly flammable.

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

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



Warning

Danger of poisoning Fuel is poisonous and a health hazard.

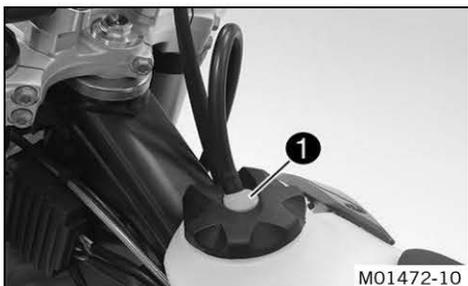
- Avoid skin, eye and clothing contact with fuel.
- Immediately consult a doctor if you swallow fuel.
- Do not inhale fuel vapors.
- In case of skin contact, rinse the affected area with plenty of water.
- Rinse the eyes thoroughly with water, and consult a doctor in case of fuel contact with the eyes.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



Warning

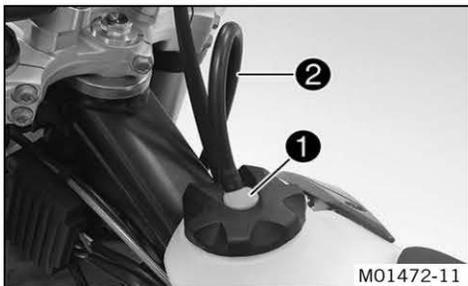
Environmental hazard Improper handling of fuel is a danger to the environment.

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



- Press release button **1**, turn the filler cap counterclockwise, and lift it off.

12.2 Closing the filler cap



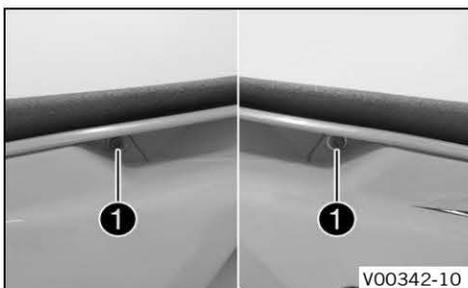
- Fit the filler cap and turn clockwise until release button **1** locks in place.



Info

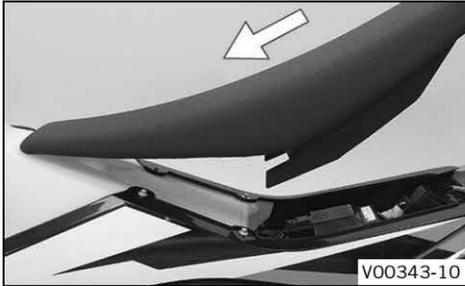
Route fuel tank breather hose **2** without kinks.

12.3 Removing the seat

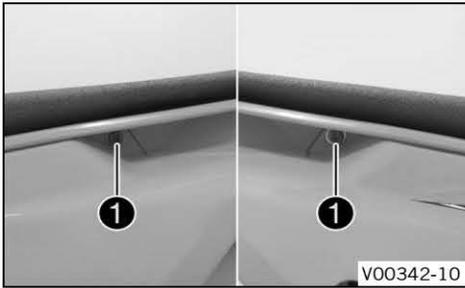


- Remove screws **1**.
- Raise the rear of the seat, pull the seat back, and lift it off.

12.4 Mounting the seat



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



- Mount and tighten screws ①.

Guideline

Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
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12.5 Removing the fuel tank



Danger

Fire hazard Fuel is highly flammable.

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

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



Warning

Danger of poisoning Fuel is poisonous and a health hazard.

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

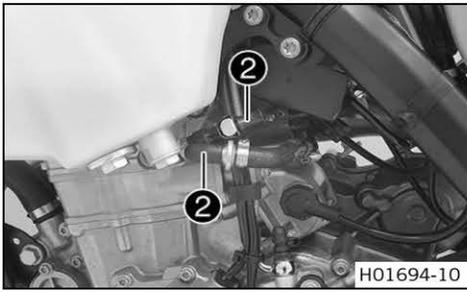
Preparatory work

- Remove the seat. (📖 p. 101)

Main work

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





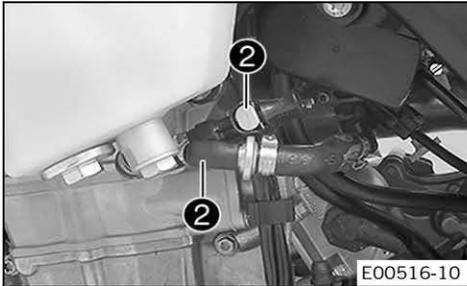
(EXC-F EU/AU, EXC-F Six Days EU)

- 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!

- Disconnect the plug-in connection of the fuel line.
- Mount wash cap set **2**.

Wash cap set (81212016100)



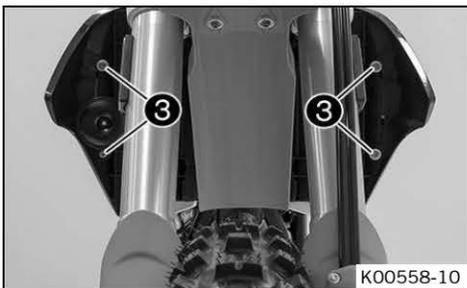
(All US models)

- 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!

- Disconnect the plug-in connection of the fuel line.
- Mount wash cap set **2**.

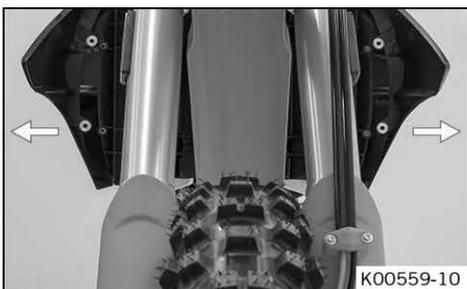
Wash cap set (81212016100)



- Remove screws **3** with the collar bushings.
- Hang the horn and horn bracket to one side.



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



- Pull both spoilers off the sides of the radiator bracket and lift off the fuel tank.

12.6 Installing the fuel tank

Danger
Fire hazard Fuel is highly flammable.
 The fuel in the fuel tank expands when warm and can escape if overfilled.

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

Warning
Danger of poisoning Fuel is poisonous and a health hazard.

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

Main work

- Check throttle cable routing. (🗨️ p. 59)
- Position the fuel tank and fit the two spoilers to the sides in front of the radiator bracket.
- Make sure that no cables or throttle cables are trapped or damaged.
- Attach the fuel tank breather hose.
- Mount and tighten screw **1** with the rubber bushing.

Guideline

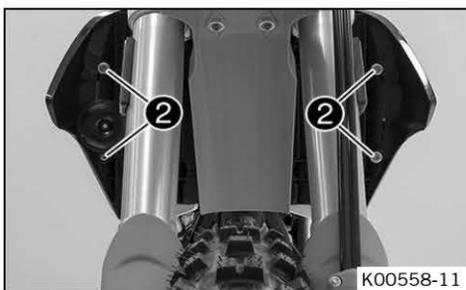
Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
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- Position the horn with the horn bracket.
- Mount and tighten screws **2** with the collar bushings.

Guideline

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



(EXC-F EU/AU, EXC-F Six Days EU)

- Plug in connector **3** for the fuel pump.
- Remove the wash cap set.
- Thoroughly clean the plug-in connection of the fuel line using compressed air.

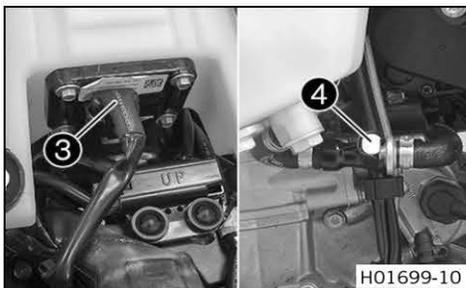
i Info

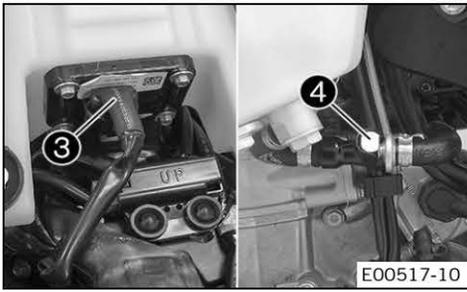
Under no circumstances should dirt enter into the fuel line. Dirt in the fuel line clogs the injection valve!

- Lubricate the O-ring and connect plug-in connection **4** for the fuel line.

i Info

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





(All US models)

- Plug in connector **3** for the fuel pump.
- Remove the wash cap set.
- 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!

- Lubricate the O-ring and connect plug-in connection **4** for the fuel line.



Info

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

Finishing work

- Mount the seat. (📖 p. 102)

12.7 Changing the fuel screen



Danger

Fire hazard Fuel is highly flammable.

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

- Do not 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.

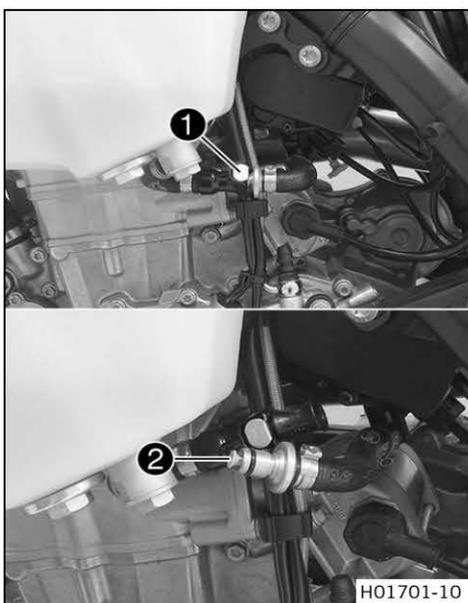
- Avoid skin, eye and clothing contact with fuel.
- Immediately consult a doctor if you swallow fuel.
- Do not inhale fuel vapors.
- In case of skin contact, rinse the affected area with plenty of water.
- Rinse the eyes thoroughly with water, and consult a doctor in case of fuel contact with the eyes.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



Warning

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.



(EXC-F EU/AU, EXC-F Six Days EU)

- Clean plug-in connection **1** of the fuel line thoroughly with compressed air.

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

- Disconnect the plug-in connection of the fuel line.

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

- Pull fuel screen **2** out of the connecting piece.
- Insert the new fuel screen all the way into the connecting piece.
- Lubricate the O-ring and connect plug-in connection of the fuel line.

! 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 an effective exhaust extraction system when starting or running the engine in an enclosed space.

- Start the engine and check the response.

(All US models)

- Clean plug-in connection **1** of the fuel line thoroughly with compressed air.

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

- Disconnect the plug-in connection of the fuel line.

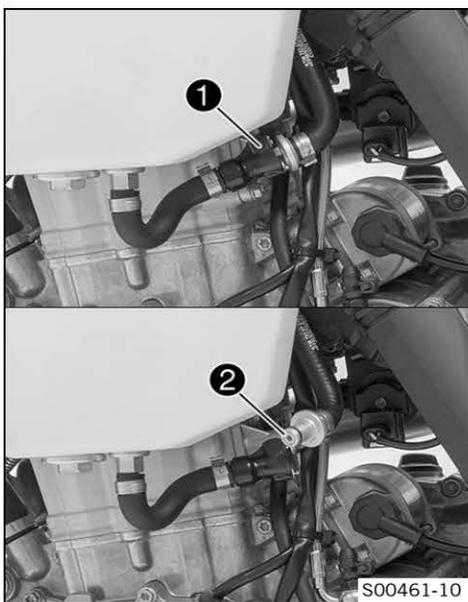
i Info
Remaining fuel may flow out of the fuel hose.

- Pull fuel screen **2** out of the connecting piece.
- Insert the new fuel screen all the way into the connecting piece.
- Lubricate the O-ring and connect plug-in connection of the fuel line.

! 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 an effective exhaust extraction system when starting or running the engine in an enclosed space.

- Start the engine and check the response.



12.8 Changing the fuel filter

! Danger
Fire hazard Fuel is highly flammable.

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

- Do not 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.

**Warning**

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

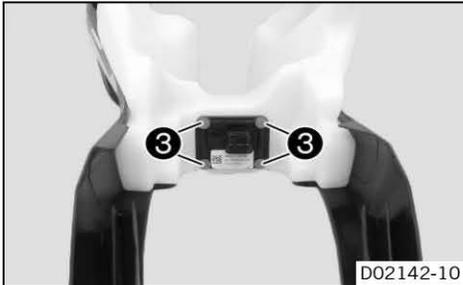
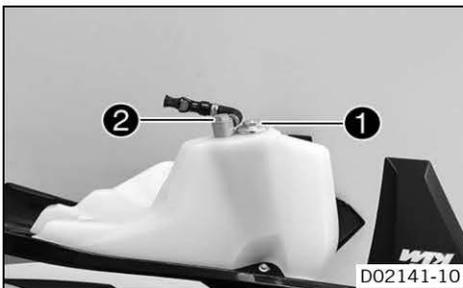
- Do not allow fuel to enter the groundwater, the soil, or the sewage system.

Preparatory work

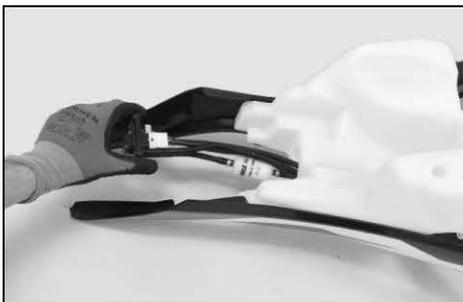
- Drain the fuel from the fuel tank into a suitable container.
- Remove the seat. (📖 p. 101)
- Remove the fuel tank. (📖 p. 102)

Main work

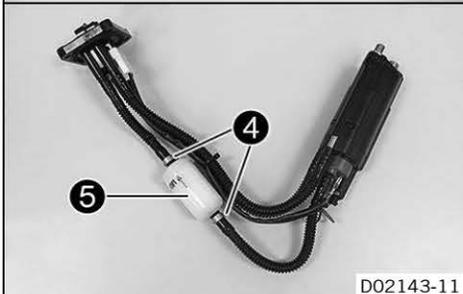
- Remove nut **1** with the gasket.
- Remove fuel connection **2** with the gasket.

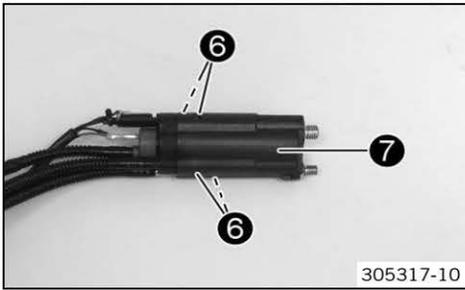


- Remove screws **3**.

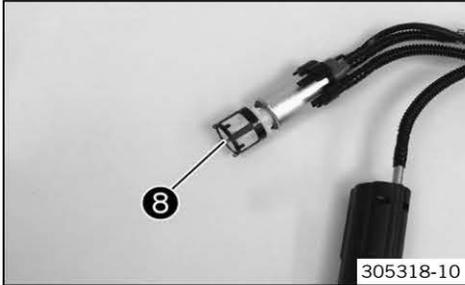


- Pull out the fuel pump.
- Remove hose clamps **4**.
- Remove fuel filter **5**.

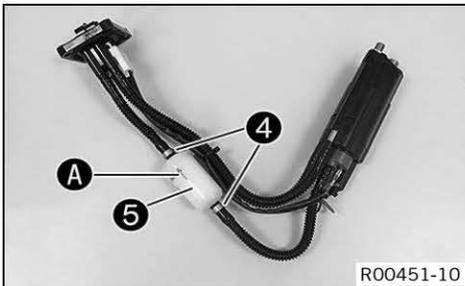




- Press locking mechanism ⑥.
- Pull back fuel pump housing ⑦.

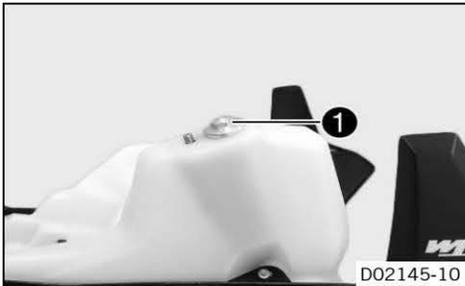


- Change fuel screen ⑧.
- Mount the fuel pump housing.

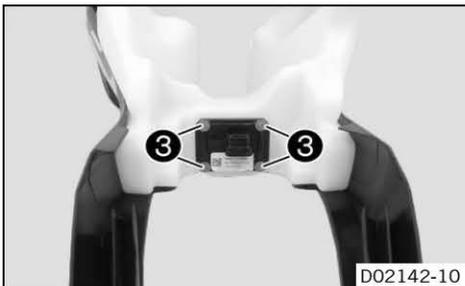


- Mount fuel filter ⑤.
- ✓ Arrow A points away from the fuel pump.
- Mount hose clamps ④.

Hose clamp pliers (60029057000) (📖 p. 365)



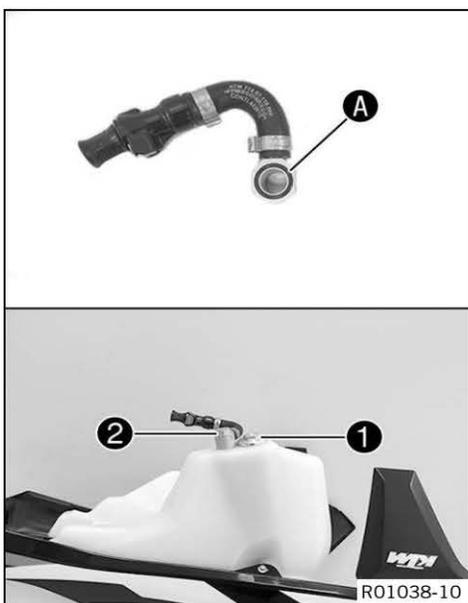
- Position the fuel pump.
- Mount nut ① with gasket, but do not tighten yet.



- Mount and tighten screws ③.

Guideline

Screw, fuel pump	EJOT PT®	2.3 Nm (1.7 lbf ft)
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- Grease O-ring **A** slightly.

Multi-purpose grease (00062010051) (📖 p. 358)



Info

Make sure that no grease gets into the fuel connection.

- Mount fuel connection **2** with the gasket but do not tighten yet.
- Tighten nut **1**.

Guideline

Nut, fuel pump fixation	M12	15 Nm (11.1 lbf ft)
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- Tighten fuel connection **2**.

Guideline

Fuel connection on fuel pump	M8	10 Nm (7.4 lbf ft)
------------------------------	----	--------------------

Finishing work

- Install the fuel tank. (📖 p. 104)
- Mount the seat. (📖 p. 102)

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.



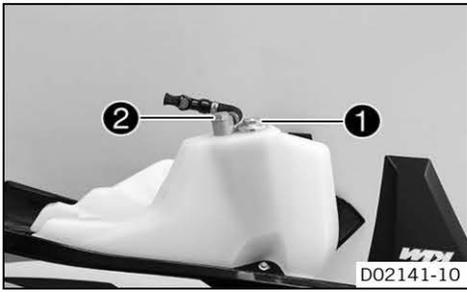
Warning

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

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

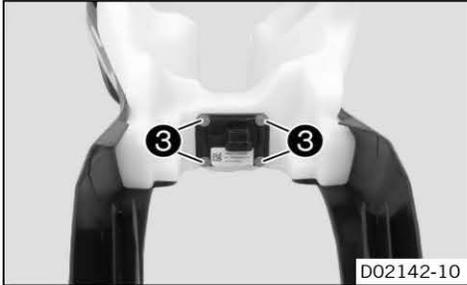
Preparatory work

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

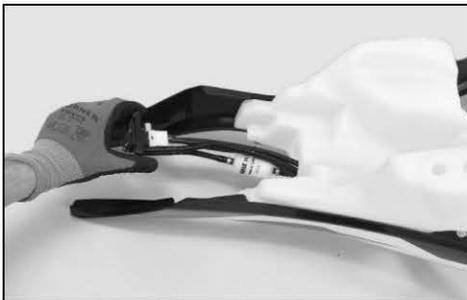


Main work

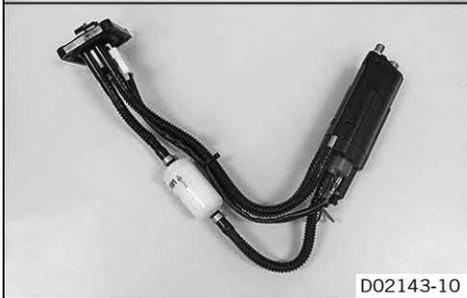
- Remove nut **1** with the gasket.
- Remove fuel connection **2** with the gasket.



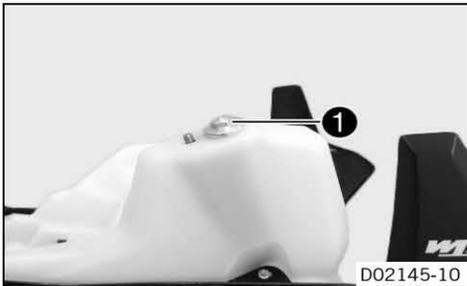
- Remove screws **3**.



- Pull out the fuel pump.



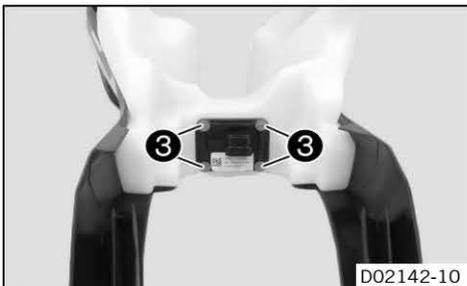
- Position the new fuel pump.
- Mount nut **1** with gasket, but do not tighten yet.

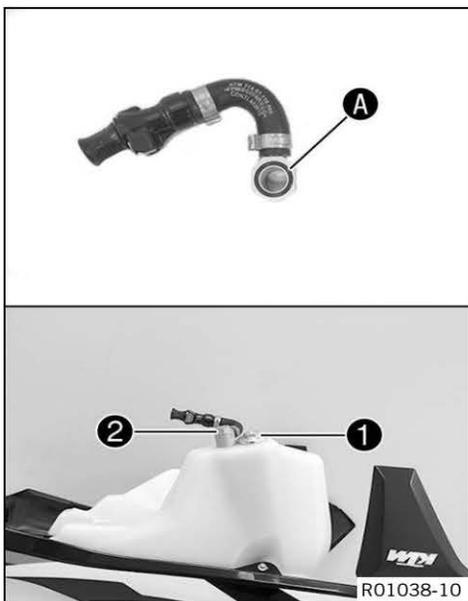


- Mount and tighten screws **3**.

Guideline

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





- Grease O-ring **A** slightly.

Multi-purpose grease (00062010051) (📖 p. 358)

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

- Mount fuel connection **2** with the gasket but do not tighten yet.
- Tighten nut **1**.

Guideline

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

- Tighten fuel connection **2**.

Guideline

Fuel connection on fuel pump	M8	10 Nm (7.4 lbf ft)
------------------------------	----	--------------------

Finishing work

- Install the fuel tank. (📖 p. 104)
- Mount the seat. (📖 p. 102)

12.10 Checking the fuel pressure

! Danger
Fire hazard Fuel is highly flammable.

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

- Do not 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

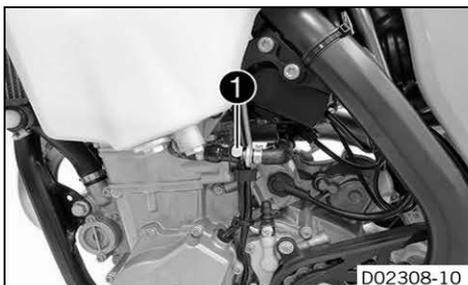
The fuel tank is full.
Ensure that the battery voltage does not drop below 12.5 V.
The diagnostics tool is disconnected.

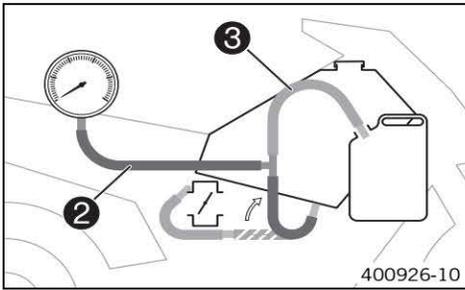
- Thoroughly clean the plug-in connection of the fuel line using compressed air.

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.





- Mount special tool **2**.

Pressure tester (61029094000) (📖 p. 365)
--

- Mount special tool **3** with nozzle label **0,60**.

Testing hose (61029093000) (📖 p. 365)

- Position the hose end in a fuel cannister.

Guideline

Minimum size of fuel cannister	10 l (2.6 US gal)
--------------------------------	-------------------

- Connect the diagnostics tool and start it.
- Select the **"Function test of fuel pump control"** actuator test.

Guideline

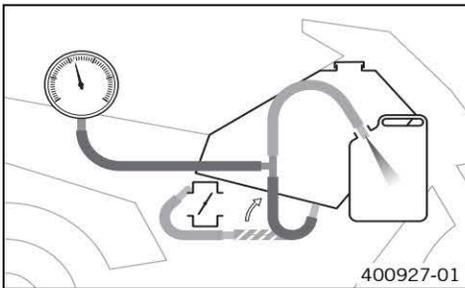
Maximum duration of the actuator test	3 min
---------------------------------------	-------

- Check the fuel pressure with the filler cap closed.

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

» If the specification is not reached:

- Open the filler cap. (📖 p. 101)
- Check the tank air vent system.



- Check the fuel pressure with the filler cap open.

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

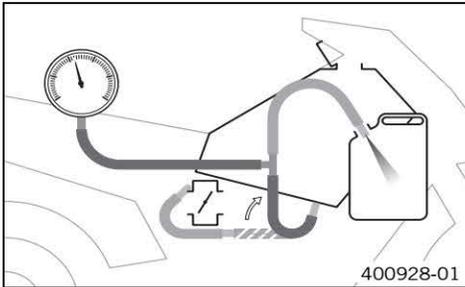
» If the specification is not reached:

- Check that the fuel line is clear.
- Change the fuel filter. (📖 p. 106)
- Change the fuel pump. (📖 p. 109)

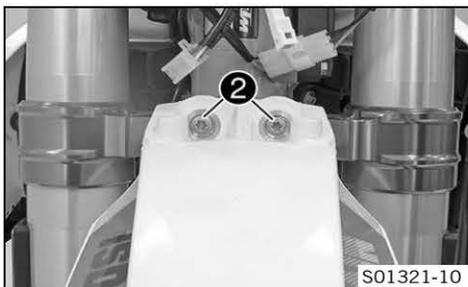
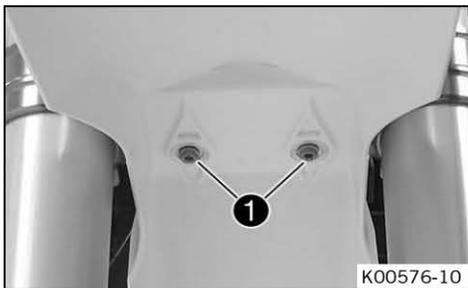
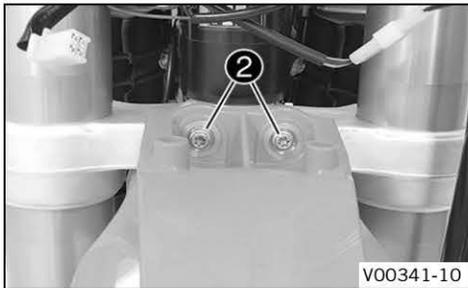
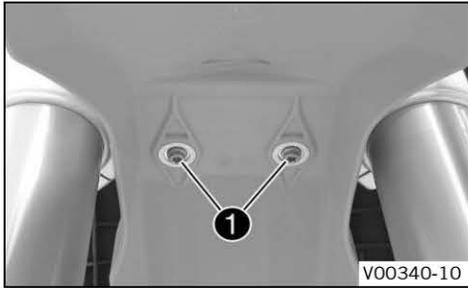
- Stop the **"Function test of fuel pump control"** actuator test by pressing the **"Quit"** button.

- Remove the special tools.

- Join the fuel hose connection.



13.1 Removing the front fender



Preparatory work

- Remove the headlight mask with the headlight. (📖 p. 114)

Main work (EXC-F EU/AU/US)

- Remove screws ❶.

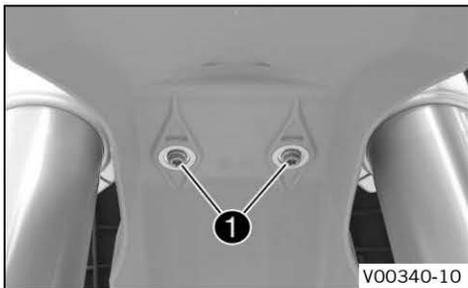
- Remove screws ❷. Remove the front fender.

(All EXC-F Six Days)

- Remove screws ❶.

- Remove screws ❷. Remove the front fender.

13.2 Installing the front fender

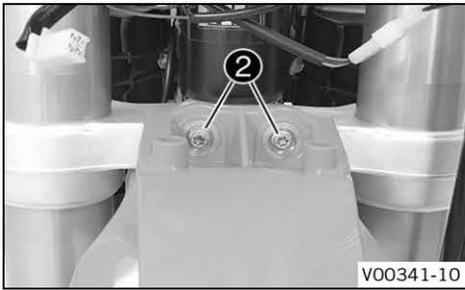


Main work (EXC-F EU/AU/US)

- Position the front fender. Mount and tighten screws ❶.

Guideline

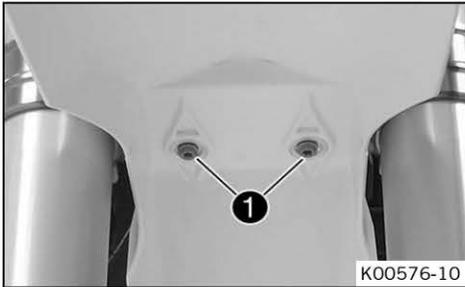
Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)
---------------------------	----	-----------------------



- Mount and tighten screws ②.

Guideline

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

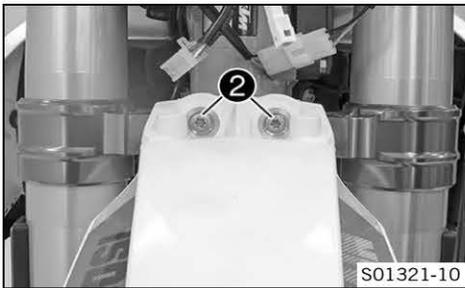


(All EXC-F Six Days)

- Position the front fender. Mount and tighten screws ①.

Guideline

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



- Mount and tighten screws ②.

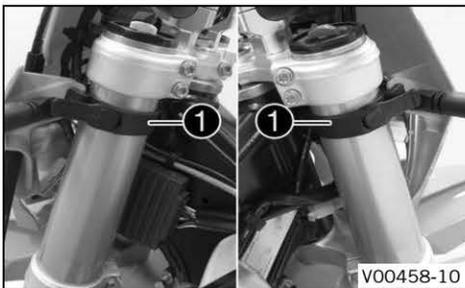
Guideline

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

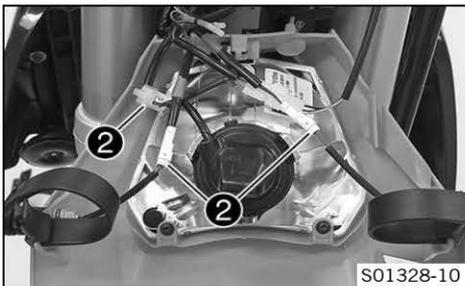
- Install the headlight mask with the headlight. (📖 p. 115)
- Check the headlight setting. (📖 p. 151)

13.3 Removing the headlight mask with the headlight

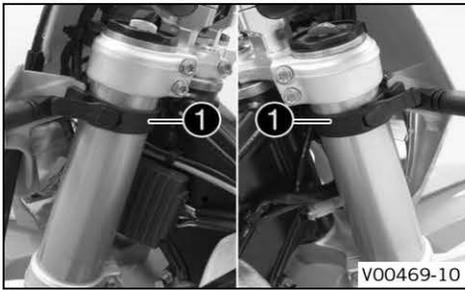


(EXC-F EU/AU, EXC-F Six Days EU)

- Switch off all power consumers and switch off the engine.
- Detach the brake line and wiring harness from the headlight mask.
- Release rubber bands ①. Slide the headlight mask up and swing it forward.

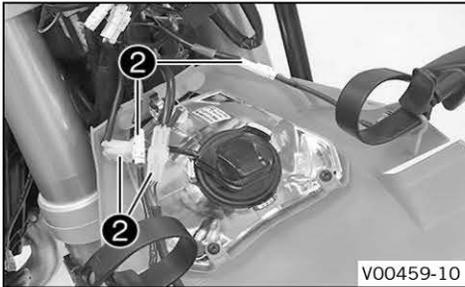


- Detach plug-in connectors ② and take off the headlight mask with the headlight.



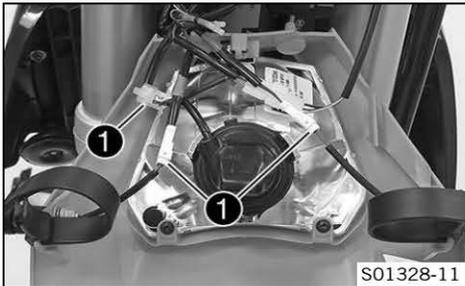
(All US models)

- Switch off all power consumers and switch off the engine.
- Detach the brake line and wiring harness from the headlight mask.
- Release rubber bands ❶. Slide the headlight mask up and swing it forward.



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

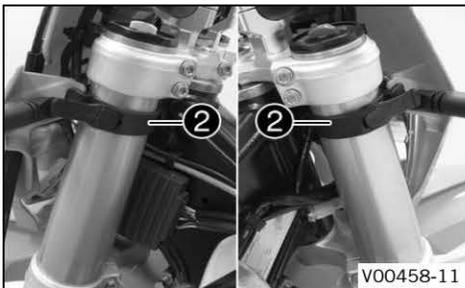
13.4 Installing the headlight mask with the headlight



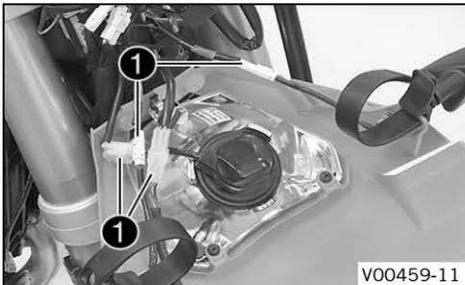
Main work

(EXC-F EU/AU, EXC-F Six Days EU)

- Connect plug-in connectors ❶.

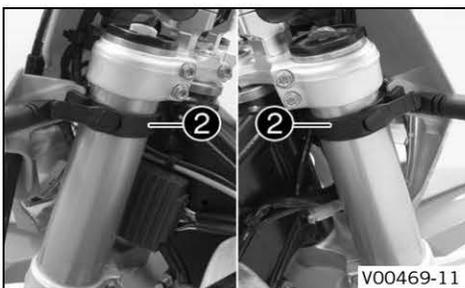


- Position the headlight mask and fix it with rubber bands ❷.
- ✓ The holding lugs engage in the fender.
- Position the brake line and wiring harness in the brake line guide.



(All US models)

- Connect plug-in connectors ❶.



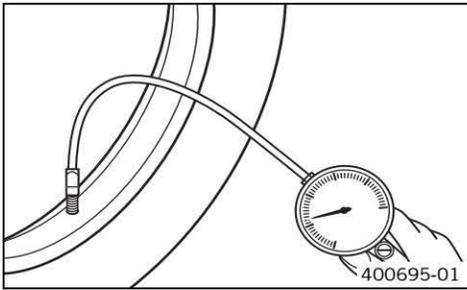
- Position the headlight mask and fix it with rubber bands ❷.
- ✓ The holding lugs engage in the fender.
- Position the brake line and wiring harness in the brake line guide.

Finishing work

- Check the headlight setting. (📖 p. 151)

14.1 Checking the tire air pressure

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



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

Tire air pressure off road	
Front	1.0 bar (15 psi)
Rear	1.0 bar (15 psi)

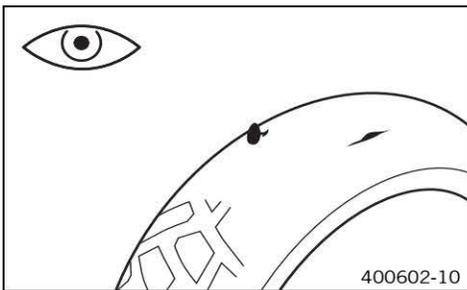
Road tire pressure (EXC-F EU/AU, EXC-F Six Days EU)	
Front	1.5 bar (22 psi)
Rear	1.5 bar (22 psi)

Road tire pressure (All US models)	
Front	1.5 bar (22 psi)
Rear	2.0 bar (29 psi)

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

14.2 Checking the tire condition

i Info
 Only mount tires approved and/or recommended by KTM.
 Other tires could have a negative effect on handling characteristics.
 The type, condition, and air pressure of the tires all have a major impact on the handling of the motorcycle.
 The tires mounted on the front and rear wheels must have a similar profile.
 Worn tires have a negative effect on handling characteristics, especially on wet surfaces.

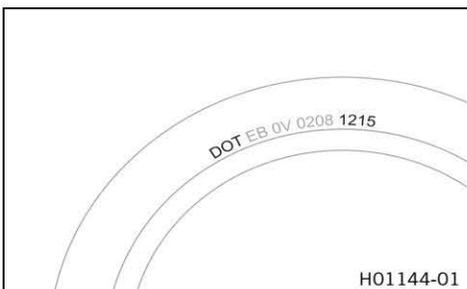


- Check the front and rear tires for cuts, run-in objects, and other damage.
 - » If the tires have cuts, run-in objects, or other damage:
 - Change the tires.
- Check the tread depth.

i Info
 Adhere to the legally required minimum tread depth.

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

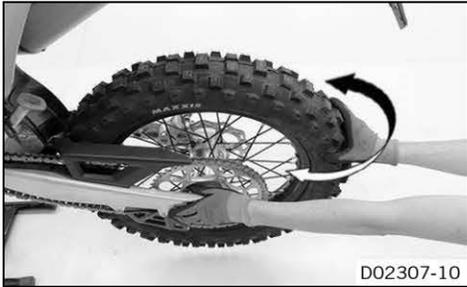
- » If the tread depth is less than the minimum tread depth:
 - Change the tires.
- Check the tire age.



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 motorcycle with the lift stand. (📖 p. 11)
- Place a load on the rear of the vehicle.
- ✓ The front wheel is not in contact with the ground.

Main work

- Move the front wheel from side to side.



Info

Hold the fork leg to check it.

- » If there is detectable play:
 - Change the front wheel bearing. (📖 p. 121)

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



Info

Hold the swingarm to check it.

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

Finishing work

- Remove the motorcycle from the lift stand. (📖 p. 11)

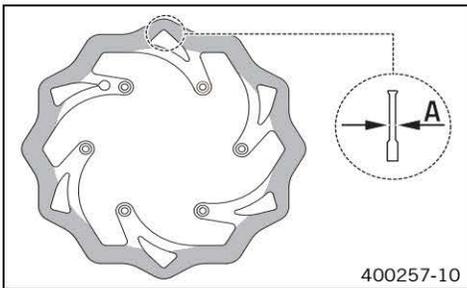
14.4 Checking the brake discs



Warning

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

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



- Check the thickness of the front and rear brake discs at multiple points on each brake disc to ensure it is at least thickness **A**.



Info

Wear reduces the thickness of the brake disc around the area used by the brake linings.

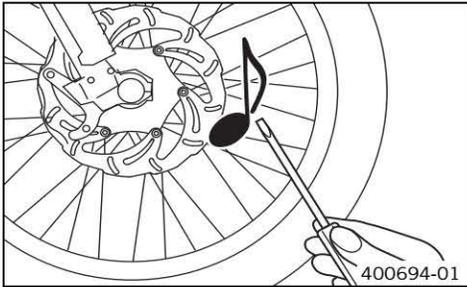
Brake discs - wear limit (EXC-F EU/AU/US)	
Front	2.5 mm (0.098 in)
Rear	3.5 mm (0.138 in)
Brake discs - wear limit (All EXC-F Six Days)	
Front	2.5 mm (0.098 in)
Rear	3.7 mm (0.146 in)

- » If the brake disc thickness is less than the specified value:
 - Change the front brake disc. (📖 p. 121)
 - Change the rear brake disc. (📖 p. 124)
- Check the front and rear brake discs for damage, cracking, and deformation.
 - » If the brake disc exhibits damage, cracking, or deformation:
 - Change the front brake disc. (📖 p. 121)
 - Change the rear brake disc. (📖 p. 124)

14.5 Checking spoke tension

Warning
Danger of accidents Incorrectly tensioned spokes impair the handling characteristic and result in secondary damage. The spokes break due to being overloaded if they are too tightly tensioned. If the tension in the spokes is too low, then lateral and radial run-out will form in the wheel. Other spokes will become looser as a result.

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



- Strike each spoke briefly using a screwdriver blade.

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

You should hear a high note.

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

Guideline

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

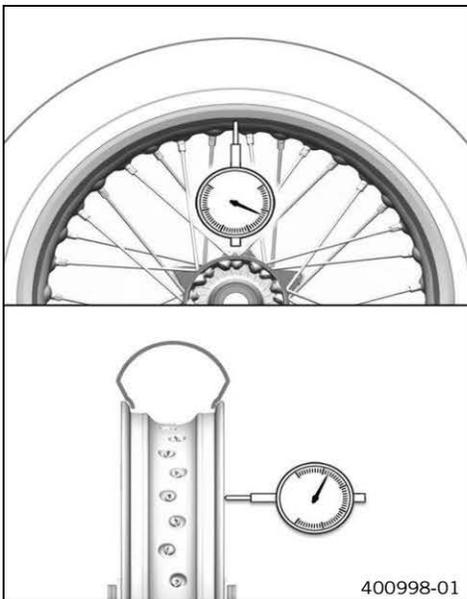
Torque wrench with various accessories in set (58429094000) (📖 p. 364)

14.6 Checking the rim run-out

Warning
Danger of accidents Incorrectly tensioned spokes impair the handling characteristic and result in secondary damage. The spokes break due to being overloaded if they are too tightly tensioned. If the tension in the spokes is too low, then lateral and radial run-out will form in the wheel. Other spokes will become looser as a result.

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

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



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

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

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

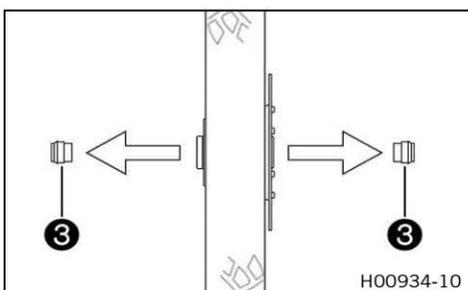
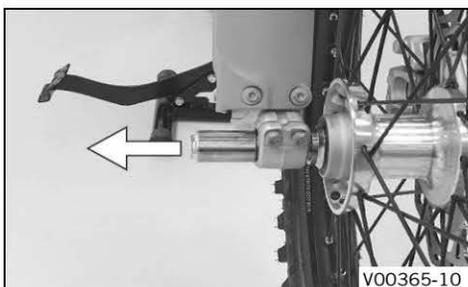
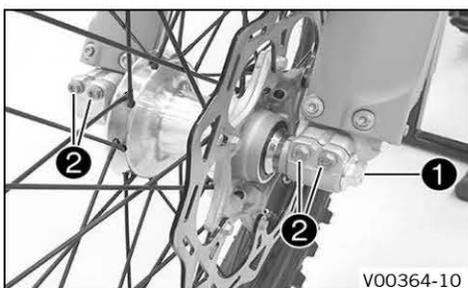
- » If the measured value is greater than the specified value:
 - Center the rim.

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

- Correct the spoke tension.

14.7 Front wheel

14.7.1 Removing the front wheel



Preparatory work

- Raise the motorcycle with the lift stand. (📖 p. 11)

Main work

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



Info

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

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



Warning

Danger of accidents Damaged brake discs reduce the braking effect.

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

- Holding the front wheel, withdraw the wheel spindle. Take the front wheel out of the fork.



Info

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

- Remove spacers ③.

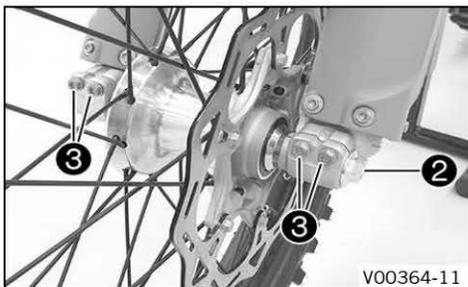
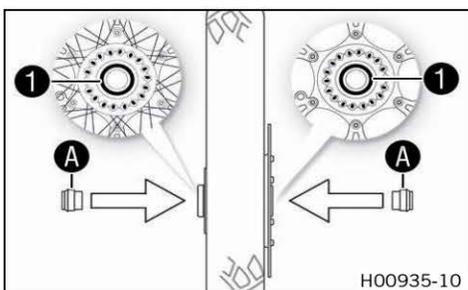
14.7.2 Installing the front wheel



Warning

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

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



- Check the wheel bearing for damage and wear.
 - » If the wheel bearing is damaged or worn:
 - Change the front wheel bearing. (📖 p. 121)
- Clean and grease shaft seal rings ① and contact surface A of the spacers.

Long-life grease (📖 p. 358)

- Insert the spacers.
- Position the front wheel and insert the wheel spindle.
 - ✓ The brake linings are correctly positioned.
- Mount and tighten screw ②.

Guideline

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

- Operate the hand brake lever several times until the brake linings are seated correctly against the brake disc.
- Remove the motorcycle from the lift stand. (📖 p. 11)
- Operate the front brake and compress the fork a few times firmly.
 - ✓ The fork legs straighten.
- Tighten screws ③.

Guideline

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

14.7.3 Changing the front brake discs

Preparatory work

- Raise the motorcycle with the lift stand. (📖 p. 11)
- Remove the front wheel. (📖 p. 120)

Main work (EXC-F EU/AU/US)

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

Guideline

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

(All EXC-F Six Days)

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

Guideline

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

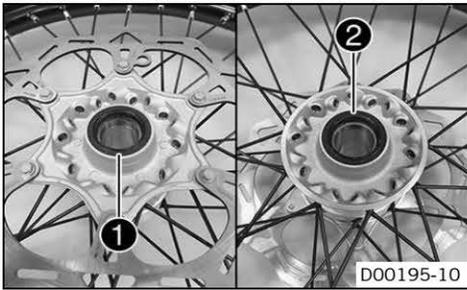
Finishing work

- Install the front wheel. (📖 p. 120)

14.7.4 Changing the front wheel bearing

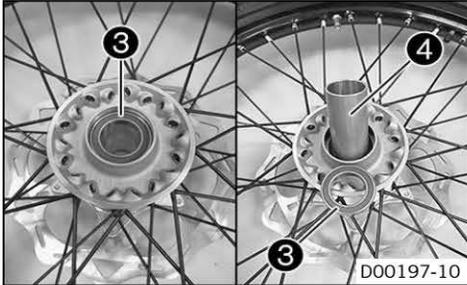
Preparatory work

- Raise the motorcycle with the lift stand. (📖 p. 11)
- Remove the front wheel. (📖 p. 120)



Main work

- Remove shaft seal rings **1** and **2**.



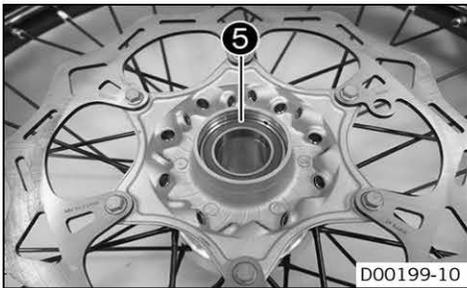
- Press out bearing **3** using a suitable tool.



Info

Spacing tube **4** can be pushed aside.

- Remove spacing tube **4**.

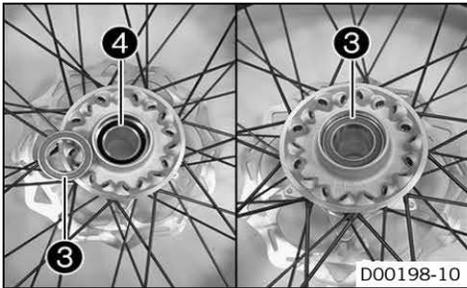


- Press out bearing **5** using a suitable tool.
- Press in the new bearing **5** all the way using a suitable tool.



Info

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

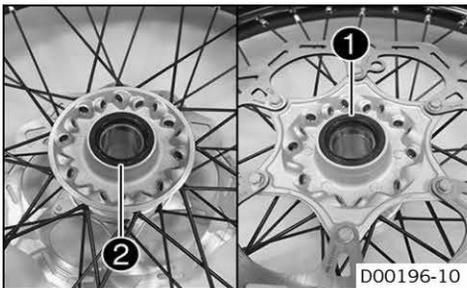


- Position spacing tube **4**.
- Press in the new bearing **3** all the way using a suitable tool.



Info

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



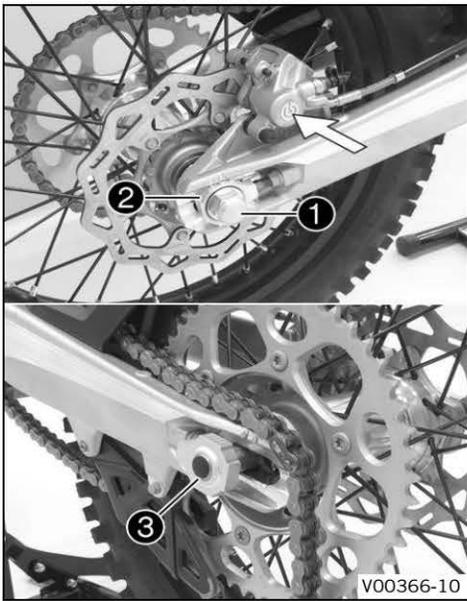
- Grease new shaft seal rings **2** and **1** and press in until they are flush.

Finishing work

- Install the front wheel. (📖 p. 120)

14.8 Rear wheel

14.8.1 Removing the rear wheel



Preparatory work

- Raise the motorcycle with the lift stand. (📖 p. 11)

Main work

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



Info

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

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



Info

Cover the components to protect them against damage.



Warning

Danger of accidents Damaged brake discs reduce the braking effect.

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

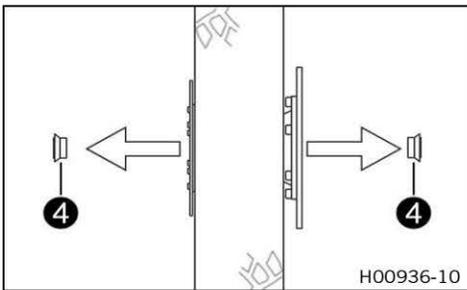
- Holding the rear wheel, withdraw the wheel spindle. Take the rear wheel out of the swingarm.



Info

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

- Remove spacers ④.



14.8.2 Installing the rear wheel



Warning

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

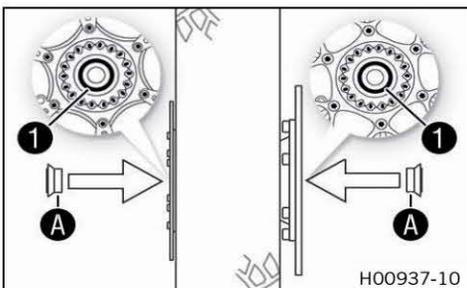
- Always keep the brake discs free of oil and grease.
- Clean the brake discs with brake cleaner when necessary.

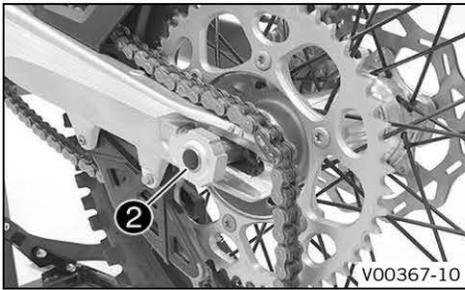
Main work

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

Long-life grease (📖 p. 358)

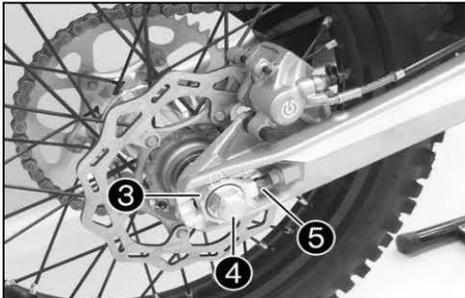
- Insert the spacers.





V00367-10

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



- Position chain adjuster ❸. Mount nut ❹, but do not tighten it yet.
- Make sure that chain adjusters ❸ are fitted correctly on adjusting screws ❺.
- Check the chain tension. (📖 p. 126)
- Tighten nut ❹.

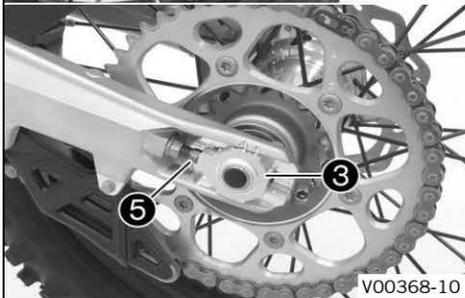
Guideline

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



Info

The wide adjustment range of the chain adjusters (32 mm (1.26 in)) enables different secondary ratios with the same chain length. Chain adjusters ❸ can be turned by 180°.



V00368-10

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

Finishing work

- Remove the motorcycle from the lift stand. (📖 p. 11)

14.8.3 Changing the rear brake disc

Preparatory work

- Raise the motorcycle with the lift stand. (📖 p. 11)
- Remove the rear wheel. (📖 p. 123)

Main work (EXC-F EU/AU/US)

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

Guideline

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



D02132-10

(All EXC-F Six Days)

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

Guideline

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



D02133-10

Finishing work

- Install the rear wheel. (📖 p. 123)
- Remove the motorcycle from the lift stand. (📖 p. 11)

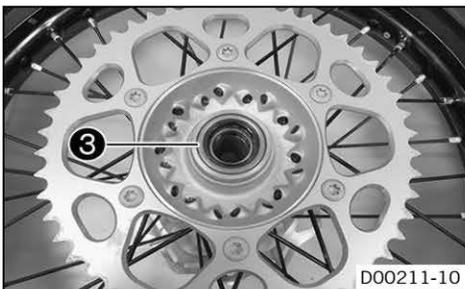
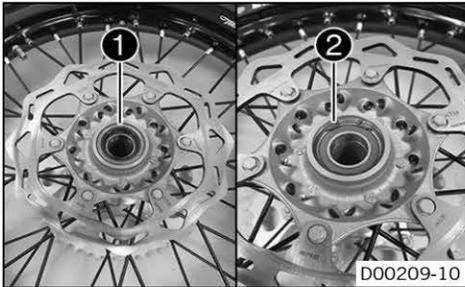
14.8.4 Changing the rear wheel bearing

Preparatory work

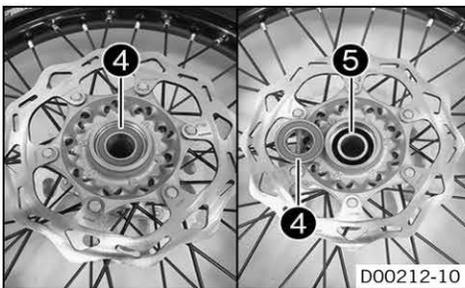
- Raise the motorcycle with the lift stand. (📖 p. 11)
- Remove the rear wheel. (📖 p. 123)

Main work

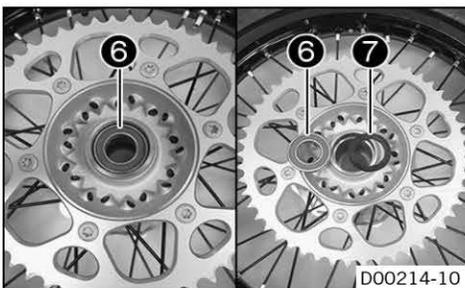
- Remove shaft seal ring **1**.
- Remove lock ring **2**.



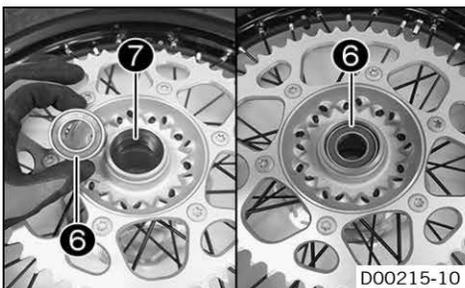
- Remove shaft seal ring **3**.



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



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

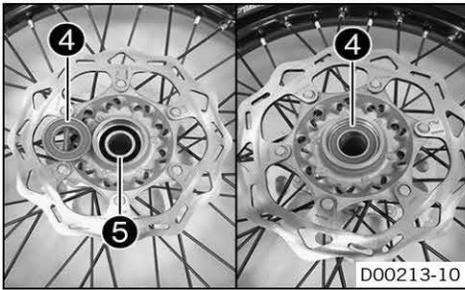


- Position spacer washer **7**.
- Press new bearing **6** all the way in from the outside to the inside.



Info

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



- Clean, grease, and mount spacing tube 5.

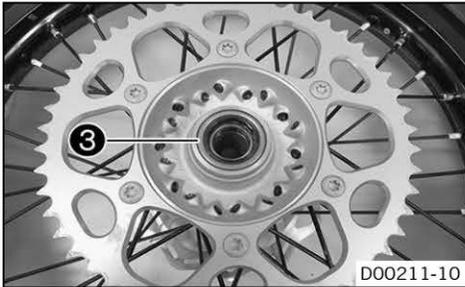
Long-life grease (📖 p. 358)

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

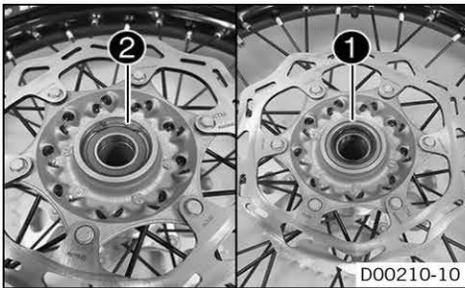


Info

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



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



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

Finishing work

- Install the rear wheel. (📖 p. 123)
- Remove the motorcycle from the lift stand. (📖 p. 11)

14.8.5 Checking the chain tension



Warning

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

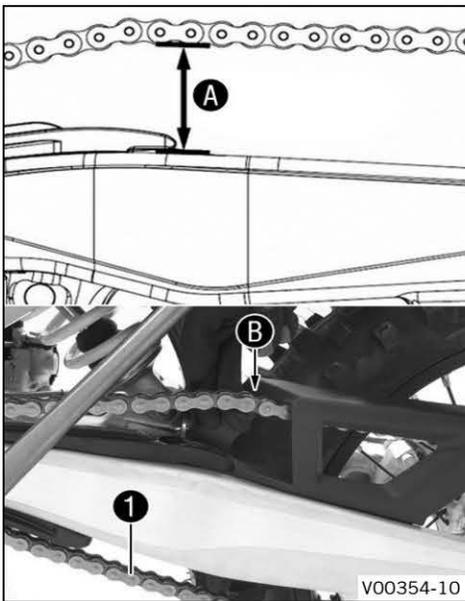
If the chain is tensioned too much, the chain, engine sprocket, rear sprocket, transmission and rear wheel bearings wear more quickly. Some components may break if overloaded.

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 motorcycle with the lift stand. (📖 p. 11)



Main work

- Pull the chain at the end of the chain sliding component upwards to measure chain tension **A**.

i Info

The lower chain section **1** must be taut.
 When the chain guard is mounted, it must be possible to pull up the chain at least to the point where it makes contact with chain guard **B**.
 Chain wear is not always even, so you should repeat this measurement at different chain positions.

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

- » If the chain tension does not meet specifications:
 - Adjust the chain tension. (📖 p. 127)

Finishing work

- Remove the motorcycle from the lift stand. (📖 p. 11)

14.8.6 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 motorcycle with the lift stand. (📖 p. 11)
- Check the chain tension. (📖 p. 126)

Main work

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

Guideline

Chain tension	55... 58 mm (2.17... 2.28 in)	
Turn adjusting screws 3 on the left and right so that the markings on the left and right chain adjusters are in the same position relative to reference marks A . The rear wheel is then correctly aligned.		

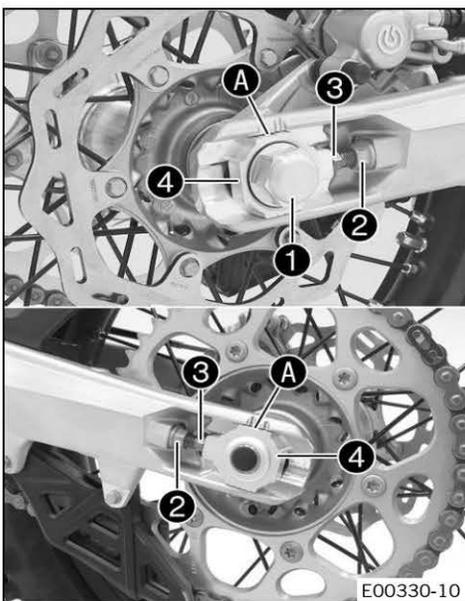
- Tighten nuts **2**.
- Make sure that the chain adjusters **4** are fitted correctly on the adjusting screws **3**.
- Tighten nut **1**.

Guideline

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

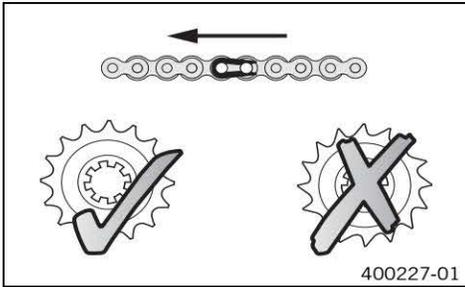
The wide adjustment range of the chain adjusters (32 mm (1.26 in)) enables different secondary ratios with the same chain length.
 Chain adjusters **4** can be turned by 180°.



Finishing work

- Remove the motorcycle from the lift stand. (📖 p. 11)

14.8.7 Checking the chain, rear sprocket, motor sprocket, and chain guide



Preparatory work

- Raise the motorcycle with the lift stand. (📖 p. 11)

Main work

- Shift the transmission to idle.
- Check the rear sprocket and motor sprocket for wear.
 - » If the rear sprocket and motor sprocket are worn:
 - Change the drivetrain kit. (📖 p. 130)



Info

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

- Pull at the top part of the chain with the specified weight **A**.

Guideline

Weight of chain wear measurement	10... 15 kg (22... 33 lb.)
----------------------------------	----------------------------

- Measure the distance **B** of 18 chain links in the lower chain section.



Info

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

Maximum distance B at the longest chain section	272 mm (10.71 in)
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- » If distance **B** is greater than the specified measurement:

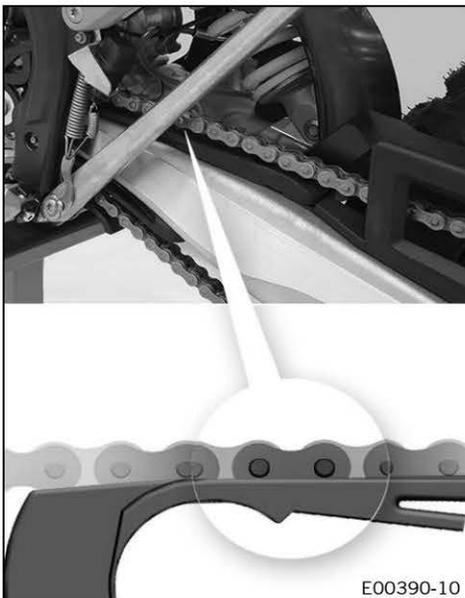
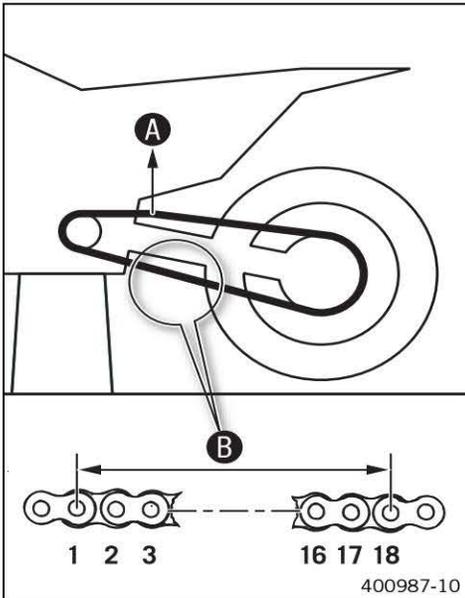
- Change the drivetrain kit. (📖 p. 130)



Info

When the chain is replaced, the rear sprocket and engine sprocket should also be changed.

New chains wear out faster on old, worn sprockets.



- Check the chain sliding guard for wear.
 - » If the lower edge of the chain pin is at the level of or below the chain sliding guard:
 - Change the chain sliding guard.

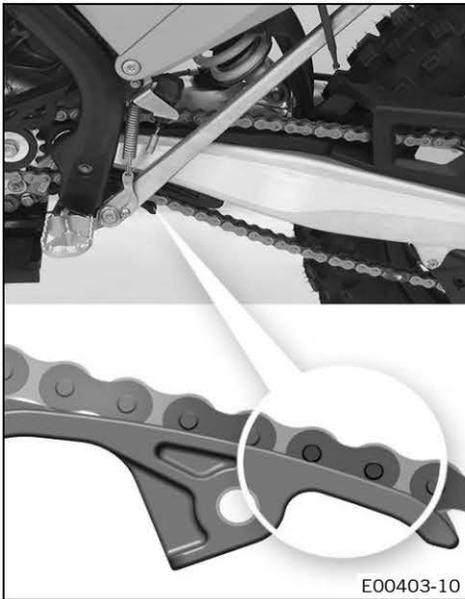
- Check that the chain sliding guard is firmly seated.

- » If the chain sliding guard is loose:

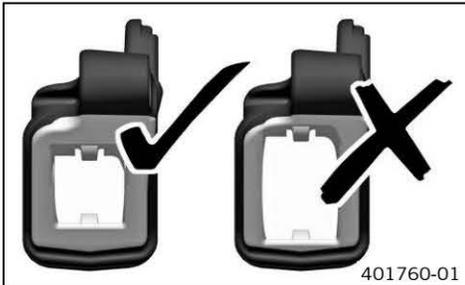
- Tighten the screws on the chain sliding guard.

Guideline

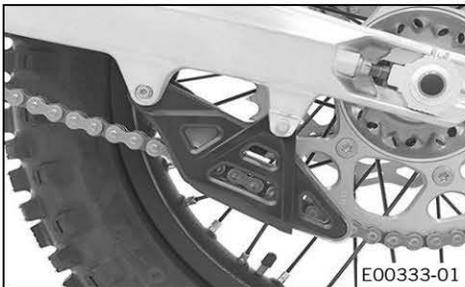
Screw, chain sliding guard	M6	14 Nm (10.3 lbf ft)	Loctite® 243™
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E00403-10



401760-01



E00333-01

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

Guideline

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

- Check the chain guide for wear.



Info

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

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

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

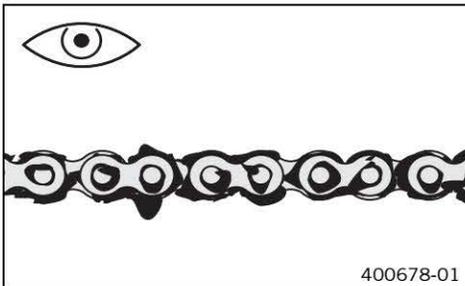
Guideline

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

Finishing work

- Remove the motorcycle from the lift stand. (📖 p. 11)

14.8.8 Checking for chain dirt accumulation



400678-01

- Check the chain for coarse dirt accumulation.
 - » If the chain is very dirty:
 - Clean the chain. (📖 p. 129)

14.8.9 Cleaning the chain



Warning

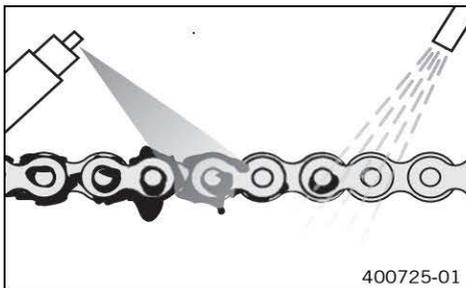
Danger of accidents Oil or grease on the tires reduces the road grip.

- Remove the lubricant 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.

- Warning**
Environmental hazard Hazardous substances cause environmental damage.
- Dispose of oils, grease, filters, fuel, cleaning agents, brake fluid, etc., correctly and in compliance with the applicable regulations.

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



Preparatory work

- Raise the motorcycle with the lift stand. (📖 p. 11)

Main work

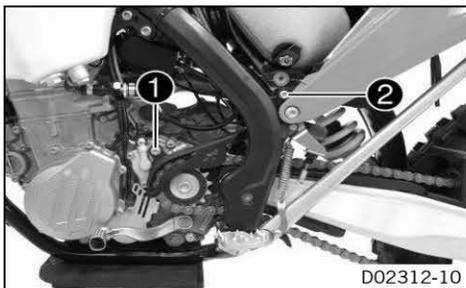
- Clean the chain regularly and then treat with chain spray.

Chain cleaner (📖 p. 358)
Off-road chain spray (📖 p. 359)

Finishing work

- Remove the motorcycle from the lift stand. (📖 p. 11)

14.8.10 Changing the drivetrain kit

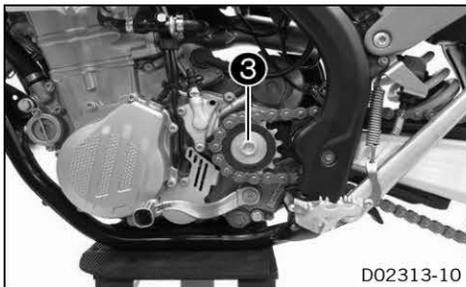


Preparatory work

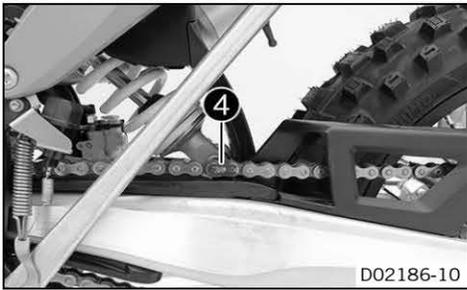
- Raise the motorcycle with the lift stand. (📖 p. 11)
- Remove the air filter box cover. (📖 p. 98)

Main work

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



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



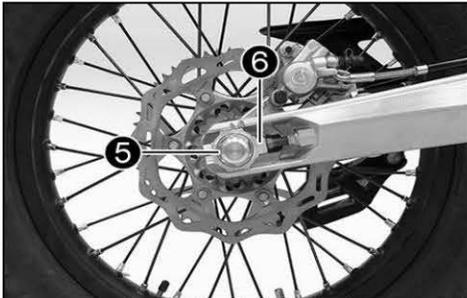
- Remove connecting link 4 of the chain.



Info

Cover the components to protect them against damage.

- Take off the chain.



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

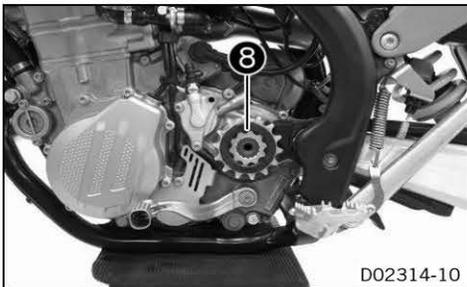


Info

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



- Remove engine sprocket 8.

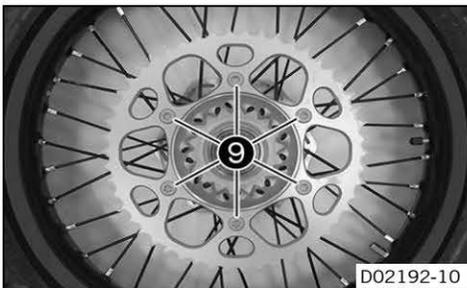


(EXC-F EU/AU/US)

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

Guideline

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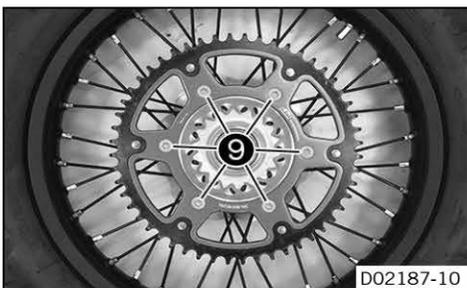


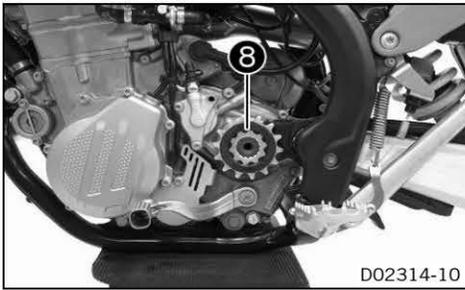
(All EXC-F Six Days)

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

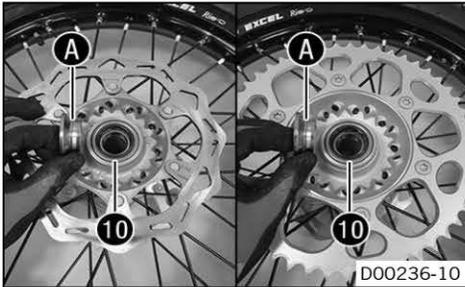
Guideline

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





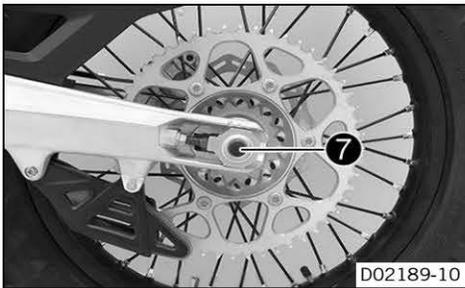
- Slide new engine sprocket **8** onto the countershaft.



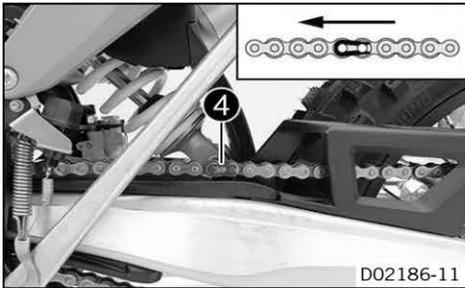
- Check the wheel bearing for damage and wear.
 - » If the wheel bearing is damaged or worn:
 - Change the rear wheel bearing. (📖 p. 125)
- Remove the spacers.
- Clean and grease shaft seal rings **10** and contact surface **A** of the spacers.

Long-life grease (📖 p. 358)

- Insert the spacers.



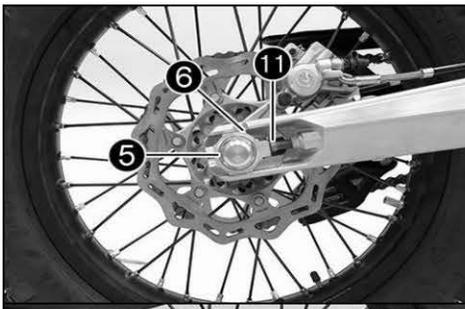
- Position the rear wheel.
 - ✓ The brake linings are correctly positioned.
- Insert wheel spindle **7**.



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

Guideline

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



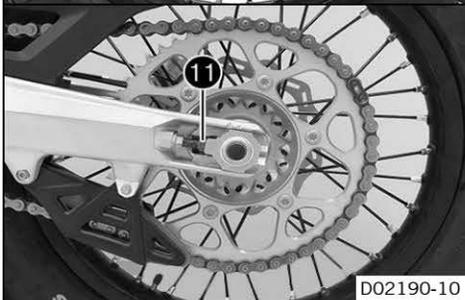
- Position chain adjuster **6**. Mount nut **5**, but do not tighten it yet.
- Make sure that chain adjusters **6** are fitted correctly on adjusting screws **11**.
- Check the chain tension. (📖 p. 126)
- Tighten nut **5**.

Guideline

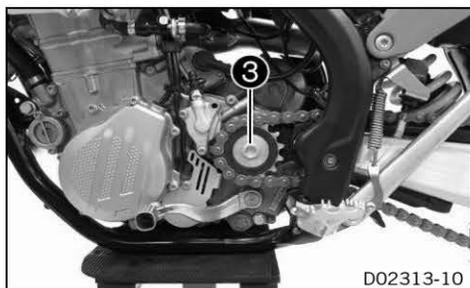
Nut, rear wheel spindle	M20x1.5	80 Nm (59 lbf ft)
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i Info

The wide adjustment range of the chain adjusters enables different secondary ratios with the same chain length.
Chain adjusters **6** can be turned by 180°.



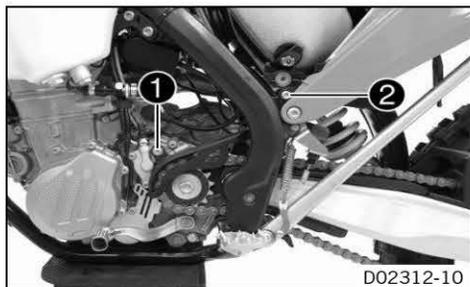
- Operate the rear brake lever several times until the brake linings are in contact with the brake disc and there is a pressure point.



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

Guideline

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



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

Guideline

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

- Mount and tighten screw ②.

Guideline

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

Finishing work

- Install the air filter box cover. (📖 p. 98)
- Remove the motorcycle from the lift stand. (📖 p. 11)

15.1 Changing the main fuse

- Warning**
Fire hazard Incorrect fuses overload the electrical system.
- Only use fuses with the required ampere value.
 - Do not bypass or repair fuses.

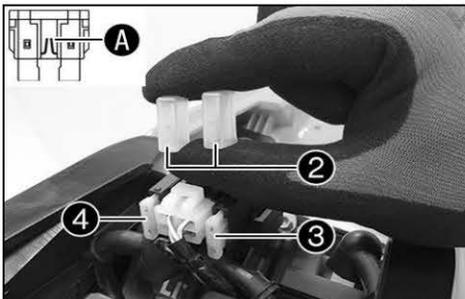
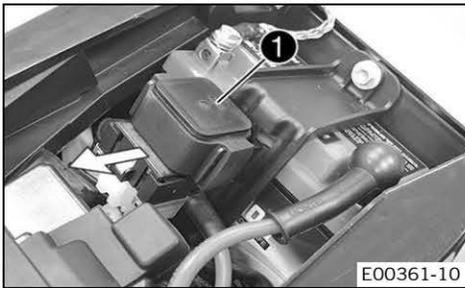
i Info
 The main fuse protects all power consumers of the vehicle.

Preparatory work

- Switch off all power consumers and switch off the engine.
- Remove the seat. (📖 p. 101)

Main work

- Pull starter relay **1** from the holder.



- Take off protection caps **2**.
- Remove faulty main fuse **3**.

i Info
 You can recognize a defective fuse by a burned-out fuse wire **A**.
 A spare fuse **4** is located in the starter relay.

- Install a new main fuse.
- Fuse (58011109120) (📖 p. 265)
- Check that the electrical equipment is functioning properly.

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

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



Finishing work

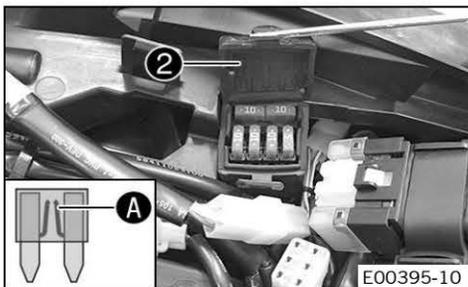
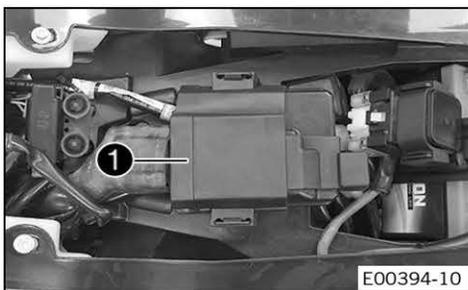
- Mount the seat. (📖 p. 102)

15.2 Changing the fuses of individual power consumers

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

Preparatory work

- Switch off all power consumers and switch off the engine.
- Remove the seat. (📖 p. 101)



Main work

- Pull EFI control unit **1** from the holder and hang it to one side.

- Open fuse box cover **2**.
- Remove the defective fuse.

Guideline

(EXC-F EU, EXC-F Six Days EU)

Fuse **1** - 10 A - EFI control unit, lambda sensor, speedometer, combination switch (optional), fuel injection, diagnostics connector, fuse **4**

(EXC-F AU)

Fuse **1** - 10 A - EFI control unit, speedometer, combination switch (optional), fuel injection, diagnostics connector, fuse **4**

(All US models)

Fuse **1** - 10 A - EFI control unit, speedometer, fuel injection, diagnostics connector, fuse **4**

Fuse **2** - 10 A - high beam, low beam, parking light, tail light, license plate lamp

Fuse **3** - 10 A - radiator fan, horn, brake light, turn signal

Fuse **4** - 5 A - fuel pump

Fuses **res** - 10 A - spare fuse



Info

You can recognize a defective fuse by a burned-out fuse wire **A**.



Warning

Fire hazard Incorrect fuses overload the electrical system.

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

- Use spare fuses with the correct rating only.

Fuse (75011088010) (📖 p. 265)

Fuse (58011109105) (📖 p. 265)



Tip

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

- Check that the power consumer is functioning properly.
- Close the fuse box cover.
- Mount EFI control unit **1** on the holder.

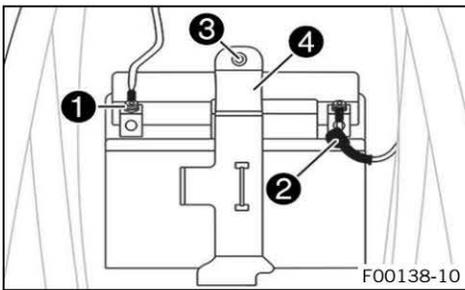
Finishing work

- Mount the seat. (📖 p. 102)

15.3 Removing the battery

Warning
Risk of injury Batteries contain harmful substances.

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



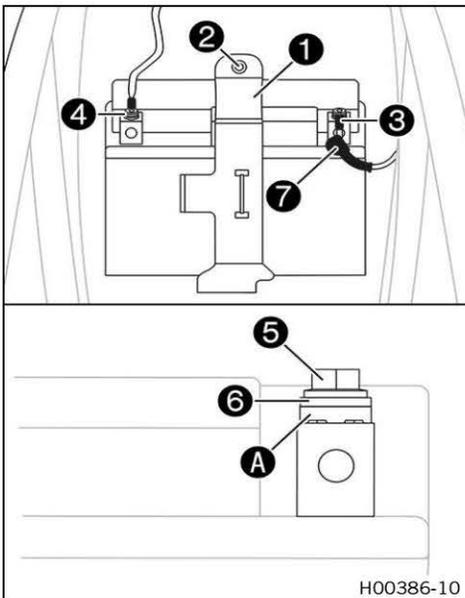
Preparatory work

- Switch off all power consumers and switch off the engine.
- Remove the seat. (📖 p. 101)

Main work

- Disconnect negative cable ① from the battery.
- Pull back positive terminal cover ② and disconnect the positive cable from the battery.
- Remove screw ③.
- Pull holding bracket ④ forward and remove battery toward the top.

15.4 Installing the battery



Main work

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

Battery (HJTZ5S-FP) (📖 p. 265)

- Mount and tighten screw ②.

Guideline

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

- Connect positive cable ③ to the battery.

Guideline

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

- Slide positive terminal cover ⑦ over the positive terminal.
- Connect negative cable ④ to the battery.

Guideline

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

Contact disks A must be mounted under screws ⑤ and cable sockets ⑥ with the claws toward the battery terminal.

Finishing work

- Mount the seat. (📖 p. 102)

15.5 Recharging the battery

Warning
Risk of injury Batteries contain harmful substances.

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

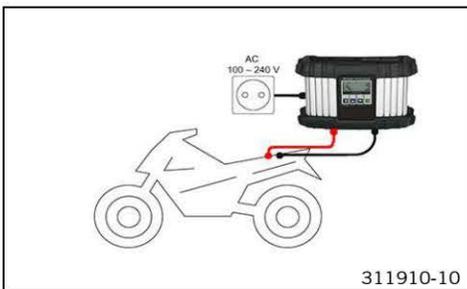
Warning
Environmental hazard Batteries contain environmentally-hazardous materials.

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

Warning
Environmental hazard Hazardous substances cause environmental damage.

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

Info
 Even when there is no load on the battery, it discharges steadily.
 The charging level and the method of charging are very important for the service life of the 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 battery will be destroyed.
 If the battery is depleted from starting the vehicle repeatedly, the battery must be charged immediately.
 If the battery is left in a discharged state for an extended period, it will become over-discharged and sulfated, destroying the battery.
 The battery is maintenance-free.



Preparatory work
 - Remove the seat. (🔧 p. 101)

Main work
 - Connect the battery charger to the battery. Set the battery charger.

Alternative 1
 Battery charger **XCharge-professional** EU (00029095050) (🔧 p. 360)

Alternative 2
 Battery charger **XCharge-professional** US (00029095051) (🔧 p. 360)

Alternative 3
 Battery charger **XCharge-professional** GB (00029095052) (🔧 p. 361)

Alternative 4
 Battery charger **XCharge-professional** CH (00029095053) (🔧 p. 361)

Info
 Follow the instructions of the charger and the manual.

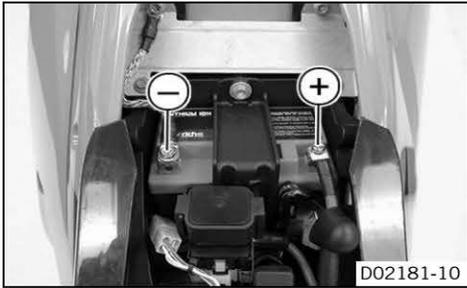
- Disconnect the battery charger after charging the battery.

Guideline

The charging current, charging voltage, and charging time must not be exceeded.	
Charge the battery regularly when the motorcycle is not in use	3 months

Finishing work
 - Mount the seat. (🔧 p. 102)

15.6 Checking the charging voltage



Condition

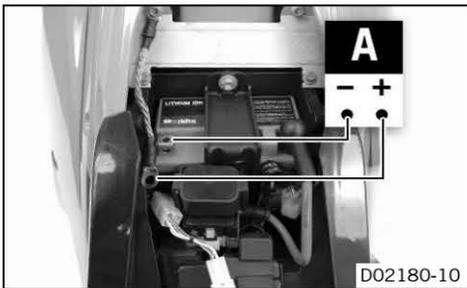
The battery must be fully functional and completely charged.

- Carry out the start procedure. (📖 p. 11)
- **V** Measure the voltage between the specified points.
Measuring point **Plus (+)** – Measuring point **Ground (-)**

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

- » If the displayed value is less than the specified value:
 - Check the plug-in connections from the alternator to the voltage regulator.
 - Check the plug-in connectors from the voltage regulator to the wiring harness.
 - Check the stator winding of the alternator. (📖 p. 252)
- » If the displayed value is greater than the specified value:
 - Change the voltage regulator.

15.7 Checking the quiescent current



Preparatory work

- Switch off all power consumers and switch off the engine.
- Remove the seat. (📖 p. 101)

Main work

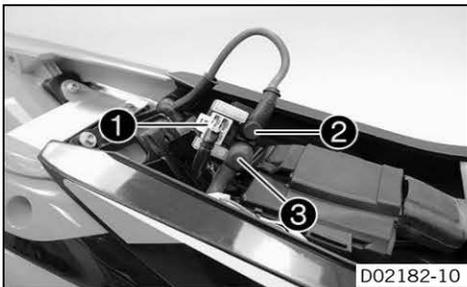
- Disconnect the negative cable from the battery.
- Measure the current between battery ground (-) and the negative cable.

i Info
The value of the quiescent current applies only to vehicles in the original state, i.e. without additional power consumers.

Maximum closed-circuit current	< 1.0 mA
--------------------------------	----------

- » If the measured value is higher than the specified value:
 - Disconnect the voltage regulator from the wiring harness and perform the measurement again.

15.8 Checking the starter relay

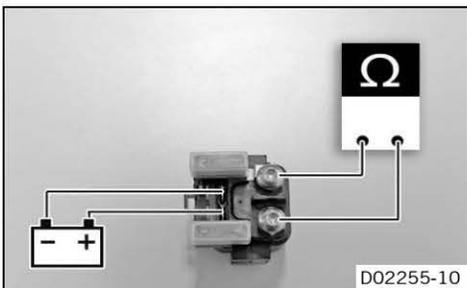


Preparatory work

- Switch off all power consumers and switch off the engine.
- Remove the seat. (📖 p. 101)

Main work

- Disconnect the negative cable of the battery.
- Pull the starter relay off of the bracket.
- Pull off connector **1**.
- Disconnect cables **2** and **3** on the starter relay.



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

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

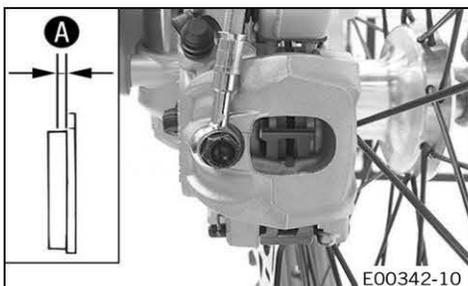
- » If the value displayed does not meet specifications:
 - Change the starter relay.

16.1 Checking the front brake linings

**Warning**

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

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



- Check the brake linings for minimum thickness **A**.

Minimum thickness A	≥ 1 mm (≥ 0.04 in)
----------------------------	--------------------

- » If the minimum thickness is less than specified:
 - Change the front brake linings. (📖 p. 139)
- Check the brake linings for damage and cracking.
 - » If damage or cracking is visible:
 - Change the front brake linings. (📖 p. 139)

16.2 Changing the front brake linings

**Warning**

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

- Ensure that service work and repairs are performed professionally.

**Warning**

Skin irritation Brake fluid causes skin irritation.

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

**Warning**

Danger of accidents Old brake fluid reduces the braking effect.

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

**Warning**

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

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

**Warning**

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

Not all brake linings are tested and approved for KTM motorcycles. The structure and friction coefficient of the brake linings, and thus their brake power, may vary greatly from that of original brake linings.

If brake linings are used that differ from the original equipment, compliance with the original homologation is not guaranteed. In this case, the vehicle no longer corresponds to its condition at delivery and the warranty shall be void.

- Only use brake linings approved and recommended by KTM.

**Warning**

Environmental hazard Hazardous substances cause environmental damage.

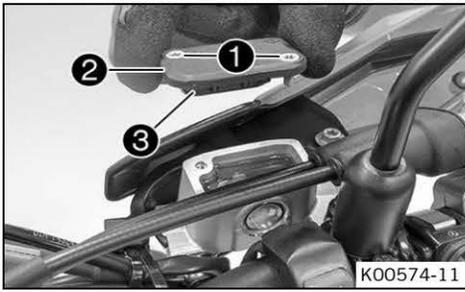
- Dispose of oils, grease, filters, fuel, cleaning agents, brake fluid, etc., correctly and in compliance with the applicable regulations.

**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.

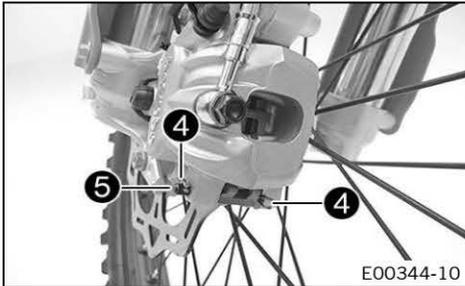


- Move the brake fluid reservoir mounted on the handlebar to a horizontal position.
- Remove screws 1.
- Remove cover 2 with membrane 3.
- Press the brake caliper onto the brake disc by hand in order to push back the brake pistons. Ensure that brake fluid does not flow out of the brake fluid reservoir, extracting it by suction if it does.

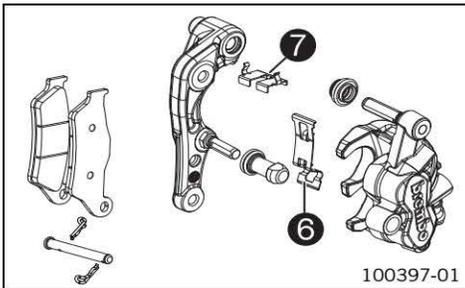


Info

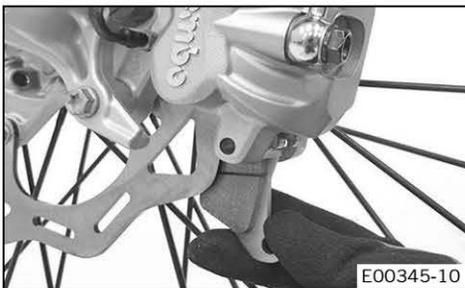
Make sure that you do not press the brake caliper against the spokes when pushing back the brake pistons.



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



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



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



Info

Always change the brake linings in pairs.

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



- Correct the brake fluid quantity to level A.

Guideline

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

Brake fluid DOT 4 / DOT 5.1 (p. 356)

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



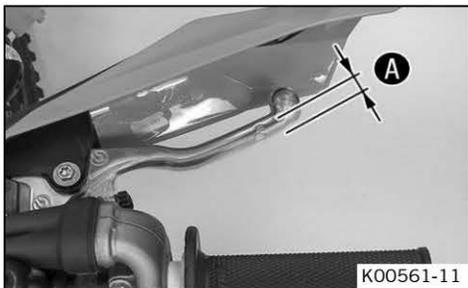
Info

Clean up overflowed or spilled brake fluid immediately with water.

16.3 Checking free travel of hand brake lever

Warning
Danger of accidents The brake system fails in the event of overheating.
 If there is no free travel on the hand brake lever, pressure builds up on the front brake circuit.

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

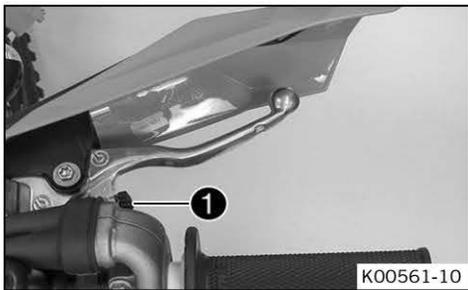


- Push the hand brake to the handlebar and check free travel **A**.

Free travel of hand brake lever	$\geq 3 \text{ mm } (\geq 0.12 \text{ in})$
---------------------------------	---

- » If the free travel does not meet specifications:
 - Adjust the free travel of the hand brake lever. (📖 p. 141)

16.4 Adjusting free travel of hand brake lever



- Check the free travel of the hand brake lever. (📖 p. 141)
- Adjust the free travel of the hand brake lever with adjusting screw **1**.

i Info
 Turn the adjusting screw clockwise to reduce free travel. The pressure point moves away from the handlebar.
 Turn the adjusting screw counterclockwise to increase free travel. The pressure point moves towards the handlebar.
 The range of adjustment is limited.
 Turn the adjusting screw by hand only, and do not apply any force.
 Do not make any adjustments while riding!

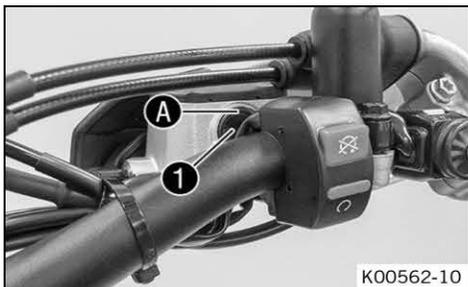
16.5 Checking the brake fluid level of the front brake

Warning
Danger of accidents An insufficient brake fluid level will cause the brake system to fail.
 If the brake fluid level drops below the specified marking or the specified value, the brake system is leaking or the brake linings are worn down.

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

Warning
Danger of accidents Old brake fluid reduces the braking effect.

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



- Move the brake fluid reservoir mounted on the handlebar to a horizontal position.
- Check the brake fluid level in level viewer **1**.
 - » If the brake fluid level has dropped below marking **A**:
 - Add front brake fluid. (📖 p. 142)

16.6 Adding front brake fluid

Warning
Danger of accidents An insufficient brake fluid level will cause the brake system to fail.
 If the brake fluid level drops below the specified marking or the specified value, the brake system is leaking or the brake linings are worn down.

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

Warning
Skin irritation Brake fluid causes skin irritation.

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

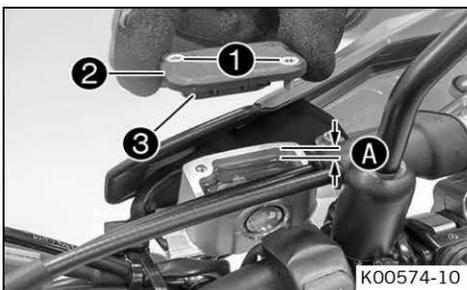
Warning
Danger of accidents Old brake fluid reduces the braking effect.

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

Warning
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. 139)

Main work
 - Move the brake fluid reservoir mounted on the handlebar to a horizontal position.
 - Remove screws ①.
 - Remove cover ② with membrane ③.
 - Add brake fluid to level A.

Guideline

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

Brake fluid DOT 4 / DOT 5.1 (📖 p. 356)

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

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

16.7 Changing the front brake fluid

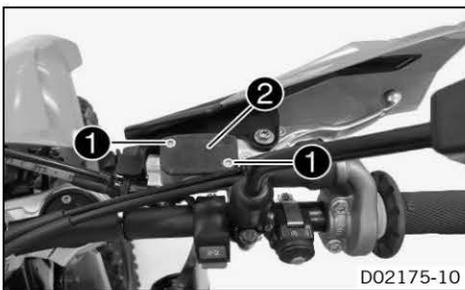
Warning
Skin irritation Brake fluid causes skin irritation.

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

Warning
Environmental hazard Hazardous substances cause environmental damage.

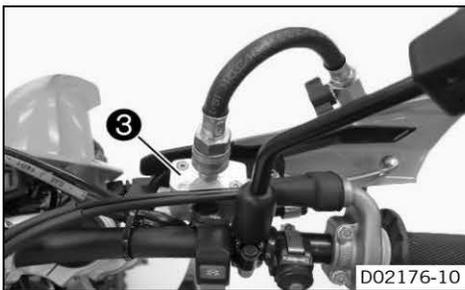
- Dispose of oils, grease, filters, fuel, cleaning agents, brake fluid, etc., correctly and in compliance with the applicable regulations.

Info
 Avoid contact between brake fluid and painted parts. Brake fluid attacks paint!
 Use only clean brake fluid from a sealed container.



- Move the brake fluid reservoir mounted on the handlebar to a horizontal position.
- Cover the painted parts.
- Remove screws **1**.
- Remove cover **2** with membrane.
- Draw the old brake fluid out of the brake fluid reservoir using a syringe and fill with fresh brake fluid.

Bleed syringe (50329050000) (📖 p. 362)
Brake fluid DOT 4 / DOT 5.1 (📖 p. 356)

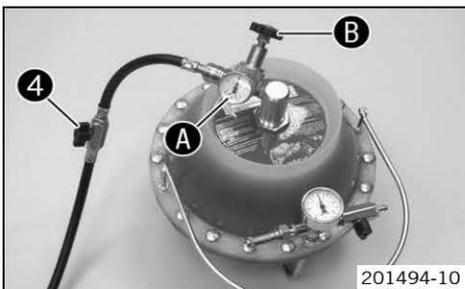


- Mount bleeder cover **3**.

Bleeder cover (00029013005) (📖 p. 360)
--

- Connect the bleeding device.

Bleeding device (00029013100) (📖 p. 360)
--



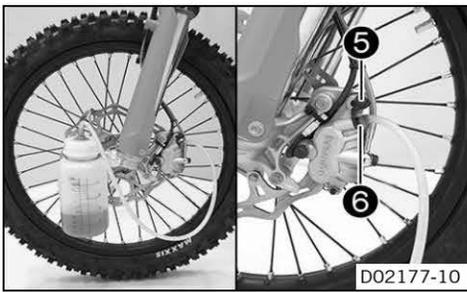
- Open shut-off valve **4**.

Info
 Follow the operating instructions of the bleeding device.

- Ensure that the filling pressure is correctly set at pressure gauge **A**. If necessary, adjust the filling pressure at pressure regulator **B**.

Guideline

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



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

Bleeding device (00029013100) (📖 p. 360)
--

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



Info

Bleed until fresh brake fluid emerges from the bleeder bottle hose without bubbles.

- Tighten the bleeder screw.
- Close shut-off valve **4**.
- Open the bleeder screw again until no more brake fluid emerges.



Info

This prevents overfilling of the brake fluid reservoir.

- Tighten the bleeder screw. Remove the hose of the bleeder bottle. Mount the protection cap.
- Disconnect the bleeding device. Remove the bleeder cover.
- Correct the brake fluid to level **C**.

Guideline

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

Brake fluid DOT 4 / DOT 5.1 (📖 p. 356)
--

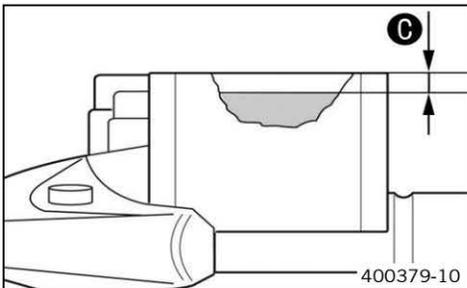
- Position the cover with the membrane. Mount and tighten the screws.



Info

Clean up overflowed or spilt brake fluid immediately with water.

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



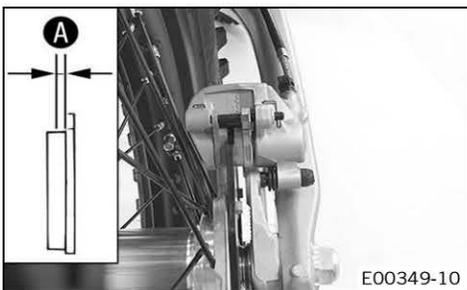
16.8 Checking the rear brake linings



Warning

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

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



- 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. 144)

- Check the brake linings for damage and cracking.

» If damage or cracking is visible:

- Change the rear brake linings. (📖 p. 144)

16.9 Changing the rear brake linings



Warning

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

- Ensure that service work and repairs are performed professionally.



Warning

Skin irritation Brake fluid causes skin irritation.

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



Warning

Danger of accidents Old brake fluid reduces the braking effect.

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



Warning

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

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



Warning

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

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

- Only use brake linings approved and recommended by KTM.



Warning

Environmental hazard Hazardous substances cause environmental damage.

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



Info

Never use DOT 5 brake fluid. It is silicone-based and purple in color. Oil seals and brake lines are not designed for DOT 5 brake fluid. Avoid contact between brake fluid and painted parts. Brake fluid attacks paint. Only use clean brake fluid from a sealed container.

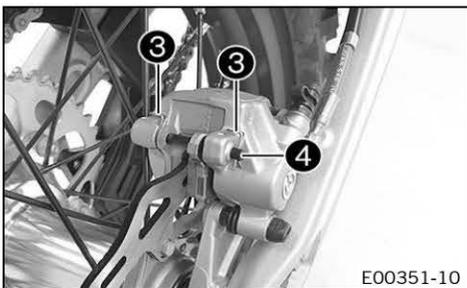


- Stand the vehicle upright.
- Remove screw cap ① with membrane ② and the O-ring.
- Press the brake piston back to its basic position and make sure that no brake fluid overflows from the brake fluid reservoir, extracting it if necessary.

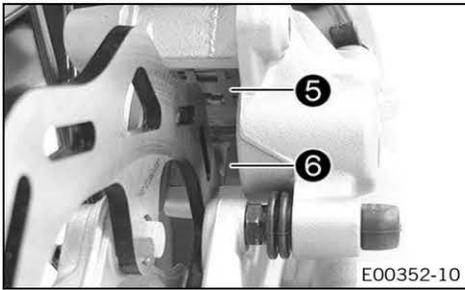


Info

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

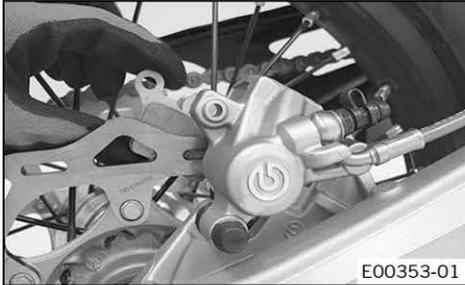


- Remove cotter pins ③, pull out pin ④, and remove the brake linings.
- Clean the brake caliper and brake caliper support.



E00352-10

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



E00353-01

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



Info

Always change the brake linings in pairs.

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



- Add brake fluid to level **A**.

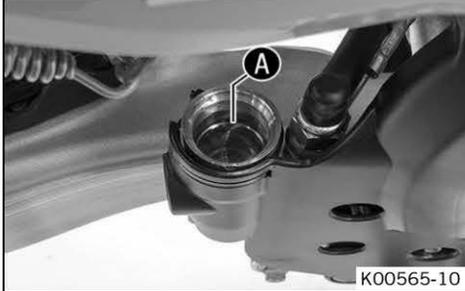
Brake fluid DOT 4 / DOT 5.1 (📖 p. 356)
--

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



Info

Clean up overflowed or spilled brake fluid immediately with water.



K00565-10

16.10 Checking the free travel of foot brake lever

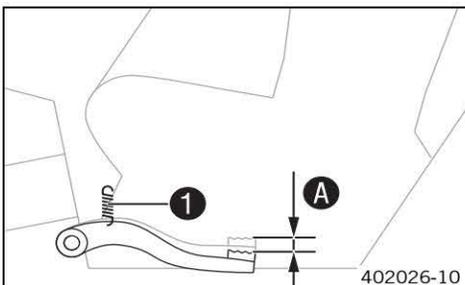


Warning

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

If there is no free travel on the foot brake lever, pressure builds up in the brake system on the rear brake.

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



402026-10

- Disconnect spring **1**.
- Move the foot brake lever back and forth between the end stop and the contact to the foot brake cylinder piston and check free travel **A**.

Guideline

Free travel at foot brake lever	3... 5 mm (0.12... 0.2 in)
---------------------------------	----------------------------

» If the free travel does not meet specifications:

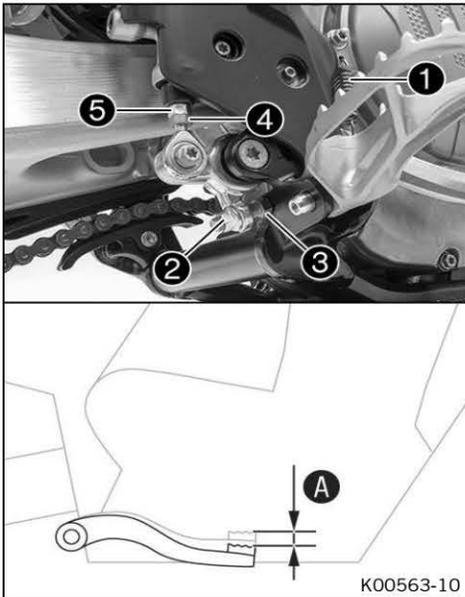
- Adjust the basic position of the foot brake lever. (📖 p. 147)

- Reconnect spring **1**.

16.11 Adjusting the basic position of the foot brake lever

Warning
Danger of accidents The brake system fails in the event of overheating.
 If there is no free travel on the foot brake lever, pressure builds up in the brake system on the rear brake.

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



- Disconnect spring ①.
- Loosen nut ④ and, with push rod ⑤, turn it back until you have maximum free travel.
- To adjust the basic position of the foot brake lever individually, loosen nut ② and turn screw ③ accordingly.

i Info
 The range of adjustment is limited.

- Turn push rod ⑤ accordingly until you have free travel A. If necessary, adjust the basic position of the foot brake lever.

Guideline

Free travel at foot brake lever	3... 5 mm (0.12... 0.2 in)
---------------------------------	----------------------------

- Hold screw ③ and tighten nut ②.

Guideline

Nut, foot brake lever stop	M8	20 Nm (14.8 lbf ft)
----------------------------	----	---------------------

- Hold push rod ⑤ and tighten nut ④.

Guideline

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

- Reconnect spring ①.

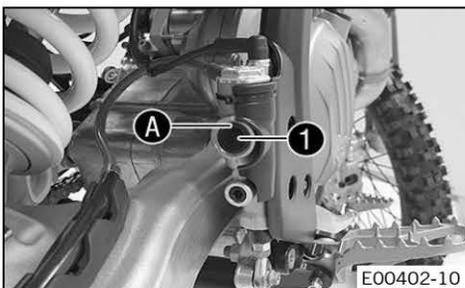
16.12 Checking the rear brake fluid level

Warning
Danger of accidents An insufficient brake fluid level will cause the brake system to fail.
 If the brake fluid level drops below the specified marking or the specified value, the brake system is leaking or the brake linings are worn down.

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

Warning
Danger of accidents Old brake fluid reduces the braking effect.

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



- Stand the vehicle upright.
- Check the brake fluid level in level viewer ①.
 - » If the brake fluid level has dropped below marking A:
 - Add rear brake fluid. (📖 p. 148)

16.13 Adding rear brake fluid

Warning
Danger of accidents An insufficient brake fluid level will cause the brake system to fail.
 If the brake fluid level drops below the specified marking or the specified value, the brake system is leaking or the brake linings are worn down.

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

Warning
Skin irritation Brake fluid causes skin irritation.

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

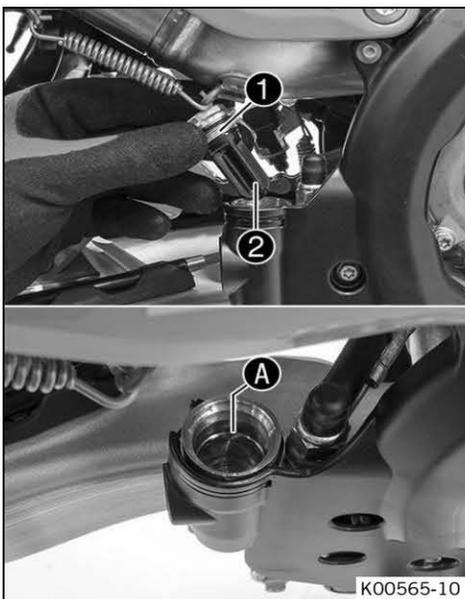
Warning
Danger of accidents Old brake fluid reduces the braking effect.

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

Warning
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 rear brake linings. (📖 p. 144)

Main work

- Stand the vehicle upright.
- Remove screw cap 1 with membrane 2 and the O-ring.
- Add brake fluid to level A.

Brake fluid DOT 4 / DOT 5.1 (📖 p. 356)

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

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

K00565-10

16.14 Changing the rear brake fluid

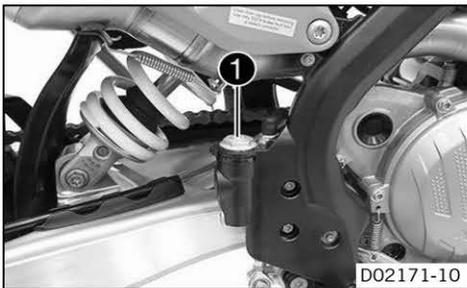
Warning
Skin irritation Brake fluid causes skin irritation.

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

Warning
Environmental hazard Hazardous substances cause environmental damage.

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

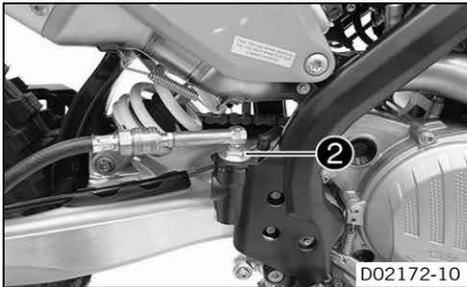
Info
 Avoid contact between brake fluid and painted parts. Brake fluid attacks paint!
 Use only clean brake fluid from a sealed container.



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

Bleed syringe (50329050000) (📖 p. 362)
--

Brake fluid DOT 4 / DOT 5.1 (📖 p. 356)
--

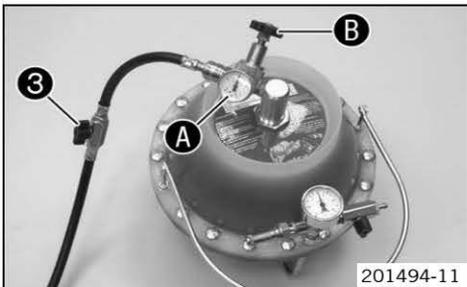


- Mount bleeder cover 2.

Bleeder cover (00029013006) (📖 p. 360)
--

- Connect the bleeding device.

Bleeding device (00029013100) (📖 p. 360)
--



- Open shut-off valve 3.

Info
 Follow the operating instructions of the bleeding device.

- Ensure that the filling pressure is correctly set at pressure gauge A. If necessary, adjust the filling pressure at pressure regulator B.

Guideline

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



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

Bleeding device (00029013100) (📖 p. 360)

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



Info

Bleed until new brake fluid emerges from the bleeder bottle hose without bubbles.

- Tighten the bleeder screw.
- Close shut-off valve ③.
- Open the bleeder screw again until no more brake fluid emerges.



Info

This prevents overfilling of the brake fluid reservoir.

- Tighten the bleeder screw. Remove the hose of the bleeder bottle. Mount the protection cap.
- Disconnect the bleeding device. Remove the bleeder cover.
- Stand the vehicle upright.
- Correct the brake fluid to marking ①.

Brake fluid DOT 4 / DOT 5.1 (📖 p. 356)

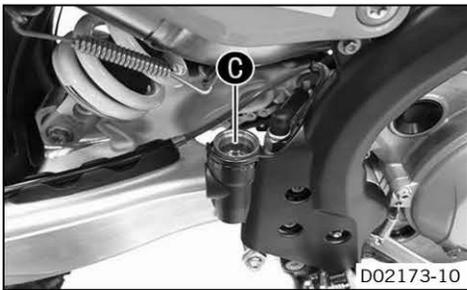
- Fit and tighten plug with oil screen and O-ring.



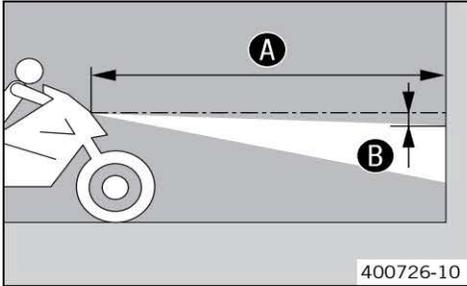
Info

Clean up overflowed or spilt brake fluid immediately with water.

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



17.1 Checking the headlight setting



- Position the vehicle upright on a horizontal surface in front of a light wall and make a mark at the height of the center of the low beam headlight.
- Make another mark a distance **B** under the first mark.

Guideline

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

- Position the vehicle vertically at a distance **A** away from the wall.

Guideline

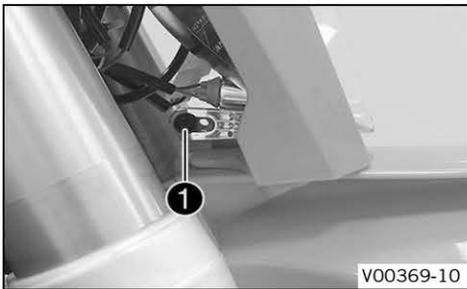
Distance A	5 m (16 ft)
-------------------	-------------

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

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

- » If the light-dark border does not meet specifications:
 - Adjust the headlight range. (📖 p. 151)

17.2 Adjusting the headlight range



Preparatory work

- Check the headlight setting. (📖 p. 151)

Main work

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

Guideline

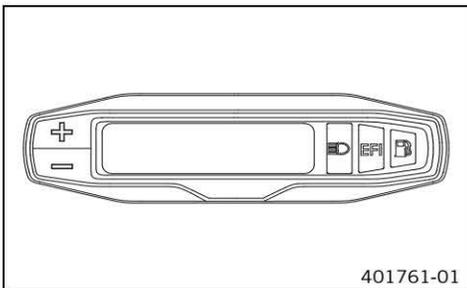
The boundary between light and dark must be exactly on the lower marking for a motorcycle with rider (instructions on how to apply the marking: Checking the headlight setting).

Info

A change in weight on the vehicle may require a correction of the headlight range.

- Tighten screw **1**.

17.3 Speedometer overview

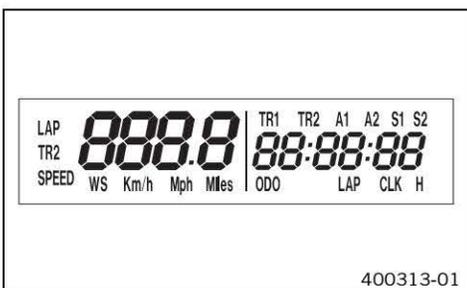


- Press the button **+** to control different functions.
- Press the button **-** to control different functions.

Info

When the vehicle is delivered, only the **SPEED/H** and **SPEED/ODO** display modes are activated.

17.4 Activation and test



Activating the speedometer

The speedometer is activated when one of the buttons is pressed or an impulse comes from the wheel speed sensor.

Display test

To enable you to check that the display is functioning properly, all display segments light up briefly.



WS (wheel size)

After the display function check, the wheel size **WS** is displayed briefly.



Info

The number 2205 equals the circumference of the 21" front wheel with standard tires.

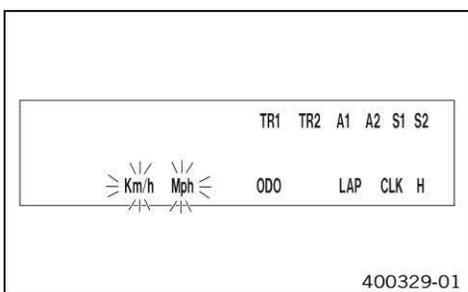
The display then changes to the last selected mode.

17.5 Setting kilometers or miles



Info

If you change the unit, the value **ODO** is retained and converted accordingly. The values **TR1** , **TR2** , **A1** , **A2** and **S1** are cleared when the unit of measure is changed.



Condition

The motorcycle is stationary.

- Repeatedly press the button **+** briefly until **H** appears at the bottom right of the display.
- Press the button **+** for 2–3 seconds.
 - ✓ The Setup menu is displayed and the active functions are shown.
- Repeatedly press the button **+** briefly until **Km/h/Mph** flashes.

Setting the Km/h

- Press the button **+**.

Setting the Mph

- Press the button **-**.
- Wait 3–5 seconds
- ✓ The settings are stored.



Info

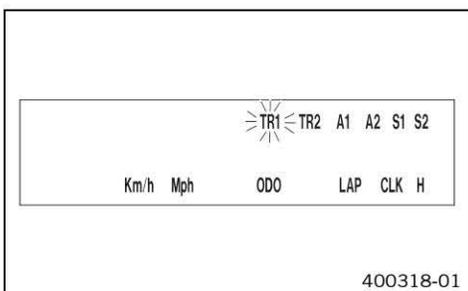
If no button is pressed for 10 -12 seconds, or if an impulse comes from the wheel speed sensor, the settings are automatically saved and the setup menu is closed.

17.6 Setting the speedometer functions



Info

When the vehicle is delivered, only the **SPEED/H** and **SPEED/ODO** display modes are activated.



Condition

The motorcycle is stationary.

- Repeatedly press the button **+** briefly until **H** appears at the bottom right of the display.
- Press the button **+** for 2–3 seconds.
 - ✓ The Setup menu is displayed and the active functions are shown.



Info

If no button is pressed for 10–12 seconds, the settings are automatically saved.

If no button is pressed for 20 seconds, or if an impulse comes from the wheel speed sensor, the settings are automatically saved and the setup menu is closed.

- Repeatedly press the button **+** briefly until the desired function flashes.
 - ✓ The selected function flashes.

Activating the function

- Press the button **+**.
 - ✓ The symbol continues to appear in the display and the next function appears.

Deactivating a function

- Press the button .
- ✓ The symbol disappears in the display and the next function appears.

17.7 Setting the clock**Condition**

The motorcycle is stationary.

- Repeatedly press the button  briefly until **CLK** appears at the bottom right of the display.
- Press the button  for 2-3 seconds.
 - ✓ The hour display flashes.
- Set the hour display with the button  and/or button .
- Wait 3-5 seconds
 - ✓ The next segment of the display flashes and can be set.
- You can set the following segments in the same way as the hours by pressing the button  and the button .

i Info

The seconds can only be set to zero.

If no button is pressed for 15 -20 seconds, or if an impulse comes from the wheel speed sensor, the settings are automatically saved and the setup menu is closed.

17.8 Activating additional functions**Danger**

Voiding of the government approval for road use and the insurance coverage The vehicle is only authorized for operation on public roads in the homologated version.

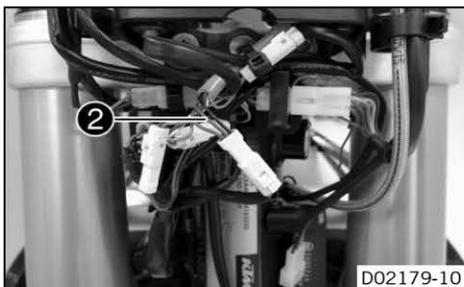
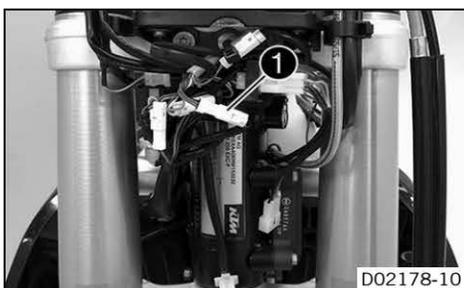
- If the vehicle is modified in any way, it may only be used on designated tracks away from public roads. Advise the vehicle owner and rider of this.
- If you undertake any modifications, please insist on receiving a signed workshop order from your customer in which you inform the customer in writing that these modifications are performed at the customer's own risk and that the vehicle will no longer be approved for use on public roads once modified.

Preparatory work

- Remove the headlight mask with the headlight. (📖 p. 114)

Main work

- Expose connector **CZ** .

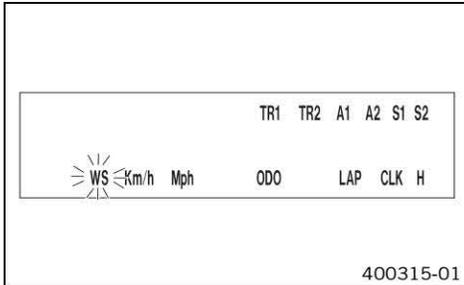


- Cut brown cable  **PIN 1**.
- Insulate both cable ends.

Finishing work

- Install the headlight mask with the headlight. (📖 p. 115)
- Check the headlight setting. (📖 p. 151)

17.9 Setting the wheel circumference

**Condition**

The motorcycle is stationary.

Preparatory work

- Remove the headlight mask with the headlight. (📖 p. 114)
- Activate additional functions. (📖 p. 153)

Main work

- Repeatedly press the button  briefly until **H** appears at the bottom right of the display.
- Press the button  for 2–3 seconds.
- When **WS** flashes, press the  button briefly.

**Info**

The wheel circumference is displayed in millimeters.

Enlarging the wheel circumference

- Press the button .

Reducing the wheel circumference

- Press the button .

**Info**

If no button is pressed for 20 seconds, or if no impulse comes from the wheel speed sensor, the settings are automatically saved and the Setup menu is closed.

17.10 Viewing the lap time

**Info**

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

**Condition**

The motorcycle is stationary.

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

**Info**

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

18.1 Removing the engine

Preparatory work

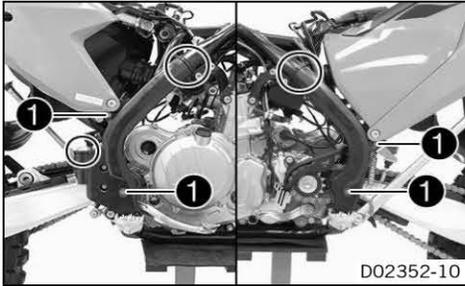
- Raise the motorcycle with the lift stand. (📖 p. 11)

(All EXC-F Six Days, EXC-F AU)

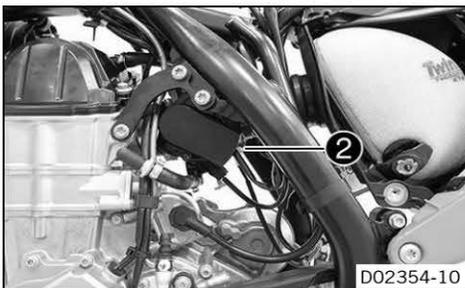
- Remove the engine guard. (📖 p. 62)
- Drain the coolant. (📖 p. 245)
- Remove shock absorber. (📖 p. 69)
- Remove the main silencer. (📖 p. 94)
- Remove the seat. (📖 p. 101)
- Remove the fuel tank. (📖 p. 102)
- Remove the manifold. (📖 p. 93)

Main work

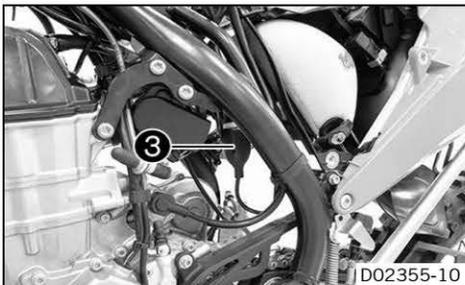
- Remove screws ①.
- Remove the cable ties.
- Take off the frame protectors on both sides.
- Remove the air filter box cover. (📖 p. 98)



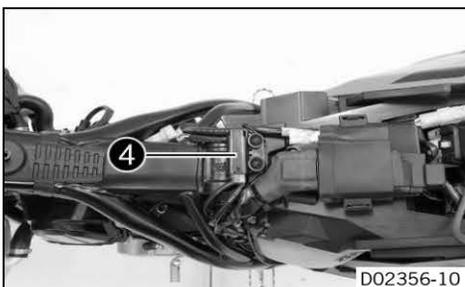
- Disconnect the negative cable of the battery.



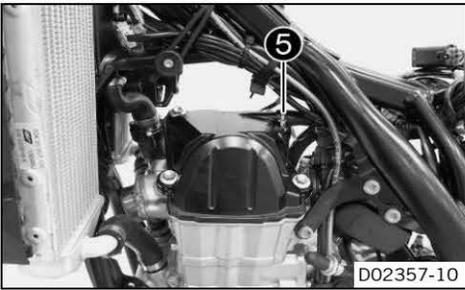
- Loosen hose clip ②.



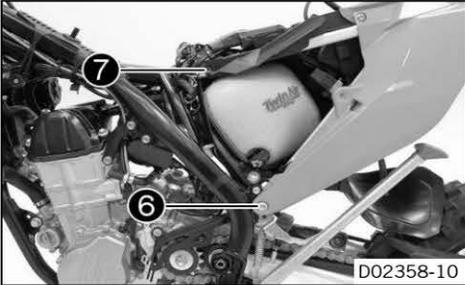
- Push back protection cap ③.
- Unplug the connector.



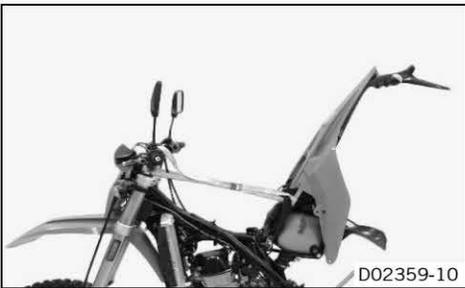
- Pull rollover sensor ④ off of the holder and hang to one side.



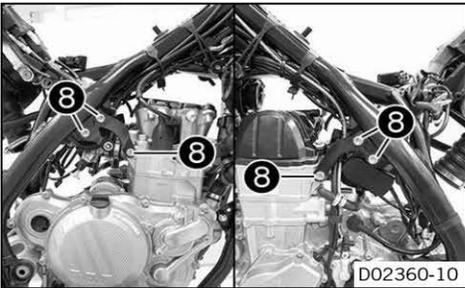
- Push back hose clamp **5** and pull off the vent hose.



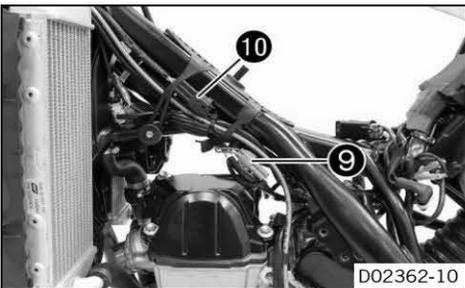
- Remove screw **6**.
- Hang the side stand switch with the retaining bracket to the side.
- Loosen screw **7**.
- Repeat these steps on the opposite side.



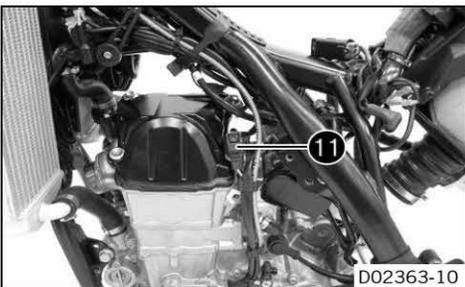
- Pivot up the subframe and secure it.



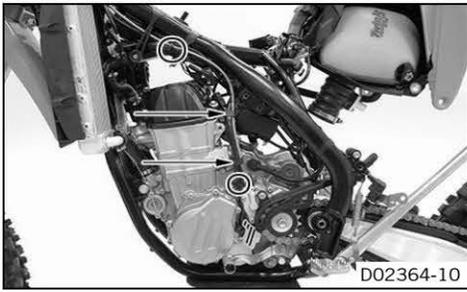
- Remove screws **8**.
- Take off the engine brace.



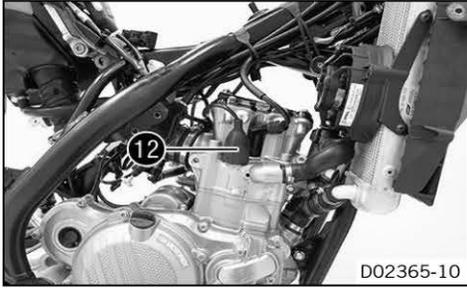
- Disconnect plug-in connector **9**.
- Disconnect plug-in connector **10**.



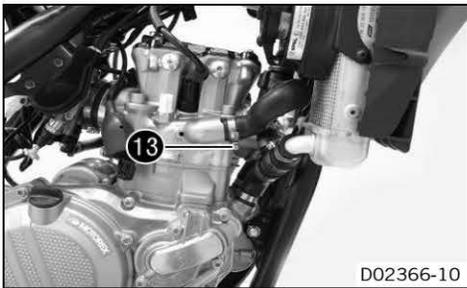
- Disconnect plug-in connector **11**.



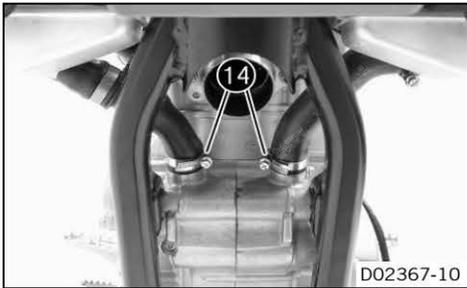
- Remove the cable ties.
- Remove the cable clamps and expose the cable.



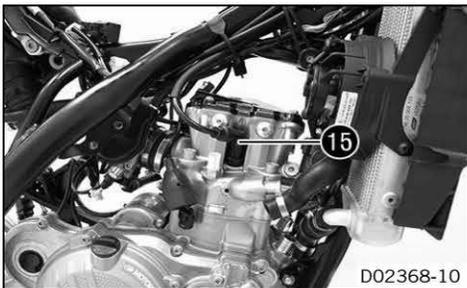
- Push back protection cap **12**.
- Unplug the connector.



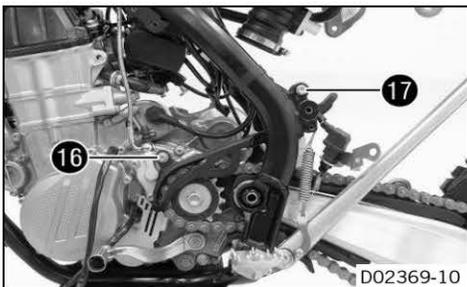
- Loosen hose clip **13**.
- Pull off the radiator hose.



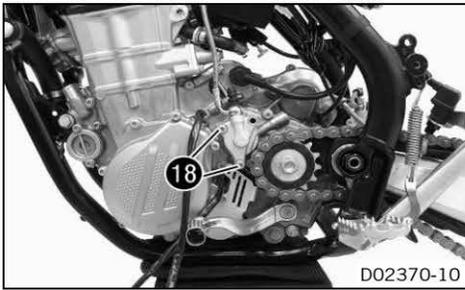
- Loosen hose clips **14**.
- Pull off the radiator hoses.



- Disconnect spark plug connector **15**.



- Remove screw **16**.
- Remove screw **17**.
- Take off the engine sprocket cover.

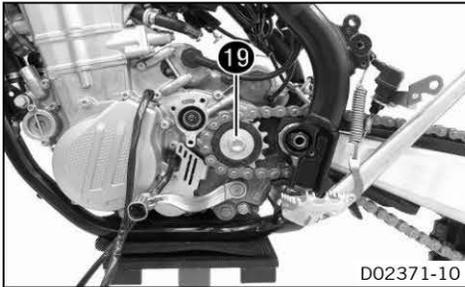


- Remove screws 18.
- Take off the clutch slave cylinder with the gasket and hang it to the side.



Info

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

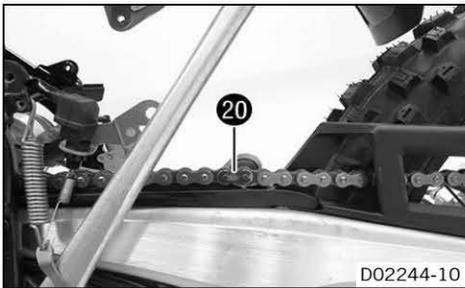


- Activate the foot brake lever.
- Loosen screw 19.

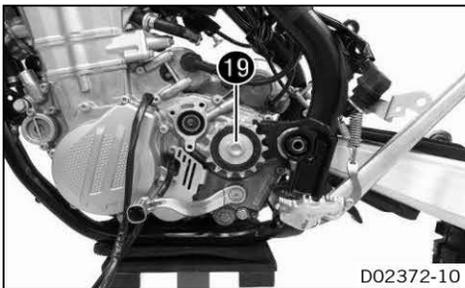


Info

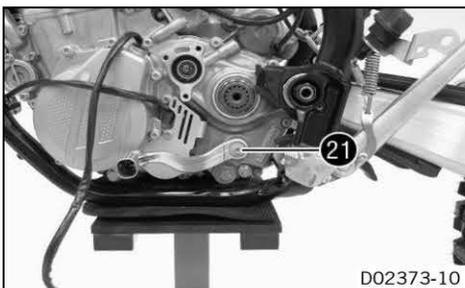
The help of an assistant is useful in this step.



- Remove connecting link 20 of the chain.
- Take off the chain.



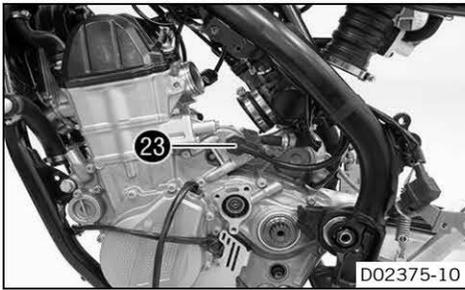
- Remove screw 19 with the washer.
- Take off the engine sprocket.



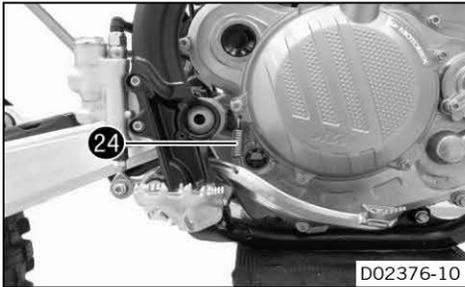
- Remove screw 21 with the washers.
- Take off the shift lever.



- Loosen hose clip 22.
- Pull the throttle valve body off of the cylinder head toward the rear and hang it to one side.



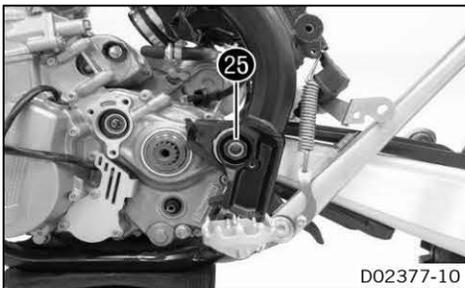
- Push back protection cap 23 and remove the nut.
- Hang the positive cable to the side.



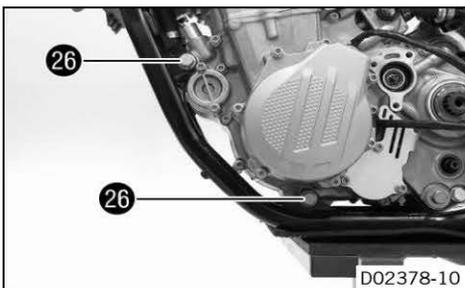
- Remove spring 24.



- Take the brake line out of the guide.



- Remove nut 25.
- Remove the swingarm pivot.
- Carefully pull the swingarm back, and secure the swingarm.



- Remove screws 26.



- Lift out the engine sideways.



Info

The help of an assistant is useful in this step.
 Make sure that the engine is sufficiently secured against falling over.
 Protect the frame and attachments against damage.

18.2 Installing the engine



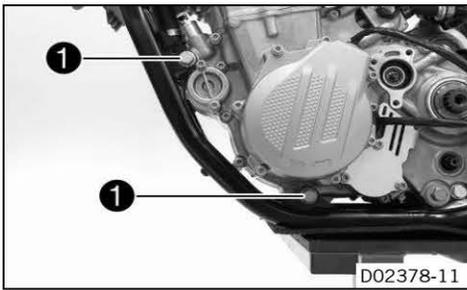
Main work

- Position the engine in the frame.



Info

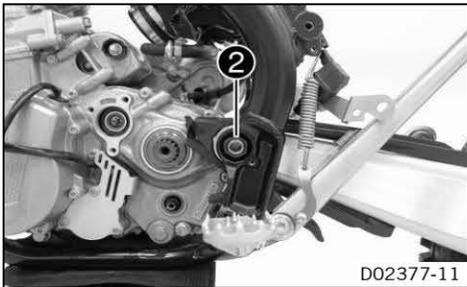
The help of an assistant is useful in this step. Make sure that the engine is sufficiently secured against falling over. Protect the frame and attachments against damage.



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

Guideline

Engine attachment bolt	M10	60 Nm (44.3 lbf ft)
------------------------	-----	------------------------



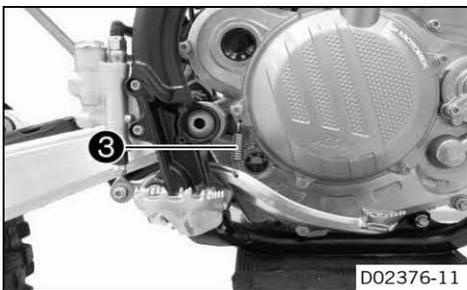
- Position the swingarm.
- Mount the swingarm pivot.
- Mount and tighten nut **2**.

Guideline

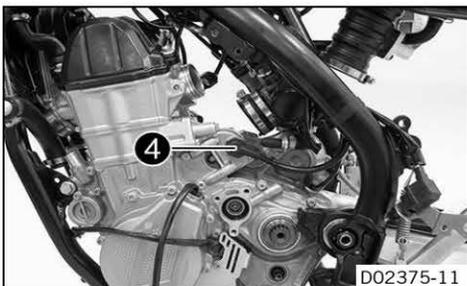
Nut, swingarm pivot	M16x1.5	100 Nm (73.8 lbf ft)
---------------------	---------	-------------------------



- Position the brake line in the guide.



- Mount spring **3**.

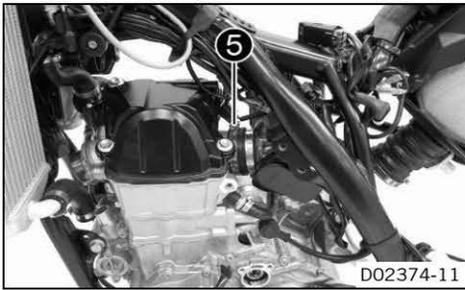


- Position the positive cable on the starter motor.
- Mount and tighten the nut.

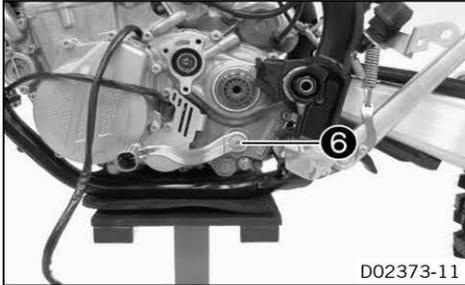
Guideline

Remaining nuts, chassis	M6	10 Nm (7.4 lbf ft)
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- Position protection cap **4**.



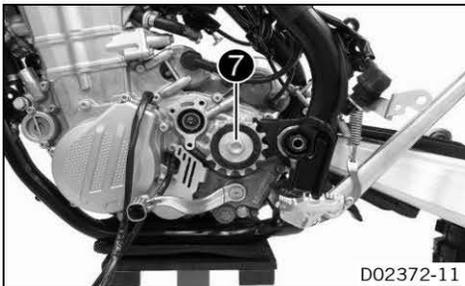
- Position the throttle valve body.
- Tighten hose clip **5**.



- Position the shift lever.
- Mount and tighten screw **6** with the washers.

Guideline

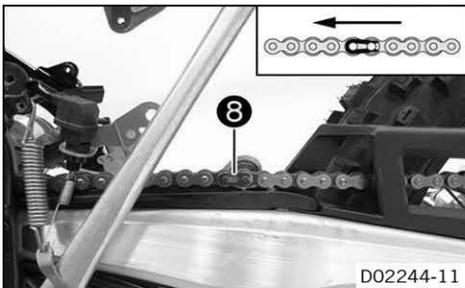
Screw, shift lever	M6	14 Nm (10.3 lbf ft)	Loctite® 243™
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- Slide on the engine sprocket with the collar facing the engine.
- Mount screw **7** with the washer but do not tighten yet.

Guideline

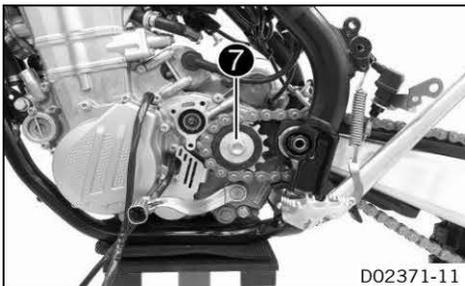
Screw, engine sprocket	M10	60 Nm (44.3 lbf ft)	Loctite® 2701™
------------------------	-----	------------------------	----------------



- Mount the chain.
- Connect the chain with connecting link **8**.

Guideline

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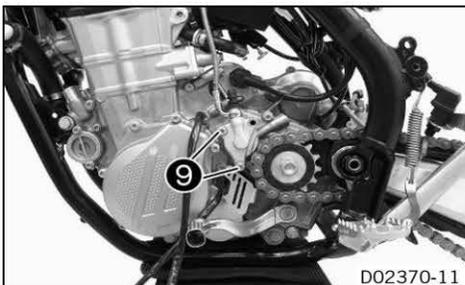


- Activate the foot brake lever.
- Tighten screw **7**.

Guideline

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

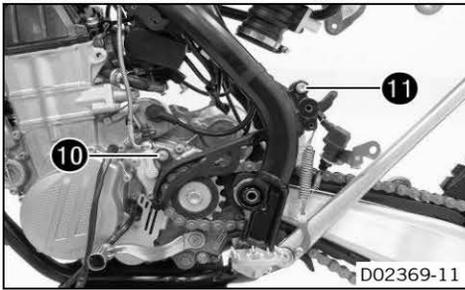
i Info
The help of an assistant is useful in this step.



- Position clutch slave cylinder with the new gasket.
- Mount and tighten screws **9**.

Guideline

Screw, clutch slave cylinder	M6	10 Nm (7.4 lbf ft)	
------------------------------	----	--------------------	--



- Position the engine sprocket cover.
- Mount and tighten screw 10.

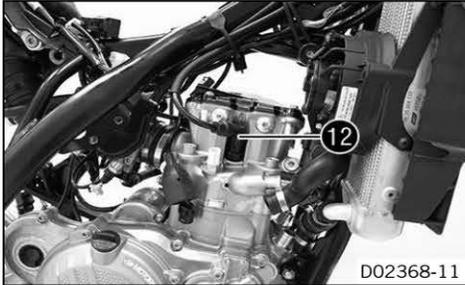
Guideline

Screw, clutch slave cylinder	M6	10 Nm (7.4 lbf ft)
------------------------------	----	--------------------

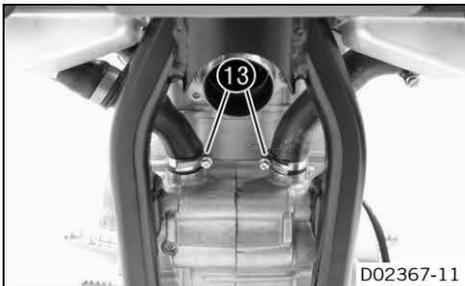
- Mount and tighten screw 11.

Guideline

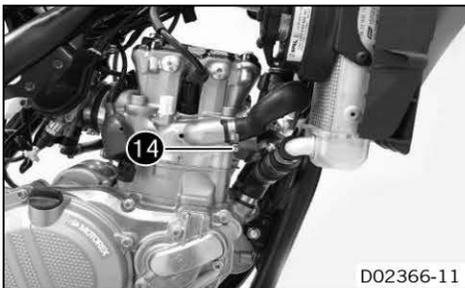
Screw, engine sprocket cover	M8	20 Nm (14.8 lbf ft)
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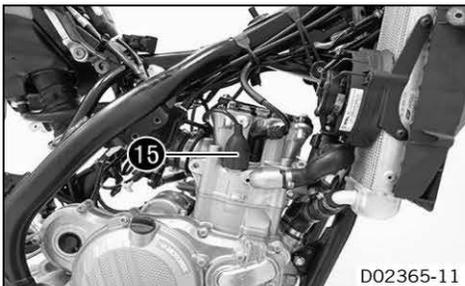
- Plug in spark plug connector 12.



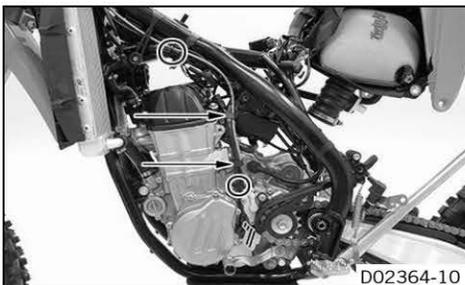
- Mount the radiator hoses.
- Position and tighten hose clips 13.



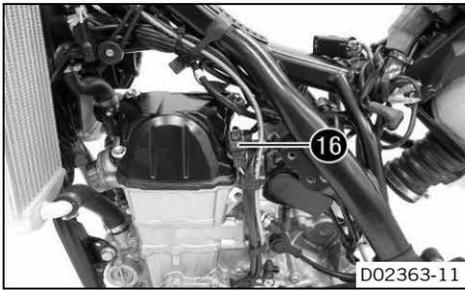
- Mount the radiator hose.
- Position and tighten hose clip 14.



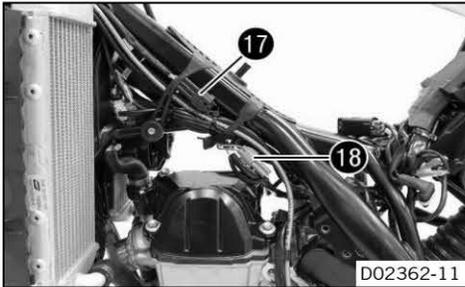
- Plug in the connector.
- Mount protection cap 15.



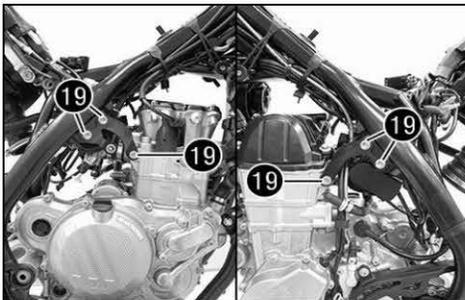
- Route the cable without tension and secure with cable clips and cable ties.



- Connect plug-in connector **16** of the gear position sensor.



- Connect plug-in connector **17**.
- Connect plug-in connectors **18**.
- Route the cable without tension.



- Position the engine brace.
- Mount and tighten screws **19**.

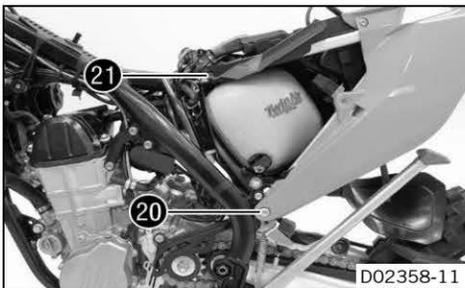
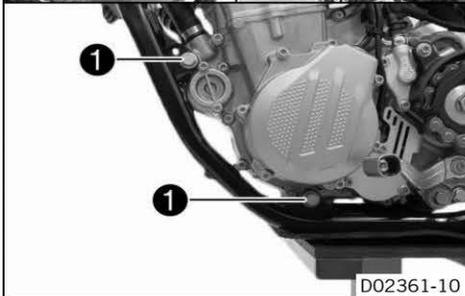
Guideline

Screw, engine brace	M8	25 Nm (18.4 lbf ft)	Loctite® 2701™
---------------------	----	------------------------	----------------

- Tighten screws **1**.

Guideline

Engine attachment bolt	M10	60 Nm (44.3 lbf ft)	
------------------------	-----	------------------------	--



- Remove the locking piece and position the subframe.

i Info
Watch out for the intake flange.

- Position the side stand switch with the retaining bracket.
- Mount and tighten screw **20**.

Guideline

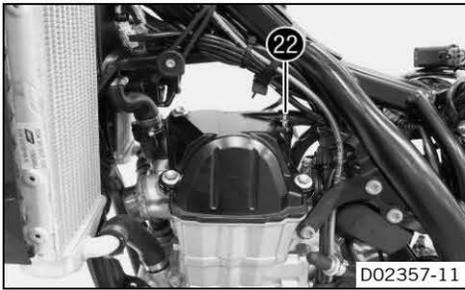
Screw, subframe	M8	35 Nm (25.8 lbf ft)	Loctite® 2701™
-----------------	----	------------------------	----------------

- Remove screw **21**.
- Mount and tighten screw **21**.

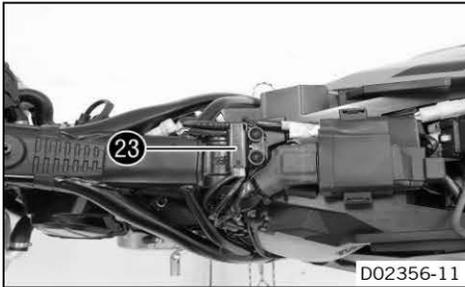
Guideline

Screw, subframe	M8	35 Nm (25.8 lbf ft)	Loctite® 2701™
-----------------	----	------------------------	----------------

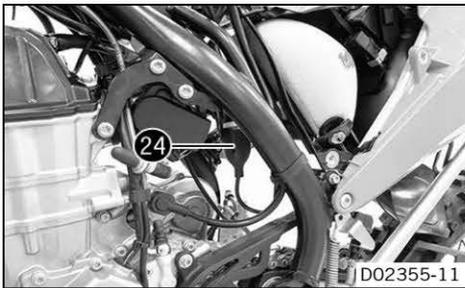
- Repeat the operation on the opposite side.



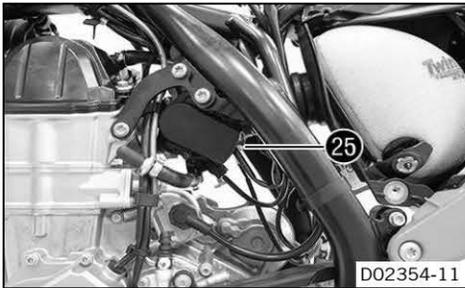
- Mount the vent hose and hose clamp 22.



- Mount rollover sensor 23.



- Plug in the connector.
- Mount protection cap 24.



- Position and tighten hose clip 25.



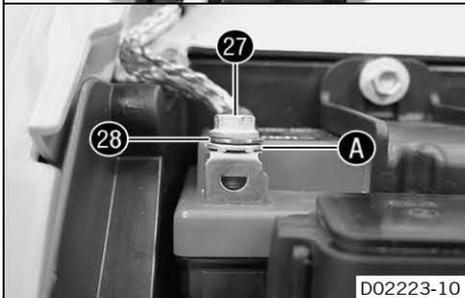
- Connect negative cable 26.

Guideline

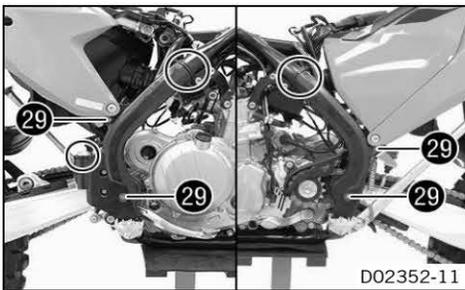
Screw, battery terminal	M5	2.5 Nm (1.84 lbf ft)
-------------------------	----	-------------------------

i Info

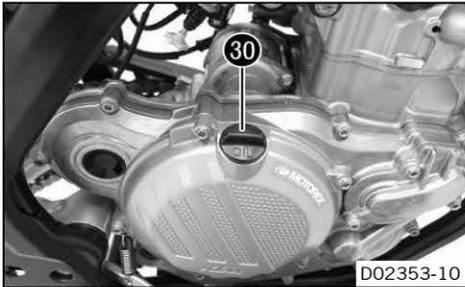
Contact disk **A** must be mounted under screw 27 and the cable lug 28 with the claws facing down.



- Install the air filter box cover. (📖 p. 98)



D02352-11



D02353-10

- Position the frame protectors on both sides.
- Mount and tighten screws **29**.

Guideline

Screw, frame protector	M5	3 Nm (2.2 lbf ft)
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- Attach the frame protector with cable ties.

- Remove filler plug **30** and add engine oil.

Engine oil	1.2 l (1.3 qt.)	Engine oil (SAE 10W/50) (p. 356)
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- Mount and tighten filler plug **30**.

Finishing work

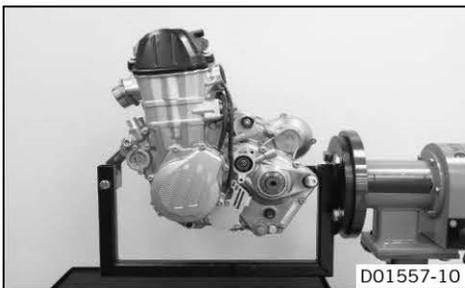
- Install the manifold. (p. 93)
- Install the fuel tank. (p. 104)
- Mount the seat. (p. 102)
- Install the main silencer. (p. 95)
- Install the shock absorber. (p. 69)
- Remove the motorcycle from the lift stand. (p. 11)
- Refill the coolant. (p. 246)

(All EXC-F Six Days, EXC-F AU)

- Install the engine guard. (p. 62)
- Take a short test ride.
- Execute the initialization run. (p. 261)
- Read out the fault memory using the KTM diagnostics tool.
- Check the engine for leak tightness.
- Check the engine oil level. (p. 247)
- Check the coolant level. (p. 245)

18.3 Engine disassembly

18.3.1 Preparations



D01557-10

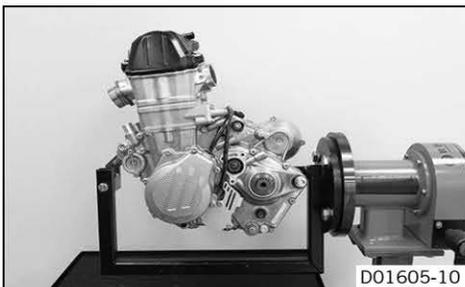
(All 450 models)

- Mount the special tool on the engine assembly stand.

Engine fixing arm (79429002000) (p. 369)
Engine assembly stand (61229001000) (p. 365)

- Mount the engine on the special tool.

i Info
Work with an assistant or a motorized hoist.



D01605-10

(All 500 models)

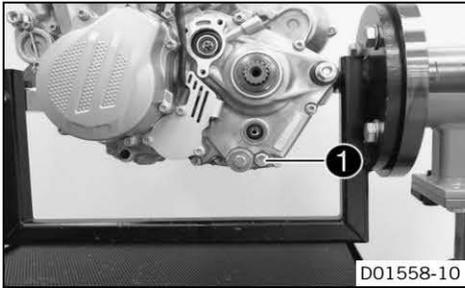
- Mount the special tool on the engine assembly stand.

Engine fixing arm (79429002000) (p. 369)
Engine assembly stand (61229001000) (p. 365)

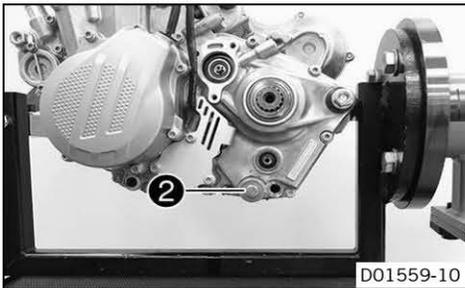
- Mount the engine on the special tool.

i Info
Work with an assistant or a motorized hoist.

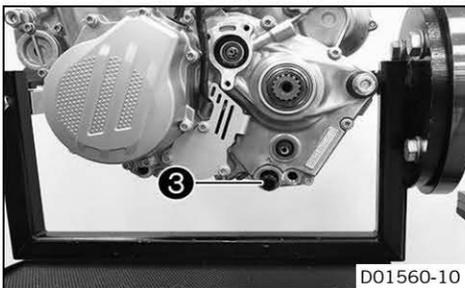
18.3.2 Draining the engine oil



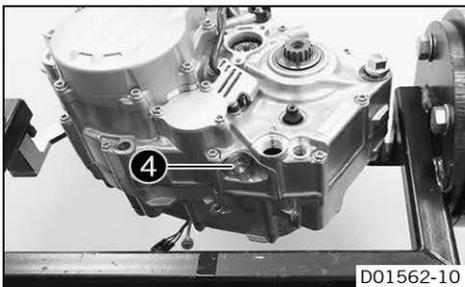
- Remove oil drain plug **1** with the magnet and seal ring.



- Remove screw plug **2**.
- Completely drain the engine oil.

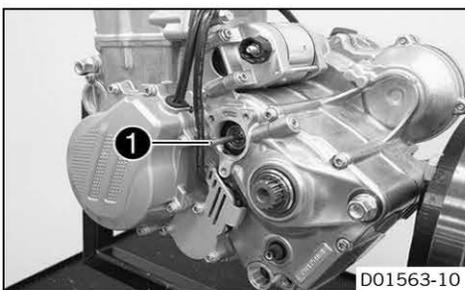


- Remove the long oil screen **3**.



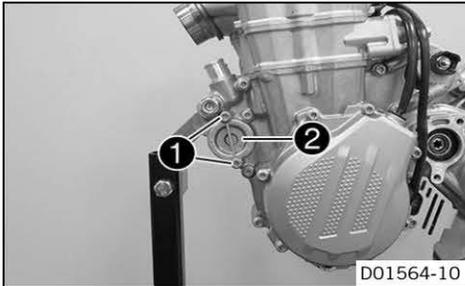
- Remove screw plug **4** with the short oil screen.

18.3.3 Removing the clutch push rod



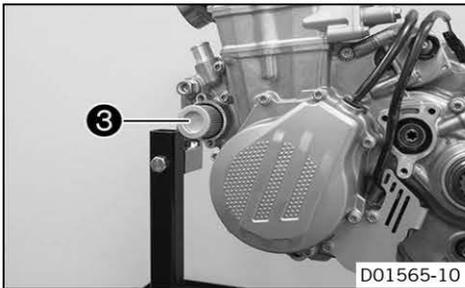
- Remove clutch push rod **1**.

18.3.4 Removing the oil filter



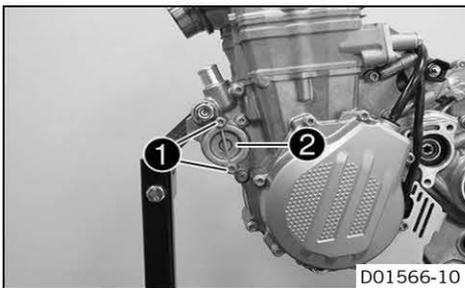
(All 450 models)

- Remove screws ①.
- Remove oil filter cover ② with the O-ring.



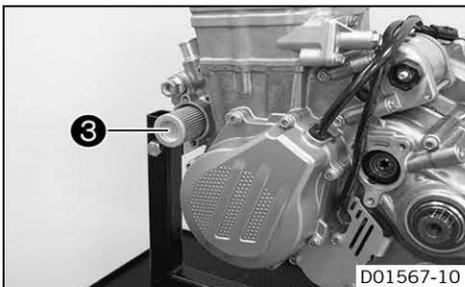
- Pull oil filter ③ out of the oil filter housing.

Circlip pliers reverse (51012011000) (📖 p. 362)



(All 500 models)

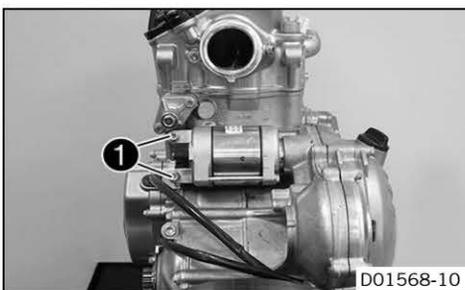
- Remove screws ①.
- Remove oil filter cover ② with the O-ring.



- Pull oil filter ③ out of the oil filter housing.

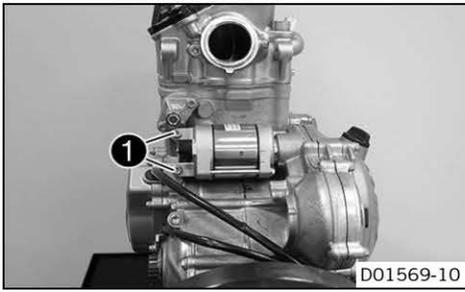
Circlip pliers reverse (51012011000) (📖 p. 362)

18.3.5 Removing the starter motor



(All 450 models)

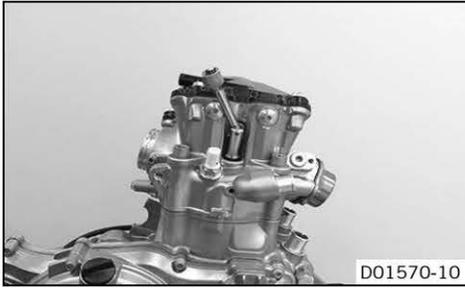
- Remove screws ① and the starter motor.



(All 500 models)

- Remove screws ❶ and the starter motor.

18.3.6 Removing the spark plug



(All 450 models)

- Remove the spark plug using the special tool.

Spark plug wrench (77229172000) (見 p. 367)

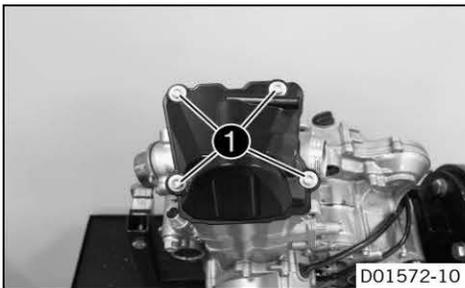


(All 500 models)

- Remove the spark plug using the special tool.

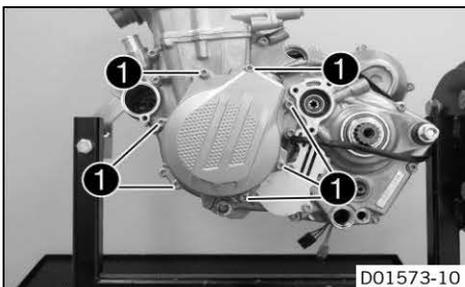
Spark plug wrench (77229172000) (見 p. 367)

18.3.7 Removing the valve cover

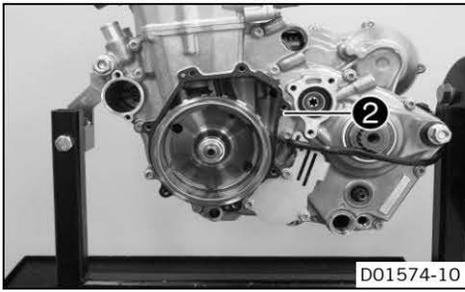


- Remove screws ❶.
- Take off the valve cover with the valve cover seal.

18.3.8 Removing the alternator cover

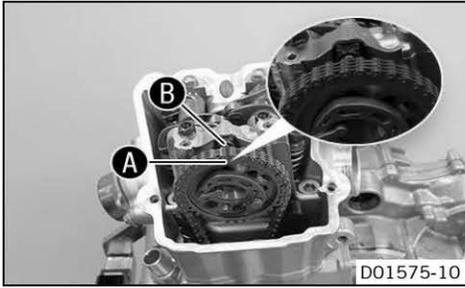


- Remove screws ❶.
- Take off the alternator cover.

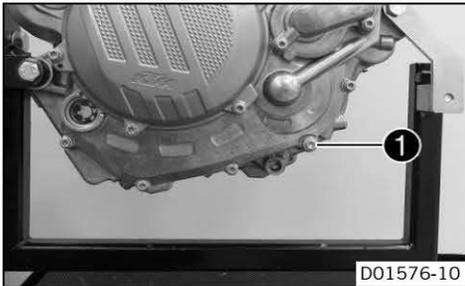


- Take off alternator cover gasket **2**.

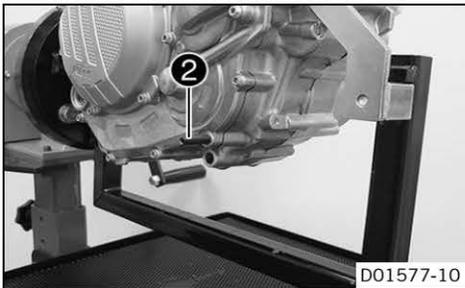
18.3.9 Positioning the engine at ignition top dead center



- Align camshaft marking **A** with the center of screw **B** on the cylinder head.



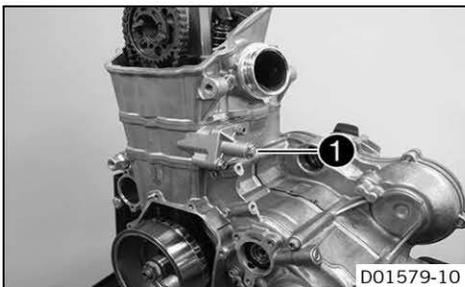
- Remove screw **1** with the washer.



- Screw in special tool **2**.

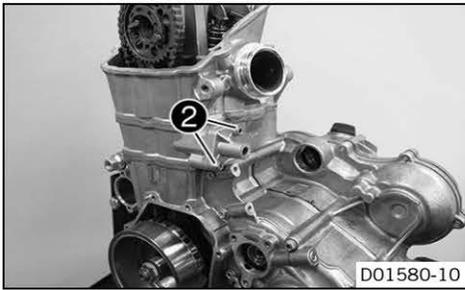
Locking screw (113080802) (📖 p. 361)

18.3.10 Removing the timing chain tensioner

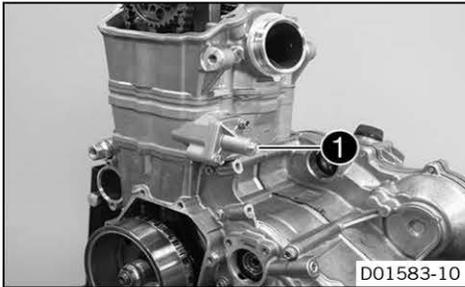


(All 450 models)

- Remove screw **1** with the washer and spring.

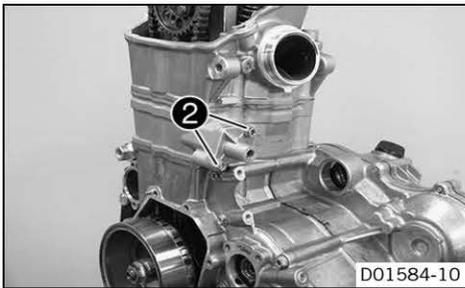


- Remove screws ②.
- Take off the chain adjuster with the gasket.



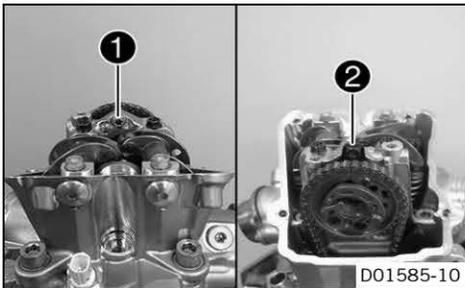
(All 500 models)

- Remove screw ① with the washer and spring.



- Remove screws ②.
- Take off the chain adjuster with the gasket.

18.3.11 Removing the camshaft

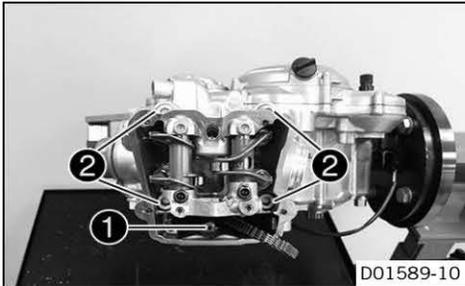


- Remove screw ①. Remove the camshaft support plate ②.



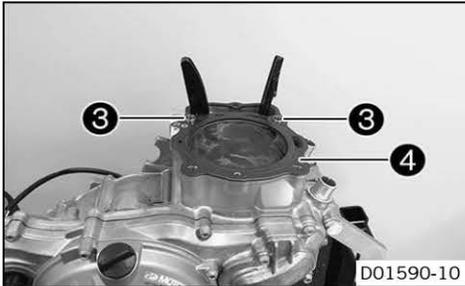
- Pull the camshaft out of the bearing seats. Take the timing chain off the camshaft gear. Remove the camshaft.

18.3.12 Removing the cylinder head

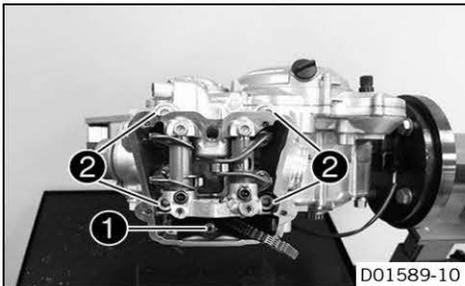


(All 450 models)

- Remove screw ①.
- Loosen screws ② in a crisscross pattern and remove them.
- Remove the cylinder head.

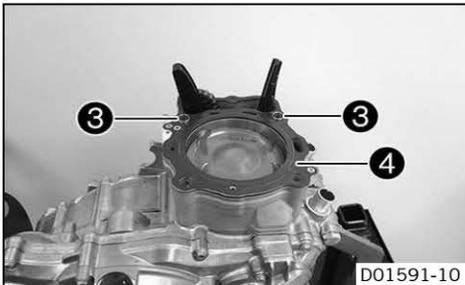


- Take off dowels ③.
- Remove cylinder head gasket ④.



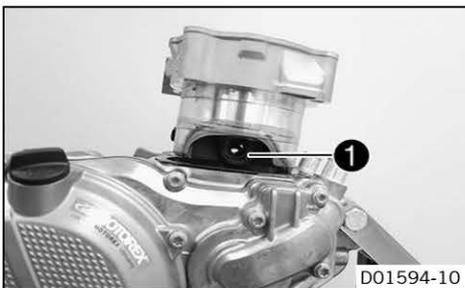
(All 500 models)

- Remove screw ①.
- Loosen screws ② in a crisscross pattern and remove them.
- Remove the cylinder head.



- Take off dowels ③.
- Remove cylinder head gasket ④.

18.3.13 Removing the piston



(All 450 models)

- Push the cylinder upward.

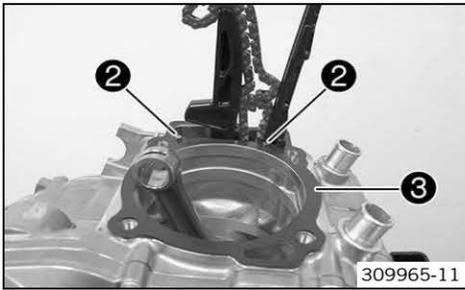
i Info

Only push the cylinder as far up as necessary to take the piston pin out.

- Remove piston ring lock ①.
- Remove the piston pin.
- Take off the cylinder and piston.
- Push the piston upward out of the cylinder.

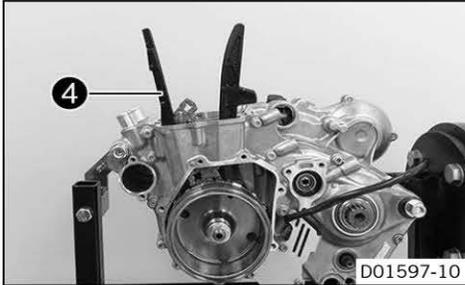
i Info

If no further work is to be performed on the cylinder and piston, the piston can remain in the cylinder.

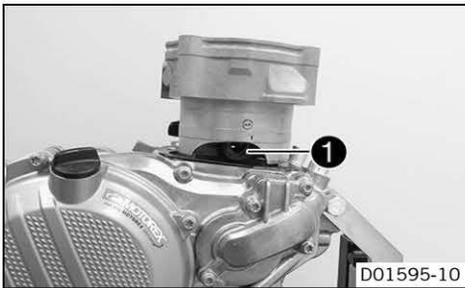


- Remove cylinder base gasket ③.

i Info
Ensure locating pins ② remain in place.



- Remove timing chain guide rail ④ from the top.



(All 500 models)

- Push the cylinder upward.

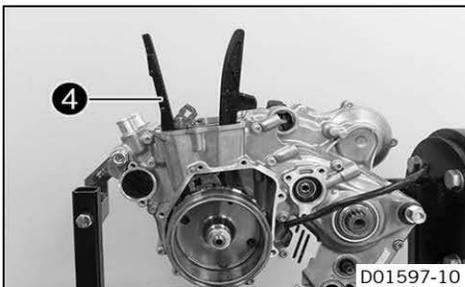
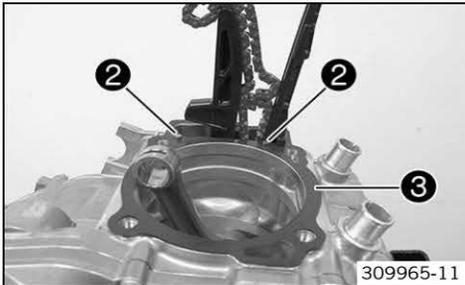
i Info
Only push the cylinder as far up as necessary to take the piston pin out.

- Remove piston ring lock ①.
- Remove the piston pin.
- Take off the cylinder and piston.
- Push the piston upward out of the cylinder.

i Info
If no further work is to be performed on the cylinder and piston, the piston can remain in the cylinder.

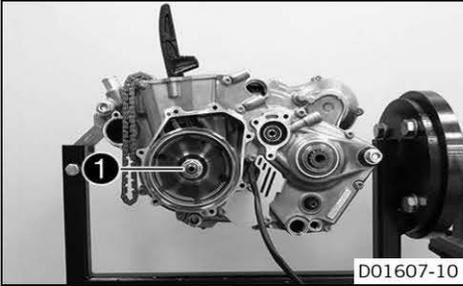
- Remove cylinder base gasket ③.

i Info
Ensure locating pins ② remain in place.

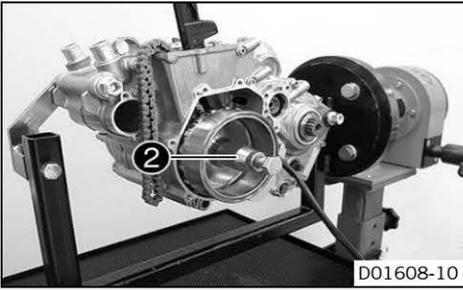


- Remove timing chain guide rail ④ from the top.

18.3.14 Removing the rotor

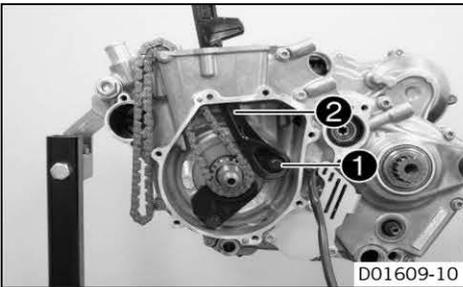


- Remove nut **1** with the spring washer.

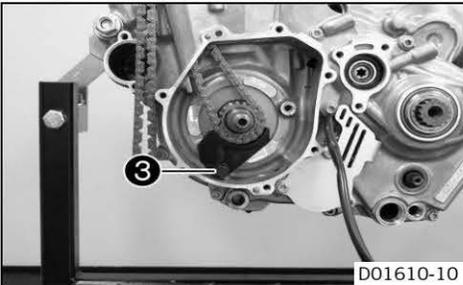


- Mount special tool **2** on the rotor.
- Extractor (58012009000) (📖 p. 363)
- Hold it tight using the special tool and pull off the rotor by turning the screw in.
 - Remove the woodruff key.

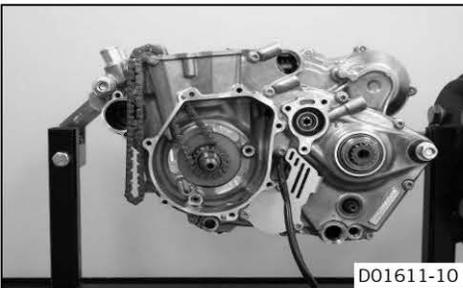
18.3.15 Removing the timing chain



- Remove screw **1**.
- Remove timing chain tensioning rail **2** toward the top.



- Remove screw **3**.
- Remove the timing chain securing guide.



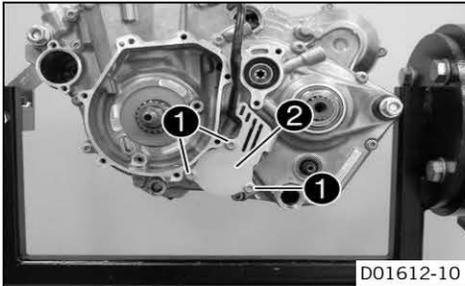
- Take off the timing chain.



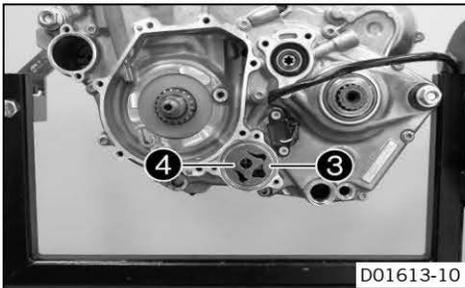
Info

If the timing chain is to be reused, mark the direction of travel.

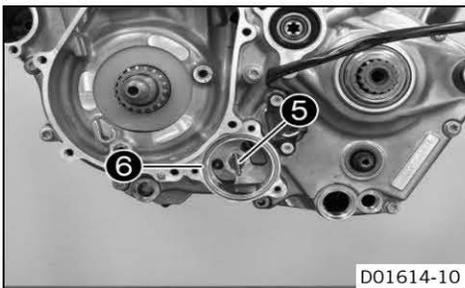
18.3.16 Removing suction pump



- Remove screws **1**.
- Take off oil pump cover **2** of the suction pump.

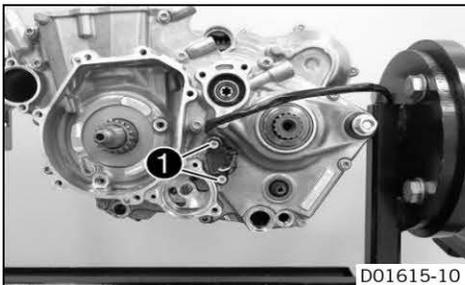


- Remove external rotor **3** and internal rotor **4**.



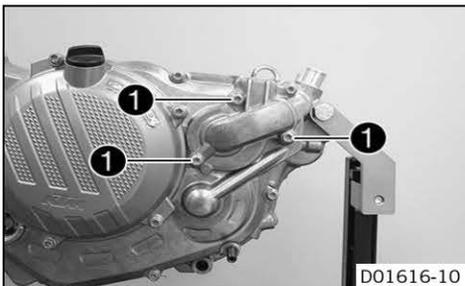
- Take off pin **5**.
- Remove O-ring **6**.

18.3.17 Removing the gear position sensor



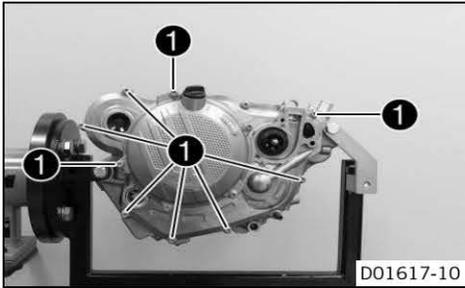
- Remove screws **1**.
- Take off the gear position sensor.

18.3.18 Removing the water pump cover



- Remove screws **1**. Take off the water pump cover.
- Take off the water pump cover seal.

18.3.19 Removing the clutch cover

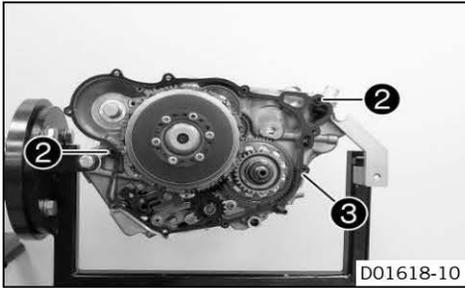


- Remove screws ①.
- Take off the clutch cover.



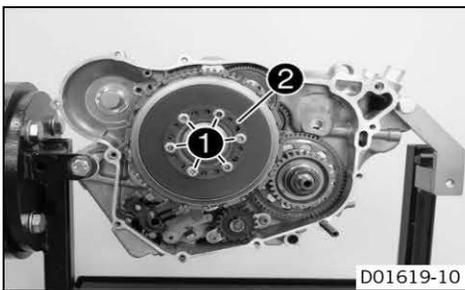
Info

If work is to be performed on the water pump, unscrew the nut of the water pump impeller.

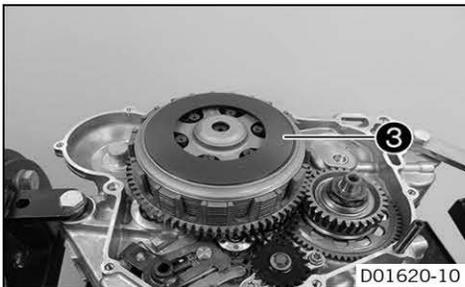


- Remove dowels ②.
- Take off clutch cover gasket ③.

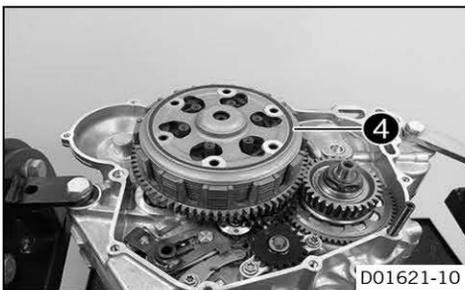
18.3.20 Removing the clutch discs



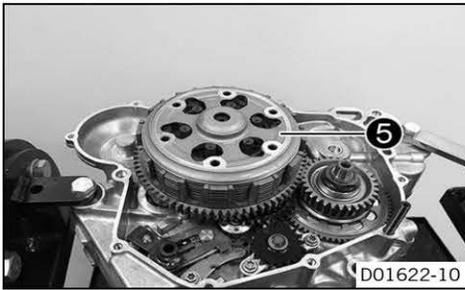
- Loosen screws ① in a crisscross pattern and remove them.
- Take off spring retainer ②.



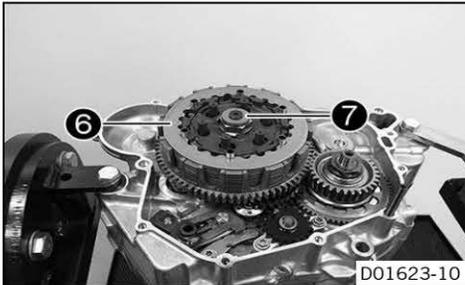
- Take off spring washer ③.



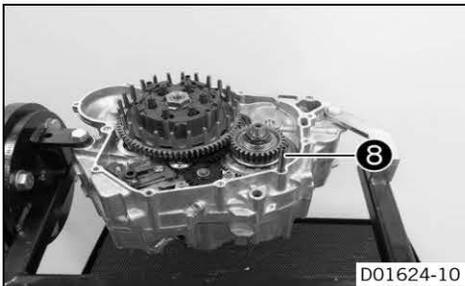
- Take off pretension ring ④.



- Take off pressure cap **5**.



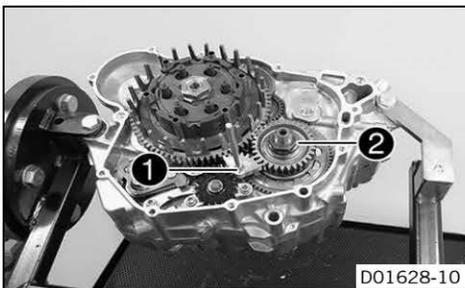
- Remove clutch disc pack **6** entirely.
- Remove clutch throw-out **7**.



- Remove special tool **8**.

Locking screw (113080802) (📖 p. 361)

18.3.21 Removing the clutch basket

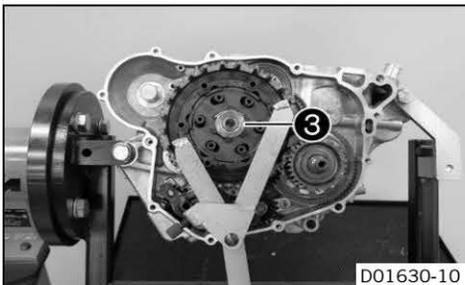


- Lock the clutch basket and primary gear using special tool **1**.

Gear segment (80029004000) (📖 p. 370)

- Remove nut **2**.

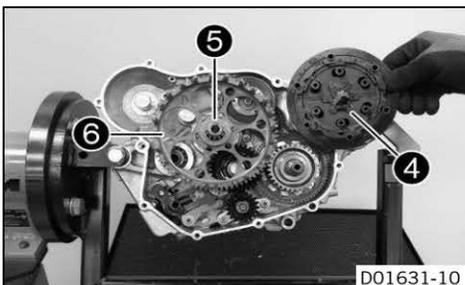
i **Info**
Left-handed thread!



- Bend up the lock washer.
- Hold the inner clutch hub with the special tool.

Clutch holder (51129003000) (📖 p. 362)

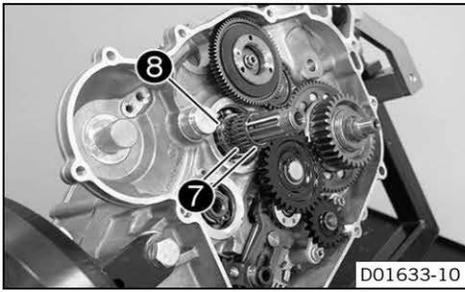
- Remove nut **3** with lock washer.



- Take off inner clutch hub **4** and washer **5**.

i **Info**
The washer usually sticks to the inner clutch hub.

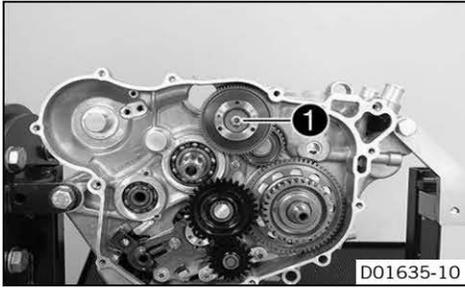
- Take off clutch basket **6**.



D01633-10

- Take off both needle bearings ⑦ and collar bushing ⑧.

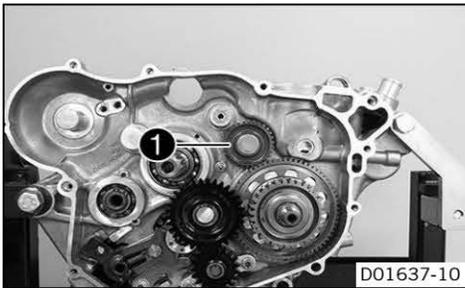
18.3.22 Removing the torque limiter



D01635-10

- Remove screw ① with the washer.
- Take off the torque limiter.

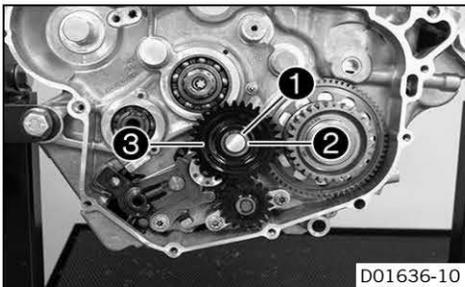
18.3.23 Removing the starter idler gear



D01637-10

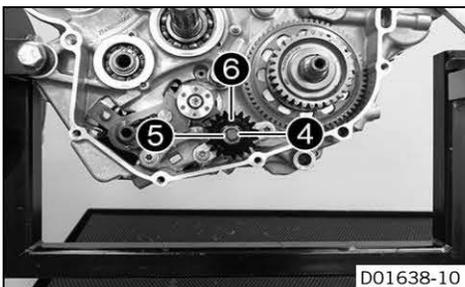
- Take off starter idler gear ①.

18.3.24 Removing the force pump



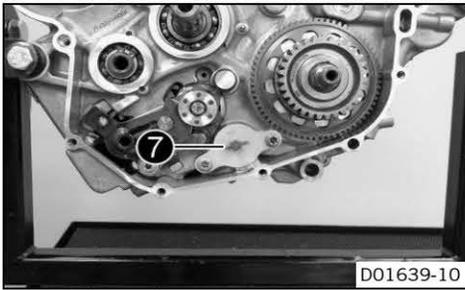
D01636-10

- Remove lock ring ①.
- Take off washer ②.
- Remove oil pump idler gear ③.

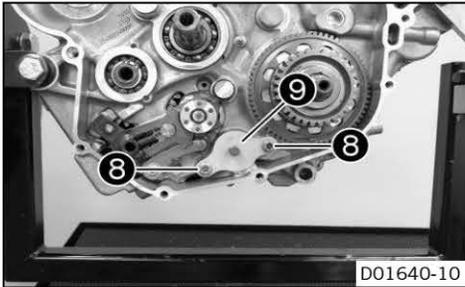


D01638-10

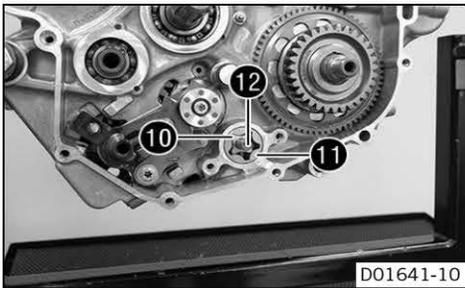
- Remove lock washer ④.
- Take off washer ⑤.
- Take off oil pump gear wheel ⑥.



- Remove pin 7.

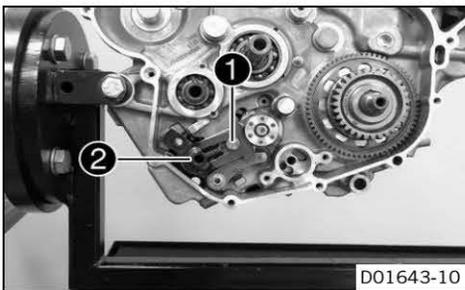


- Remove screws 8.
- Take off oil pump cover 9.



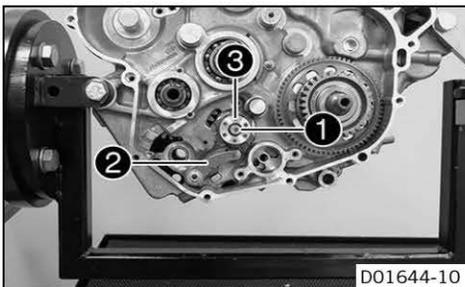
- Remove internal rotor 10 and external rotor 11.
- Remove the pin.
- Push oil pump shaft 12 inward and take it out of the engine from the ignition side.

18.3.25 Removing the shift shaft



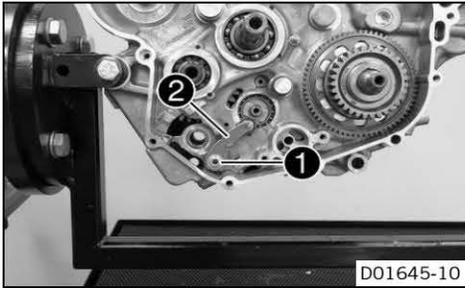
- Push sliding plate 1 away from the shift drum locating unit.
- Remove shift shaft 2 with the washer.

18.3.26 Removing the shift drum locating unit



- Remove screw 1.
- Push away locking lever 2 from shift drum locating unit 3 and remove the shift drum locating unit.
- Relieve tension from the locking lever.

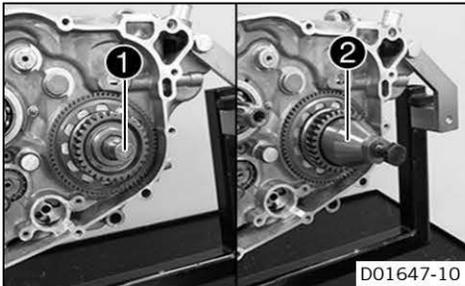
18.3.27 Removing the locking lever



D01645-10

- Unscrew **1** and remove together with locking lever **2**, washer, sleeve and spring.

18.3.28 Removing the primary gear



D01647-10

- Insert special tool **1** in the crankshaft.

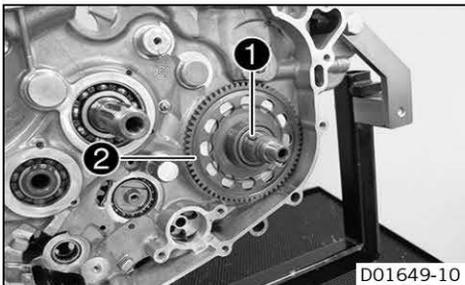
Protection cap (75029090000) (📖 p. 367)

- Install special tool **2**.

Extractor (75029021000) (📖 p. 366)

- Hold it using the special tool and pull off the primary gear by turning the screw in.
- Remove the special tools.

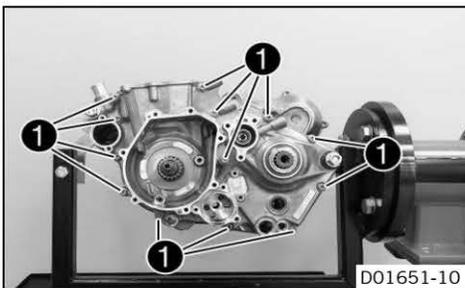
18.3.29 Removing the freewheel gear



D01649-10

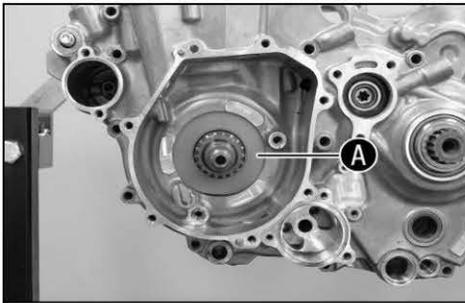
- Remove woodruff key **1**.
- Take off freewheel gear **2**.

18.3.30 Removing the left engine case section



D01651-10

- Remove screws **1**.



- Mount special tool **2** with suitable screws.

Case separating tool (79229048000) (📖 p. 369)

i Info

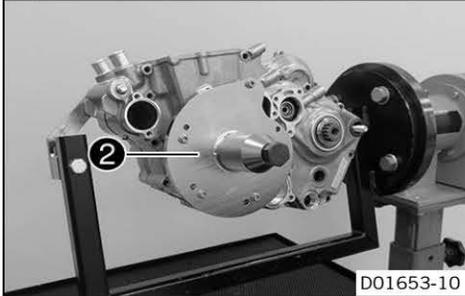
Use the drill hole with marking **794**.

- Tilt the left section of the engine case upward and remove the fitting of the engine fixing arm.
- Pull off the section of the engine case.

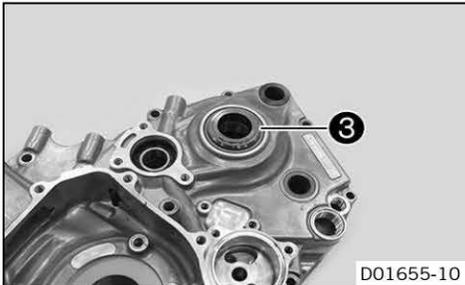
i Info

Ensure that washer **A** is not damaged.
Do not tension the section of the engine case.

- Remove the special tool.
- Take off the left section of the engine case.

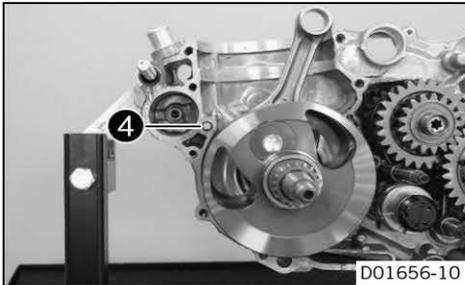


D01653-10



D01655-10

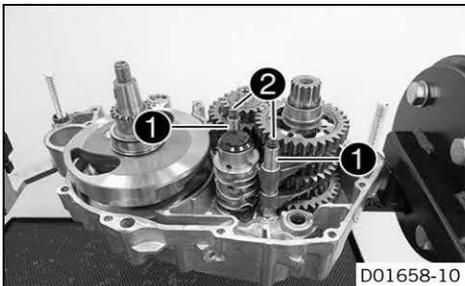
- Remove spacer **3**.



D01656-10

- Remove dowel **4**.

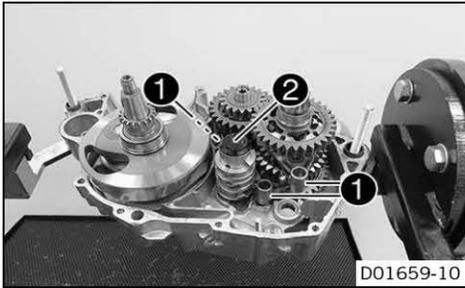
18.3.31 Removing the shift rails



D01658-10

- Remove shift rails **1** together with upper springs **2** and lower springs.

18.3.32 Removing the shift drum



- Tilt shift forks **1** to the side.

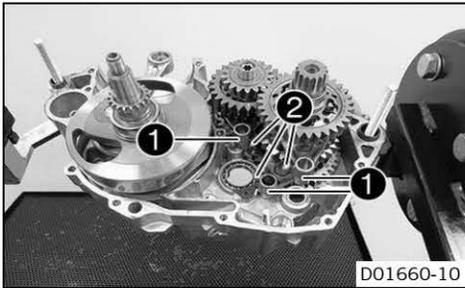


Info

Do not misplace the shift rollers.

- Remove shift drum **2**.

18.3.33 Removing the shift forks



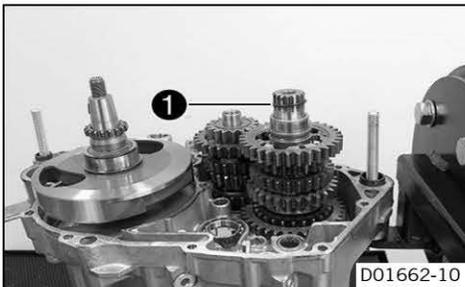
- Take shift forks **1** out of the shift grooves.



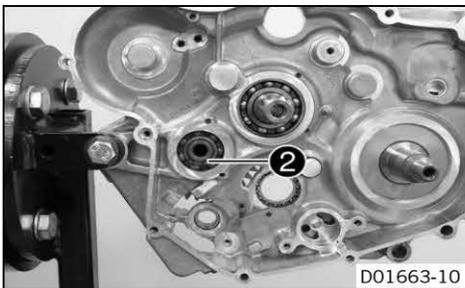
Info

Do not misplace shift rollers **2**.

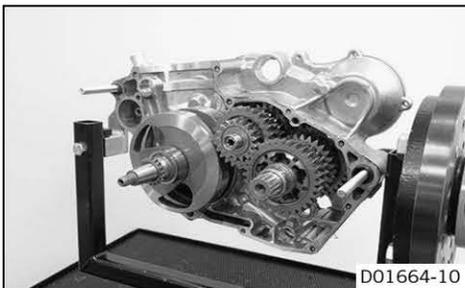
18.3.34 Removing the transmission shafts



- Remove O-ring **1**.



- Position the engine upright.
- Remove lock ring **2**.



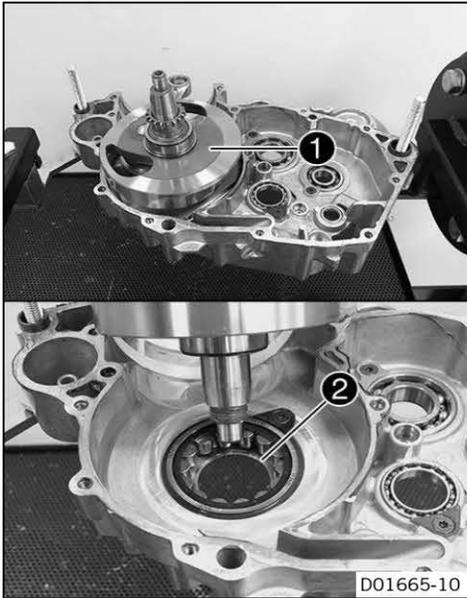
- Pull both transmission shafts out of the bearing seats together.



Info

Make sure not to misplace the washers.

18.3.35 Removing the crankshaft



- Remove crankshaft ①.



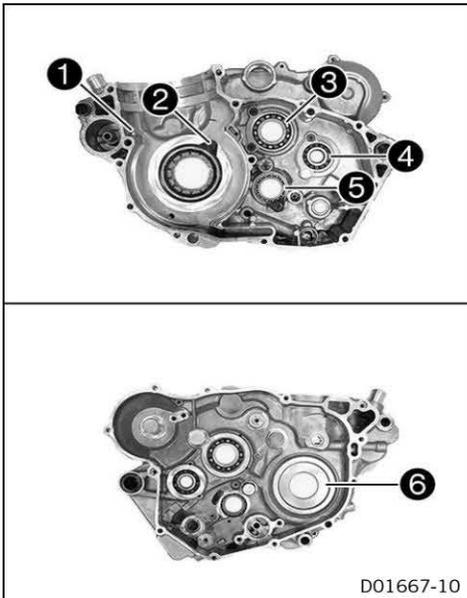
Info

Ensure that washer ② is not damaged.

- Take off the right section of the engine case.

18.4 Working on individual parts

18.4.1 Working on the right section of the engine case



Preparatory work

- Remove the oil pressure regulator valve. (📖 p. 184)

Main work

- Remove all remaining dowels.
- Remove oil nozzle ①.
- Remove screw ② and take off the bearing retainers.
- Remove the bearing retainer of main shaft bearing ③, of countershaft bearing ④ and of shift drum bearing ⑤.
- Remove any remnants of sealing compound and clean the section of the engine case thoroughly.
- Warm the engine case section in an oven.

Guideline

150 °C (302 °F)

- Knock the engine case section against a level wooden board. This will cause the bearings to drop out of the bearing seats.



Info

Any bearings that remain in the engine case section must be removed using a suitable tool.

- Remove washer ⑥.
- Warm the engine case section again.

Guideline

150 °C (302 °F)

- Position washer ⑥.
- Insert the new cold bearings into the bearing seats of the hot engine case section 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 the bearings in, ensure that the engine case section is level to prevent damage.

Only press the bearings in via the outer bearing race; otherwise, the bearings will be damaged when they are pressed in.

- After the engine case section has cooled, check that the bearings are firmly seated.



Info

If the bearings are not firmly seated after cooling, it is likely that they will rotate in the engine case when warm. In this case, the engine case must be renewed.

- Position all bearing retainers. Mount and tighten the screws.

Guideline

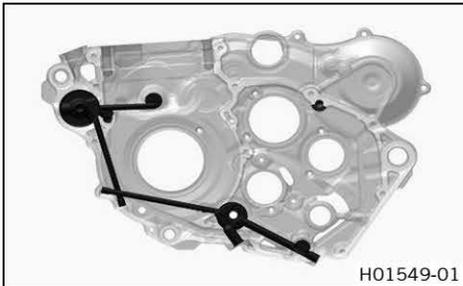
Screw, bearing retainer	M5	6 Nm (4.4 lbf ft)	Loctite® 243™
-------------------------	----	----------------------	---------------

- Mount and tighten oil nozzle ①.

Guideline

Oil nozzle, piston cooling	M5	2 Nm (1.5 lbf ft)	Loctite® 243™
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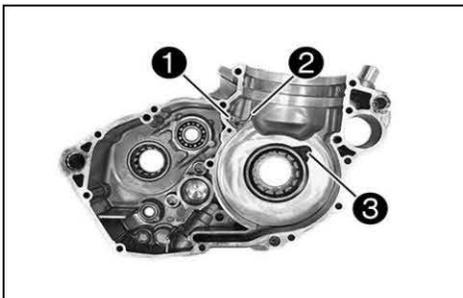
- Blow compressed air through all oil channels and check that they are clear.



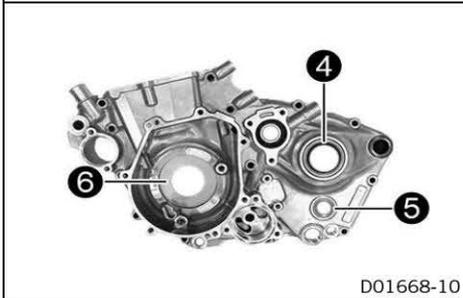
Finishing work

- Install the oil pressure regulator valve. (📖 p. 185)

18.4.2 Working on the left section of the engine case



- Remove all remaining dowels.
- Remove screw ①.
- Remove oil spray tube ②.
- Remove screw ③.
- Remove the bearing retainers.
- Remove shaft seal ring ④ of the countershaft and shaft seal ring ⑤ of the shift shaft.
- Remove any remnants of sealing compound and clean the section of the engine case thoroughly.



- Warm the engine case section in an oven.

Guideline

150 °C (302 °F)

- Knock the engine case section against a level wooden board. This will cause the bearings to drop out of the bearing seats.



Info

Any bearings that remain in the engine case section must be removed using a suitable tool.

- Remove washer ⑥.
- Warm the engine case section again.

Guideline

150 °C (302 °F)

- Position washer ⑥.
- Insert the new cold bearings in the bearing seats of the heated section of the engine case; if necessary, use a suitable press drift to push them all the way in and make them flush.



Info

When pressing the bearings in, ensure that the engine case section is level to prevent damage.
Only press the bearings in via the outer bearing race; otherwise, the bearings will be damaged when they are pressed in.

- After the engine case section has cooled, check that the bearings are firmly seated.



Info

If the bearings are not firmly seated after cooling, it is likely that they will rotate in the engine case when warm. In this case, the engine case must be renewed.

- Press in shaft seal ring ④ of the countershaft and shaft seal ring ⑤ of the shift shaft with the open side facing inward until it is flush.
- Position the bearing retainers.
- Mount and tighten screw ③.

Guideline

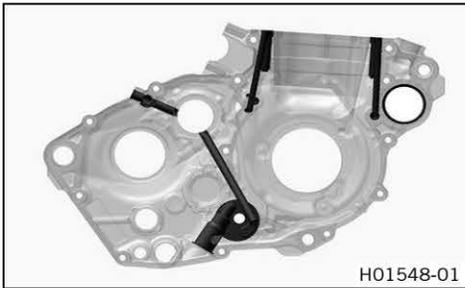
Screw, bearing retainer	M5	6 Nm (4.4 lbf ft)	Loctite® 243™
-------------------------	----	----------------------	---------------

- Position oil spray tube ②.
- Mount and tighten screw ①.

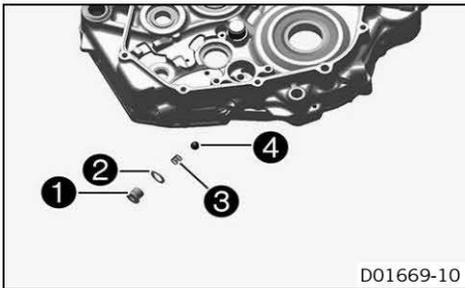
Guideline

Screw, oil spray tube	M4	5 Nm (3.7 lbf ft)	Loctite® 243™
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- Mount the dowels.
- Blow compressed air through all oil channels and check that they are clear.



18.4.3 Removing the oil pressure regulator valve

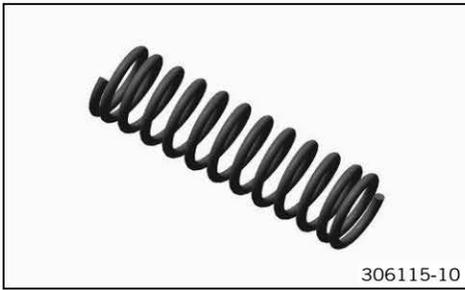


- Remove screw plug ① with sealing washer ②.
- Remove pressure spring ③ and ball ④.

18.4.4 Checking spring length of oil pressure regulator valve

Preparatory work

- Remove the oil pressure regulator valve. (📖 p. 184)



Main work

- Measure the spring length of the oil pressure regulator valve.

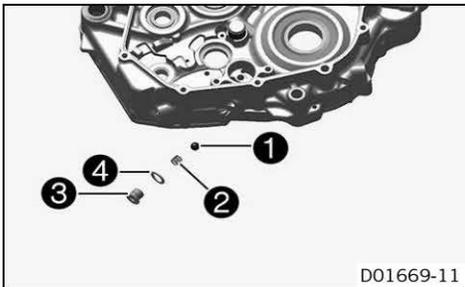
Oil pressure regulator valve	
Minimum length of preload spring	24.5 mm (0.965 in)

- » If the measured value does not meet specifications:
 - Change the spring.

Finishing work

- Install the oil pressure regulator valve. (📖 p. 185)

18.4.5 Installing the oil pressure regulator valve

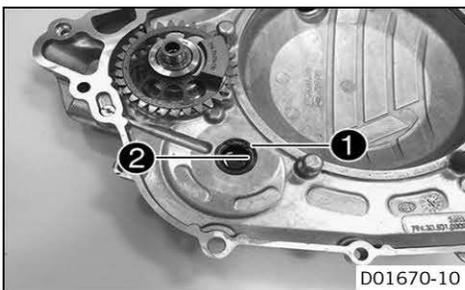


- Install ball ① and pressure spring ②.
- Mount and tighten plug ③ with sealing washer ④.

Guideline

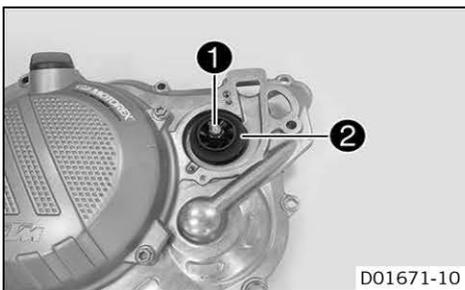
Plug, oil pressure regulator valve	M12x1.5	20 Nm (14.8 lbf ft)
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18.4.6 Changing the crankshaft seal ring in the clutch cover



- Remove lock ring ①.
- Remove crankshaft seal ring ②.
- Press the new crankshaft seal ring into the clutch cover with the open side facing inward until it is flush.
- Mount lock ring ①.
- Grease the sealing lip.

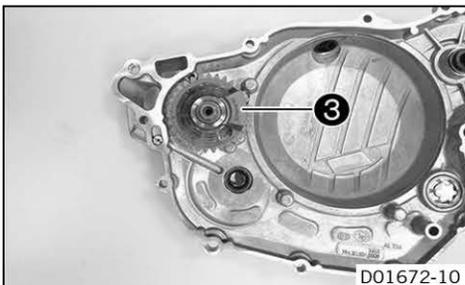
18.4.7 Removing the water pump



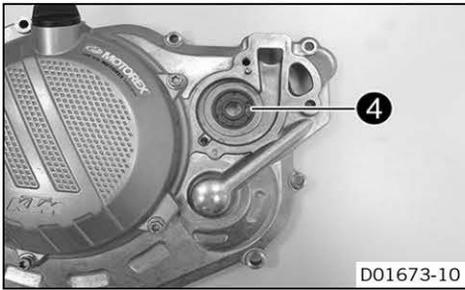
- Remove nut ①.
- Remove water pump impeller ②.

Info

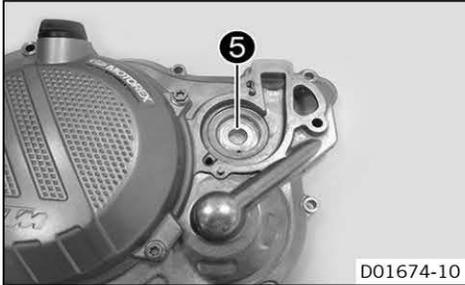
If the water pump impeller cannot be detached, then the water pump shaft can be pressed out toward the inside.



- Remove balancer shaft ③.



- Remove shaft seal ring **4**.



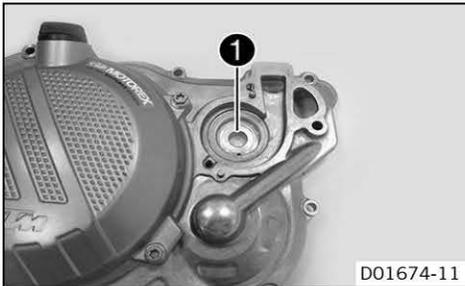
- Press out water pump shaft bearing **5** toward the inside with an appropriate tool.



Info

Suitably support the clutch cover while pressing it out.

18.4.8 Installing the water pump



- Press bearing **1** of the water pump shaft up to the stop with a suitable tool.

Push-in drift (79429006000) (🗨️ p. 369)



Info

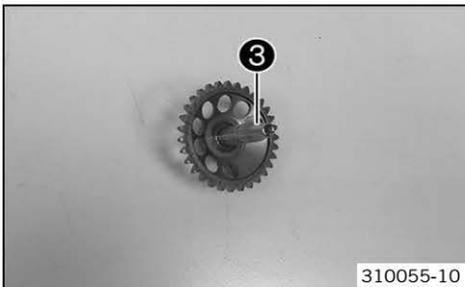
Provide suitable support for the clutch cover while pressing in.



- Press shaft seal ring **2** all the way in.

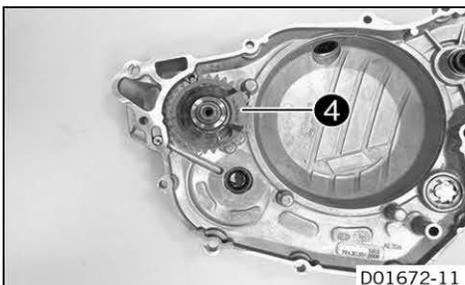
Press drift (60029043040) (🗨️ p. 365)

- ✓ The narrower chamfer faces the balancer shaft.



- Mount special tool **3** on the water pump shaft.

Mounting sleeve (90129005000) (🗨️ p. 370)



- Mount balancer shaft **4**.

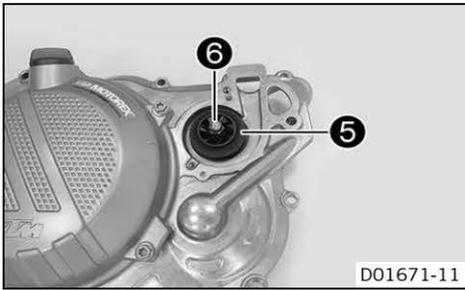


Info

Be careful not to damage the shaft seal rings.

- Remove the special tool.

Mounting sleeve (90129005000) (🗨️ p. 370)

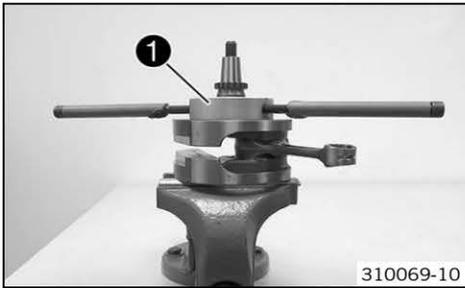


- Mount water pump impeller ⑤.
- Mount and tighten nut ⑥.

Guideline

Nut, water pump impeller	M6	6 Nm (4.4 lbf ft)	Loctite® 243™
--------------------------	----	----------------------	---------------

18.4.9 Removing the crankshaft bearing inner race



- Fix the crankshaft in the vise.

i Info
Use soft jaws.

- Warm up special tool ①.

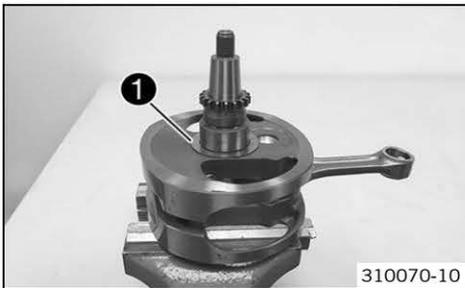
Guideline

150 °C (302 °F)

Tool for inner bearing race (58429037043) (📖 p. 363)
--

- Push the warmed up special tool ① onto the crankshaft bearing inner race, press firmly together, and pull jointly from the crankshaft.
- Take off the compensating disk.
- Repeat these steps on the opposite side.

18.4.10 Installing the crankshaft bearing inner race



Main work

- Fix the crankshaft in the vise.

i Info
Use soft jaws.

- Slide on compensating disk ①.

i Info
The compensating disks have a larger diameter than the crankshaft stub. Ensure that the compensating disks are centered and fixed with a small amount of grease. Only add the compensating disks on the ignition side.

- Heat the crankshaft bearing inner race in special tool ② and mount together.

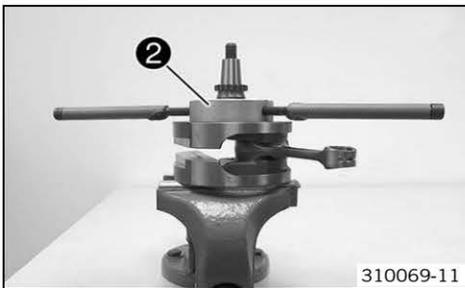
Guideline

120 °C (248 °F)

Tool for inner bearing race (58429037043) (📖 p. 363)
--

- Repeat these steps on the opposite side.
- Ensure that the new crankshaft bearing inner race is flush.

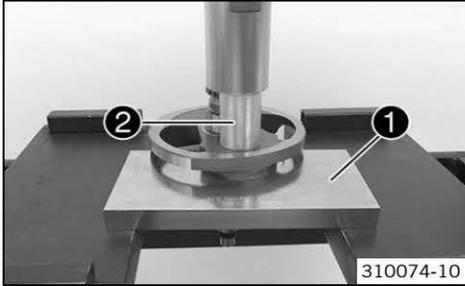
i Info
After replacing the crankshaft bearings, the crankshaft end play must be measured.



Finishing work

- Measure the crankshaft end play. (📖 p. 189)

18.4.11 Changing the connecting rod, conrod bearing, and crank pin



Main work

- Position the crankshaft with special tool **1** in the press.

Separator plate (79029009000) (📖 p. 368)

- Press the crank pin out of the upper crankweb with special tool **2**.

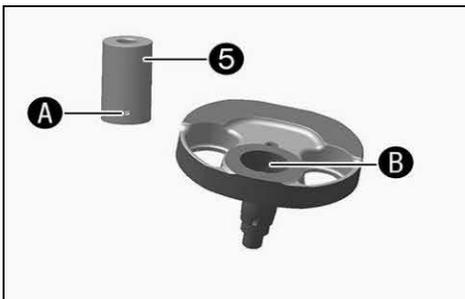
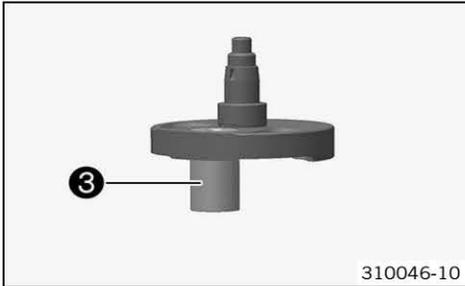
Pressing tool for crankshaft, complete (75029047000) (📖 p. 366)



Info

Hold the lower crankweb.

- Remove the connecting rod and bearing.
- Press crank pin **3** out of the lower crankweb.



- Place the crankweb onto special tool **4**.

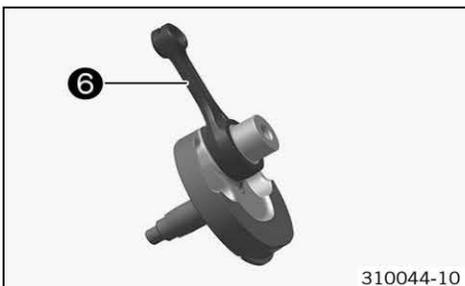
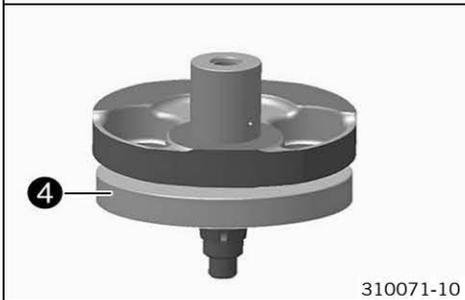
Insert for crankshaft pressing tool (79429008000) (📖 p. 369)



Info

The special tool must be positioned with the flat surface facing downward.

- Press in new crank pin **5** all the way.
 - ✓ Oil channel **A** is aligned with oil channel **B**.
 - ✗ If the oil channels are not correctly aligned, the conrod bearing will not be supplied with oil.
- Blow compressed air through the oil channels to check that they are clear.

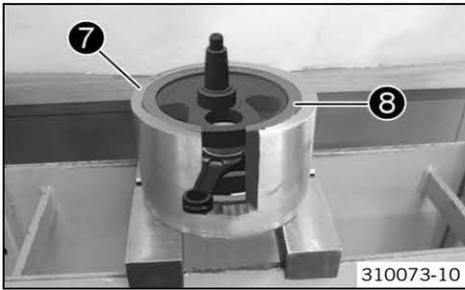


- Mount new connecting rod **6**.



Info

Thoroughly lubricate the bearing.

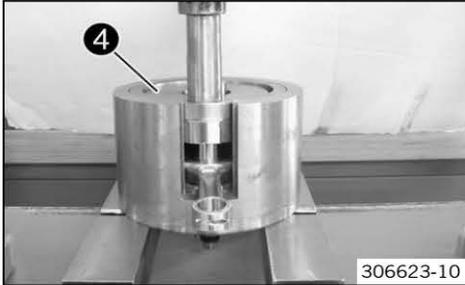


- Position special tools 7 and 8 on the press.

Pressing tool for crankshaft, complete (75029047000) (p. 366)

Insert for crankshaft pressing tool (79429008000) (p. 369)

- Insert the crankweb with the connecting rod and bearing. Position the second crankweb.



- Position special tool 4 with the heel pointing down.

Insert for crankshaft pressing tool (78929008000) (p. 368)

- Press in the upper crankweb as far as possible.



Info

The press mandrel must be positioned over the crank pin.

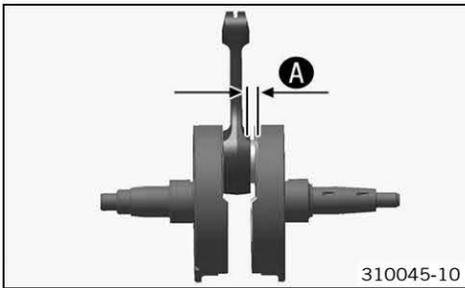
- Take the crankshaft out of the special tool and check that the connecting rod can move freely.

- Measure axial play A between the connecting rod and the crankwebs using the special tool.

Feeler gauge (59029041100) (p. 364)

Connecting rod - end play of lower con-rod bearing	0.20... 0.45 mm (0.0079... 0.0177 in)
--	---------------------------------------

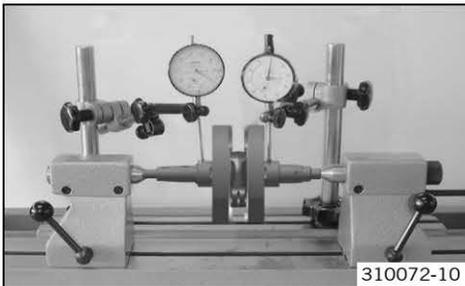
- » If the measured value is less than the specification:
 - Correct it so the dimension is equal to the specified value.



Finishing work

- Check the crankshaft run-out at bearing pin. (p. 189)

18.4.12 Checking crankshaft run-out at bearing pin



- Position the crankshaft on a roller block.
- Turn the crankshaft slowly.
- Check the crankshaft run-out on both bearing pins.

Crankshaft - run-out on bearing pin	≤ 0.03 mm (≤ 0.0012 in)
-------------------------------------	-------------------------

- » If the crankshaft run-out at the bearing pin is larger than the specification:
 - Align the crankshaft.

18.4.13 Measuring the crankshaft end play



- Insert the crankshaft into the right section of the engine case.



Info

Do not forget the fitted bushings.

- Mount the left section of the engine case.
- Mount and tighten the screws.

Guideline

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 crankshaft end play.

Guideline

Crankshaft - axial play	0.50... 0.60 mm (0.0197... 0.0236 in)
-------------------------	---------------------------------------

- » If the measured value does not meet specifications:
 - Remove the crankshaft.
 - Remove the crankshaft bearing inner race. (📖 p. 187)
 - Calculate the thickness of the compensating disks.
 - Add or remove compensating disks equally on both sides.

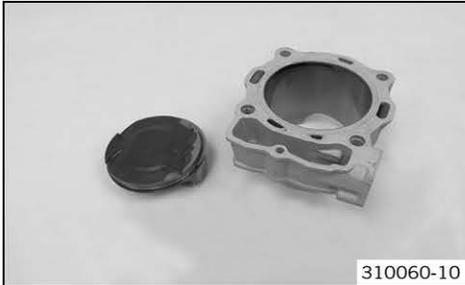


Info

If the end play is too small, remove compensating disks.
If the end play is too large, add compensating disks.

- Install the crankshaft bearing inner race. (📖 p. 187)

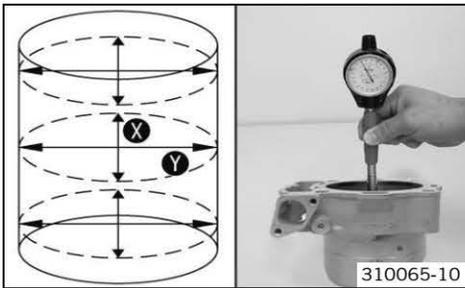
18.4.14 Cylinder - Nikasil® coating



310060-10

Nikasil® is a surface protection layer for a coating procedure developed by Mahle. The name is derived from the two materials used in this procedure - a layer of nickel into which is embedded the particularly hard silicone carbide. The most important advantages of the **Nikasil®** coating are very good heat conductivity, resulting in much improved performance, low wear, and a lightweight cylinder.

18.4.15 Checking/measuring the cylinder



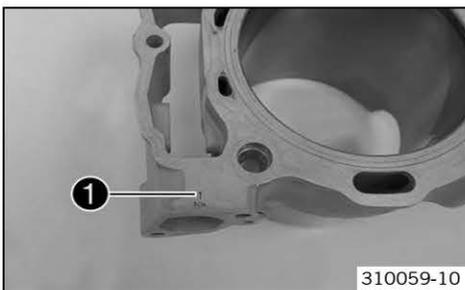
310065-10

(All 450 models)

- Check the cylinder bearing surface for damage.
 - » If the cylinder bearing surface is damaged:
 - Change the cylinder and piston.
- Measure the cylinder diameter at several locations on the **X**- and **Y**-axes using a micrometer to identify oval wear.

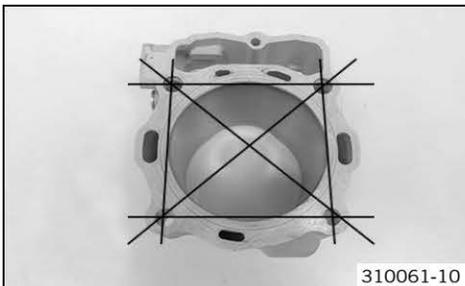
Guideline

Cylinder - drill hole diameter	
Size I	95.000... 95.012 mm (3.74015... 3.74062 in)
Size II	95.013... 95.025 mm (3.74066... 3.74113 in)



310059-10

- The cylinder size **1** is marked on the side of the cylinder.

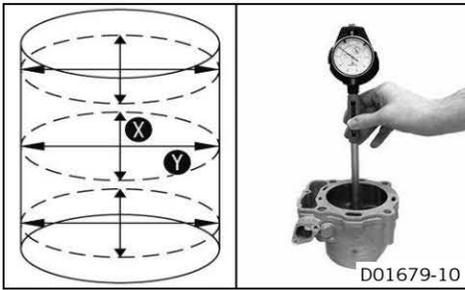


310061-10

- Using a straightedge and the special tool, check the sealing surface of the cylinder head for distortion.

Feeler gauge (59029041100) (📖 p. 364)	
Cylinder/cylinder head - sealing area distortion	≤ 0.10 mm (≤ 0.0039 in)

- » If the measured value does not meet specifications:
 - Change the cylinder.



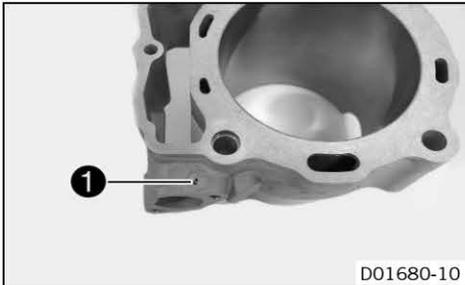
(All 500 models)

- Check the cylinder bearing surface for damage.
 - » If the cylinder bearing surface is damaged:
 - Change the cylinder and piston.
- Measure the cylinder diameter at several locations on the **X**- and **Y**-axes using a micrometer to identify oval wear.

Guideline

Cylinder - drill hole diameter	
Size I	95.000... 95.012 mm (3.74015... 3.74062 in)
Size II	95.013... 95.025 mm (3.74066... 3.74113 in)

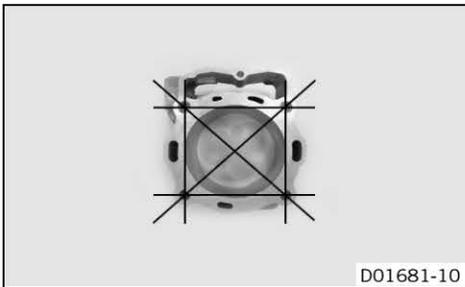
- The cylinder size **1** is marked on the side of the cylinder.



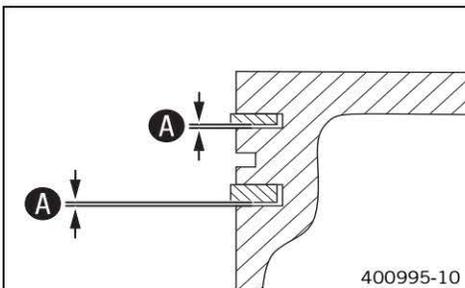
- Using a straightedge and the special tool, check the sealing surface of the cylinder head for distortion.

Feeler gauge (59029041100) (📖 p. 364)	
Cylinder/cylinder head - sealing area distortion	≤ 0.10 mm (≤ 0.0039 in)

- » If the measured value does not meet specifications:
 - Change the cylinder.



18.4.16 Checking/measuring the piston



(All 450 models)

- Use the special tool to measure clearance **A** of the piston rings in the piston ring groove.

Guideline

Piston ring - groove clearance	
Compression ring	≤ 0.08 mm (≤ 0.0031 in)
Oil scraper ring	≤ 0.07 mm (≤ 0.0028 in)

Feeler gauge (59029041100) (📖 p. 364)	
---------------------------------------	--

- » If clearance **A** larger than the specified value:
 - Change the piston and piston rings.
 - Check/measure the cylinder. (📖 p. 190)
- Check the piston bearing surface for damage.
 - » If the piston bearing surface is damaged:
 - Replace the piston and, if necessary, the cylinder.
- Check that the piston rings move easily in the piston ring grooves.
 - » If the piston ring is stiff:
 - Clean the piston ring groove.

i Tip
An old piston ring can be used to clean the piston ring groove.



- Check the piston rings for damage.

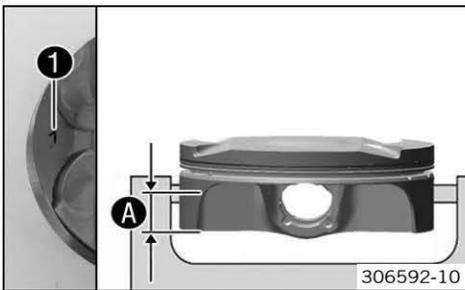
- » If the piston ring is damaged:
 - Change the piston ring.

i Info
Mount the piston ring with the marking facing upward.

- Check the piston pins for discoloration or signs of wear.
 - » If the piston pin shows severe discoloration/signs of wear:
 - Change the piston pin.
- Place the piston pin in the connecting rod and check the seating for play.
 - » If the piston pin seating has excessive play:
 - Change the connecting rod and piston pin.
- Place the piston pin in the piston and check the seating for play.
 - » If the piston pin seating has excessive play:
 - Replace the piston and, if necessary, the cylinder and piston pin.
- Measure the piston at the piston skirt, at right angles to the piston pin, at a distance **A**.

Guideline

Distance A	7 mm (0.28 in)
Piston - diameter	
Size I	94.93... 94.96 mm (3.7374... 3.7386 in)
Size II	94.94... 94.97 mm (3.7378... 3.739 in)



i Info
Piston dimensions **1** are marked on the piston head.

(All 500 models)

- Use the special tool to measure clearance **A** of the piston rings in the piston ring groove.

Guideline

Piston ring - groove clearance	
Compression ring	≤ 0.08 mm (≤ 0.0031 in)
Oil scraper ring	≤ 0.07 mm (≤ 0.0028 in)

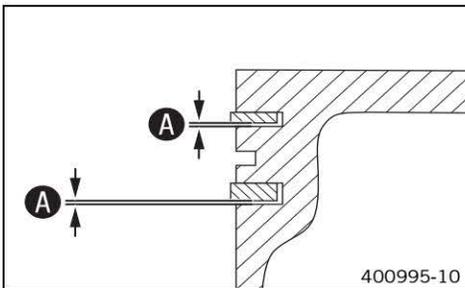
Feeler gauge (59029041100) (📖 p. 364)

- » If clearance **A** larger than the specified value:
 - Change the piston and piston rings.
 - Check/measure the cylinder. (📖 p. 190)
- Check the piston bearing surface for damage.
 - » If the piston bearing surface is damaged:
 - Replace the piston and, if necessary, the cylinder.
- Check that the piston rings move easily in the piston ring grooves.
 - » If the piston ring is stiff:
 - Clean the piston ring groove.

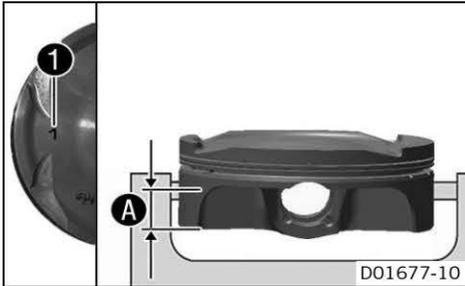
i Tip
An old piston ring can be used to clean the piston ring groove.

- Check the piston rings for damage.
 - » If the piston ring is damaged:
 - Change the piston ring.

i Info
Mount the piston ring with the marking facing upward.



- Check the piston pins for discoloration or signs of wear.
 - » If the piston pin shows severe discoloration/signs of wear:
 - Change the piston pin.
- Place the piston pin in the connecting rod and check the seating for play.
 - » If the piston pin seating has excessive play:
 - Change the connecting rod and piston pin.
- Place the piston pin in the piston and check the seating for play.
 - » If the piston pin seating has excessive play:
 - Replace the piston and, if necessary, the cylinder and piston pin.
- Measure the piston at the piston skirt, at right angles to the piston pin, at a distance **A**.



Guideline

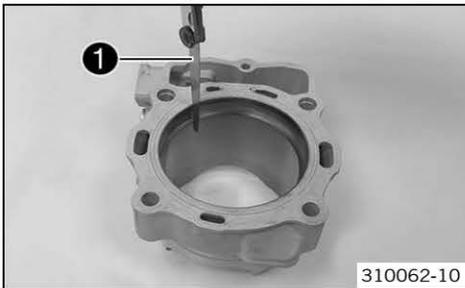
Distance A	7 mm (0.28 in)
Piston - diameter	
Size I	94.93... 94.96 mm (3.7374... 3.7386 in)
Size II	94.94... 94.97 mm (3.7378... 3.739 in)



Info

Piston dimensions **1** are marked on the piston head.

18.4.17 Checking piston ring end gap



(All 450 models)

- Remove the piston ring from the piston.
- Place the piston ring in the cylinder and align with the piston.

Guideline

Below the upper edge of the cylinder	10 mm (0.39 in)
--------------------------------------	-----------------

- Using special tool **1**, measure the end gap.

Guideline

Piston ring end gap	
Compression ring	≤ 1.00 mm (≤ 0.0394 in)
Oil scraper ring	≤ 1.20 mm (≤ 0.0472 in)

Feeler gauge (59029041100) (📖 p. 364)

- » If the end gap is greater than the specified value:
 - Check/measure the cylinder. (📖 p. 190)
- » If cylinder wear lies within the specified tolerance:
 - Change the piston ring.
- Mount the piston ring with the marking facing upward.

(All 500 models)

- Remove the piston ring from the piston.
- Place the piston ring in the cylinder and align with the piston.

Guideline

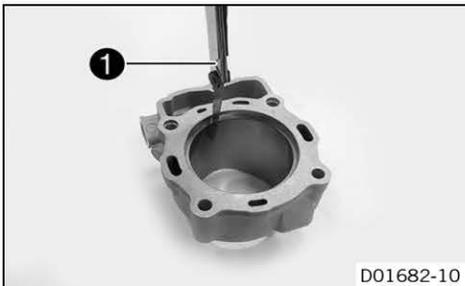
Below the upper edge of the cylinder	10 mm (0.39 in)
--------------------------------------	-----------------

- Using special tool **1**, measure the end gap.

Guideline

Piston ring end gap	
Compression ring	≤ 1.00 mm (≤ 0.0394 in)
Oil scraper ring	≤ 1.20 mm (≤ 0.0472 in)

Feeler gauge (59029041100) (📖 p. 364)



- » If the end gap is greater than the specified value:
 - Check/measure the cylinder. (📖 p. 190)
- » If cylinder wear lies within the specified tolerance:
 - Change the piston ring.
- Mount the piston ring with the marking facing upward.

18.4.18 Measuring the piston/cylinder mounting clearance



(All 450 models)

- Check/measure the cylinder. (📖 p. 190)
- Check/measure the piston. (📖 p. 191)
- The smallest piston/cylinder mounting clearance equals the smallest cylinder bore diameter minus the largest piston diameter. The largest piston/cylinder mounting clearance equals the largest cylinder bore diameter minus the smallest piston diameter.

Guideline

Piston/cylinder - mounting clearance	
Size I	0.040... 0.082 mm (0.00157... 0.00323 in)
Size II	0.043... 0.085 mm (0.00169... 0.00335 in)
Wear limit	0.120 mm (0.00472 in)



(All 500 models)

- Check/measure the cylinder. (📖 p. 190)
- Check/measure the piston. (📖 p. 191)
- The smallest piston/cylinder mounting clearance equals the smallest cylinder bore diameter minus the largest piston diameter. The largest piston/cylinder mounting clearance equals the largest cylinder bore diameter minus the smallest piston diameter.

Guideline

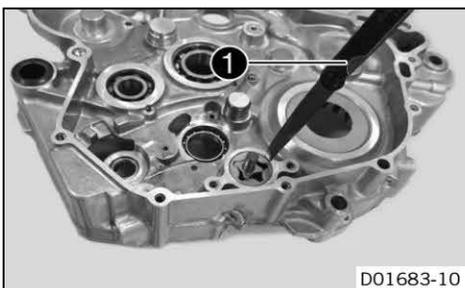
Piston/cylinder - mounting clearance	
Size I	0.040... 0.082 mm (0.00157... 0.00323 in)
Size II	0.043... 0.085 mm (0.00169... 0.00335 in)
Wear limit	0.120 mm (0.00472 in)

18.4.19 Checking the oil pumps



Info

The following steps apply to both oil pumps.



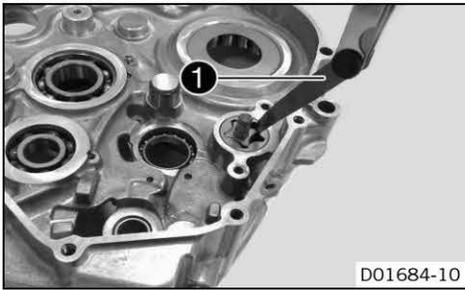
- Use special tool ❶ to measure the play between the external rotor and the engine case.

Feeler gauge (59029041100) (📖 p. 364)

Oil pump

External rotor/engine case clearance	≤ 0.20 mm (≤ 0.0079 in)
--------------------------------------	-------------------------

- » If the measured value does not meet specifications:
 - Change the oil pump and, if necessary, the engine case.



- Use special tool **1** to measure the play between the external rotor and the internal rotor.

Feeler gauge (59029041100) (📖 p. 364)

Oil pump

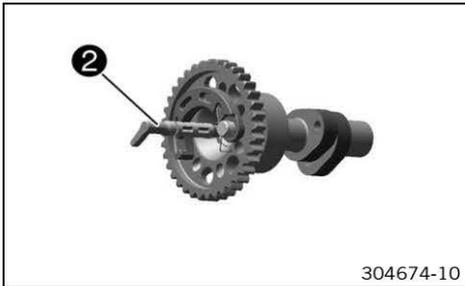
External rotor/internal rotor clearance	≤ 0.20 mm (≤ 0.0079 in)
---	-------------------------

- » If the measured value does not meet specifications:
 - Replace the oil pump.

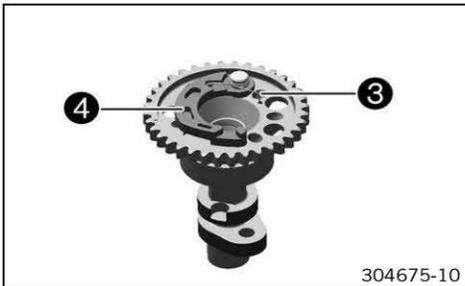
18.4.20 Disassembling the autodecompressor



- Take lock ring **1** from the autodecompression shaft and dispose of it.



- Pull autodecompression shaft **2** out of the camshaft.

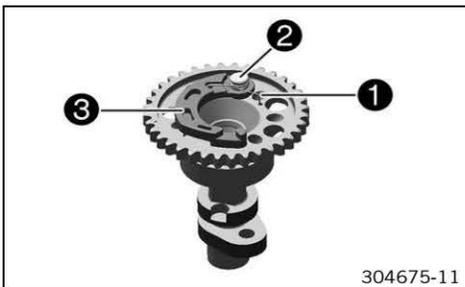


- Release and remove autodecompression spring **3**.

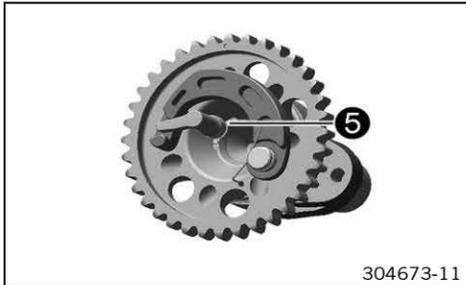
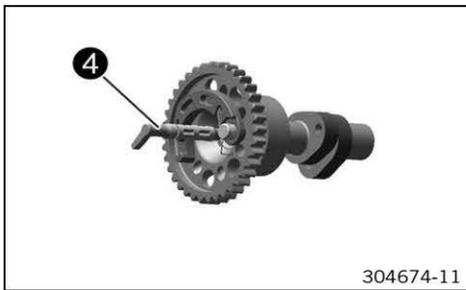
i Info

Autodecompression weight **4** cannot be taken off.

18.4.21 Assembling the autodecompressor

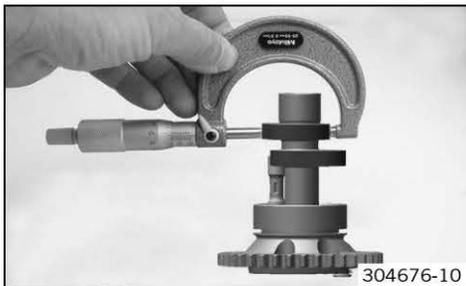


- Insert long flange **1** of the autodecompression spring in the hole, push the autodecompression spring over bearing bolt **2** and hook it into autodecompression weight **3**.



- Mount autodecompression shaft ④ in the camshaft.
- Mount new lock ring ⑤.
- Perform a function check.
 - » The autodecompression spring does not turn the autodecompression shaft back to the stop:
 - Pre-tension the autodecompression spring more or replace it.

18.4.22 Checking camshaft

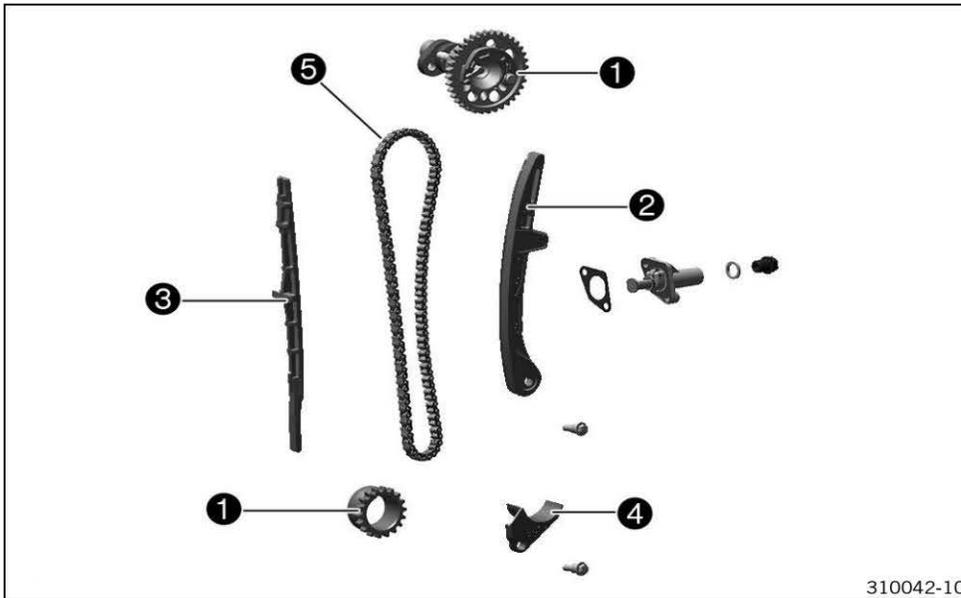


- Check the camshaft for damage and wear.
 - » If there is damage or wear:
 - Change the camshaft.
 - If the camshaft surface is damaged, check the oil supply of the camshaft and the rocker arm.
- Measure the cams of the camshaft.

Camshaft - cam height	
Exhaust	33.10... 33.30 mm (1.3031... 1.311 in)
Camshaft - cam height (All 450 models)	
Intake	34.00... 34.20 mm (1.3386... 1.3465 in)
Camshaft - cam height (All 500 models)	
Intake	34.40... 34.60 mm (1.3543... 1.3622 in)

- » If the measured value does not meet specifications:
 - Change the camshaft.

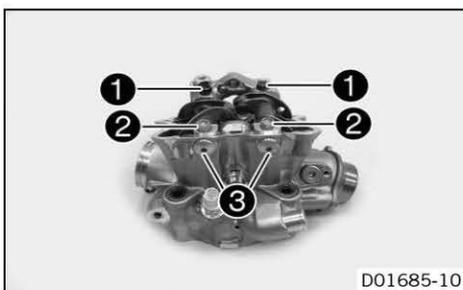
18.4.23 Checking the timing assembly



310042-10

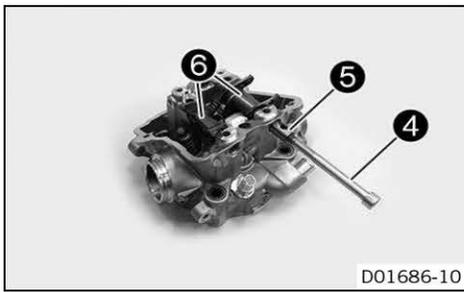
- Clean all parts well.
- Check the timing chain gear/timing chain sprocket **1** for damage and wear.
 - » If there is damage or wear:
 - Change the camshaft/timing chain sprocket.
- Check the timing chain tensioning rail **2** for damage and wear.
 - » If there is damage or wear:
 - Replace the timing chain tensioning rail.
- Check the timing chain guide rail **3** for damage and wear.
 - » If there is damage or wear:
 - Replace the timing chain guide rail.
- Check the timing chain securing guide **4** for damage and wear.
 - » If there is damage or wear:
 - Replace the timing chain securing guide.
- Check timing chain **5** for damage and wear.
 - » If there is damage or wear:
 - Replace 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:
 - Replace the timing chain.

18.4.24 Removing the rocker arm



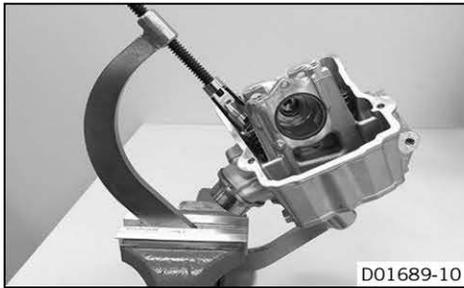
D01685-10

- Remove screws **1** and **2** of the rocker arm shafts.
- Remove plugs **3** with the O-rings.



- Screw appropriate screw ④ into the rocker arm shafts ⑤. Pull out rocker arm shafts ⑤.
- Take off rocker arm ⑥.

18.4.25 Removing the valves

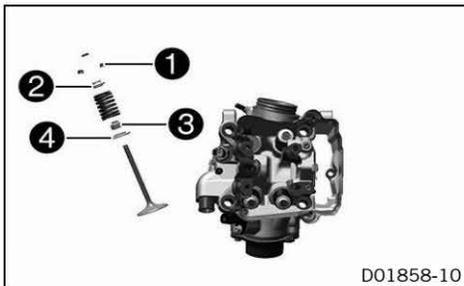


- Take the shims out of the valve spring retainers and lay them to one side according to their normal built-in position.
- Pretension the valve springs using the special tool.

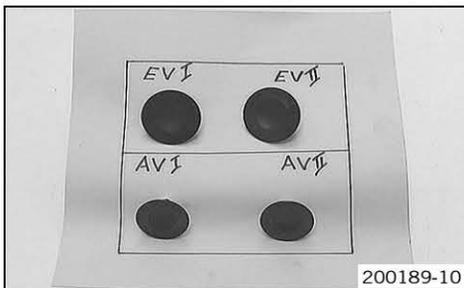
Valve spring mounter (59029019000) (p. 364)

Insert for valve spring lever (77029041200) (p. 367)

- Remove valve keys ① and relax the valve springs.



- Remove valve spring retainer ② and the valve spring.
- Pull the valve out of the valve guide from below and remove valve stem seal ③ and valve spring seat ④.



- Mark the valves corresponding to their installation position.

i Info

Place the valves in a carton corresponding to their installation position and label them.

18.4.26 Changing the camshaft bearing

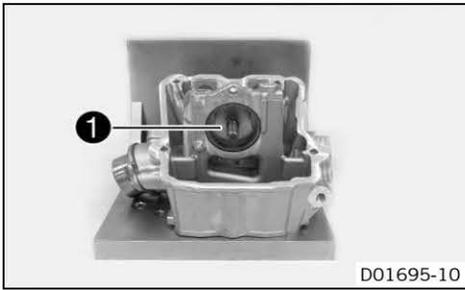
Condition

The valves are removed and the exhaust flange is removed.

- Mount the cylinder head.

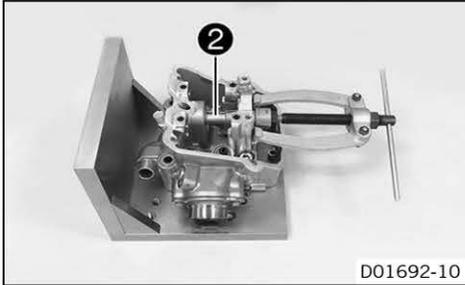
Clamping plate (75029050000) (p. 366)





- Remove the large camshaft bearing using special tool ①.

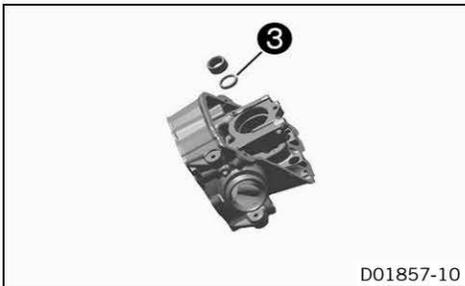
Push-out drift (75029051000) (📖 p. 367)



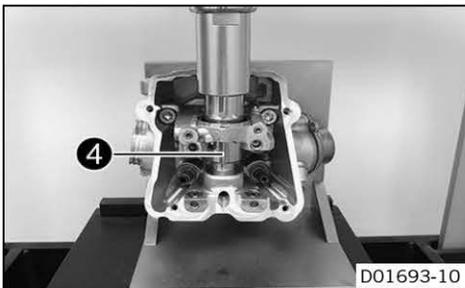
- Remove small camshaft bearing ② using the special tool.

Bearing puller (15112017000) (📖 p. 361)

Internal bearing puller (15112018100) (📖 p. 361)

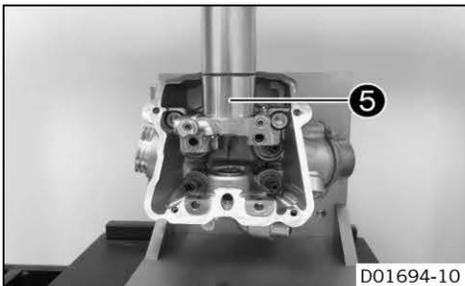


- Remove shaft seal ring ③ using a suitable tool.
- Press the new shaft seal ring in all the way with the open side facing down.



- Press the small camshaft bearing in until flush using special tool ④.

Push-in drift (75029044020) (📖 p. 366)



- Press the large camshaft bearing in all the way using special tool ⑤.

Push-in drift (75029044010) (📖 p. 366)

18.4.27 Checking the valves



Info

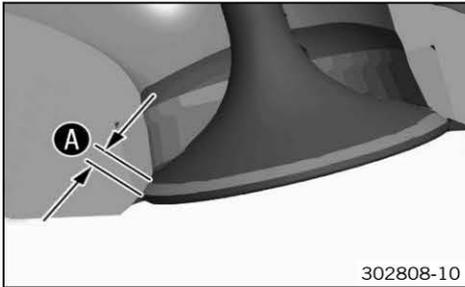
The valve stem is hard-chrome plated; wear generally appears at the valve guide.



- Check the valve plate for run-out.

Valve	
Run-out at valve plate	≤ 0.05 mm (≤ 0.002 in)

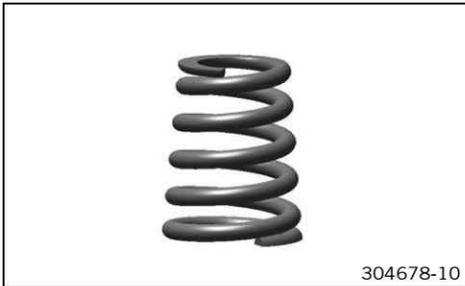
- » If the measured value does not meet specifications:
 - Change the valve.



- Check sealing seat **A** on valve for damage and wear.

- » If the sealing surface is damaged or worn:
 - Machine the valve seat.

18.4.28 Checking valve springs



- Check the valve springs for breakage and wear (visual check).
 - » If the valve spring is broken or worn:
 - Change the valve spring.
- Measure the length of the valve springs.

Valve spring	
Minimum length, intake (without valve spring seat)	40.7 mm (1.602 in)

Valve spring	
Minimum length, exhaust (without valve spring seat)	40.7 mm (1.602 in)

- » If the measured value does not meet specifications:
 - Change the valve spring.

18.4.29 Checking valve spring seat

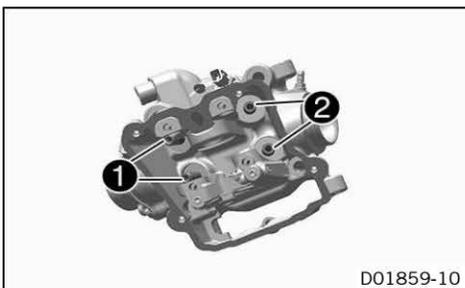


- Check the valve spring seat for breakage and wear (visual check).
 - » If the valve spring seat is broken or worn:
 - Change the valve spring seat.
- Measure the thickness of the valve spring seat.

Valve spring	
Valve spring seat	1.9... 2.1 mm (0.075... 0.083 in)

- » If the measured value does not meet specifications:
 - Change the valve spring seat.

18.4.30 Checking the cylinder head



- Check exhaust valve guides **1** using the special tool.

Limit plug gauge (59029026006) (見 p. 364)

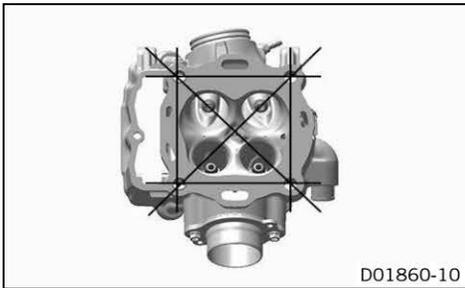
- » If the special tool is easy to insert in the valve guide:
 - Change the valve guide and valve.

- Check intake valve guides **2** using the special tool.

Limit plug gauge (59029026006) (見 p. 364)

- » If the special tool is easy to insert in the valve guide:

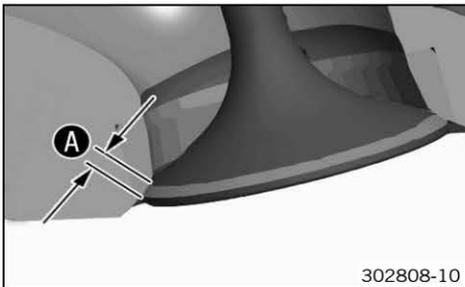
- Change the valve guide and valve.
- Check the sealing area of the spark plug thread and the valve seats from damage and cracking.
 - » If there is damage or cracking:
 - Change the cylinder head.
- Using a straightedge and the special tool, check the sealing area of the cylinder for distortion.



Feeler gauge (59029041100) (🔧 p. 364)

Cylinder/cylinder head - sealing area distortion	≤ 0.10 mm (≤ 0.0039 in)
--	-------------------------

- » If the measured value does not meet specifications:
 - Change the cylinder head.



- Check sealing seat **A** of the valves.

Valve	
Intake sealing seat width	2.00 mm (0.0787 in)

Valve	
Exhaust sealing seat width	2.00 mm (0.0787 in)

- » If the measured value does not meet specifications:
 - Rework the valve seat.

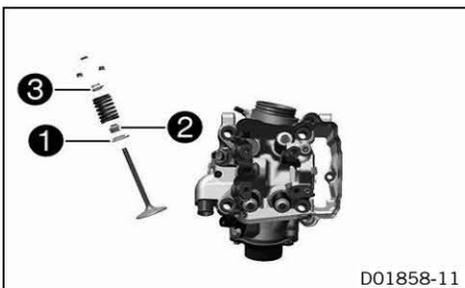
- Blow compressed air through all oil channels and check that they are clear.

18.4.31 Checking the rocker arm shafts

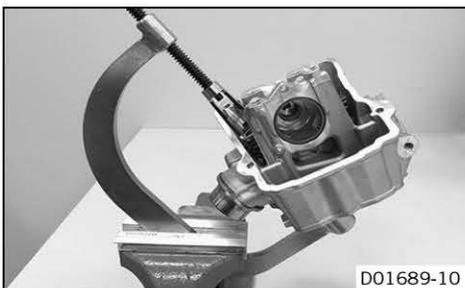


- Check the rocker arm shafts for damage and wear.
 - » If there is damage or wear:
 - Change the rocker arm shafts.

18.4.32 Installing the valves



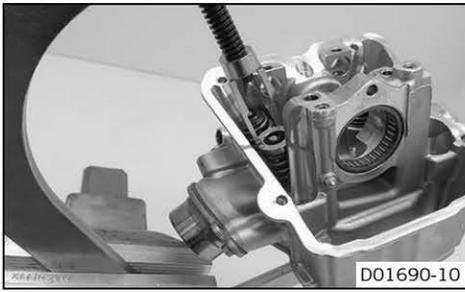
- Position valve spring seats **1**. Mount the new valve stem seals **2**.
- Mount the valves according to their normal built-in position.
- Mount the springs and spring retainers **3**.



- Pretension the valve springs using the special tool.

Valve spring mouter (59029019000) (🔧 p. 364)
--

Insert for valve spring lever (77029041200) (🔧 p. 367)
--



D01690-10

- Mount the valve keys.

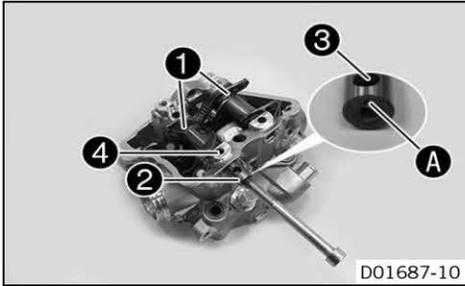


Info

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 into the valve spring retainers according to the installation position.

18.4.33 Installing the rocker arm



D01687-10

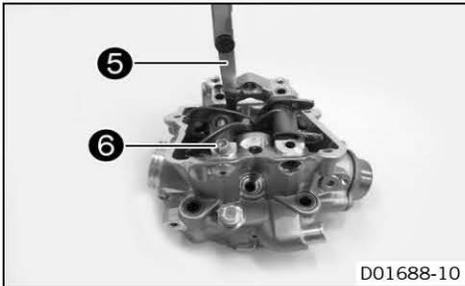
- Position rocker arm ① and mount rocker arm shaft ②.

- ✓ The rocker arm shaft with marking **A** is installed on the intake side.
- ✓ Markings **A** face upward.



Info

Make sure that the tapped hole of the rocker arm shaft is facing outward. Align drill holes ③ of the rocker arm shafts with drill holes ④ of the cylinder head.



D01688-10

- Use special tool ⑤ to set the distance of the intake rocker arm.

Guideline

Rocker arm - axial play	0.10 mm (0.0039 in)
-------------------------	---------------------

Feeler gauge (59029041100) (📖 p. 364)

- Press the rocker arm shaft of the intake side all the way into the cylinder head.
- Mount and tighten screw ⑥.

Guideline

Screw, rocker arm bearing	M7	15 Nm (11.1 lbf ft)
---------------------------	----	------------------------

- Remove special tool ⑤.

Feeler gauge (59029041100) (📖 p. 364)

- Repeat these operations on the rocker arm of the exhaust side.

- Mount and tighten screws ⑦.

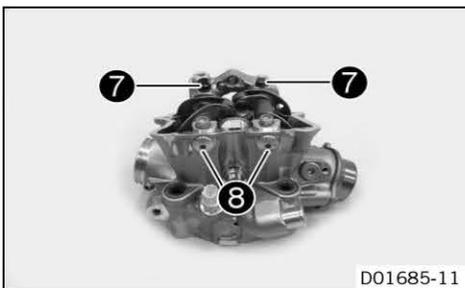
Guideline

Screw, rocker arm bearing	M7	15 Nm (11.1 lbf ft)
---------------------------	----	------------------------

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

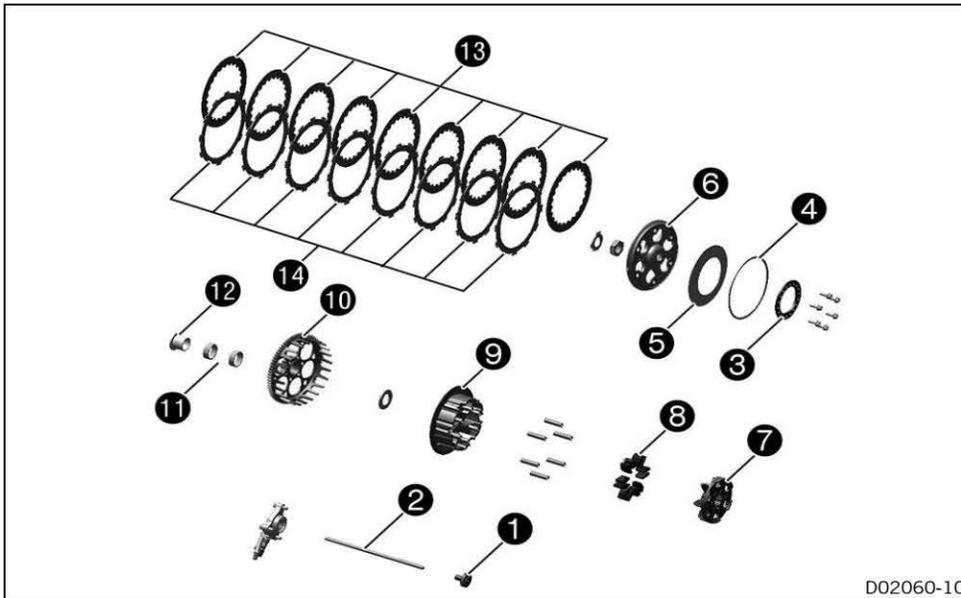
Guideline

Screw plug, rocker arm shaft	M10x1.25	10 Nm (7.4 lbf ft)
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D01685-11

18.4.34 Checking the clutch



D02060-10

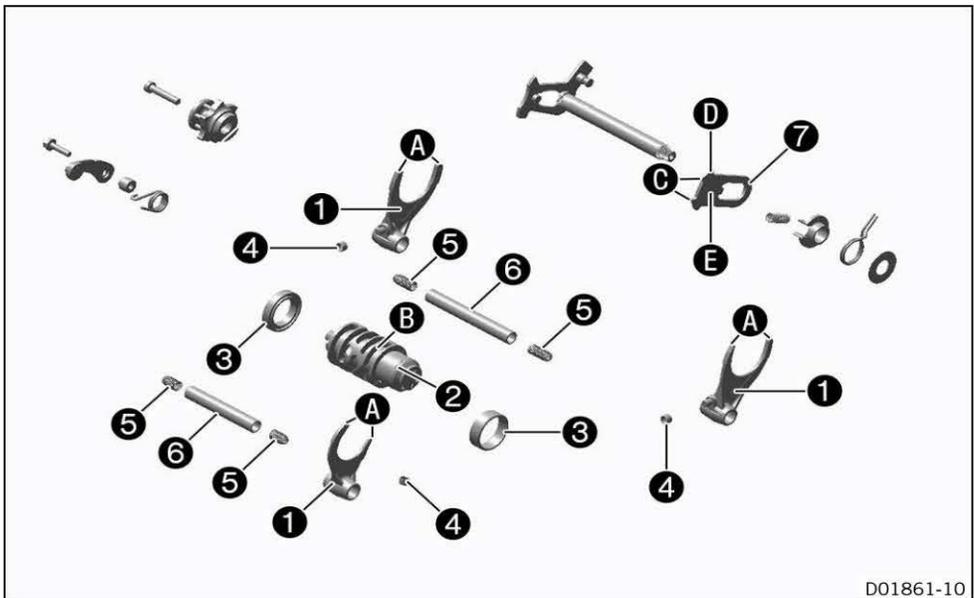
- Check clutch throw-out **1** for damage and wear.
 - » If there is damage or wear:
 - Change the clutch throw-out.
- Place push rod **2** on a level surface and check for run-out.
 - » If there is run-out:
 - Change the push rod.
- Check spring retainer **3** for damage and wear.
 - » If there is damage or wear:
 - Change the spring retainer.
- Check pretension ring **4** for damage and wear.
 - » If there is damage or wear:
 - Change the pretension ring.
- Check spring washer **5** for damage and wear.
 - » If there is damage or wear:
 - Change the spring washer.
- Check the contact surface of pressure cap **6** for damage and wear.
 - » If there is damage or wear:
 - Change the pressure cap.
- Check clutch center **7** for damage and wear.
 - » If there is damage or wear:
 - Change the clutch center.
- Check damping rubber pieces **8** for damage and wear.
 - » If there is damage or wear:
 - Change the damping rubber pieces.
- Check inner clutch hub **9** for damage and wear.
 - » If there is damage or wear:
 - Change the inner clutch hub.
- Check the thrust surfaces of the clutch facing discs in clutch basket **10** for damage and wear.
 - » If there is damage or wear:
 - Change the clutch facing discs and the clutch basket.
- Check needle bearings **11** and collar bushing **12** for damage and wear.
 - » If there is damage or wear:

- Change the needle bearings and collar bushing.
- Check intermediate clutch discs **13** for damage and wear.
 - » If the intermediate clutch discs are not level and are pitted:
 - Change all intermediate clutch discs.
- Check clutch facing discs **14** for discoloration and scoring.
 - » If there is discoloration or scoring:
 - Change all clutch facing discs.
- Check the thickness of the clutch pack.

Clutch pack - thickness	
Wear limit	≥ 26.4 mm (≥ 1.039 in)

- » If the clutch pack does not meet specifications:
 - Change the clutch pack.

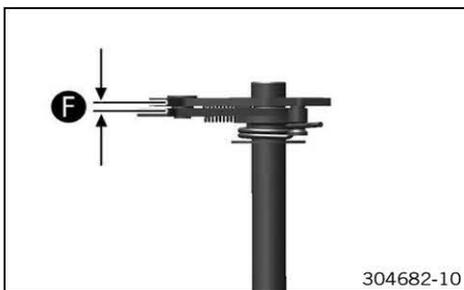
18.4.35 Checking the shift mechanism



D01861-10

- Check shift forks **1** at leaf **A** for wear.
 - » If there is damage or wear:
 - Change the shift fork.
- Check shift grooves **B** of shift drum **2** for wear.
 - » If the shift groove is worn:
 - Change the shift drum.
- Check the seat of shift drum in bearing **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 bearing is stiff or worn:
 - Change the bearings.
- Check shift rollers **4** for surface damage and cracking.
 - » If the shift roller exhibits surface damage or cracking:
 - Change the shift roller.
- 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 shift rails **6** on a flat surface for run-out.

- » If there is run-out:
 - Change the shift rail.
- Check the shift rails for scoring, seizure marks, and stiffness in the shift fork.
 - » If the shift rail has scoring, seizure marks, or does not move easily in the shift fork:
 - 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.
- Preassemble the shift shaft. (📖 p. 205)

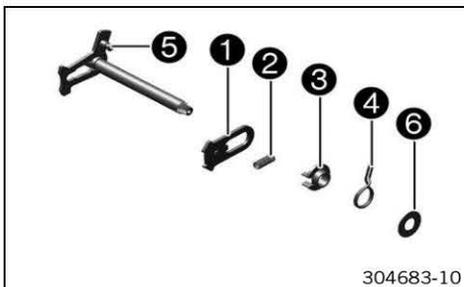


- Check clearance **F** between the sliding plate and the shift quadrant.

Shift shaft - play in sliding plate/shift quadrant	0.40... 0.80 mm (0.0157... 0.0315 in)
--	---------------------------------------

- » If the measured value does not meet specifications:
 - Change the sliding plate.

18.4.36 Preassembling the shift shaft



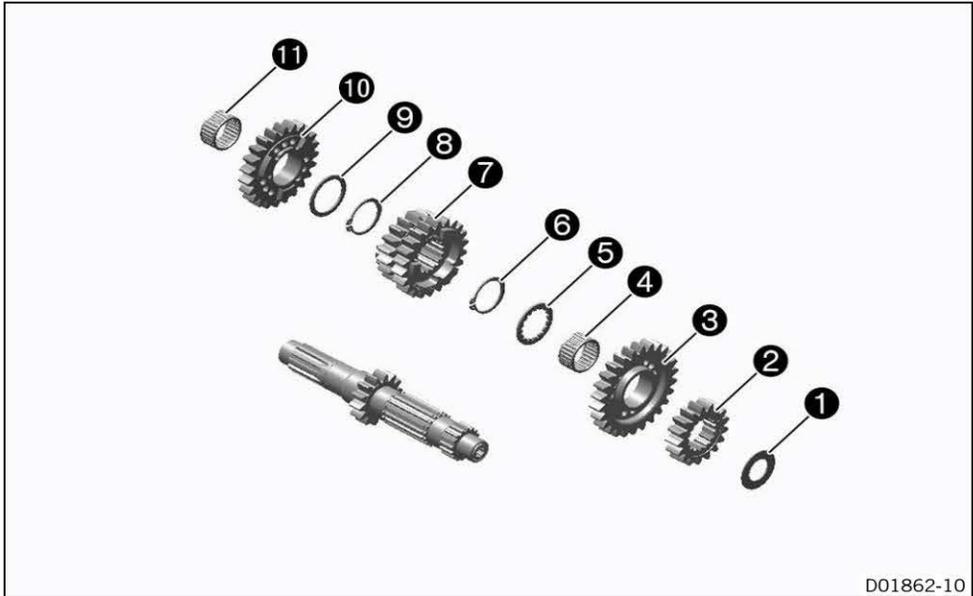
- Secure the short end of the shift shaft in the bench vise.

Guideline

Use soft jaws.

- Mount sliding plate **1** with the guide pin facing downward and put the guide pin on the shift quadrant.
- Mount pressure spring **2**.
- Slide on spring guide **3**, push return spring **4**, with the offset end facing upward, over the spring guide and lift the offset end over abutment bolt **5**.
- Mount stop disk **6**.

18.4.37 Disassembling the main shaft



D01862-10

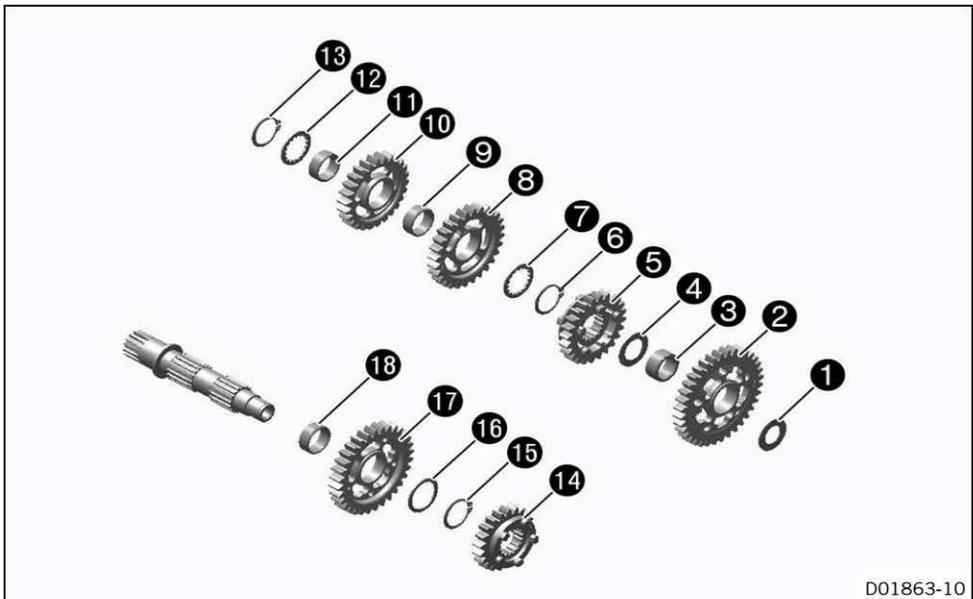
- Secure the main shaft in the vise with the gear teeth facing downward.

Guideline

Use soft jaws.

- Remove stop disk **1** and second-gear fixed gear **2**.
- Remove sixth-gear idler gear **3**.
- Remove the split needle bearing **4** and stop disk **5**.
- Remove lock ring **6**.
- Remove third/fourth-gear sliding gear **7**.
- Remove lock ring **8**.
- Remove stop disk **9** and fifth-gear idler gear **10**.
- Remove split needle bearing **11**.

18.4.38 Disassembling the countershaft



D01863-10

- Secure the countershaft in the bench vise with the toothed end facing downward.

Guideline

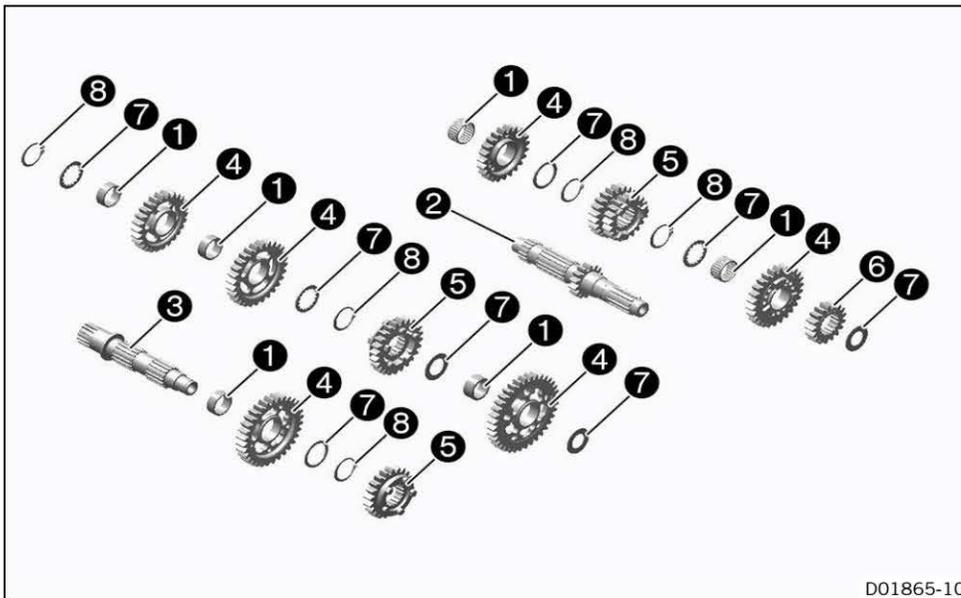
Use soft jaws.

- 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 third-gear idler gear ⑧.
- Remove needle bearing ⑨ and fourth-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.

18.4.39 Checking the transmission

Condition

The transmission has been disassembled.



D01865-10

- Check needle bearings ① for damage and wear.
 - » If there is damage or wear:
 - Change the needle bearings.
- Check the pivot points of main shaft ② and countershaft ③ for damage and wear.
 - » If there is damage or wear:
 - Change the main shaft and/or countershaft.
- Check the tooth profiles of main shaft ② and countershaft ③ for damage and wear.
 - » If there is damage or wear:
 - Change the main shaft and/or countershaft.
- Check the pivot points of idler gears ④ for damage and wear.
 - » If there is damage or wear:
 - Change the gear wheel pair.
- Check the shift dogs of idler gears ④ and sliding gears ⑤ for damage and wear.
 - » If there is damage or wear:
 - Change the gear wheel pair.
- Check the tooth faces of idler gears ④, sliding gears ⑤, and fixed gear ⑥ for damage and wear.
 - » If there is damage or wear:
 - Change the gear wheel pair.
- Check the tooth profiles of sliding gears ⑤ for damage and wear.
 - » If there is damage or wear:

- Change the gear wheel pair.
- Check sliding gear **5** for smooth operation in the profile of main shaft **2**.
 - » If the sliding gear does not move freely:
 - Change the sliding gear or the main shaft.
- Check sliding gears **5** for smooth operation in the profile of countershaft **3**.
 - » If the sliding gear does not move freely:
 - Change the sliding gear or the countershaft.
- Check stop disks **7** for damage and wear.
 - » If there is damage or wear:
 - Change the stop disks.
- Use new lock rings **8** with every repair.

18.4.40 Assembling the main shaft

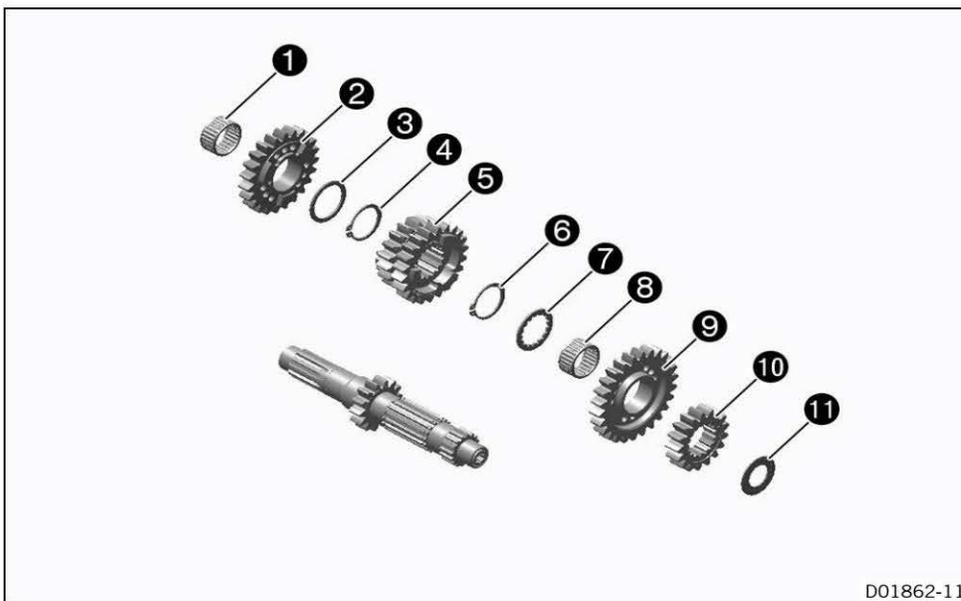


Info

Use new lock rings with every repair.

Preparatory work

- Lubricate all parts carefully before assembling.
- Check the transmission. (📖 p. 207)



D01862-11

Main work

- Secure the main shaft with the toothed end facing downward in the vise.

Guideline

Use soft jaws.

- Mount the divided needle bearing **1** and attach the fifth-gear idler gear **2** with the shift dogs facing up.
- Mount stop disk **3** and lock ring **4**.
- Push on the third/fourth-gear sliding gear **5** with the small gear wheel facing downward and mount lock ring **6**.
- Push on stop disk **7** and split 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 gear wheels for smooth operation.

18.4.41 Assembling the countershaft

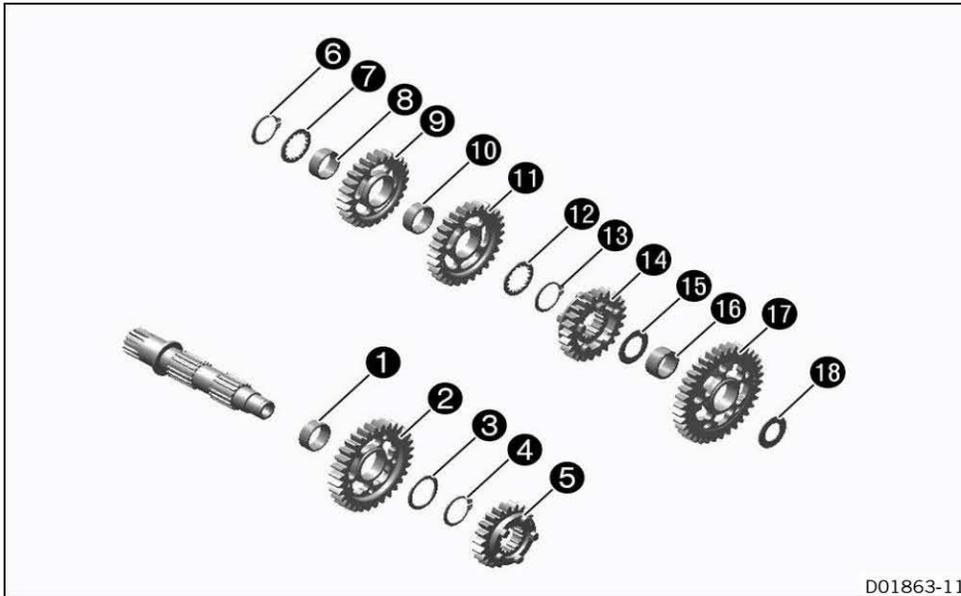


Info

Use new lock rings with every repair.

Preparatory work

- Lubricate all parts carefully before assembling.
- Check the transmission. (📖 p. 207)



Main work

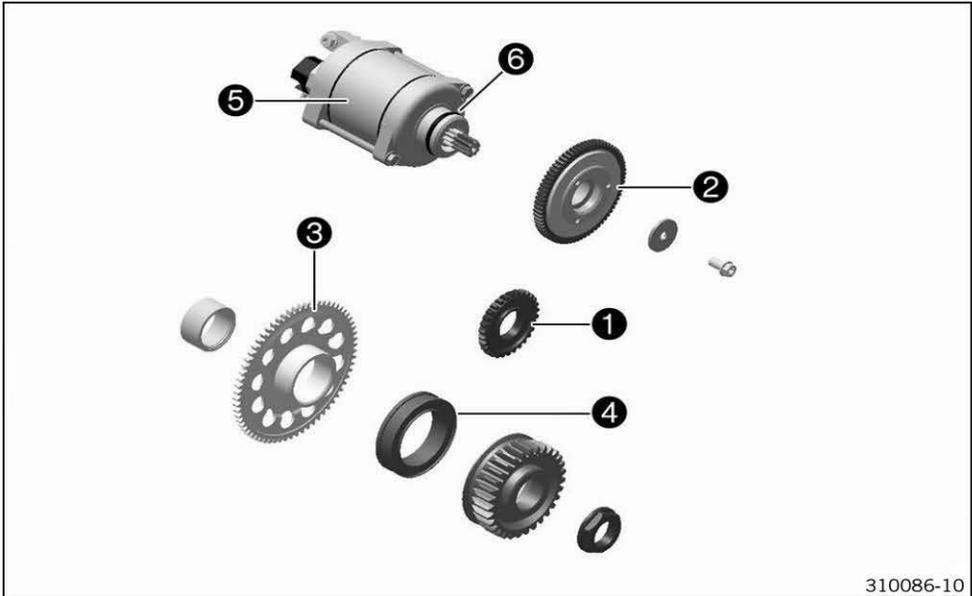
- Secure the countershaft in the bench vise with the toothed end facing downward.

Guideline

Use soft jaws.

- Mount needle bearing ① and second-gear idler gear ② onto the countershaft with the protruding collar facing downward.
- Mount stop disk ③ and lock ring ④.
- Mount the sixth-gear sliding gear ⑤ with the shift groove facing up.
- Mount lock ring ⑥ and stop disk ⑦.
- Mount needle bearing ⑧ and the fourth-gear idler gear ⑨ with the collar facing up.
- Mount needle bearing ⑩ and the third-gear idler gear ⑪ with the collar facing down.
- Mount stop disk ⑫ and lock ring ⑬.
- Mount 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 gear wheels for smooth operation.

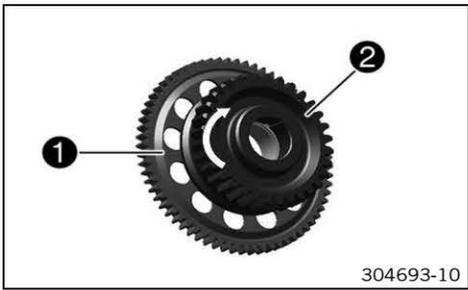
18.4.42 Checking the starter drive



310086-10

- Check the gear mesh and bearing of starter idler gear **1** for damage and wear.
 - » If there is damage or wear:
 - Change the starter idler gear.
- Check the gear mesh and bearing of torque limiter **2** for damage and wear.
 - » If there is damage or wear:
 - Change the torque limiter.
- Check the gear mesh and bearing of freewheel gear **3** for damage and wear.
 - » If there is damage or wear:
 - Change the freewheel gear or bearing.
- Check freewheel **4** for damage and wear when it is disassembled.
 - » If there is damage or wear:
 - Change the freewheel.
- Check the gear mesh of starter motor **5** for damage and wear.
 - » If there is damage or wear:
 - Change the starter motor.
- Change the O-ring **6** of the starter motor.
- Connect the negative cable of a 12 volt power supply to the housing of the starter motor. Connect the positive cable of the power supply briefly with connector of the starter motor.
 - » If the starter motor does not turn when the circuit is closed:
 - Change the starter motor.

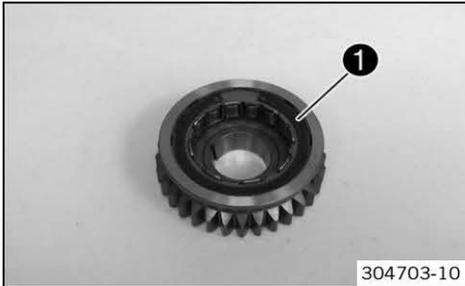
18.4.43 Checking the freewheel



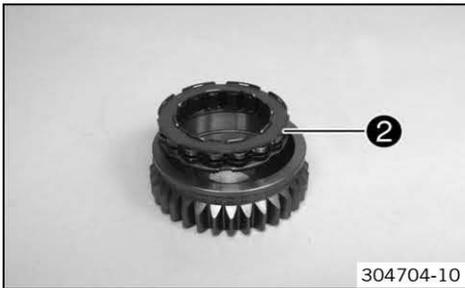
304693-10

- Insert freewheel gear **1** into primary gear **2**, turning the primary gear clockwise; do not wedge!
- Check the locking action of freewheel gear **1**.
 - » If the primary gear does not turn clockwise or if it does not lock counterclockwise:
 - Change the freewheel.

18.4.44 Removing the freewheel

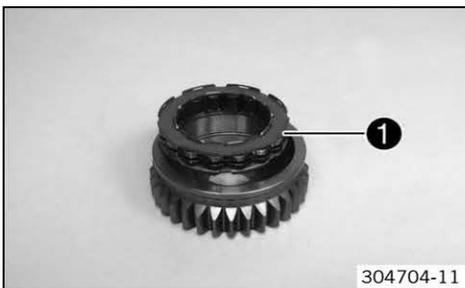


- Press expansion ring **1** together with suitable pliers and take off.



- Take the freewheel **2** out of the primary gear.

18.4.45 Installing the freewheel

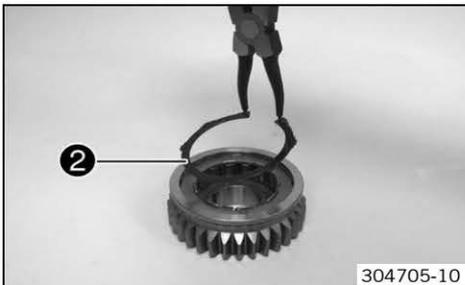


- Thoroughly oil all parts.
- Push the freewheel **1** into the primary gear.

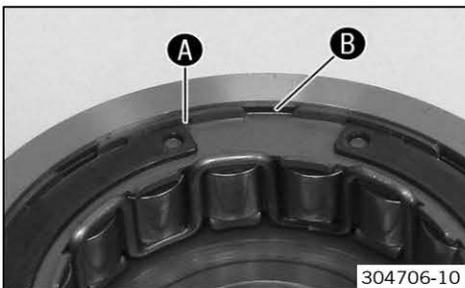


Info

Note the direction of rotation.



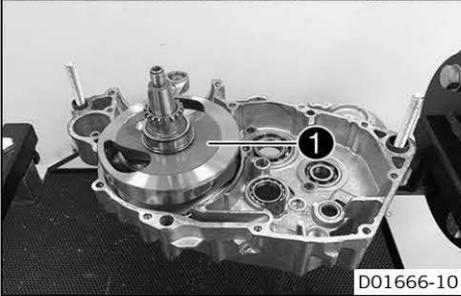
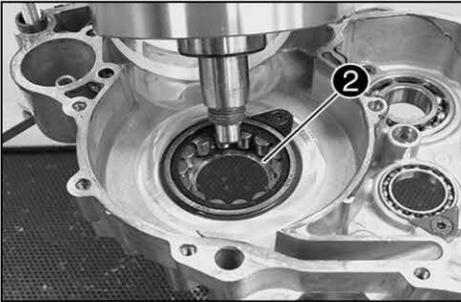
- Mount spreader ring **2**.



- Ensure that all lugs of the spreader ring pass through slots **A** of the freewheel and engage in groove **B** of the primary gear.

18.5 Engine assembly

18.5.1 Installing the crankshaft



D01666-10

- Position the right section of the engine case in the engine work stand.
- Oil the bearing.

Engine oil (SAE 10W/50) (📖 p. 356)

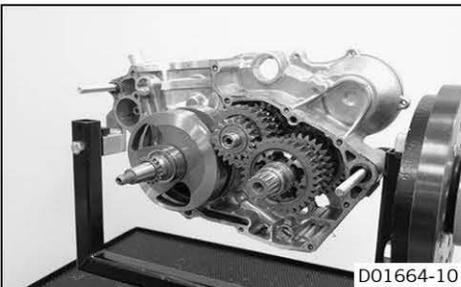
- Slide crankshaft **1** into the bearing seat.



Info

Ensure that washer **2** is not damaged.

18.5.2 Installing the transmission shafts



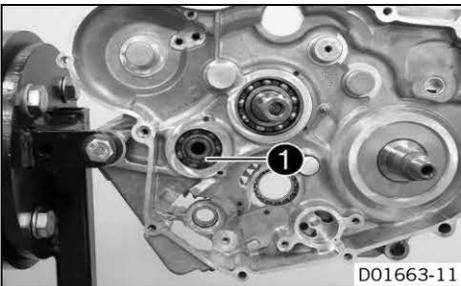
D01664-10

- Oil all bearings.
- Slide both transmission shafts into the bearing seats.



Info

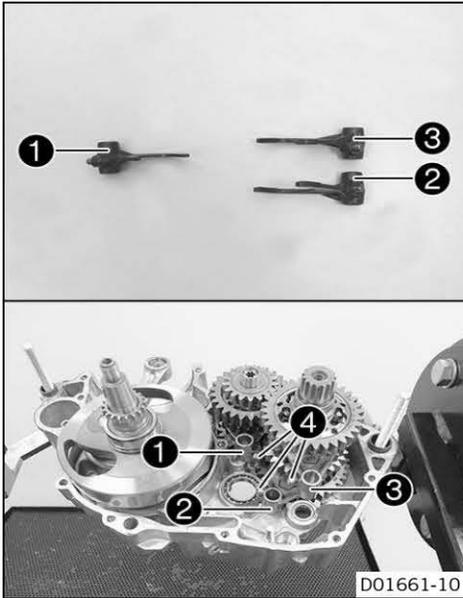
Make sure not to misplace the washers.



D01663-11

- Mount lock ring **1**.

18.5.3 Installing the shift forks



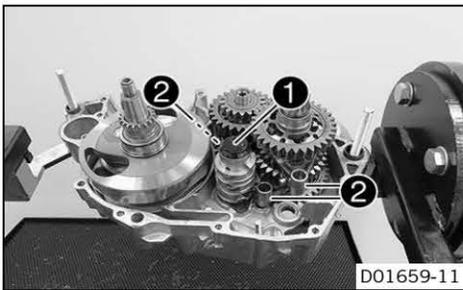
- Thoroughly oil all parts.
- Mount shift fork **1** in the upper shift groove of the main shaft.
- Mount shift fork **2** in the lower shift groove of the countershaft.
- Mount shift fork **3** in the upper shift groove of the countershaft.
- Mount shift rollers **4**.



Info

Fix the shift rollers in the shift forks with grease.

18.5.4 Installing the shift drum



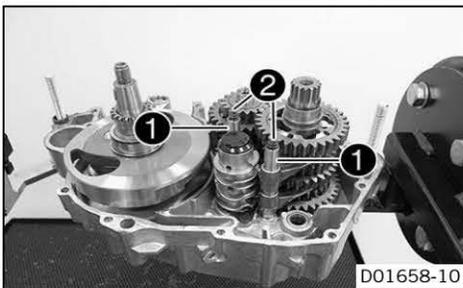
- Push shift drum **1** into the bearing seat.
- Attach shift forks **2** to the shift drum.



Info

Do not misplace the shift rollers.

18.5.5 Installing the shift rails



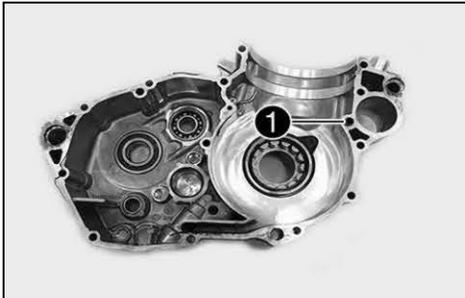
- Install shift rails **1** together with upper springs **2** and lower springs.



Info

Fix the springs in the shift rails with grease.

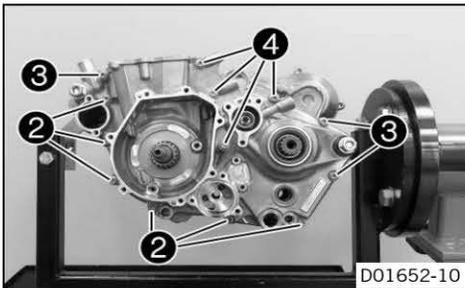
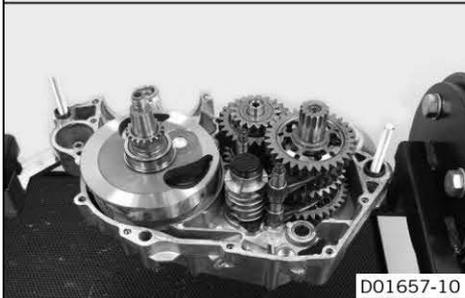
18.5.6 Installing the left engine case



- Install dowel **1**.
- Degrease the sealing surfaces. Apply sealing compound to the left section of the engine case.

Loctite® 5910

i Info
To prevent sealing compound from entering into the oil channel, dowel **1** must be mounted first.



- Mount the left section of the engine case. If necessary, strike lightly with a rubber mallet.

i Info
Do not use the screws to pull the two sections of the engine case together.

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

Guideline

Screw, engine case	M6x60	10 Nm (7.4 lbf ft)
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- Mount screws **3** but do not tighten yet.

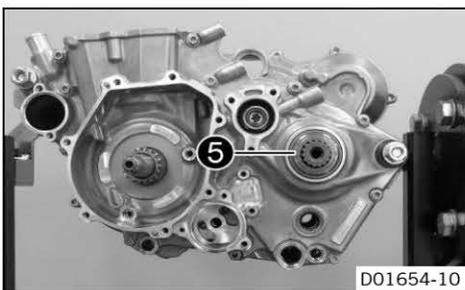
Guideline

Screw, engine case	M6x70	10 Nm (7.4 lbf ft)
--------------------	-------	--------------------

- Mount screws **4** and tighten all screws in a crisscross pattern.

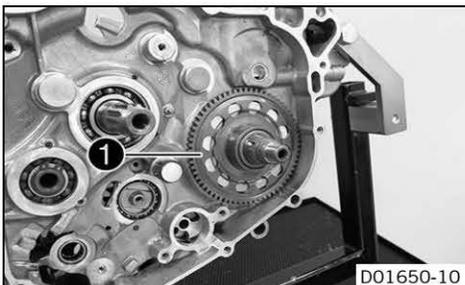
Guideline

Screw, engine case	M6x80	10 Nm (7.4 lbf ft)
--------------------	-------	--------------------



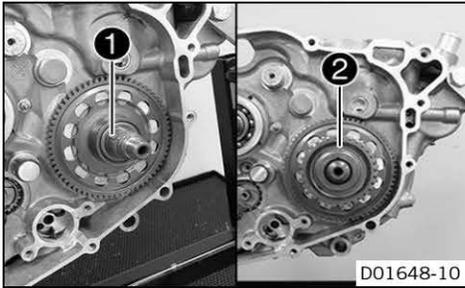
- Mount the O-ring on the countershaft.
- Lightly grease and mount spacer **5**.

18.5.7 Installing the freewheel gear



- Mount freewheel gear **1**.

18.5.8 Installing the primary gear



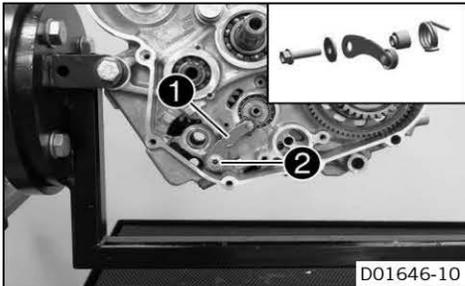
- Mount woodruff key ①.
- Degrease the cone.
- Mount primary gear ②.



Info

Turn the freewheel gear to ease engagement.

18.5.9 Installing the locking lever

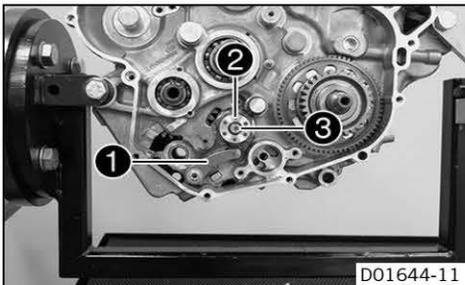


- Mount locking lever ① with the washer, sleeve and spring.
- Mount and tighten screw ②.

Guideline

Screw, locking lever	M5	6 Nm (4.4 lbf ft)	Loctite® 243™
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18.5.10 Installing the shift drum locating unit



- Push away locking lever ① from the shift drum locating unit and position the shift drum locating unit ②.



Info

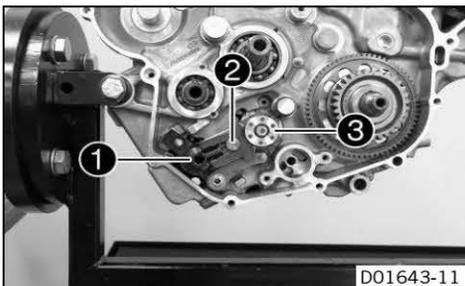
The flat areas of the shift drum locating unit are not symmetric.

- Relieve tension from the locking lever.
- Mount and tighten screw ③.

Guideline

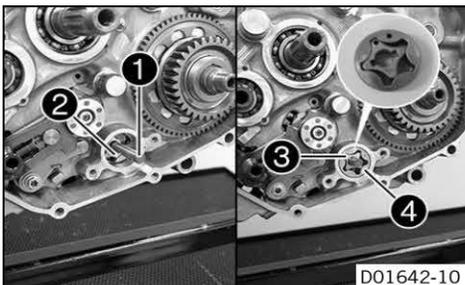
Screw, shift drum locating	M6	10 Nm (7.4 lbf ft)	Loctite® 243™
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18.5.11 Installing the shift shaft

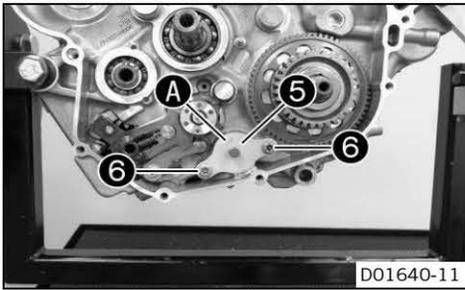


- Slide shift shaft ① with the washer into the bearing seat.
- Push sliding plate ② away from the shift drum locating unit and insert the shift shaft all the way.
- Let the sliding plate engage in the shift drum locating unit ③.
- Shift through the transmission.

18.5.12 Installing the force pump



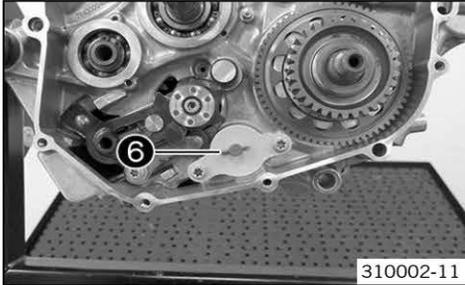
- Oil the oil pump shaft, internal rotor, and external rotor before assembly.
- Mount oil pump shaft ①.
- Mount pin ②.
- Mount internal rotor ③ and external rotor ④.
- ✓ The markings on the external rotor and internal rotor face the engine case.



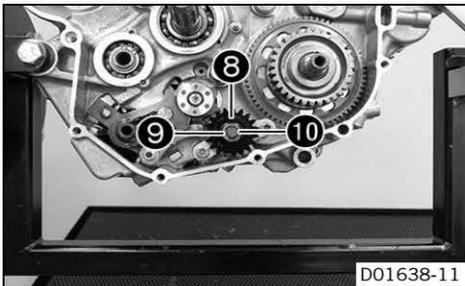
- Position the oil pump cover **5**.
- ✓ The **Top** marking **A** faces up.
- Mount and tighten screws **6**.

Guideline

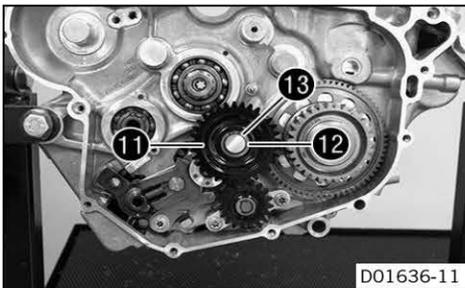
Screw, pressure pump cover	M6	10 Nm (7.4 lbf ft)	Loctite® 243™
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- Insert pin **7**.

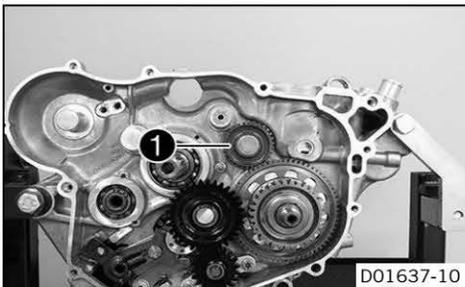


- Position oil pump gear wheel **8**.
- Position washer **9**.
- Mount lock washer **10**.



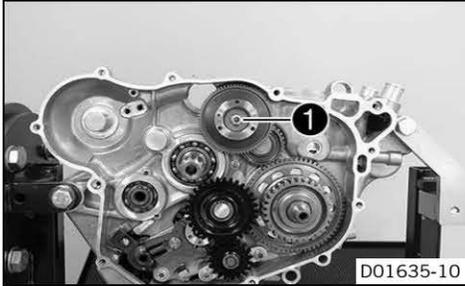
- Mount oil pump idler gear **11**.
- Mount washer **12** and lock ring **13**.
- Crank the oil pump gear wheels and ensure that they can move easily.

18.5.13 Installing the starter idler gear



- Slide on starter idler gear **1** with the collar facing the engine case.

18.5.14 Installing the torque limiter

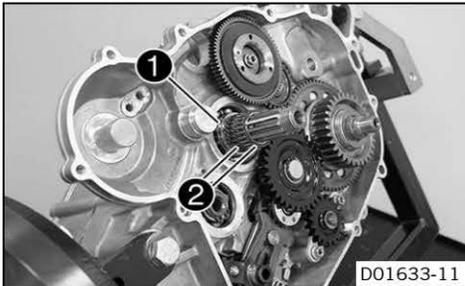


- Position the washer.
- Mount the torque limiter.
- Mount and tighten screw **1** with the washer.

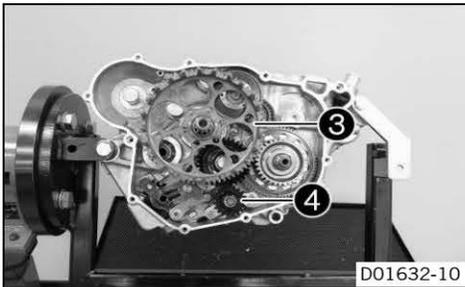
Guideline

Screw, bearing bolt, torque limiter	M6	10 Nm (7.4 lbf ft)	Loctite® 243™
-------------------------------------	----	-----------------------	---------------

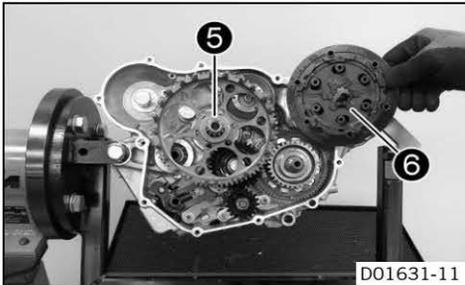
18.5.15 Installing the clutch basket



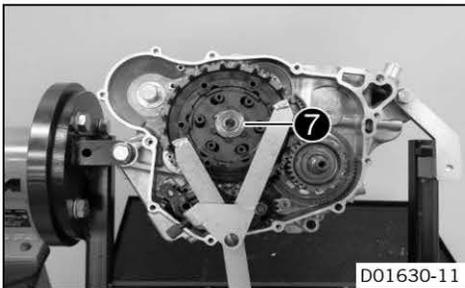
- Mount collar bushing **1** and both needle bearings **2**.



- Slide clutch basket **3** onto the gearbox main shaft.
- Turn oil pump gear wheel **4** until the gear teeth of the clutch basket engage.



- Slide on washer **5** and inner clutch hub **6**.



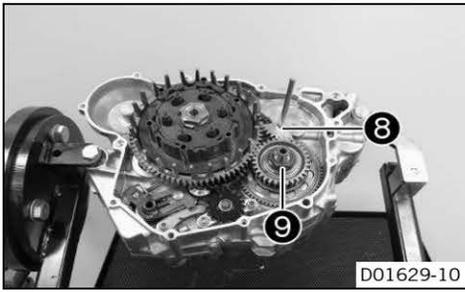
- Position the new lock washer and mount nut **7**. Tighten the nut, holding the inner clutch hub with a special tool.

Guideline

Nut, inner clutch hub	M18x1.5	80 Nm (59 lbf ft)
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Clutch holder (51129003000) (見 p. 362)
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- Secure the nut with the lock washer.



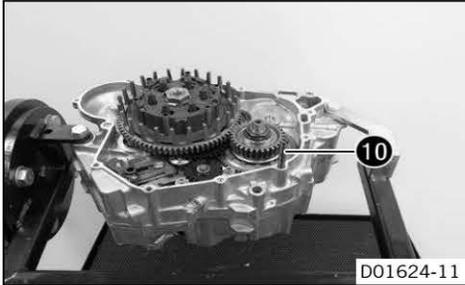
- Lock the clutch basket and primary gear using special tool **8**.

Gear segment (80029004000) (📖 p. 370)

- Mount and tighten nut **9**.

Guideline

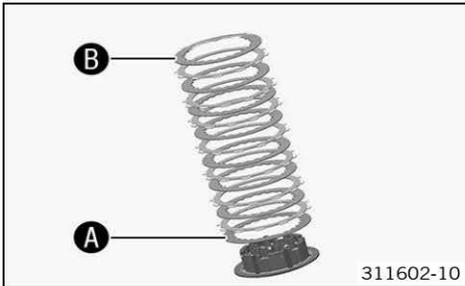
Nut, primary gear	M20LHx1.5	100 Nm (73.8 lbf ft)	Loctite® 243™
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- Position crankshaft to TDC and lock with special tool **10**.

Locking screw (113080802) (📖 p. 361)

18.5.16 Installing the clutch discs



- Thoroughly oil the clutch facing discs.
- Mount intermediate clutch disc **A** with marking **S**.

Guideline

Thickness of intermediate clutch disc A	1.0 mm (0.039 in)
--	-------------------

- Alternately place the clutch facing and 7 intermediate discs into the clutch basket.

Guideline

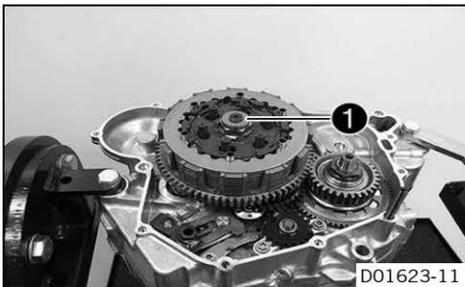
Thickness of intermediate clutch discs	1.4 mm (0.055 in)
--	-------------------

- Place intermediate clutch disc **B** into the clutch basket.

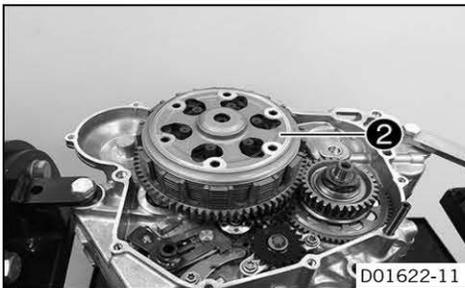
Guideline

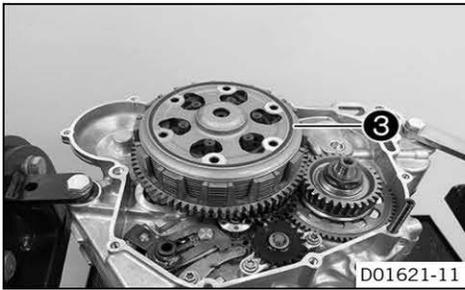
Thickness of intermediate clutch disc B	1.0 mm (0.039 in)
--	-------------------

- Place clutch facing disc into the clutch basket.
- Mount clutch throw-out **1**.

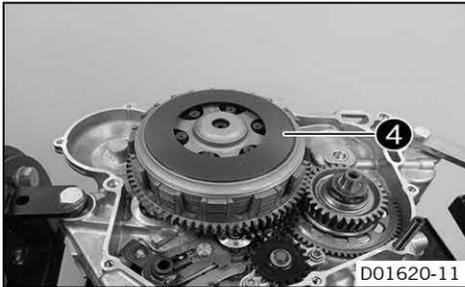


- Position pressure cap **2**.

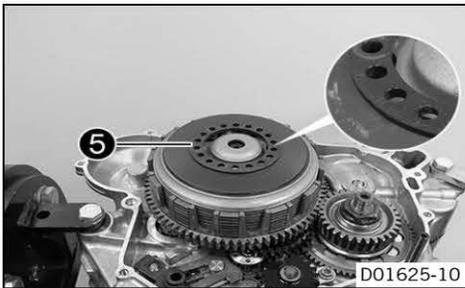




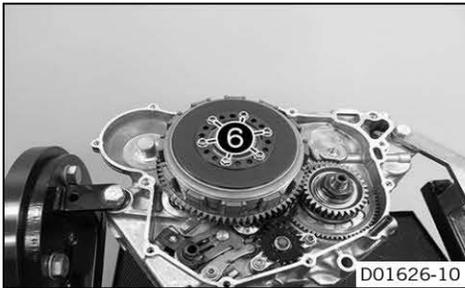
- Mount pretension ring **3** with marking **Top** facing up.



- Position spring washer **4**.



- Position spring retainer **5** with marking **I**.



- Mount screws **6** and tighten in a crisscross pattern.

Guideline

Screw, clutch spring retainer	M5	6 Nm (4.4 lbf ft)
-------------------------------	----	-------------------



- Using a straightedge and the special tool, check the spring washer for distortion.

Feeler gauge (59029041100) (📖 p. 364)	
---------------------------------------	--

Spring washer distortion	0... 0.10 mm (0... 0.0039 in)
--------------------------	-------------------------------

» If the specified value is not reached:

- Remove screws **6** and mount the spring retainer with marking **II**.

- Using a straightedge and the special tool, check the spring washer for distortion.

Feeler gauge (59029041100) (📖 p. 364)	
---------------------------------------	--

Spring washer distortion	0... 0.10 mm (0... 0.0039 in)
--------------------------	-------------------------------

» If the specified value is not reached:

- Remove screws **6** and mount the spring retainer with marking **III**.

- Using a straightedge and the special tool, check the spring washer for distortion.

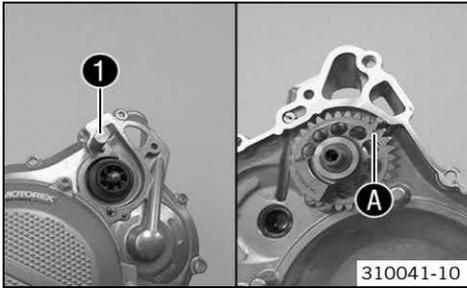
Feeler gauge (59029041100) (📖 p. 364)	
---------------------------------------	--

Spring washer distortion	0... 0.10 mm (0... 0.0039 in)
--------------------------	-------------------------------

» If the specified value is not reached:

- Change the clutch facing discs.

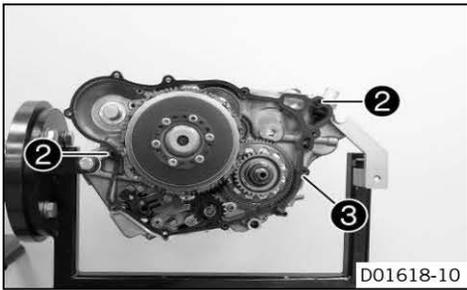
18.5.17 Installing the clutch cover



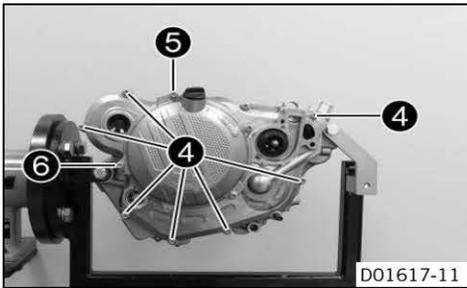
- Position the balancer shaft with special tool **1**.

Fixing drift (78129032000) (📖 p. 368)

- ✓ Marking **A** and the special tool are aligned.



- Mount dowels **2** and position the clutch cover gasket **3**.



- Mount the clutch cover.
- Mount screws **4** but do not tighten yet.

Guideline	Screw, clutch cover	M6x25	10 Nm (7.4 lbf ft)
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- Mount screw **5** but do not tighten yet.

Guideline	Screw, clutch cover	M6x55	10 Nm (7.4 lbf ft)
-----------	---------------------	-------	--------------------

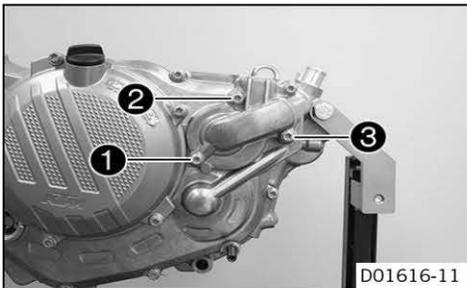
- Mount screw **6** and tighten all screws in a crisscross pattern.

Guideline	Screw, clutch cover	M6x30	10 Nm (7.4 lbf ft)
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- Remove the special tool.

Fixing drift (78129032000) (📖 p. 368)

18.5.18 Installing the water pump cover



- Put the water pump cover seal in place.
- Mount the water pump cover.
- Mount screw **1** with the sealing washer but do not tighten yet.

Guideline	Screw, water pump cover	M6x25	10 Nm (7.4 lbf ft)
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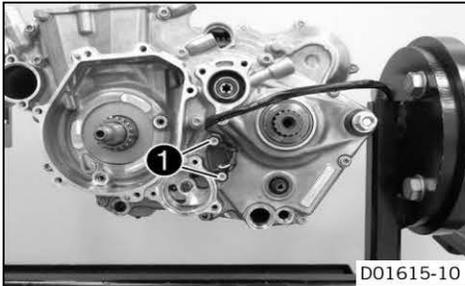
- Mount screw **2** but do not tighten yet.

Guideline	Screw, water pump cover	M6x25	10 Nm (7.4 lbf ft)	Loctite® 243™
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- Mount screw **3** and tighten all screws in a crisscross pattern.

Guideline	Screw, water pump cover	M6x55	10 Nm (7.4 lbf ft)
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18.5.19 Installing the gear position sensor

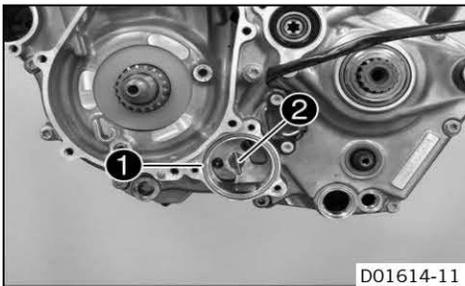


- Position the gear position sensor.
- Mount and tighten screws **1**.

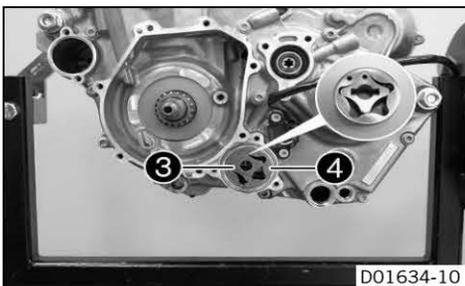
Guideline

Screw, gear position sensor	M5	5 Nm (3.7 lbf ft)	Loctite® 243™
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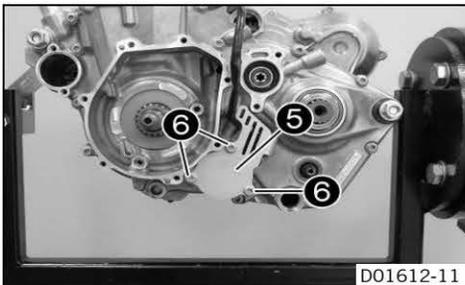
18.5.20 Installing the suction pump



- Oil the internal rotor and external rotor before mounting.
- Insert O-ring **1**.
- Position pin **2**.



- Mount internal rotor **3** and external rotor **4**.
- ✓ The markings on the external rotor and internal rotor face the engine case.

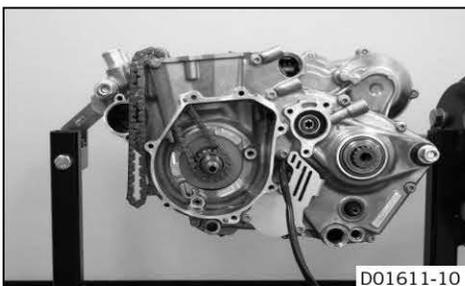


- Position the oil pump cover **5**. Mount and tighten screws **6**.

Guideline

Screw, suction pump cover	M5	6 Nm (4.4 lbf ft)	Loctite® 243™
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18.5.21 Installing the timing chain

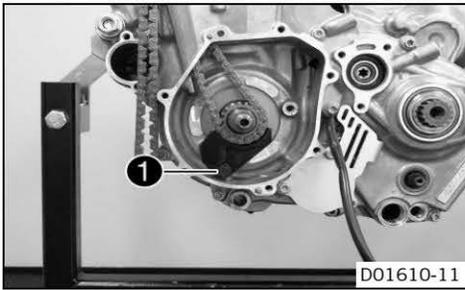


- Thread in the timing chain and place it over the timing chain sprocket.



Info

If the timing chain was used before, ensure it is running in the correct direction.

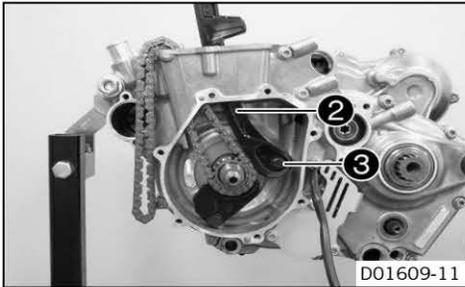


D01610-11

- Position the timing chain securing guide.
- Mount and tighten screw ❶.

Guideline

Screw, timing chain securing guide	M6	10 Nm (7.4 lbf ft)	Loctite® 243™
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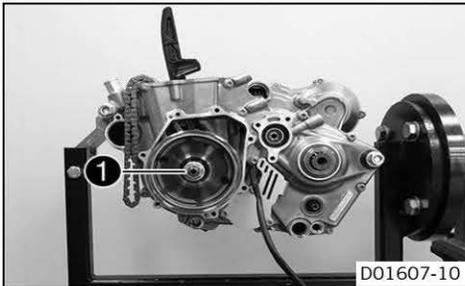
D01609-11

- Thread in timing chain tensioning rail ❷ from above.
- Mount and tighten screw ❸.

Guideline

Screw, timing chain tensioning rail	M6	10 Nm (7.4 lbf ft)	Loctite® 243™
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18.5.22 Installing the rotor



D01607-10

- Mount the woodruff key.
- Mount the rotor.
- Mount and tighten nut ❶ with the spring washer.

Guideline

Nut, rotor	M12x1	60 Nm (44.3 lbf ft)	Thread, oiled with engine oil/cone degreased
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18.5.23 Installing the piston



310076-10

(All 450 models)

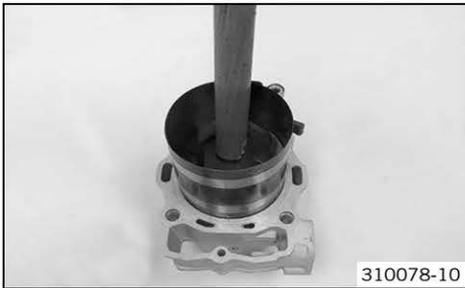
- Move the joints of the compression ring and oil scraper ring so they are offset by 180°.
- Place the oiled piston on the cylinder.
- Clamp the piston rings together using the special tool.

Piston ring mounting tool (60029015000) (📄 p. 364)
--

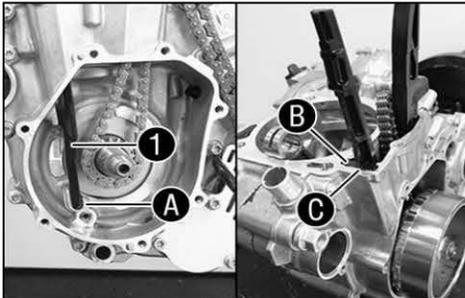


310077-10

- Tap lightly on the piston ring mounting tool from above with a plastic hammer so that it lies flush with the cylinder.
- ✓ The special tool must press the piston rings together properly and lie flush with the cylinder.

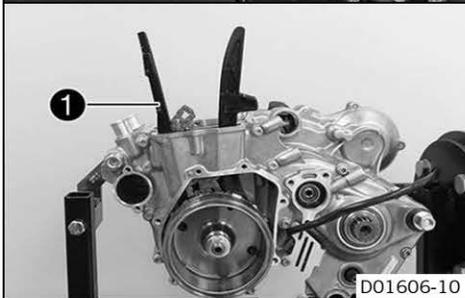


- Drive the piston into the cylinder by striking it carefully with the hammer handle.
- ✓ The piston rings should not catch or they will be damaged.



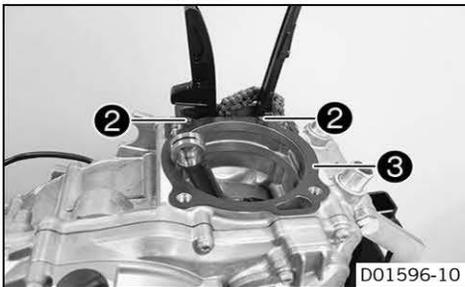
- Mount timing chain guide rail **1** from above.
- ✓ Catch **B** engages in recess **C**.
- ✓ The timing chain guide rail engages in recess **A**.

i **Info**
This step is illustrated with the rotor removed for a clearer view.

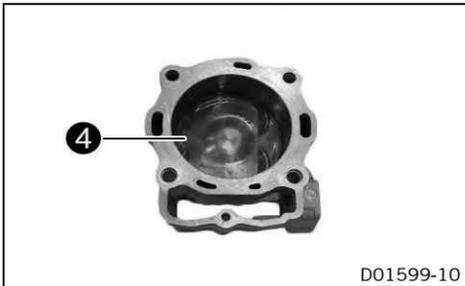


- Mount cylinder base gasket **3**.

i **Info**
Ensure that locating pins **2** are seated properly.



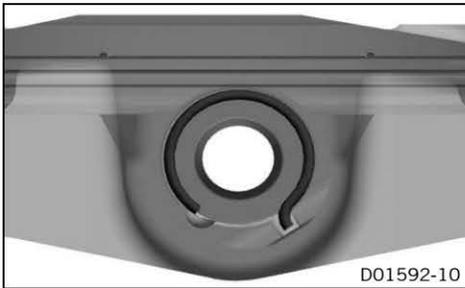
- Ensure that piston marking **4** faces the exhaust side.



- Cover the engine case opening with a cloth.
- Feed the timing chain through the timing chain shaft and mount the piston pin.

i **Info**
For purposes of illustration, the following operations are shown on the removed piston.





- Position the piston ring lock.

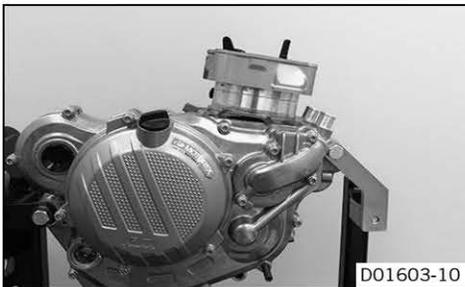


- Insert the special tool and press it with force towards the piston.
- Turn the special tool clockwise, thereby pushing the piston ring lock into the groove.

Insertion tool for piston ring lock (77329030100) (📖 p. 367)



- Ensure that the piston ring lock is in the correct position on both sides.



- Remove the cloth. Keep the timing chain taut.
- Carefully push the cylinder downward, letting the dowels engage.



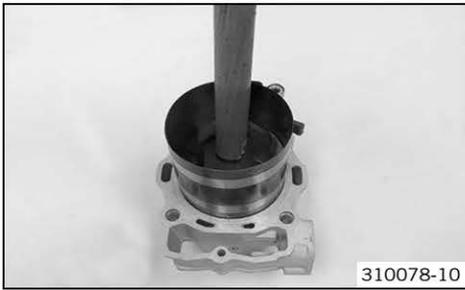
(All 500 models)

- Move the joints of the compression ring and oil scraper ring so they are offset by 180°.
- Place the oiled piston on the cylinder.
- Clamp the piston rings together using the special tool.

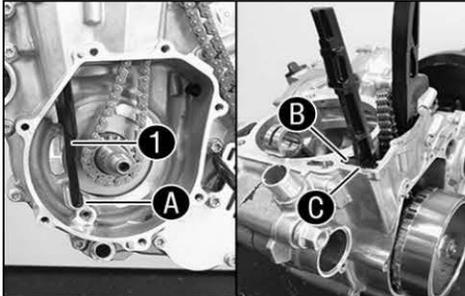
Piston ring mounting tool (60029015000) (📖 p. 364)



- Tap lightly on the piston ring mounting tool from above with a plastic hammer so that it lies flush with the cylinder.
- ✓ The special tool must press the piston rings together properly and lie flush with the cylinder.



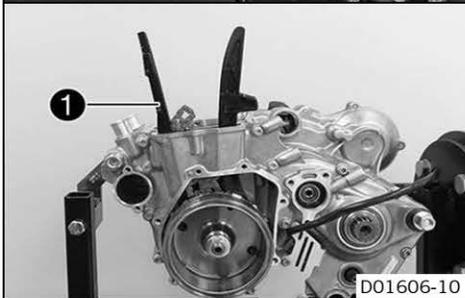
- Drive the piston into the cylinder by striking it carefully with the hammer handle.
- ✓ The piston rings should not catch or they will be damaged.



- Mount timing chain guide rail **1** from above.
- ✓ Catch **B** engages in recess **C**.
- ✓ The timing chain guide rail engages in recess **A**.

i Info

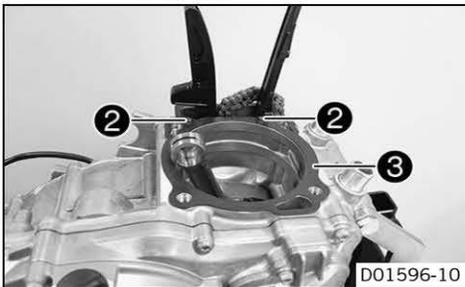
This step is illustrated with the rotor removed for a clearer view.



- Mount cylinder base gasket **3**.

i Info

Ensure that locating pins **2** are seated properly.



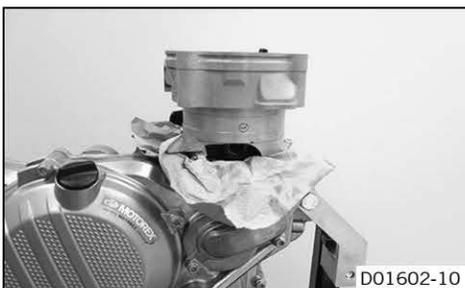
- Ensure that piston marking **4** faces the exhaust side.

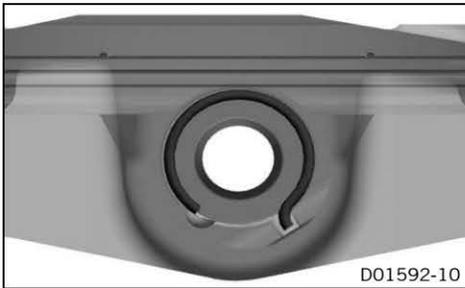


- Cover the engine case opening with a cloth.
- Feed the timing chain through the timing chain shaft and mount the piston pin.

i Info

For purposes of illustration, the following operations are shown on the removed piston.





- Position the piston ring lock.

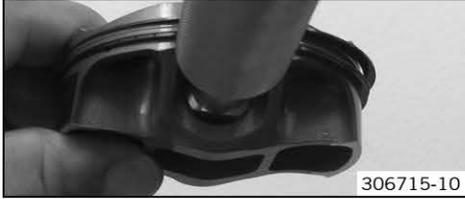


- Insert the special tool and press it with force towards the piston.
- Turn the special tool clockwise, thereby pushing the piston ring lock into the groove.

Insertion tool for piston ring lock (77329030100) (📖 p. 367)

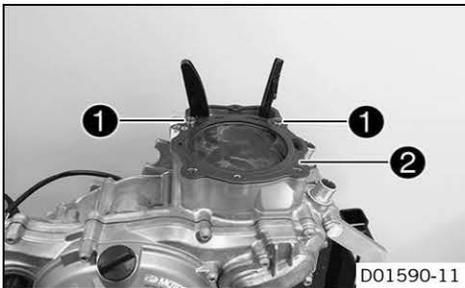


- Ensure that the piston ring lock is in the correct position on both sides.



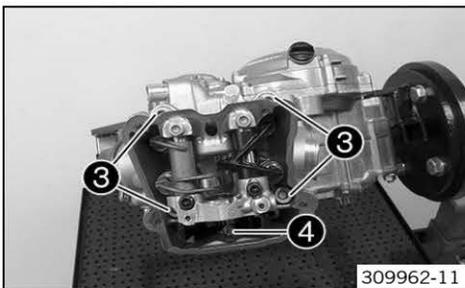
- Remove the cloth. Keep the timing chain taut.
- Carefully push the cylinder downward, letting the dowels engage.

18.5.24 Installing cylinder head



(All 450 models)

- Mount dowels ① and fit cylinder head gasket ②.



- Put the cylinder head in place.
- Mount screws ③ with the washers and tighten them in a crisscross pattern.

Guideline

Screw, cylinder head	M10x1.25	Step 1 10 Nm (7.4 lbf ft) Step 2 30 Nm (22.1 lbf ft) Step 3 50 Nm (36.9 lbf ft)	Lubricated with engine oil
----------------------	----------	---	----------------------------

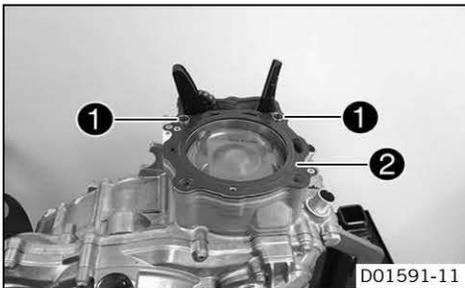
- Mount and tighten screw ④.

Guideline

Screw, cylinder head	M6	10 Nm (7.4 lbf ft)
----------------------	----	-----------------------

(All 500 models)

- Mount dowels ① and fit cylinder head gasket ②.



- Put the cylinder head in place.
- Mount screws ③ with the washers and tighten them in a crisscross pattern.

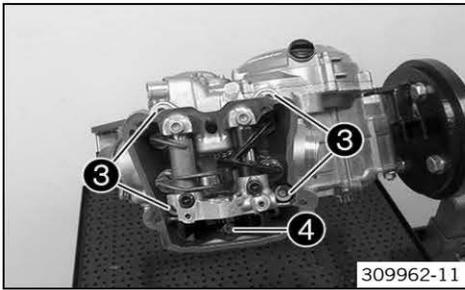
Guideline

Screw, cylinder head	M10x1.25	Step 1 10 Nm (7.4 lbf ft) Step 2 30 Nm (22.1 lbf ft) Step 3 50 Nm (36.9 lbf ft)	Lubricated with engine oil
----------------------	----------	---	----------------------------

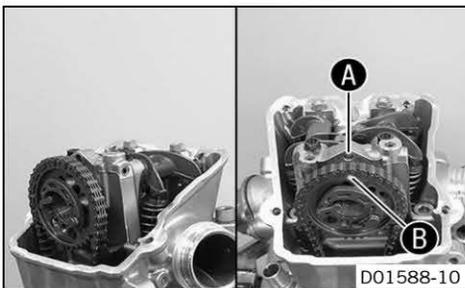
- Mount and tighten screw ④.

Guideline

Screw, cylinder head	M6	10 Nm (7.4 lbf ft)
----------------------	----	-----------------------



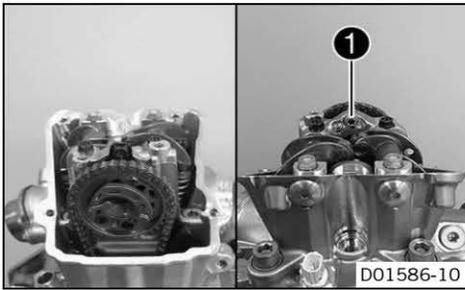
18.5.25 Installing the camshaft



- Place the timing chain over the camshaft gear.
- Push the camshaft into the bearing seats.
- ✓ Marking B on the camshaft and hole A on the cylinder head are lined up with each other.

i Info

Make sure that the crankshaft is at top dead center.

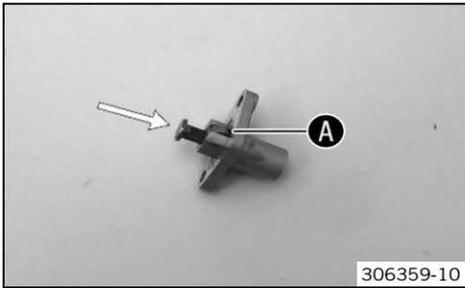


- Position the camshaft support plate.
- Mount and tighten screw **1**.

Guideline

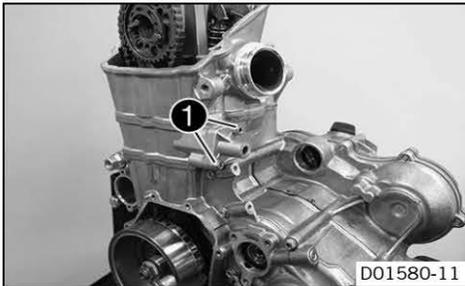
Screw, camshaft support plate	M6	10 Nm (7.4 lbf ft)	Loctite® 243™
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18.5.26 Installing the timing chain tensioner



(All 450 models)

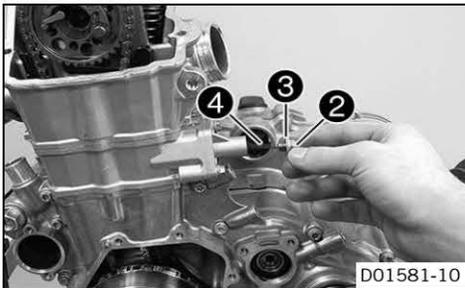
- Activate release **A** and push the timing chain tensioner all the way back.



- Position the timing chain tensioner with the gasket.
- Mount and tighten screws **1**.

Guideline

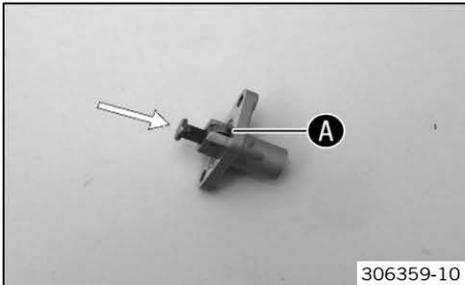
Screw, timing chain tensioner	M6	10 Nm (7.4 lbf ft)
-------------------------------	----	-----------------------



- Mount and tighten screw plug **2** with washer **3** and spring **4**.

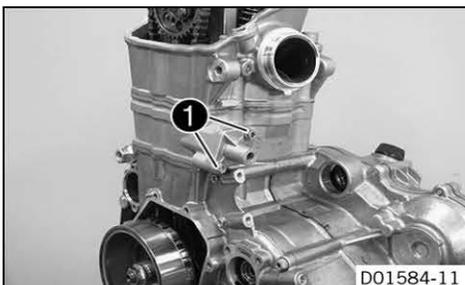
Guideline

Plug, timing chain tensioner	M8	8 Nm (5.9 lbf ft)
------------------------------	----	-------------------



(All 500 models)

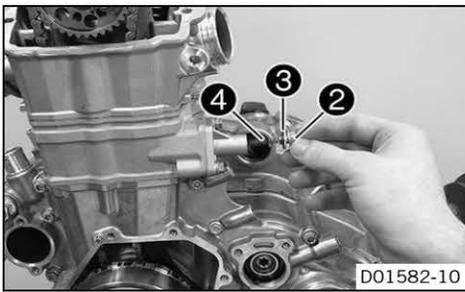
- Activate release **A** and push the timing chain tensioner all the way back.



- Position the timing chain tensioner with the gasket.
- Mount and tighten screws **1**.

Guideline

Screw, timing chain tensioner	M6	10 Nm (7.4 lbf ft)
-------------------------------	----	-----------------------



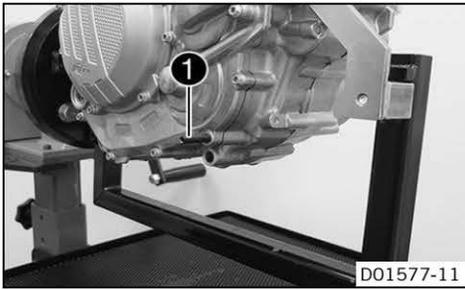
D01582-10

- Mount and tighten screw plug ② with washer ③ and spring ④.

Guideline

Plug, timing chain tensioner	M8	8 Nm (5.9 lbf ft)
------------------------------	----	-------------------

18.5.27 Checking the valve clearance

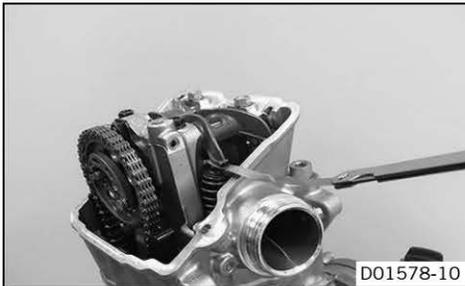


D01577-11

- Remove special tool ①.

Locking screw (113080802) (📖 p. 361)

- Crank the engine several times.
- Position the engine at ignition top dead center. (📖 p. 169)



D01578-10

- Check the valve clearance at all valves between the valve and rocker arm.

Guideline

Valve clearance	
Intake at: 20 °C (68 °F)	0.10... 0.15 mm (0.0039... 0.0059 in)
Exhaust at: 20 °C (68 °F)	0.12... 0.17 mm (0.0047... 0.0067 in)

Feeler gauge (59029041100) (📖 p. 364)

- » If the valve clearance does not meet specifications:
 - Adjust the valve clearance. (📖 p. 229)

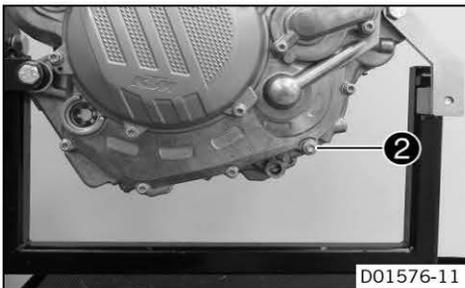
- Remove the special tool.

Locking screw (113080802) (📖 p. 361)

- Mount and tighten screw ② with washer.

Guideline

Screw plug, crankshaft location	M8	10 Nm (7.4 lbf ft)
---------------------------------	----	--------------------

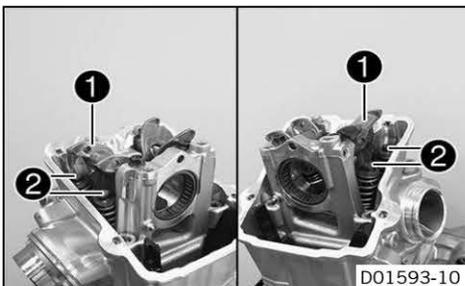


D01576-11

18.5.28 Adjusting the valve clearance

Main work

- Remove the timing chain tensioner. (📖 p. 169)
- Remove the camshaft. (📖 p. 170)
- Raise rocker arm ① on the outside.
- 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 camshaft. (📖 p. 227)
- Install the timing chain tensioner. (📖 p. 228)

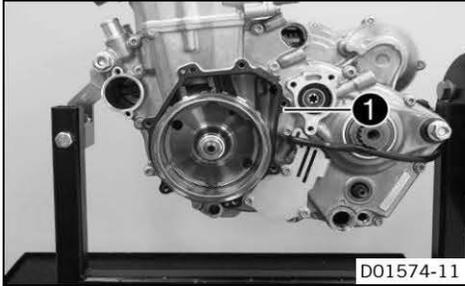


D01593-10

Finishing work

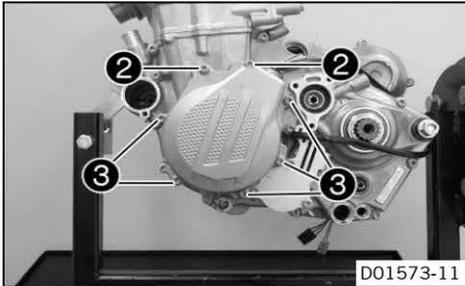
- Check the valve clearance. (📖 p. 229)

18.5.29 Installing the alternator cover



D01574-11

- Position alternator cover gasket ❶.



D01573-11

- Position the alternator cover.
- Mount screws ❷ with the washers, but do not tighten yet.

Guideline

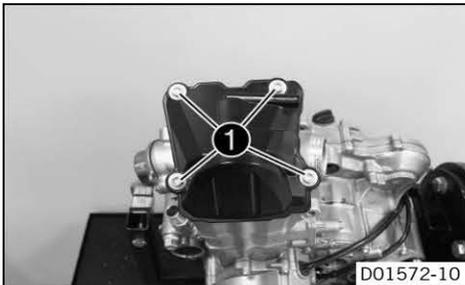
Screw, alternator cover	M6x25	10 Nm (7.4 lbf ft)
-------------------------	-------	--------------------

- Mount screws ❸ and tighten all screws in a crisscross pattern.

Guideline

Screw, alternator cover	M6x25	10 Nm (7.4 lbf ft)
-------------------------	-------	--------------------

18.5.30 Installing the valve cover



D01572-10

- Position the valve cover seal.
- Position the valve cover.
- Mount and tighten screws ❶.

Guideline

Screw, valve cover	M6	10 Nm (7.4 lbf ft)
--------------------	----	--------------------

18.5.31 Installing the spark plug



D01570-10

(All 450 models)

- Mount and tighten the spark plug using the special tool.

Guideline

Spark plug	M10x1	10... 12 Nm (7.4... 8.9 lbf ft)
------------	-------	------------------------------------

Spark plug wrench (77229172000) (📖 p. 367)		
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D01571-10

(All 500 models)

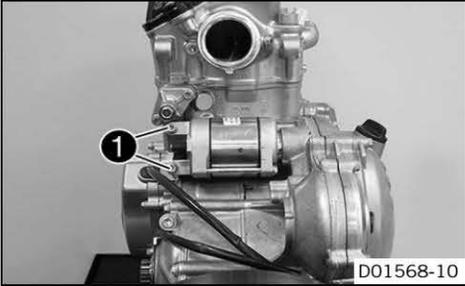
- Mount and tighten the spark plug using the special tool.

Guideline

Spark plug	M10x1	10... 12 Nm (7.4... 8.9 lbf ft)
------------	-------	------------------------------------

Spark plug wrench (77229172000) (📖 p. 367)		
--	--	--

18.5.32 Installing the starter motor



(All 450 models)

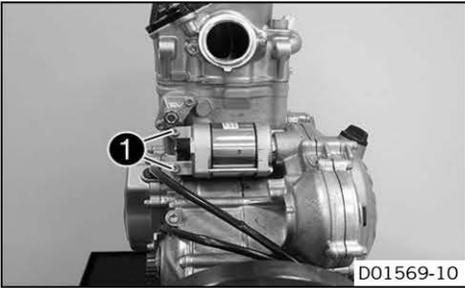
- Grease the O-ring.
- Insert the starter motor.

Long-life grease (📖 p. 358)

- Mount and tighten screws **1**.

Guideline

Screw, starter motor	M6	10 Nm (7.4 lbf ft)
----------------------	----	-----------------------



(All 500 models)

- Grease the O-ring.
- Insert the starter motor.

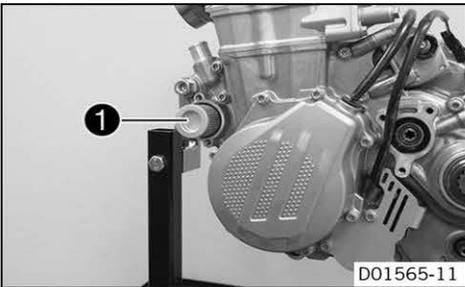
Long-life grease (📖 p. 358)

- Mount and tighten screws **1**.

Guideline

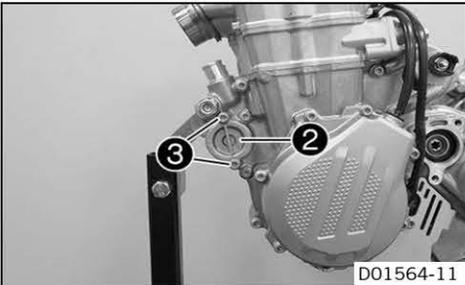
Screw, starter motor	M6	10 Nm (7.4 lbf ft)
----------------------	----	-----------------------

18.5.33 Installing the oil filter



(All 450 models)

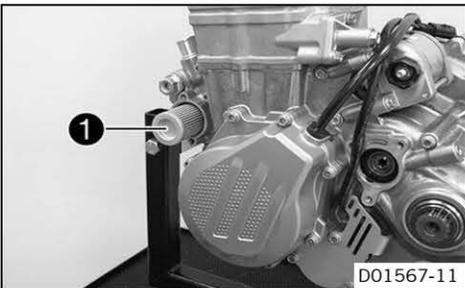
- Tilt the engine to one side and fill the oil filter housing to about 1/3 full with engine oil.
- Insert oil filter **1** into the oil filter housing.



- Lubricate the O-ring of the oil filter cover.
- Mount oil filter cover **2**.
- Mount and tighten screws **3**.

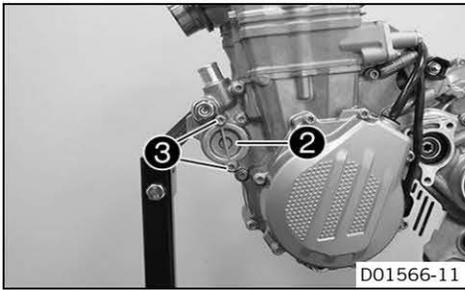
Guideline

Screw, oil filter cover	M6	10 Nm (7.4 lbf ft)
-------------------------	----	-----------------------



(All 500 models)

- Tilt the engine to one side and fill the oil filter housing to about 1/3 full with engine oil.
- Insert oil filter **1** into the oil filter housing.

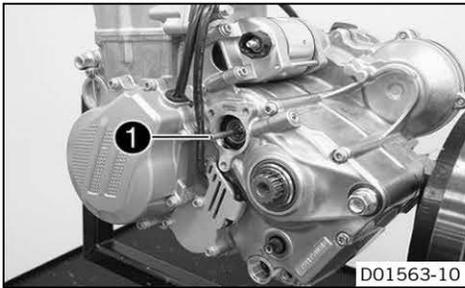


- Lubricate the O-ring of the oil filter cover.
- Mount oil filter cover **2**.
- Mount and tighten screws **3**.

Guideline

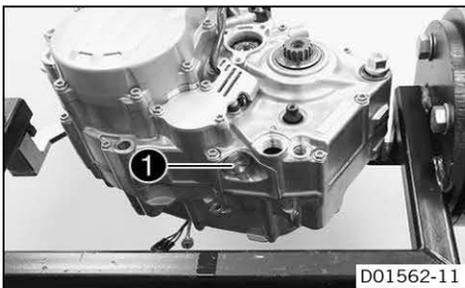
Screw, oil filter cover	M6	10 Nm (7.4 lbf ft)
-------------------------	----	-----------------------

18.5.34 Installing the clutch push rod



- Mount clutch push rod **1**.

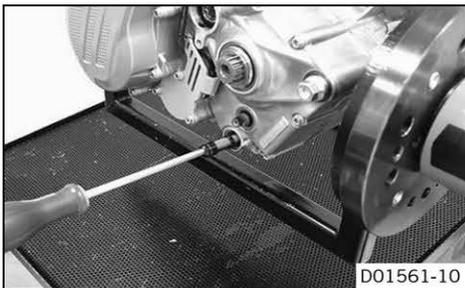
18.5.35 Installing the oil screens



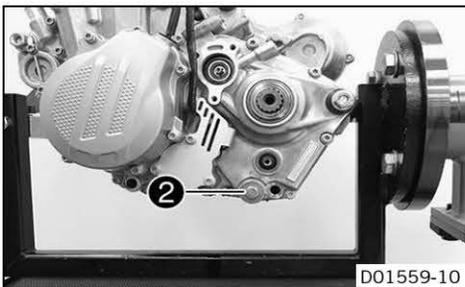
- Mount and tighten screw plug **1** with the short oil screen and the O-ring.

Guideline

Screw plug, oil screen	M20x1.5	15 Nm (11.1 lbf ft)
------------------------	---------	------------------------



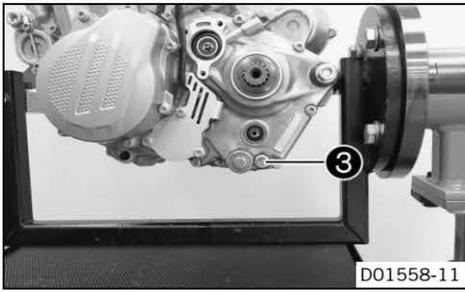
- Position the long oil screen with the O-rings on a pin wrench.
- Position the pin wrench through the drilled hole of the screw plug in the opposite section of the engine case.
- Push the oil screen all the way into the engine case.



- Mount and tighten screw plug **2** with the O-ring.

Guideline

Screw plug, oil screen	M20x1.5	15 Nm (11.1 lbf ft)
------------------------	---------	------------------------

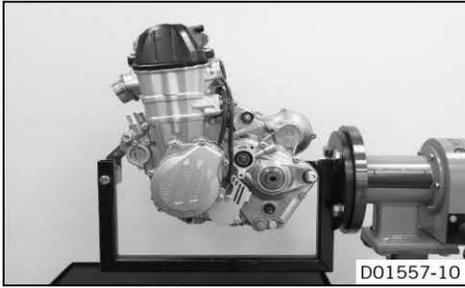


- Mount and tighten oil drain plug ③ with the magnet and a new seal ring.

Guideline

Oil drain plug with magnet	M12x1.5	20 Nm (14.8 lbf ft)
----------------------------	---------	------------------------

18.5.36 Removing the engine from the engine assembly stand



(All 450 models)

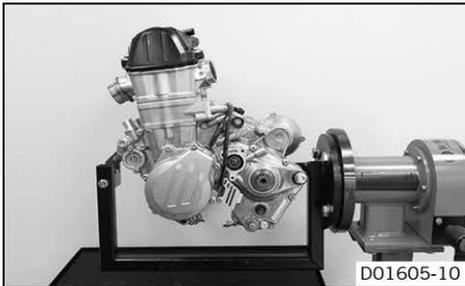
- Remove the fitting from the special tool.

Engine fixing arm (79429002000) (📖 p. 369)

- Remove the engine from the engine assembly stand.

i Info

Work with an assistant or a motorized hoist.



(All 500 models)

- Remove the fitting from the special tool.

Engine fixing arm (79429002000) (📖 p. 369)

- Remove the engine from the engine assembly stand.

i Info

Work with an assistant or a motorized hoist.

19.1 Checking/correcting the fluid level of the hydraulic clutch

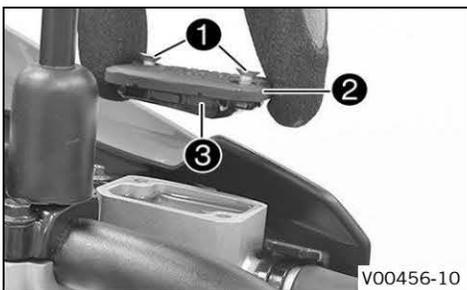
Warning
Skin irritation Brake fluid causes skin irritation.

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

Warning
Environmental hazard Hazardous substances cause environmental damage.

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

Info
 The fluid level rises with increasing wear of the clutch facing discs.
 Never use DOT 5 brake fluid. It is silicone-based and purple in color. Oil seals and clutch lines are not designed for DOT 5 brake fluid.
 Avoid contact between brake fluid and painted parts. Brake fluid attacks paint.
 Only use clean brake fluid from a sealed container.



- Move the clutch fluid reservoir mounted on the handlebar to a horizontal position.
- Remove screws ①.
- Remove cover ② with membrane ③.
- Check the fluid level.

Fluid level below container rim	4 mm (0.16 in)
---------------------------------	----------------

» If the level of the fluid does not meet specifications:

- Correct the fluid level of the hydraulic clutch.

Brake fluid DOT 4 / DOT 5.1 (📖 p. 356)
--

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

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

19.2 Changing the hydraulic clutch fluid

Warning
Skin irritation Brake fluid causes skin irritation.

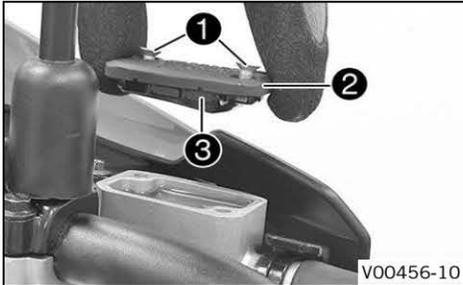
- Keep brake fluid out of the reach of children.
- Wear suitable protective clothing and safety glasses.
- Do not allow brake fluid to come into contact with the skin, the eyes or clothing.
- Consult a doctor immediately if brake fluid has been swallowed.
- Rinse the affected area with plenty of water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

Warning
Environmental hazard Hazardous substances cause environmental damage.

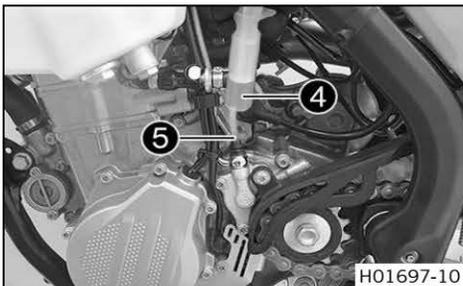
- Dispose of oils, grease, filters, fuel, cleaning agents, brake fluid, etc., correctly and in compliance with the applicable regulations.

i Info

Never use DOT 5 brake fluid. It is silicone-based and purple in color. Oil seals and 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**.



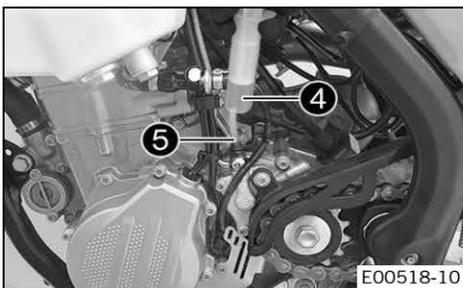
(EXC-F EU/AU, EXC-F Six Days EU)

- Fill bleeding syringe **4** with the appropriate hydraulic fluid.

Bleed syringe (50329050000) (📖 p. 362)
--

Brake fluid DOT 4 / DOT 5.1 (📖 p. 356)
--

- On the clutch slave cylinder, remove bleeder screw **5** and mount bleeding syringe **4**.



(All US models)

- Fill bleeding syringe **4** with the appropriate hydraulic fluid.

Bleed syringe (50329050000) (📖 p. 362)
--

Brake fluid DOT 4 / DOT 5.1 (📖 p. 356)
--

- On the clutch slave cylinder, remove bleeder screw **5** and mount bleeding syringe **4**.



- Inject the liquid into the system until it escapes from openings **6** of the master cylinder without bubbles.
- Now and then, extract fluid from the master cylinder reservoir to prevent overflow.
- Remove the bleeding syringe. Mount and tighten screws bleeder screw.
- Correct the fluid level of the hydraulic clutch.

Guideline

Fluid level below container rim	4 mm (0.16 in)
---------------------------------	----------------

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

i Info

Clean up overflowed or spilled brake fluid immediately with water.

19.3 Checking the clutch

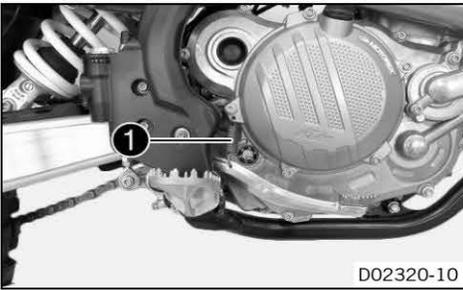


Main work

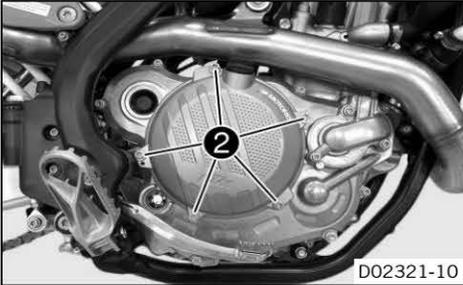
- Lay the vehicle on its side on the work stand.

i Info

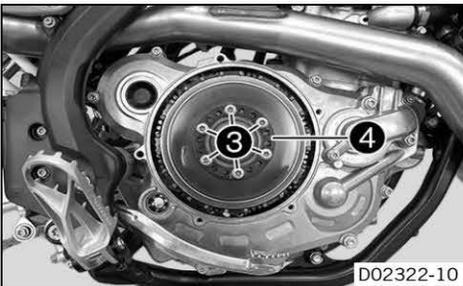
Cover the components to protect them against damage.



- Detach spring **1**.



- Remove screws **2**.
- Take off the clutch cover with the gasket.



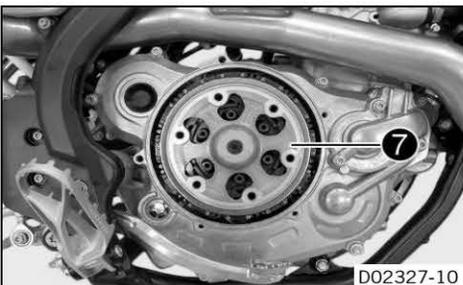
- Loosen screws **3** in a crisscross pattern and remove them.
- Take off spring retainer **4**.



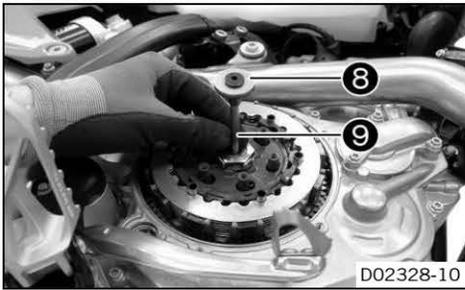
- Take off spring washer **5**.



- Take off pretension ring **6**.



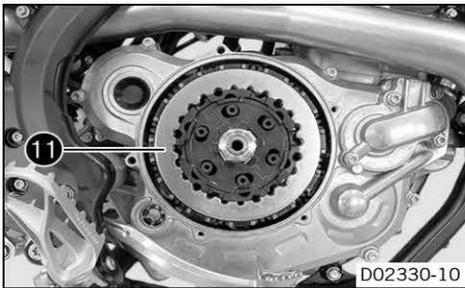
- Take off pressure cap **7**.



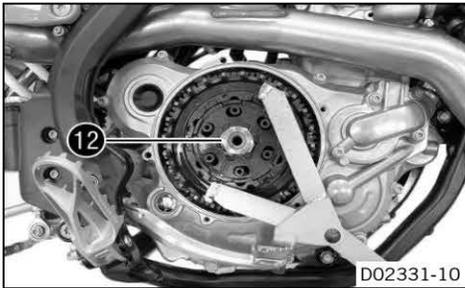
- Take off pressure piece **8** with the clutch push rod **9**.



- Remove sleeves **10**.



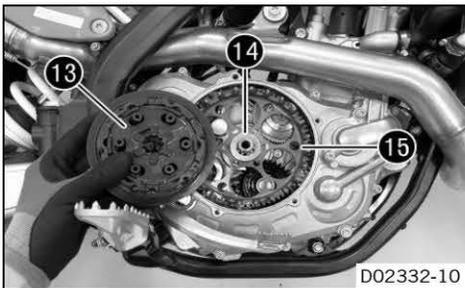
- Completely remove clutch discs **11**.



- Bend up the lock washer.
- Hold the inner clutch hub with the special tool. Loosen nut **12**.

Clutch holder (51129003000) (📖 p. 362)

- Remove the nut with the lock washer.



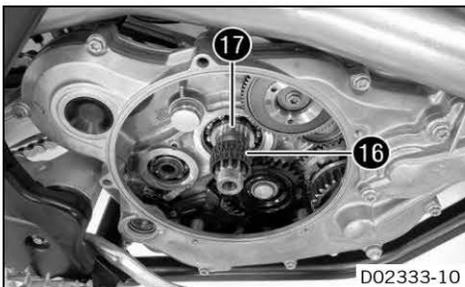
- Take off inner clutch hub **13** and washer **14**.



Info

The washer usually sticks to the inner clutch hub.

- Take off clutch basket **15**.

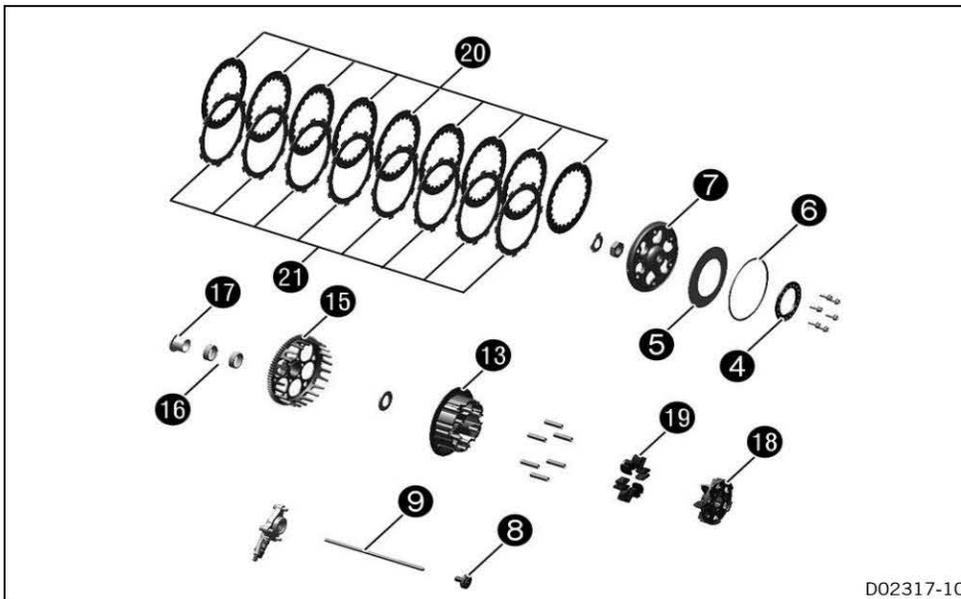


- Take off needle bearing **16** and collar bushing **17**.



Info

The needle bearing and collar bushing may be in the clutch basket.



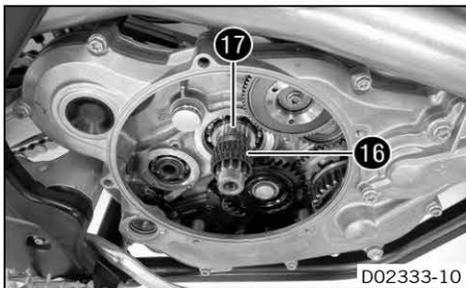
D02317-10

- Check clutch throw-out **8** for damage and wear.
 - » If there is damage or wear:
 - Change the clutch throw-out.
- Place clutch push rod **9** on a flat surface and check for run-out.
 - » If there is run-out:
 - Change the clutch push rod.
- Check spring retainer **4** for damage and wear.
 - » If there is damage or wear:
 - Change the spring retainer.
- Check pretension ring **6** for damage and wear.
 - » If there is damage or wear:
 - Change the pretension ring.
- Check spring washer **5** for damage and wear.
 - » If there is damage or wear:
 - Change the spring washer.
- Check the contact surface of pressure cap **7** for damage and wear.
 - » If there is damage or wear:
 - Change the pressure cap.
- Check clutch center **18** for damage and wear.
 - » If there is damage or wear:
 - Change the clutch center.
- Check damping rubber pieces **19** for damage and wear.
 - » If there is damage or wear:
 - Change the damping rubber pieces.
- Check inner clutch hub **13** for damage and wear.
 - » If there is damage or wear:
 - Change the inner clutch hub.
- Check the thrust surfaces of the clutch facing discs in clutch basket **15** for damage and wear.
 - » If there is damage or wear:
 - Change the clutch facing discs and the clutch basket.
- Check needle bearings **16** and collar bushing **17** for damage and wear.
 - » If there is damage or wear:
 - Change the needle bearings and collar bushing.

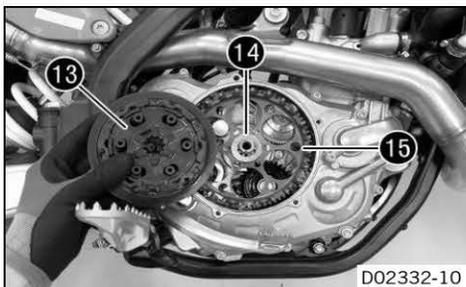
- Check intermediate clutch discs **20** for damage and wear.
 - » If the intermediate clutch discs are not level and are pitted:
 - Change all intermediate clutch discs.
- Check clutch facing discs **21** for discoloration and scoring.
 - » If there is discoloration or scoring:
 - Change all clutch facing discs.
- Check the thickness of the clutch pack.

Clutch pack - thickness	
Wear limit	≥ 26.4 mm (≥ 1.039 in)

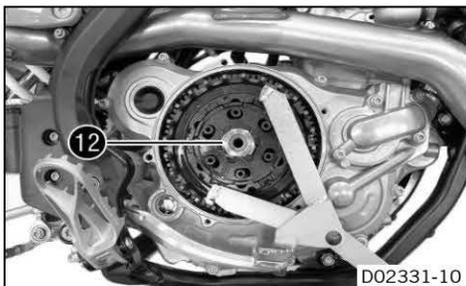
- » If the clutch pack does not meet specifications:
 - Change the clutch pack.



- Mount collar bushing **17** and needle bearings **16**.



- Install clutch basket **15**.
 - ✓ Turn clutch basket until the gear teeth mesh into the oil pump gear.
- Mount washer **14** and inner clutch hub **13**.



- Position the new lock washer and mount nut **12**. Tighten the nut, holding the inner clutch hub with a special tool.

Guideline

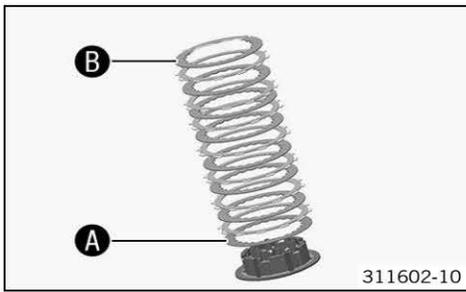
Nut, inner clutch hub	M18x1.5	80 Nm (59 lbf ft)
-----------------------	---------	-------------------

Clutch holder (51129003000) (📖 p. 362)

- Secure the nut with the lock washer.



- Mount sleeves **10**.



- Thoroughly oil the clutch facing discs.
- Mount intermediate clutch disc **A** with marking **S**.

Guideline

Thickness of intermediate clutch disc A	1.0 mm (0.039 in)
--	-------------------

- Alternately place the clutch facing and 7 intermediate discs into the clutch basket.

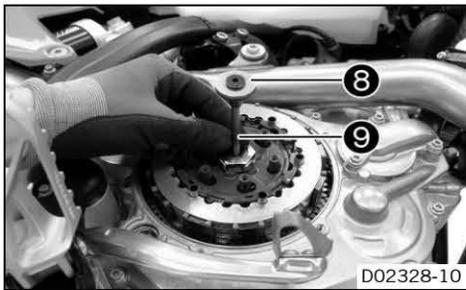
Thickness of intermediate clutch discs	1.4 mm (0.055 in)
--	-------------------

- Place intermediate clutch disc **B** into the clutch basket.

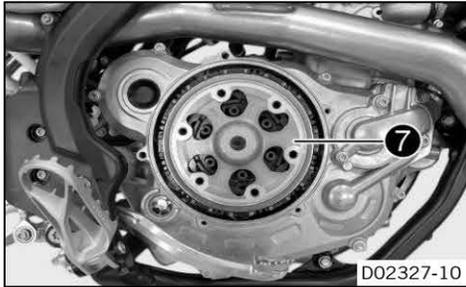
Guideline

Thickness of intermediate clutch disc B	1.0 mm (0.039 in)
--	-------------------

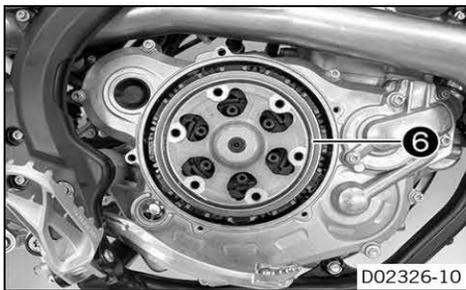
- Mount clutch throw-out **8** with clutch push rod **9**.



- Position pressure cap **7**.

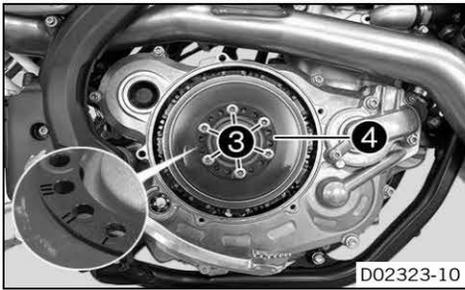


- Mount pretension ring **6** with marking **Top** facing up.



- Position spring washer **5**.





- Position spring retainer ④ with marking I.
- Mount screws ③ and tighten in a crisscross pattern.

Guideline

Screw, clutch spring retainer	M5	6 Nm (4.4 lbf ft)
-------------------------------	----	-------------------



- Using a straightedge and the special tool, check the spring washer for distortion.

Feeler gauge (59029041100) (📖 p. 364)		
---------------------------------------	--	--

Spring washer distortion	0... 0.10 mm (0... 0.0039 in)	
--------------------------	-------------------------------	--

» If the specified value is not reached:

- Remove screws ③ and mount the spring retainer with marking II.

- Using a straightedge and the special tool, check the spring washer for distortion.

Feeler gauge (59029041100) (📖 p. 364)		
---------------------------------------	--	--

Spring washer distortion	0... 0.10 mm (0... 0.0039 in)	
--------------------------	-------------------------------	--

» If the specified value is not reached:

- Remove screws ③ and mount the spring retainer with marking III.

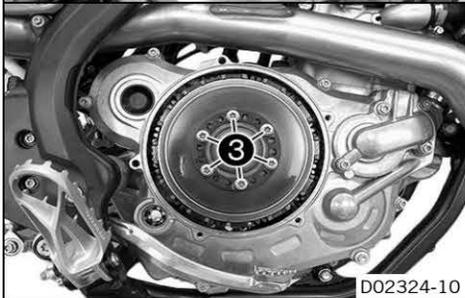
- Using a straightedge and the special tool, check the spring washer for distortion.

Feeler gauge (59029041100) (📖 p. 364)		
---------------------------------------	--	--

Spring washer distortion	0... 0.10 mm (0... 0.0039 in)	
--------------------------	-------------------------------	--

» If the specified value is not reached:

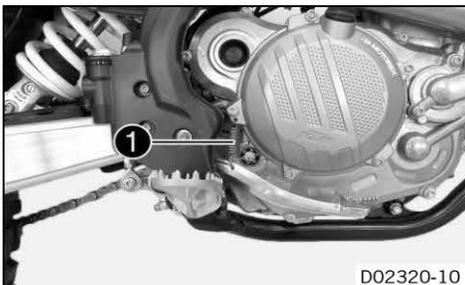
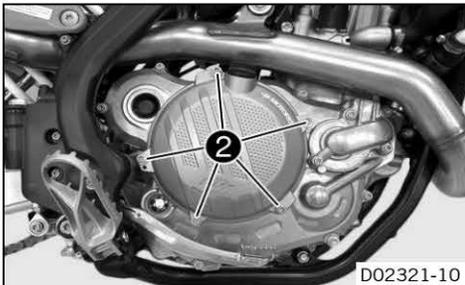
- Change the clutch facing discs.



- Position the clutch cover with the gasket.
- Mount and tighten screws ②.

Guideline

Screw, clutch cover	M6	10 Nm (7.4 lbf ft)
---------------------	----	--------------------



- Attach spring ①.



- Place vehicle in upright position and lean on the side stand.

Finishing work

- Check the engine oil level. (📖 p. 247)

19.4 Changing the clutch spring



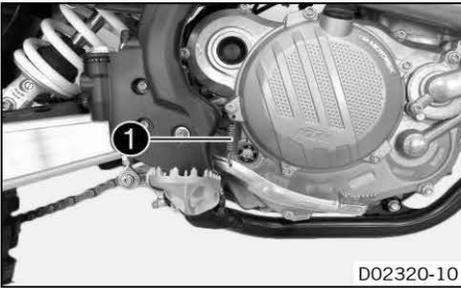
Main work

- Lay the vehicle on its side on the work stand.

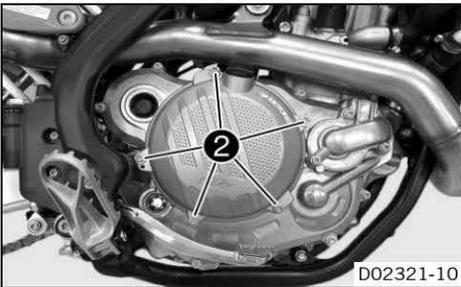


Info

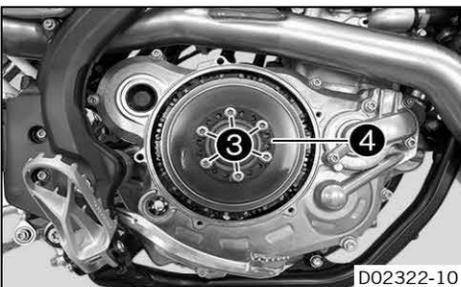
Cover the components to protect them against damage.



- Detach spring **1**.



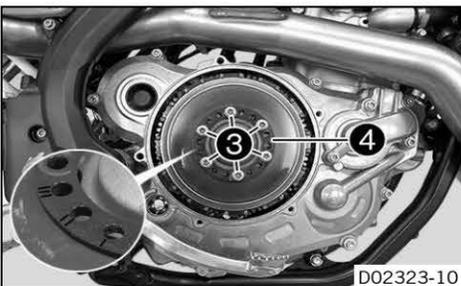
- Remove screws **2**.
- Take off the clutch cover with the gasket.



- Loosen screws **3** in a crisscross pattern and remove them.
- Take off spring retainer **4**.



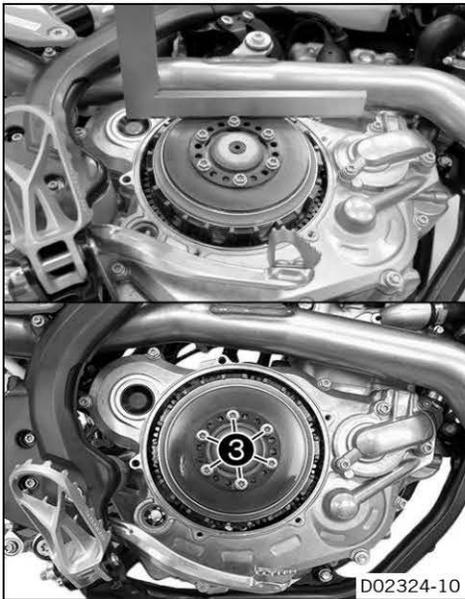
- Take off spring washer **5**.
- Position the new spring washer **5**.



- Position spring retainer **4** with marking I.
- Mount screws **3** and tighten in a crisscross pattern.

Guideline

Screw, clutch spring retainer	M5	6 Nm (4.4 lbf ft)
-------------------------------	----	-------------------



- Using a straightedge and the special tool, check the spring washer for distortion.

Feeler gauge (59029041100) (🗨️ p. 364)
--

Spring washer distortion	0... 0.10 mm (0... 0.0039 in)
--------------------------	-------------------------------

- » If the specified value is not reached:
 - Remove screws ③ and mount the spring retainer with marking II.

- Using a straightedge and the special tool, check the spring washer for distortion.

Feeler gauge (59029041100) (🗨️ p. 364)
--

Spring washer distortion	0... 0.10 mm (0... 0.0039 in)
--------------------------	-------------------------------

- » If the specified value is not reached:
 - Remove screws ③ and mount the spring retainer with marking III.

- Using a straightedge and the special tool, check the spring washer for distortion.

Feeler gauge (59029041100) (🗨️ p. 364)
--

Spring washer distortion	0... 0.10 mm (0... 0.0039 in)
--------------------------	-------------------------------

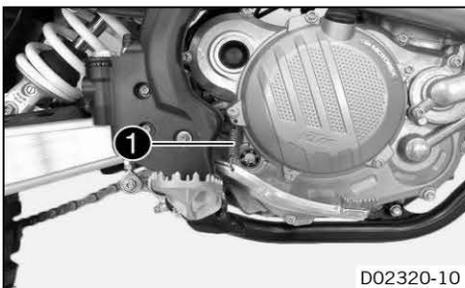
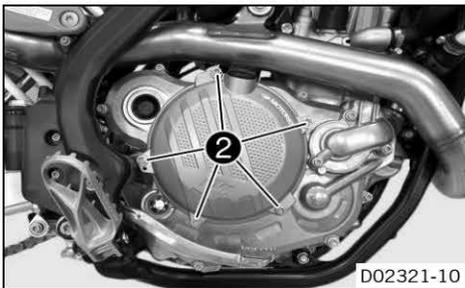
- » If the specified value is not reached:
 - Change the clutch facing discs.

- Position the clutch cover with the gasket.

- Mount and tighten screws ②.

Guideline

Screw, clutch cover	M6	10 Nm (7.4 lbf ft)
---------------------	----	--------------------



- Attach spring ①.

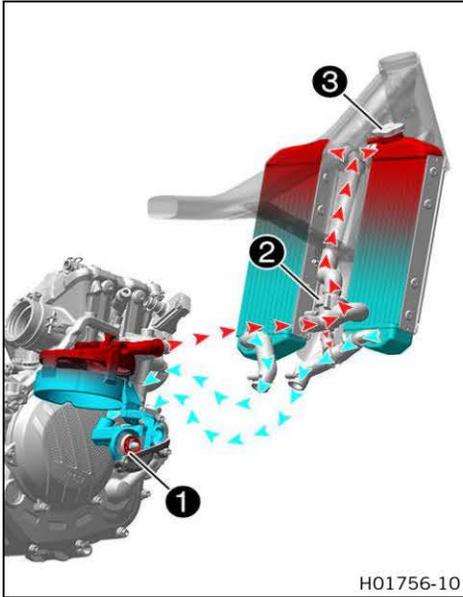


- Place vehicle in upright position and lean on the side stand.

Finishing work

- Check the engine oil level. (🗨️ p. 247)

20.1 Cooling system



H01756-10

Water pump ① in the engine circulates the coolant. The water flow through the radiator is controlled as a function of the coolant temperature. The cooling system is divided into two circuits. In the warming-up phase of the engine, the coolant flows through the small cooling circuit. This heats up the engine quickly. The thermostat ② warms up and opens the opening to the radiator (large cooling circuit). This keeps the engine temperature constant. The pressure resulting from the warming of the cooling system is regulated by a valve in radiator cap ③. This ensures that operating the vehicle at the specified coolant temperature will not result in a risk of malfunctions.

120 °C (248 °F)

Cooling is effected by the air stream. The lower the speed, the less the cooling effect. Dirty cooling fins also reduce the cooling effect. The radiator fan provides extra cooling. It is controlled by a thermostwitch.

20.2 Checking the antifreeze and coolant level



Warning

Danger of scalding During motorcycle operation, the coolant gets very hot and is under pressure.

- Do not open the radiator, the radiator hoses or other cooling system components if the engine or the cooling system are at operating temperature.
- Allow the cooling system and the engine to cool down before you open the radiator, the radiator hoses or other components of the cooling system.
- In the event of scalding, rinse the area affected immediately with lukewarm water.



Warning

Danger of poisoning Coolant is toxic and a health hazard.

- Keep coolant out of the reach of children.
- Do not allow coolant to come into contact with the skin, the eyes and clothing.
- Consult a doctor immediately if coolant is swallowed.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly with water and consult a doctor immediately if coolant gets into the eyes.
- Change clothing if coolant spills onto your clothing.

Condition

The engine is cold.

- Stand the motorcycle upright on a horizontal surface.
- Remove the radiator cap.
- Check the 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.

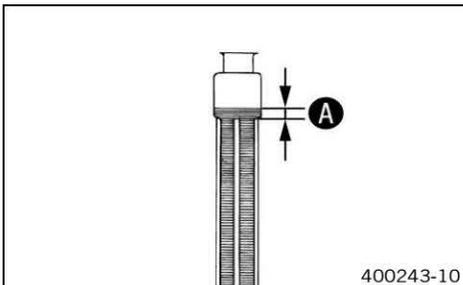
- Check the coolant level in the radiator.

Coolant level ① above the radiator fins

10 mm (0.39 in)

- » If the coolant level does not match the specified value:
 - Correct the coolant level.

Coolant (🗨️ p. 356)



400243-10

- Mount the radiator cap.

20.3 Checking the coolant level



Warning

Danger of scalding During motorcycle operation, the coolant gets very hot and is under pressure.

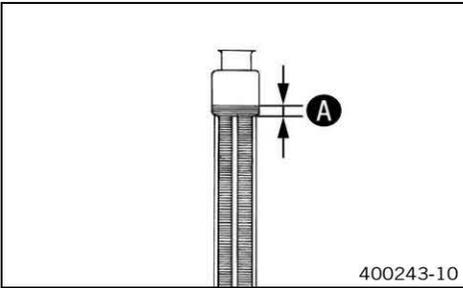
- Do not open the radiator, the radiator hoses or other cooling system components if the engine or the cooling system are at operating temperature.
- Allow the cooling system and the engine to cool down before you open the radiator, the radiator hoses or other components of the cooling system.
- In the event of scalding, rinse the area affected immediately with lukewarm water.



Warning

Danger of poisoning Coolant is toxic and a health hazard.

- Keep coolant out of the reach of children.
- Do not allow coolant to come into contact with the skin, the eyes and clothing.
- Consult a doctor immediately if coolant is swallowed.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly with water and consult a doctor immediately if coolant gets into the eyes.
- Change clothing if coolant spills onto your clothing.



Condition

The engine is cold.

- Stand the motorcycle upright on a horizontal surface.
- Remove the radiator cap.
- Check the coolant level in the radiator.

Coolant level A above the radiator fins	10 mm (0.39 in)
--	-----------------

- » If the coolant level does not match the specified value:
 - Correct the coolant level.

Coolant (📖 p. 356)

- Mount the radiator cap.

20.4 Draining the coolant



Warning

Danger of scalding During motorcycle operation, the coolant gets very hot and is under pressure.

- Do not open the radiator, the radiator hoses or other cooling system components if the engine or the cooling system are at operating temperature.
- Allow the cooling system and the engine to cool down before you open the radiator, the radiator hoses or other components of the cooling system.
- In the event of scalding, rinse the area affected immediately with lukewarm water.



Warning

Danger of poisoning Coolant is toxic and a health hazard.

- Keep coolant out of the reach of children.
- Do not allow coolant to come into contact with the skin, the eyes and clothing.
- Consult a doctor immediately if coolant is swallowed.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly with water and consult a doctor immediately if coolant gets into the eyes.
- Change clothing if coolant spills onto your clothing.

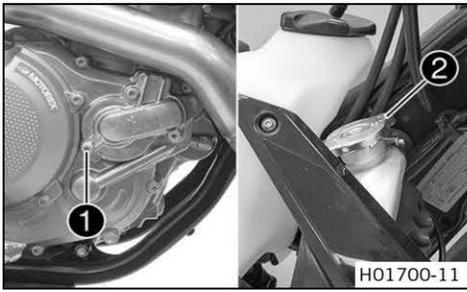
Condition

The engine is cold.

Preparatory work

(All EXC-F Six Days, EXC-F AU)

- Remove the engine guard. (📖 p. 62)

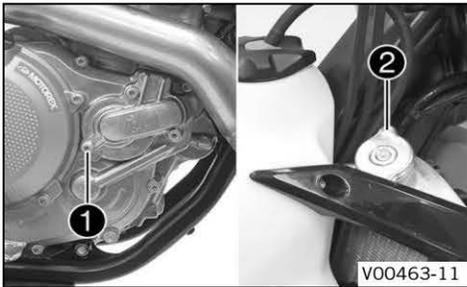


Main work
(EXC-F EU/AU, EXC-F Six Days EU)

- Position the motorcycle upright.
- Place a suitable container under the water pump cover.
- Remove screw ①. Take off radiator cap ②.
- Completely drain the coolant.
- Mount and tighten screw ① with a new seal ring.

Guideline

Screw, water pump cover	M6	10 Nm (7.4 lbf ft)
-------------------------	----	-----------------------



(All US models)

- Position the motorcycle upright.
- Place a suitable container under the water pump cover.
- Remove screw ①. Take off radiator cap ②.
- Completely drain the coolant.
- Mount and tighten screw ① with a new seal ring.

Guideline

Screw, water pump cover	M6	10 Nm (7.4 lbf ft)
-------------------------	----	-----------------------

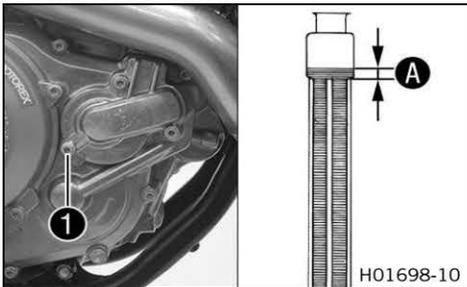
20.5 Refilling coolant



Warning

Danger of poisoning Coolant is toxic and a health hazard.

- Keep coolant out of the reach of children.
- Do not allow coolant to come into contact with the skin, the eyes and clothing.
- Consult a doctor immediately if coolant is swallowed.
- Rinse the affected area immediately with plenty of water in the event of contact with the skin.
- Rinse eyes thoroughly with water and consult a doctor immediately if coolant gets into the eyes.
- Change clothing if coolant spills onto your clothing.



Main work

- Make sure that the screw ① is tightened.
- Stand the vehicle upright.
- Pour coolant in up to measurement A above the radiator fins.

Guideline

10 mm (0.39 in)		
Coolant	1.2 l (1.3 qt.)	Coolant (📖 p. 356)

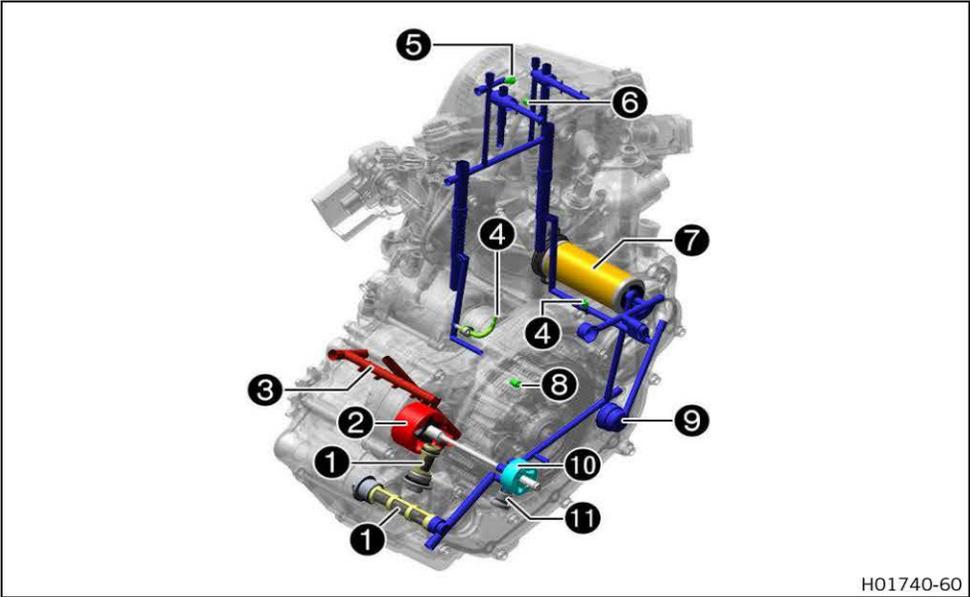
- Refit the radiator cap.

Finishing work

(All EXC-F Six Days, EXC-F AU)

- Install the engine guard. (📖 p. 62)
- Take a short test ride.
- Check the coolant level. (📖 p. 245)

21.1 Oil circuit



- | | |
|----|---|
| 1 | Oil screens |
| 2 | Suction pump |
| 3 | Oil channel, transmission lubrication |
| 4 | Oil nozzles for piston cooling |
| 5 | Oil nozzle for rocker arm lubrication |
| 6 | Oil nozzle for timing chain lubrication |
| 7 | Oil filter |
| 8 | Oil nozzle for clutch lubrication |
| 9 | Oil nozzle for conrod bearing lubrication |
| 10 | Force pump |
| 11 | Oil pressure regulator valve |

21.2 Checking the engine oil level

Condition

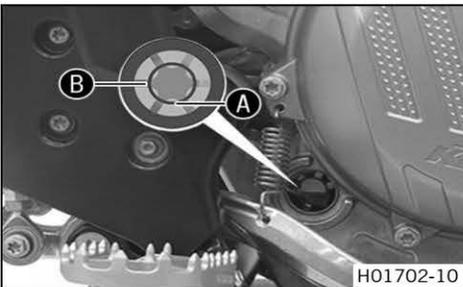
The engine is at operating temperature.

Preparatory work

- Stand the motorcycle upright on a horizontal surface.

Main work

- Check the engine oil level.



Info

After switching off the engine, wait one minute before checking the level.

The engine oil is at a level between lower edge **A** and the middle of level viewer **B**.

- » If the engine oil is not up to lower edge **A** of the level viewer:
 - Add engine oil. (📖 p. 250)

21.3 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.

- Warning**
Environmental hazard Hazardous substances cause environmental damage.
- Dispose of oils, grease, filters, fuel, cleaning agents, brake fluid, etc., correctly and in compliance with the applicable regulations.

i Info
 Drain engine oil with engine at operating temperature.

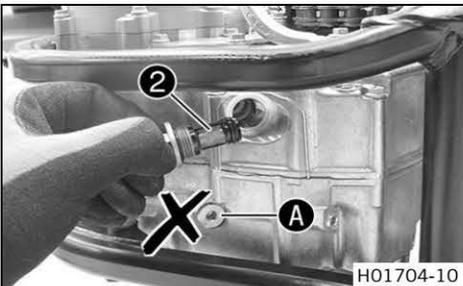
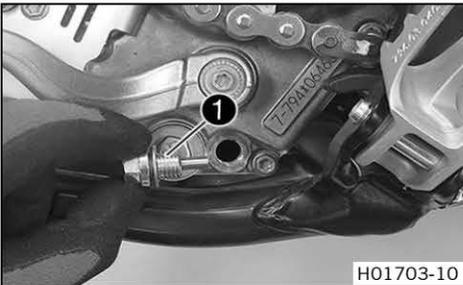
Preparatory work

(All EXC-F Six Days, EXC-F AU)

- Remove the engine guard. (📖 p. 62)
- Park the motorcycle on a level surface.

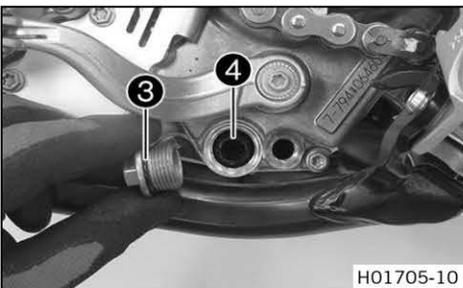
Main work

- Place a suitable container under the engine.
- Remove oil drain plug ❶ with the magnet and seal ring.

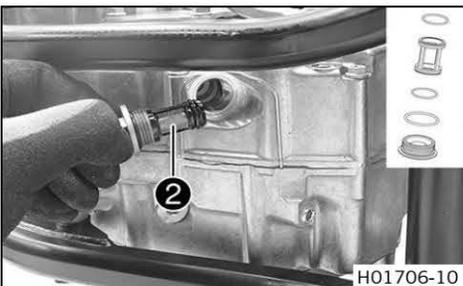


- Remove screw plug ❷ with the short oil screen and the O-rings.

i Info
 Do not remove screw A.



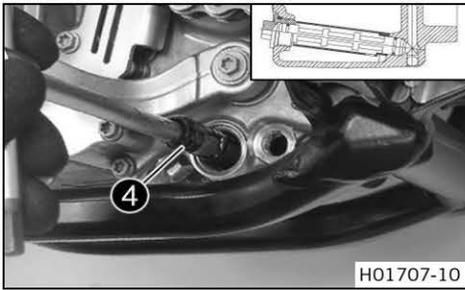
- Remove screw plug ❸ with the long oil screen ❹ and the O-rings.
- Completely drain the engine oil.
- Thoroughly clean the parts and sealing surfaces.



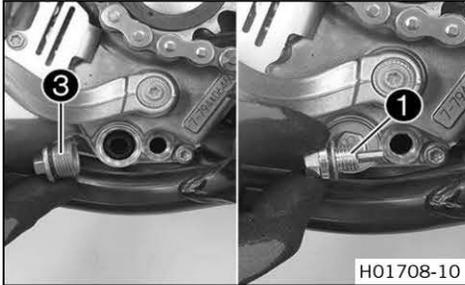
- Mount and tighten screw plug ❷ with the short oil screen and the O-rings.

Guideline

Screw plug, oil screen	M20x1.5	15 Nm (11.1 lbf ft)
------------------------	---------	------------------------



- Position long oil screen **4** with the O-rings on a pin wrench.
- Position the pin wrench through the drilled hole of the screw plug in the opposite section of the engine case.
- Push the oil screen all the way into the engine case.



- Mount and tighten screw plug **3** with the O-ring.

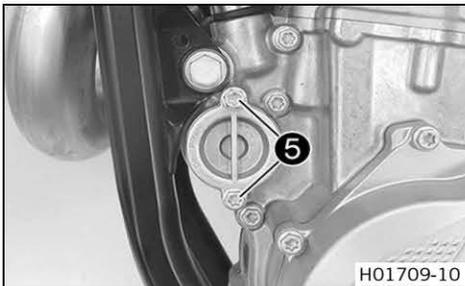
Guideline

Screw plug, oil screen	M20x1.5	15 Nm (11.1 lbf ft)
------------------------	---------	------------------------

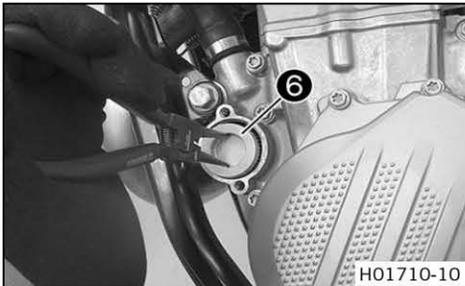
- Mount and tighten oil drain plug **1** with the magnet and a new seal ring.

Guideline

Oil drain plug with magnet	M12x1.5	20 Nm (14.8 lbf ft)
----------------------------	---------	------------------------



- Remove screws **5**. Remove the oil filter cover with the O-ring.



- Pull oil filter **6** out of the oil filter housing.

Circlip pliers reverse (51012011000) (p. 362)

- Completely drain the engine oil.
- Thoroughly clean the parts and sealing surface.

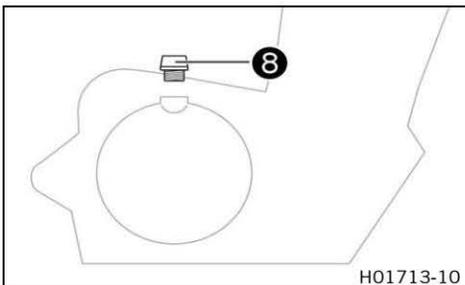


- Lay the motorcycle on its side and fill the oil filter housing to about 1/3 full with engine oil.
- Insert the new oil filter into the oil filter housing.
- Oil the O-ring of the oil filter cover and mount it with the oil filter cover **7**.
- Mount and tighten the screws.

Guideline

Screw, oil filter cover	M6	10 Nm (7.4 lbf ft)
-------------------------	----	--------------------

- Stand the motorcycle upright.



- Remove filler plug **8** with the O-ring from the clutch cover and fill up with engine oil.

Engine oil	1.2 l (1.3 qt.)	Engine oil (SAE 10W/50) (p. 356)
------------	-----------------	----------------------------------

i Info

Too little engine oil or poor-quality engine oil results in premature wear of the engine.

- Install and tighten the oil filler plug with 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 an effective exhaust extraction system when starting or running the engine in an enclosed space.

- Start the engine and check that it is oil-tight.

Finishing work
(All EXC-F Six Days, EXC-F AU)

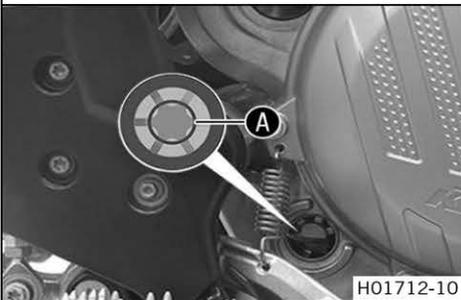
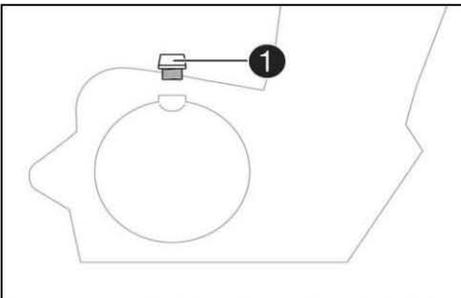
- Install the engine guard. (📖 p. 62)
- Check the engine oil level. (📖 p. 247)

21.4 Adding engine oil



Info

Too little engine oil or poor-quality engine oil results in premature wear to the engine.



Main work

- Remove the oil filler plug ① with the O-ring from the clutch cover.
- Fill engine oil to the middle A of the level viewer.
- Add the same engine oil that was used when the motor was changed.

Engine oil (SAE 10W/50) (📖 p. 356)



Info

For optimal performance of the engine oil, do not mix different types of engine oil.
If appropriate, change the engine oil.

- Install and tighten the oil filler plug with O-ring.



Danger

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

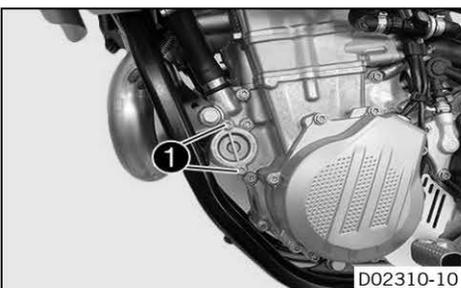
- Always make sure there is sufficient ventilation when running the engine.
- Use an effective exhaust extraction system when starting or running the engine in an enclosed space.

- Start the engine and check that it is oil-tight.

Finishing work

- Check the engine oil level. (📖 p. 247)

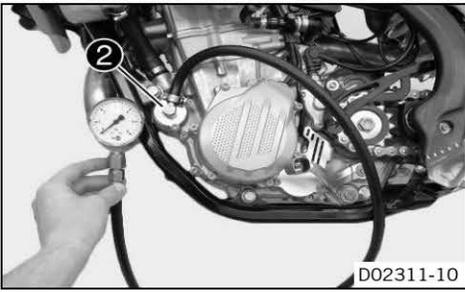
21.5 Checking the engine oil pressure



Main work

- Place a suitable container under the engine.
- Remove screws ①. Remove the oil filter cover with the O-ring.
- Remove the oil filter.

Circlip pliers reverse (51012011000) (📖 p. 362)



D02311-10

- Position special tool ② with the O-ring. Mount and tighten the screws.

Guideline

Screw, oil filter cover	M6	10 Nm (7.4 lbf ft)
-------------------------	----	--------------------

Oil pressure adapter (79429094000) (🔧 p. 369)

- Connect the pressure tester to the special tool without the T-plate.

Pressure tester (61029094000) (🔧 p. 365)
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- Check the engine oil level. (🔧 p. 247)



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

- Start the engine and let it warm up.
- Check the engine oil pressure.

Engine oil pressure	
Engine oil temperature: 80 °C (176 °F) Engine speed: 1,600 rpm	0.9 bar (13 psi)
Engine oil temperature: 80 °C (176 °F) Engine speed: 6,000 rpm	2.5 bar (36 psi)

- » If the measured value is less than the specification:
 - Check the oil pumps for wear. Check all oil channels for free flow.
- 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.
- Insert the oil filter into the oil filter housing.
- Grease the O-ring of the oil filter cover. Mount the oil filter cover.
- Mount and tighten the screws.

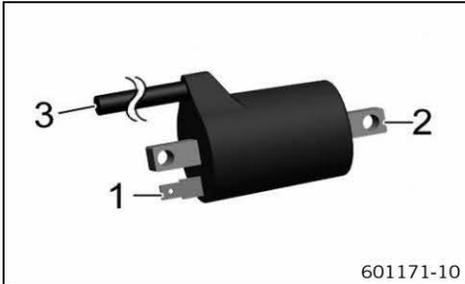
Guideline

Screw, oil filter cover	M6	10 Nm (7.4 lbf ft)
-------------------------	----	--------------------

Finishing work

- Check the engine oil level. (🔧 p. 247)

22.1 Ignition coil - checking the secondary winding



Condition

Ignition coil cylinder 1 is disconnected.
Spark plug connector cylinder 1 has been removed.

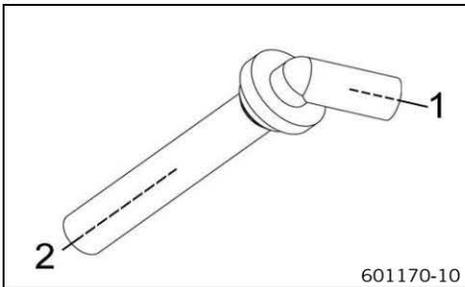
Ignition coil cylinder 1 - check the secondary winding resistance

- Ω Measure the resistance between the specified points.
Ignition coil cylinder 1 pin 2 (-) – Ignition coil cylinder 1 pin 3

Ignition coil	
Secondary winding resistance at: 20 °C (68 °F)	10.8... 16.2 k Ω

- » If the displayed value does not correspond to specifications:
 - Change the ignition coil.

22.2 Checking the spark plug connector



Condition

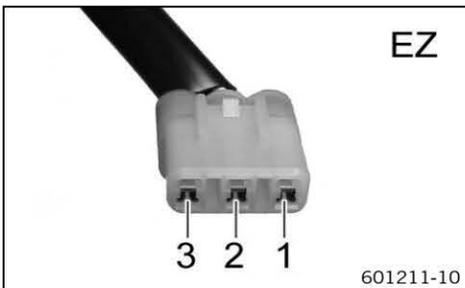
Spark plug connector cylinder 1 has been removed.

- Ω Measure the resistance between the specified points.
Measuring point 1 – Measuring point 2

Spark plug connector	
Resistance at: 20 °C (68 °F)	3.75... 6.25 k Ω

- » If the specification is not reached:
 - Change the spark plug connector.

22.3 Alternator - checking the stator winding



Condition

The stator is disconnected.

Preparatory work

- Remove the seat. (📖 p. 101)

Main work

Stator winding, measurement I - check the resistance

- Ω Measure the resistance between the specified points.
Stator, connector EZ pin 1 – Stator, connector EZ pin 2

Alternator	
Resistance of stator winding at: 20 °C (68 °F)	0.368... 0.552 Ω

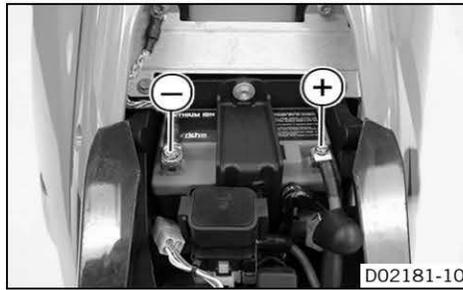
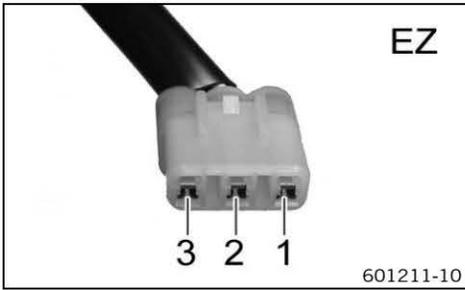
- » If the value displayed does not meet specifications:
 - Change the stator.

Stator winding, measurement II - check the resistance

- Ω Measure the resistance between the specified points.
Stator, connector EZ pin 1 – Stator, connector EZ pin 3

Alternator	
Resistance of stator winding at: 20 °C (68 °F)	0.368... 0.552 Ω

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



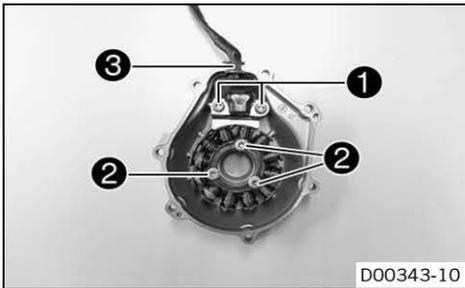
Stator winding - check for a short circuit to ground (terminal 31)

- Ω Measure the resistance between the specified points.
Stator, connector **EZ** pin **1** – Measuring point **Ground (-)**

Resistance	$\infty \Omega$
------------	-----------------

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

22.4 Removing the stator

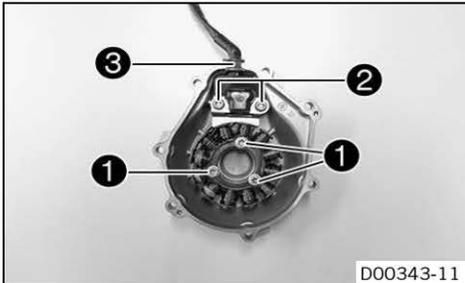


Condition

The alternator cover has been removed.

- Remove screws **1**.
- Remove the retaining bracket.
- Remove screws **2**.
- Remove cable support sleeve **3** from the alternator cover.
- Take the stator out of the alternator cover.

22.5 Installing the stator



- Position the stator in the alternator cover.
- Mount and tighten screws **1**.

Guideline

Screw, stator	M5	6 Nm (4.4 lbf ft)	Loctite® 243™
---------------	----	----------------------	---------------

- Position the retaining bracket.
- Mount and tighten screws **2**.

Guideline

Pulse generator screw and cable retainer	M5	6 Nm (4.4 lbf ft)	Loctite® 243™
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- Position cable sleeve **3** in the alternator cover.

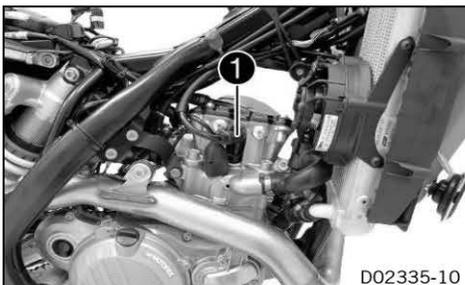
22.6 Changing the spark plug

Preparatory work

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

Main work

- Disconnect spark plug connector **1**.





- Remove the spark plug with special tool ②.

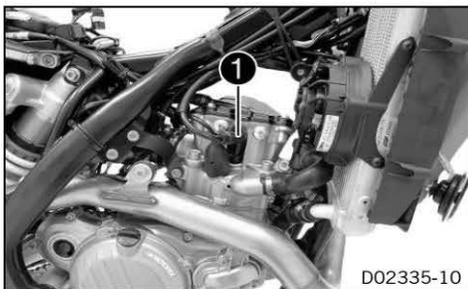
Spark plug wrench (77229172000) (📖 p. 367)
--

- Mount and tighten the new spark plug using the special tool.

Guideline

Spark plug	M10x1	10... 12 Nm (7.4... 8.9 lbf ft)
------------	-------	------------------------------------

Spark plug wrench (77229172000) (📖 p. 367)
--



- Plug in spark plug connector ①.

Finishing work

- Install the fuel tank. (📖 p. 104)
- Mount the seat. (📖 p. 102)

23.1 Checking the valve clearance

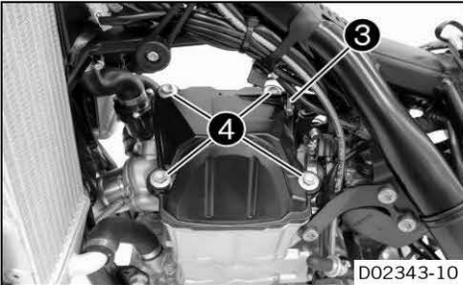
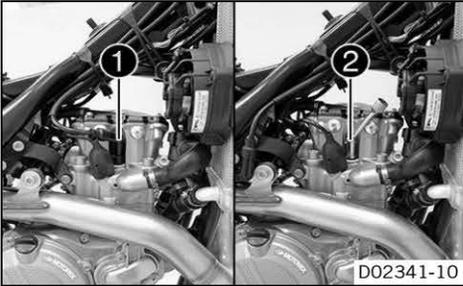
Preparatory work

- Raise the motorcycle with the lift stand. (📖 p. 11)
- Remove the seat. (📖 p. 101)
- Remove the fuel tank. (📖 p. 102)

Main work

- Disconnect spark plug connector ①.
- Remove the spark plug with special tool ②.

Spark plug wrench (77229172000) (📖 p. 367)



- Push back hose clamp ③.
- Pull off the bleeder hose.
- Remove screws ④.
- Remove the valve cover with the gasket.

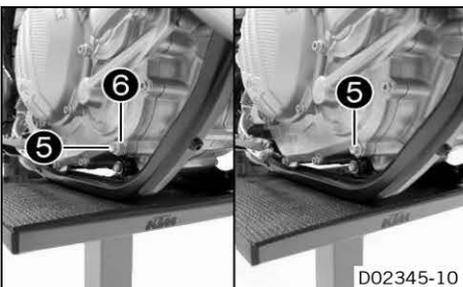
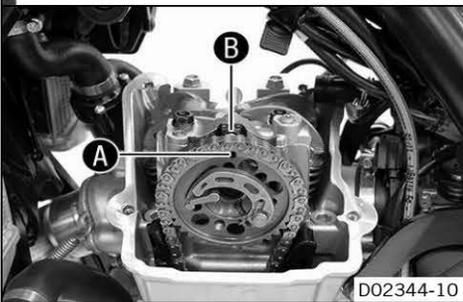


- Engage the highest gear.
- Turn the rear wheel until the engine is at ignition top dead center.
- ✓ The markings A on the camshaft and screw B on the cylinder head are lined up.



Info

Make sure that the crankshaft is at top dead center.



- Unscrew and remove screw ⑤.
- Remove washer ⑥.
- Mount and tighten screw ⑤ without the washer.



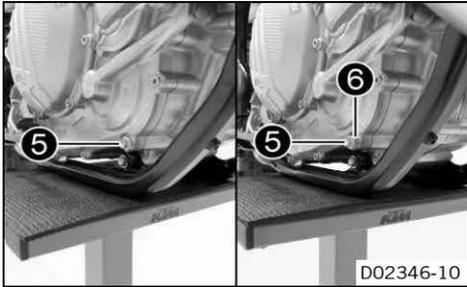
- Check the valve clearance at all valves between the valve and rocker arm.

Guideline

Valve clearance	
Intake at: 20 °C (68 °F)	0.10... 0.15 mm (0.0039... 0.0059 in)
Exhaust at: 20 °C (68 °F)	0.12... 0.17 mm (0.0047... 0.0067 in)

Feeler gauge (59029041100) (📖 p. 364)

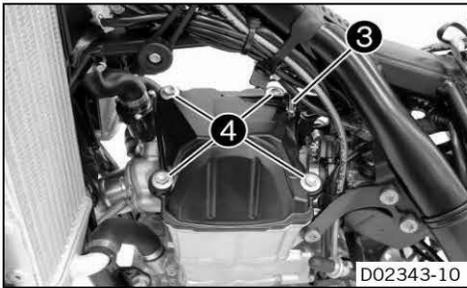
- » If the valve clearance does not meet specifications:
 - Adjust the valve clearance. (📖 p. 229)



- Remove locking screw ⑤.
- Crank the engine several times.
- Check the valve clearance and correct it if necessary.
- Mount and tighten screw ⑤ with washer ⑥.

Guideline

Screw plug, crankshaft location	M8	10 Nm (7.4 lbf ft)
---------------------------------	----	--------------------

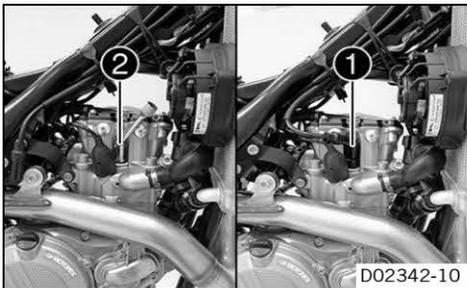


- Position the valve cover with the gasket. Mount and tighten screws ④.

Guideline

Screw, valve cover	M6	10 Nm (7.4 lbf ft)
--------------------	----	--------------------

- Mount the vent hose and hose clamp ③.



- Mount and tighten the spark plug with special tool ②.

Guideline

Spark plug	M10x1	10... 12 Nm (7.4... 8.9 lbf ft)
------------	-------	---------------------------------

Spark plug wrench (77229172000) (📖 p. 367)

- Plug in spark plug connector ①.

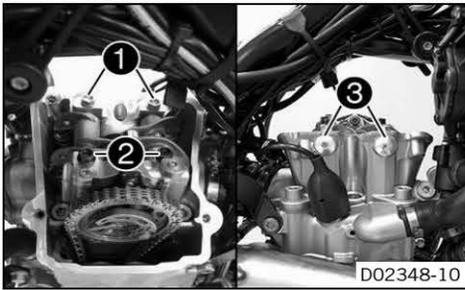
Finishing work

- Install the fuel tank. (📖 p. 104)
- Mount the seat. (📖 p. 102)
- Remove the motorcycle from the lift stand. (📖 p. 11)

23.2 Adjusting the valve clearance

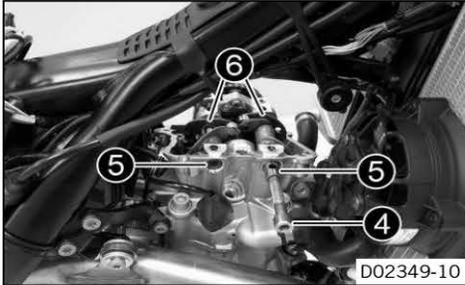
Preparatory work

- Raise the motorcycle with the lift stand. (📖 p. 11)
- Remove the seat. (📖 p. 101)
- Remove the fuel tank. (📖 p. 102)
- Check the valve clearance. (📖 p. 255)

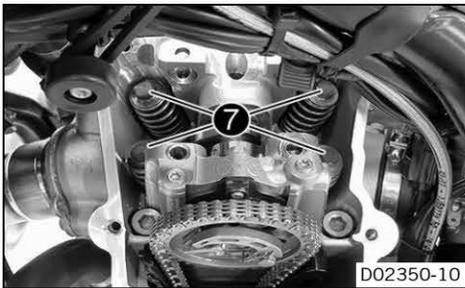


Main work

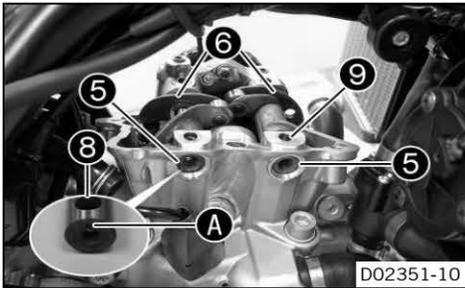
- Remove screws 1 and 2 of the rocker arm shafts.
- Remove plugs 3 with the O-rings.



- Screw a suitable screw 4 into the rocker arm shafts 5.
- Pull out rocker arm shafts 5.
- Take off rocker arm 6.



- Remove shims 7 and set them down according to the installation position.
- Correct the shims based on the results of the valve clearance check.
- Insert suitable shims.



- Position rocker arm 6.
- Mount rocker arm shafts 5.
 - ✓ The rocker arm shaft with marking A is installed on the intake side.
 - ✓ Markings A face upward.

i Info

Make sure that the tapped hole of the rocker arm shaft is facing outward. Align drill holes 8 of the rocker arm shafts with drill holes 9 of the cylinder head.

- Install and tighten screws 1 and 2 of the rocker arm shafts.

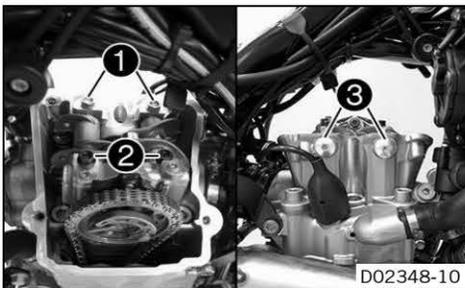
Guideline

Screw, rocker arm bearing	M7	15 Nm (11.1 lbf ft)
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- Install and tighten the screw plugs 3 with O-rings.

Guideline

Screw plug, rocker arm shaft	M10x1.25	10 Nm (7.4 lbf ft)
------------------------------	----------	--------------------



Finishing work

- Check the valve clearance. (p. 255)
- Install the fuel tank. (p. 104)
- Mount the seat. (p. 102)
- Remove the motorcycle from the lift stand. (p. 11)

24.1 Checking the starter motor



Condition

The starter motor has been removed.

- Connect the negative cable of a 12 volt power supply to the housing of the starter motor. Connect the positive cable of the power supply briefly to connector ❶ of the starter motor.
 - » If the starter motor does not turn when the circuit is closed:
 - Change the starter motor.

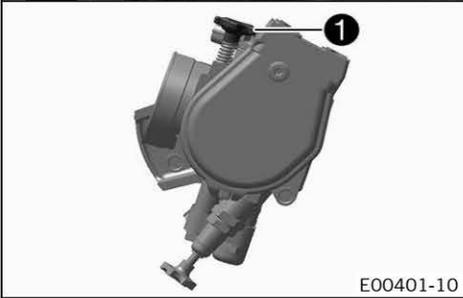
25.1 Adjusting the idle speed



Warning

Danger of accidents The engine may go out spontaneously if the idle speed is set too low.

- Set the idle speed to the specified value.



(EXC-F EU/AU, EXC-F Six Days EU)

- Run the engine until warm.
- ✓ The cold start button is deactivated – The cold start button is in its basic position.



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

- Set the idle speed by turning idle speed adjusting screw ①.

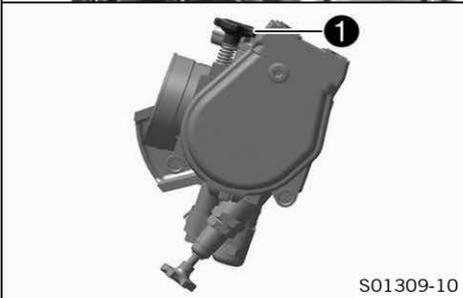
Guideline

Idle speed	1,800... 1,900 rpm
Tachometer (45129075000) (🗨️ p. 362)	



Info

Turning counterclockwise lowers the idle speed.
Turning clockwise raises the idle speed.



(All US models)

- Run the engine until warm.
- ✓ The cold start button is deactivated – The cold start button is in its basic position.



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

- Set the idle speed by turning idle speed adjusting screw ①.

Guideline

Idle speed	1,800... 1,900 rpm
Tachometer (45129075000) (🗨️ p. 362)	



Info

Turning counterclockwise lowers the idle speed.
Turning clockwise raises the idle speed.

25.2 Throttle position sensor circuit A - checking the basic settings

Condition

The diagnostics tool is connected and running.

- "Select the measured values" > "Throttle position sensor voltage circuit (THAD)" and "Throttle position sensor signal circuit (ATP)".

Throttle position sensor circuit A	
Basic position - voltage "THAD"	0.400±0.004 V
Throttle position sensor circuit A	
Signal "ATP"	0 %

- » If the displayed value does not correspond to specifications:
 - Adjust the basic throttle position sensor setting. (p. 260)

25.3 Adjusting the basic throttle position sensor setting

Condition

The diagnostics tool is connected and running.

- Select "Measured values" > "Throttle position sensor circuit A voltage (THAD)" and "Throttle position sensor circuit A signal (ATP)".
- Remove screws ① and protective cover ②.
- Loosen screws ③.
- Set "Throttle position sensor circuit A voltage (THAD)" to the setpoint. Tighten screws ③.

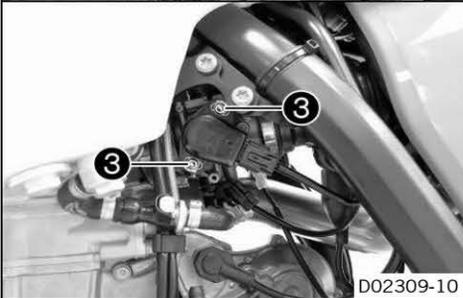
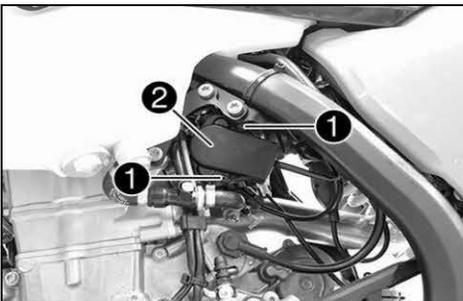
Guideline

Screw, throttle position sensor	M5	3.5 Nm (2.58 lbf ft)
---------------------------------	----	-------------------------



Info

The value of "Throttle position sensor circuit A signal (ATP)" must equal the setpoint.



D02309-10

Throttle position sensor circuit A	
Basic position - voltage "THAD"	0.400±0.004 V
Throttle position sensor circuit A	
Signal "ATP"	0 %

- » If the displayed value is equal to the setpoint value:
 - Open and close the throttle grip all the way 10 x.
 - Check the measured values of "Throttle position sensor circuit A voltage (THAD)" and "Throttle position sensor circuit A signal (ATP)" again.

- Position protective cover ②.
- Mount and tighten screws ①.

Guideline

Screw, protective cover	M4	2.1 Nm (1.55 lbf ft)
-------------------------	----	-------------------------

- "Read trouble code" selected.
- Select "Delete trouble codes".



Danger

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

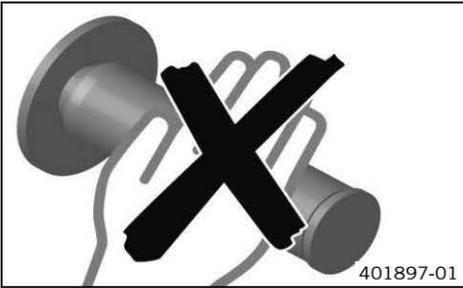
- Always make sure there is sufficient ventilation when running the engine.
- Use an effective exhaust extraction system when starting or running the engine in an enclosed space.

- Start the engine and perform the initialization run.

Guideline

Initialization run	5 min
--------------------	-------

25.4 Executing the initialization run



Condition

The diagnostics tool is connected and running.

- Execute **"Engine electronics" > "Functions" > "Delete adaptation values"**.
 - ✓ The adaptation values are deleted.
- Select **"Engine electronics" > "Measured values" > "Coolant temperature sensor (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 an effective exhaust extraction system 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)
---------------------	-------------------

- Let the engine idle until it reaches the specified temperature.

Guideline

Coolant temperature	80... 90 °C (176... 194 °F)
---------------------	-----------------------------



Info

Do not operate the throttle grip during the initialization process.

- As soon as the specified temperature is reached, switch off the ignition.



Info

If the initialization is not completed or the initialization process is interrupted, the entire process must be restarted.

26.1 Engine

Design	1-cylinder 4-stroke engine, water-cooled
Displacement (All 450 models)	449.9 cm ³ (27.455 cu in)
Displacement (All 500 models)	510.9 cm ³ (31.177 cu in)
Stroke (All 450 models)	63.4 mm (2.496 in)
Stroke (All 500 models)	72 mm (2.83 in)
Bore	95 mm (3.74 in)
Compression ratio	11.8:1
Idle speed	1,800... 1,900 rpm
Control	OHC, 4 valves controlled via rocker arm
Valve diameter, intake	40 mm (1.57 in)
Valve diameter, exhaust	33 mm (1.3 in)
Valve clearance	
Intake at: 20 °C (68 °F)	0.10... 0.15 mm (0.0039... 0.0059 in)
Exhaust at: 20 °C (68 °F)	0.12... 0.17 mm (0.0047... 0.0067 in)
Crankshaft bearing	2 cylinder roller bearing
Conrod bearing	Slide bearing
Piston pin bearing	Not a bearing bush - DLC-plated piston pins
Pistons	Forged light alloy
Piston rings	1 compression ring, 1 oil scraper ring
Engine lubrication	Pressure circulation lubrication with two Eaton pumps
Primary transmission	31:76
Clutch	Multidisc clutch in oil bath, hydraulically activated
Transmission ratio	
First gear	14:36
Second gear	17:32
Third gear	19:28
Fourth gear	22:26
Fifth gear	23:24
Sixth gear	26:21
Alternator	12 V, 168 W
Ignition	Contactless controlled fully electronic ignition with digital ignition adjustment
Spark plug	NGK LMAR9AI-10
Spark plug electrode gap	1.0 mm (0.039 in)
Cooling	Water cooling, permanent circulation of coolant by water pump
Starting aid	Electric starter

26.2 Tolerance, engine wear limits

Camshaft - cam height	
Exhaust	33.10... 33.30 mm (1.3031... 1.311 in)
Camshaft - cam height (All 450 models)	
Intake	34.00... 34.20 mm (1.3386... 1.3465 in)
Camshaft - cam height (All 500 models)	
Intake	34.40... 34.60 mm (1.3543... 1.3622 in)
Valve spring	
Minimum length, intake (without valve spring seat)	40.7 mm (1.602 in)
Minimum length, exhaust (without valve spring seat)	40.7 mm (1.602 in)
Valve spring seat	1.9... 2.1 mm (0.075... 0.083 in)
Cylinder/cylinder head - sealing area distortion	≤ 0.10 mm (≤ 0.0039 in)
Piston - diameter	
Size I	94.93... 94.96 mm (3.7374... 3.7386 in)

Size II	94.94... 94.97 mm (3.7378... 3.739 in)
Cylinder - drill hole diameter	
Size I	95.000... 95.012 mm (3.74015... 3.74062 in)
Size II	95.013... 95.025 mm (3.74066... 3.74113 in)
Piston/cylinder - mounting clearance	
Size I	0.040... 0.082 mm (0.00157... 0.00323 in)
Size II	0.043... 0.085 mm (0.00169... 0.00335 in)
Wear limit	0.120 mm (0.00472 in)
Piston ring end gap	
Compression ring	≤ 1.00 mm (≤ 0.0394 in)
Oil scraper ring	≤ 1.20 mm (≤ 0.0472 in)
Piston ring - groove clearance	
Compression ring	≤ 0.08 mm (≤ 0.0031 in)
Oil scraper ring	≤ 0.07 mm (≤ 0.0028 in)
Connecting rod - end play of lower conrod bearing	0.20... 0.45 mm (0.0079... 0.0177 in)
Crankshaft - axial play	0.50... 0.60 mm (0.0197... 0.0236 in)
Crankshaft - run-out on bearing pin	≤ 0.03 mm (≤ 0.0012 in)
Clutch pack - thickness	
Wear limit	≥ 26.4 mm (≥ 1.039 in)
Oil pressure regulator valve	
Minimum length of preload spring	24.5 mm (0.965 in)
Engine oil consumption	≤ 30 ml/h (≤ 1.01 fl. oz./hr)
Shift shaft - play in sliding plate/shift quadrant	0.40... 0.80 mm (0.0157... 0.0315 in)

26.3 Engine tightening torques

Screw, oil jet for piston cooling	M4	2 Nm (1.5 lbf ft)	Loctite® 243™
Oil nozzle for clutch lubrication	M5	2 Nm (1.5 lbf ft)	Loctite® 243™
Oil nozzle, piston cooling	M5	2 Nm (1.5 lbf ft)	Loctite® 243™
Oil nozzle, rocker arm lubrication	M5	2 Nm (1.5 lbf ft)	Loctite® 243™
Pulse generator screw and cable retainer	M5	6 Nm (4.4 lbf ft)	Loctite® 243™
Screw, bearing retainer	M5	6 Nm (4.4 lbf ft)	Loctite® 243™
Screw, clutch spring retainer	M5	6 Nm (4.4 lbf ft)	–
Screw, gear position sensor	M5	5 Nm (3.7 lbf ft)	Loctite® 243™
Screw, locking lever	M5	6 Nm (4.4 lbf ft)	Loctite® 243™
Screw, stator	M5	6 Nm (4.4 lbf ft)	Loctite® 243™
Screw, suction pump cover	M5	6 Nm (4.4 lbf ft)	Loctite® 243™
Nut, water pump impeller	M6	6 Nm (4.4 lbf ft)	Loctite® 243™
Screw, alternator cover	M6	10 Nm (7.4 lbf ft)	–
Screw, bearing bolt, torque limiter	M6	10 Nm (7.4 lbf ft)	Loctite® 243™
Screw, camshaft support plate	M6	10 Nm (7.4 lbf ft)	Loctite® 243™
Screw, clutch cover	M6	10 Nm (7.4 lbf ft)	–
Screw, cylinder head	M6	10 Nm (7.4 lbf ft)	–
Screw, engine case	M6	10 Nm (7.4 lbf ft)	–
Screw, exhaust flange	M6	10 Nm (7.4 lbf ft)	Loctite® 243™
Screw, oil filter cover	M6	10 Nm (7.4 lbf ft)	–
Screw, pressure pump cover	M6	10 Nm (7.4 lbf ft)	Loctite® 243™
Screw, shift drum locating	M6	10 Nm (7.4 lbf ft)	Loctite® 243™
Screw, shift lever	M6	14 Nm (10.3 lbf ft)	Loctite® 243™
Screw, starter motor	M6	10 Nm (7.4 lbf ft)	–
Screw, timing chain securing guide	M6	10 Nm (7.4 lbf ft)	Loctite® 243™
Screw, timing chain tensioner	M6	10 Nm (7.4 lbf ft)	–

Screw, timing chain tensioning rail	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)	–
Oil nozzle for conrod bearing lubrication	M6x0.75	4 Nm (3 lbf ft)	Loctite® 243™
Plug, oil channel	M7	9 Nm (6.6 lbf ft)	Loctite® 243™
Screw, rocker arm bearing	M7	15 Nm (11.1 lbf ft)	–
Plug, timing chain tensioner	M8	8 Nm (5.9 lbf ft)	–
Screw plug, crankshaft location	M8	10 Nm (7.4 lbf ft)	–
Plug, oil channel	M10	15 Nm (11.1 lbf ft)	Loctite® 243™
Screw, engine sprocket	M10	60 Nm (44.3 lbf ft)	Loctite® 2701™
Spark plug	M10x1	10... 12 Nm (7.4... 8.9 lbf ft)	–
Engine coolant temperature sensor	M10x1.25	12 Nm (8.9 lbf ft)	–
Screw plug, rocker arm shaft	M10x1.25	10 Nm (7.4 lbf ft)	–
Screw, cylinder head	M10x1.25	Step 1 10 Nm (7.4 lbf ft) Step 2 30 Nm (22.1 lbf ft) Step 3 50 Nm (36.9 lbf ft)	Lubricated with engine oil
Nut, rotor	M12x1	60 Nm (44.3 lbf ft)	Thread, oiled with engine oil/cone degreased
Oil drain plug with magnet	M12x1.5	20 Nm (14.8 lbf ft)	–
Plug, oil pressure regulator valve	M12x1.5	20 Nm (14.8 lbf ft)	–
Nut, inner clutch hub	M18x1.5	80 Nm (59 lbf ft)	–
Nut, primary gear	M20LHx1.5	100 Nm (73.8 lbf ft)	Loctite® 243™
Screw plug, oil screen	M20x1.5	15 Nm (11.1 lbf ft)	–

26.4 Capacities

26.4.1 Engine oil

Engine oil	1.2 l (1.3 qt.)	Engine oil (SAE 10W/50) (📖 p. 356)
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26.4.2 Coolant

Coolant	1.2 l (1.3 qt.)	Coolant (📖 p. 356)
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26.4.3 Fuel

Total fuel tank capacity, approx.	8.5 l (2.25 US gal)	Super unleaded (ROZ 95/RON 95/PON 91) (📖 p. 357)
Fuel reserve, approx.		1.5 l (1.6 qt.)

26.5 Chassis

Frame	Central tube frame made of chrome molybdenum steel tubing
Fork (EXC-F EU/AU/US)	WP Performance Systems MXMA 4860 upside down
Fork (All EXC-F Six Days)	WP Performance SystemsXplor 48
Suspension travel	
Front	300 mm (11.81 in)
Rear	310 mm (12.2 in)
Fork offset	22 mm (0.87 in)
Shock absorber	WP Performance Systems 4618 PDS DCC
Brake system	Disc brakes, brake calipers on floating bearings
Brake discs - diameter	

Front	260 mm (10.24 in)
Rear	220 mm (8.66 in)
Brake discs - wear limit (EXC-F EU/AU/US)	
Front	2.5 mm (0.098 in)
Rear	3.5 mm (0.138 in)
Brake discs - wear limit (All EXC-F Six Days)	
Front	2.5 mm (0.098 in)
Rear	3.7 mm (0.146 in)
Tire air pressure off road	
Front	1.0 bar (15 psi)
Rear	1.0 bar (15 psi)
Road tire pressure (EXC-F EU/AU, EXC-F Six Days EU)	
Front	1.5 bar (22 psi)
Rear	1.5 bar (22 psi)
Final drive (450 EXC-F EU, 450 EXC-F AU, 450 EXC-F Six Days EU)	14:52 (13:52)
Final drive (500 EXC-F EU, 500 EXC-F AU, 500 EXC-F Six Days EU)	14:50 (13:50)
Final drive (All US models)	14:45
Chain	5/8 x 1/4"
Rear sprockets available	48, 50, 52
Steering head angle	63.5°
Wheelbase	1,482±10 mm (58.35±0.39 in)
Seat height unloaded	960 mm (37.8 in)
Ground clearance unloaded	355 mm (13.98 in)
Weight without fuel, approx. (450 EXC-F EU, 450 EXC-F AU)	106 kg (234 lb.)
Weight without fuel, approx. (450 EXC-F Six Days EU, 500 EXC-F EU, 500 EXC-F AU)	106.5 kg (234.8 lb.)
Weight without fuel, approx. (500 EXC-F Six Days EU)	107 kg (236 lb.)
Weight without fuel, approx. (EXC-F US)	109 kg (240 lb.)
Weight without fuel, approx. (EXC-F Six Days US)	109.5 kg (241.4 lb.)
Maximum permissible front axle load	145 kg (320 lb.)
Maximum permissible rear axle load	190 kg (419 lb.)
Maximum permissible overall weight	335 kg (739 lb.)

26.6 Electrical system

Battery	HJTZ5S-FP	Lithium-ion battery Battery voltage: 12 V Nominal capacity: 2.0 Ah Maintenance-free
Speedometer battery	CR 2430	Battery voltage: 3 V
Fuse	58011109105	5 A
Fuse	75011088010	10 A
Fuse	58011109120	20 A
Headlight	HS1 / socket PX43t	12 V 35/35 W
Parking light	W5W / socket W2.1x9.5d	12 V 5 W
Indicator lamps	W2.3W / socket W2x4.6d	12 V 2.3 W
Turn signal (EXC-F EU/AU, EXC-F Six Days EU)	R10W / socket BA15s	12 V 10 W
Turn signal (All US models)	RY10W / socket BAU15s	12 V 10 W

Brake/tail light	LED
License plate lamp	LED

26.7 Tires

Validity	Front tires	Rear tires
(EXC-F EU/AU)	80/100 - 21 M/C 51M TT MAXXIS Maxx EnduPro	140/80 - 18 M/C 70R M+S TT MAXXIS Maxx EnduPro
(EXC-F Six Days EU)	90/90 - 21 M/C 54M M+S TT Metzeler MCE 6 Days Extreme	140/80 - 18 M/C 70M M+S TT Metzeler MCE 6 Days Extreme
(All US models)	90/90 - 21 M/C 54S M+S TT Continental TKC 80	120/90 - 18 M/C 65R M+S TT Continental TKC 80

The tires specified represent one of the possible series production tires. Additional information is available in the Service section under:
<http://www.ktm.com>

26.8 Fork

26.8.1 EXC-F EU/AU/US

Fork article number	14.18.8Q.69	
Fork	WP Performance Systems MXMA 4860 upside down	
Compression damping		
Comfort	18 clicks	
Standard	15 clicks	
Sport	12 clicks	
Rebound damping		
Comfort	18 clicks	
Standard	15 clicks	
Sport	12 clicks	
Spring length with preload spacer(s)	474 mm (18.66 in)	
Spring rate		
Weight of rider: 65... 75 kg (143... 165 lb.)	4.4 N/mm (25.1 lb/in)	
Weight of rider: 75... 85 kg (165... 187 lb.)	4.6 N/mm (26.3 lb/in)	
Weight of rider: 85... 95 kg (187... 209 lb.)	4.8 N/mm (27.4 lb/in)	
Fork length	928 mm (36.54 in)	
Air chamber length	110 \pm ₂₀ mm (4.33 \pm _{0.79} in)	
Fork oil per fork leg	600 ml (20.29 fl. oz.)	Fork oil (SAE 4) (48601166S1) (📖 p. 356)

26.8.2 All EXC-F Six Days

Fork article number	14.15.8Q.69	
Fork	WP Performance Systems Xplor 48	
Compression damping		
Comfort	18 clicks	
Standard	15 clicks	
Sport	12 clicks	
Rebound damping		
Comfort	18 clicks	
Standard	15 clicks	
Sport	12 clicks	
Spring preload - Preload Adjuster		
Comfort	+0	
Standard	+0	
Sport	+3	

Spring length with preload spacer(s)		
Weight of rider: 65... 75 kg (143... 165 lb.)		477 mm (18.78 in)
Weight of rider: 75... 85 kg (165... 187 lb.)		475 mm (18.7 in)
Weight of rider: 85... 95 kg (187... 209 lb.)		477 mm (18.78 in)
Spring rate		
Weight of rider: 65... 75 kg (143... 165 lb.)		4.4 N/mm (25.1 lb/in)
Weight of rider: 75... 85 kg (165... 187 lb.)		4.6 N/mm (26.3 lb/in)
Weight of rider: 85... 95 kg (187... 209 lb.)		4.8 N/mm (27.4 lb/in)
Fork length		932 mm (36.69 in)
Air chamber length		110 \pm $\frac{18}{10}$ mm (4.33 \pm $\frac{0.79}{16}$ in)
Fork oil per fork leg	610 ml (20.62 fl. oz.)	Fork oil (SAE 4) (48601166S1) (📖 p. 356)

26.9 Shock absorber

Shock absorber article number	12.18.7Q.69	
Shock absorber	WP Performance Systems 4618 PDS DCC	
Compression damping, low-speed		
Comfort	18 clicks	
Standard	15 clicks	
Sport	12 clicks	
Compression damping, high-speed		
Comfort	2.5 turns	
Standard	2 turns	
Sport	1 turn	
Rebound damping		
Comfort	18 clicks	
Standard	15 clicks	
Sport	12 clicks	
Spring preload		
Comfort	8 mm (0.31 in)	
Standard	8 mm (0.31 in)	
Sport	8 mm (0.31 in)	
Spring rate		
Weight of rider: 65... 75 kg (143... 165 lb.)	63 N/mm (360 lb/in)	
Weight of rider: 75... 85 kg (165... 187 lb.)	66 N/mm (377 lb/in)	
Weight of rider: 85... 95 kg (187... 209 lb.)	69 N/mm (394 lb/in)	
Spring length	225 mm (8.86 in)	
Gas pressure	10 bar (145 psi)	
Static sag	35 mm (1.38 in)	
Riding sag	110 mm (4.33 in)	
Fitted length	415 mm (16.34 in)	
Damper oil	Shock absorber fluid (SAE 2.5) (50180751S1) (📖 p. 356)	

26.10 Chassis tightening torques

Screw, pressure regulator	EJOT PT® K60x25-Z	3 Nm (2.2 lbf ft)	–
Screw, fixed grip	M4	5 Nm (3.7 lbf ft)	Loctite® 243™
Screw, protective cover	M4	2.1 Nm (1.55 lbf ft)	–
Spoke nipple, front wheel	M4.5	6 Nm (4.4 lbf ft)	–
Spoke nipple, rear wheel	M4.5	6 Nm (4.4 lbf ft)	–
Remaining nuts, chassis	M5	5 Nm (3.7 lbf ft)	–
Remaining screws, chassis	M5	5 Nm (3.7 lbf ft)	–
Screw, battery terminal	M5	2.5 Nm (1.84 lbf ft)	–
Screw, intake air temperature sensor	M5	3.5 Nm (2.58 lbf ft)	–
Screw, light switch	M5	1 Nm (0.7 lbf ft)	–
Screw, shock absorber adjusting ring	M5	5 Nm (3.7 lbf ft)	–
Screw, throttle position sensor	M5	3.5 Nm (2.58 lbf ft)	–
Nut, cable on starter motor	M6	4 Nm (3 lbf ft)	–
Remaining nuts, chassis	M6	10 Nm (7.4 lbf ft)	–
Remaining screws, chassis	M6	10 Nm (7.4 lbf ft)	–
Screw, ball joint of push rod on foot brake cylinder	M6	10 Nm (7.4 lbf ft)	Loctite® 243™
Screw, chain sliding guard	M6	14 Nm (10.3 lbf ft)	Loctite® 243™
Screw, front brake disc	M6	14 Nm (10.3 lbf ft)	Loctite® 243™
Screw, rear brake disc	M6	14 Nm (10.3 lbf ft)	Loctite® 243™
Screw, throttle grip	M6	5 Nm (3.7 lbf ft)	–
Fuel connection on fuel pump	M8	10 Nm (7.4 lbf ft)	–
Nut, foot brake lever stop	M8	20 Nm (14.8 lbf ft)	–
Nut, rear sprocket screw	M8	35 Nm (25.8 lbf ft)	Loctite® 2701™
Nut, rim lock	M8	12 Nm (8.9 lbf ft)	–
Remaining nuts, chassis	M8	25 Nm (18.4 lbf ft)	–
Remaining screws, chassis	M8	25 Nm (18.4 lbf ft)	–
Screw, bottom triple clamp (All EXC-F Six Days)	M8	15 Nm (11.1 lbf ft)	–
Screw, bottom triple clamp (EXC-F EU/AU/US)	M8	15 Nm (11.1 lbf ft)	–
Screw, chain sliding piece	M8	15 Nm (11.1 lbf ft)	–
Screw, engine brace	M8	25 Nm (18.4 lbf ft)	Loctite® 2701™
Screw, engine sprocket cover	M8	20 Nm (14.8 lbf ft)	–
Screw, fork stub	M8	15 Nm (11.1 lbf ft)	–
Screw, front brake caliper	M8	25 Nm (18.4 lbf ft)	Loctite® 243™
Screw, handlebar clamp	M8	20 Nm (14.8 lbf ft)	–
Screw, manifold	M8	15 Nm (11.1 lbf ft)	–
Screw, side stand attachment	M8	35 Nm (25.8 lbf ft)	Loctite® 2701™
Screw, subframe	M8	35 Nm (25.8 lbf ft)	Loctite® 2701™
Screw, top steering stem (All EXC-F Six Days)	M8	17 Nm (12.5 lbf ft)	Loctite® 243™
Screw, top steering stem (EXC-F EU/AU/US)	M8	20 Nm (14.8 lbf ft)	–
Screw, top triple clamp (All EXC-F Six Days)	M8	17 Nm (12.5 lbf ft)	–
Screw, top triple clamp (EXC-F EU/AU/US)	M8	20 Nm (14.8 lbf ft)	–
Engine attachment bolt	M10	60 Nm (44.3 lbf ft)	–
Remaining nuts, chassis	M10	45 Nm (33.2 lbf ft)	–
Remaining screws, chassis	M10	45 Nm (33.2 lbf ft)	–
Screw, handlebar holder	M10	40 Nm (29.5 lbf ft)	Loctite® 243™

Banjo bolt	M10x1	8 Nm (5.9 lbf ft)	–
Nut, fuel pump fixation	M12	15 Nm (11.1 lbf ft)	–
Screw, bottom shock absorber	M12	80 Nm (59 lbf ft)	Loctite® 2701™
Screw, top shock absorber	M12	80 Nm (59 lbf ft)	Loctite® 2701™
Nut, seat fixing	M12x1	20 Nm (14.8 lbf ft)	–
Nut, swingarm pivot	M16x1.5	100 Nm (73.8 lbf ft)	–
Nut, rear wheel spindle	M20x1.5	80 Nm (59 lbf ft)	–
Screw, front wheel spindle	M20x1.5	35 Nm (25.8 lbf ft)	–
Screw, top steering head	M20x1.5	12 Nm (8.9 lbf ft)	–
Screw-in nozzles, cooling system	M20x1.5	12 Nm (8.9 lbf ft)	Loctite® 243™

27.1 Cleaning the motorcycle

Note

Material damage Components become damaged or destroyed if a pressure cleaner is used incorrectly. The high pressure forces water into the electrical components, connectors, throttle cables, and bearings, etc. Pressure which is too high causes malfunctions and destroys components.

- Do not direct the water jet directly on to electrical components, connectors, throttle cables or bearings.
- Maintain a minimum distance between the nozzle of the pressure cleaner and the component.

Minimum clearance 60 cm (23.6 in)

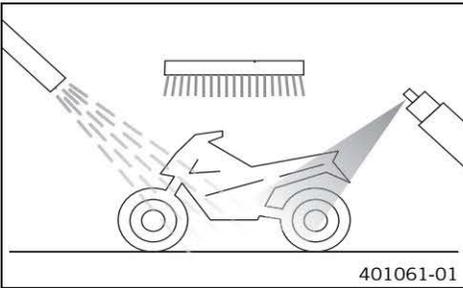
Warning

Environmental hazard Hazardous substances cause environmental damage.

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

Info

To maintain the value and appearance of the motorcycle over a long period, clean it regularly. Avoid direct sunshine when cleaning the motorcycle.



- Close off the exhaust system to keep water from entering.
- Remove coarse dirt particles with a gentle water jet.
- Spray dirty parts with a normal commercial engine cleaner and then brush off with a soft brush.

Motorcycle cleaner (📖 p. 358)

Info

Use warm water containing normal motorcycle cleaner and a soft sponge. Never apply motorcycle cleaner to a dry vehicle; always rinse the vehicle with water first.

- After rinsing the motorcycle with a gentle spray of water, allow it to dry thoroughly.
- Remove the closure of the exhaust system.

Warning

Danger of accidents Moisture and dirt impair the brake system.

- Brake carefully several times to dry out and remove dirt from the brake linings and the brake discs.

- After cleaning, ride the vehicle a short distance until the engine warms up.

Info

The heat produced causes water at inaccessible locations in the engine and on the brake system to evaporate.

- After the motorcycle has cooled off, lubricate all moving parts and bearings.
- Clean the chain. (📖 p. 129)
- Treat bare metal (except for brake discs and the exhaust system) with a corrosion inhibitor.

Preserving materials for paints, metal and rubber (📖 p. 359)

- Treat all plastic parts and powder-coated parts with a mild cleaning and care product.

Special cleaner for glossy and matte paint finishes, metal and plastic surfaces (📖 p. 359)

- Grease steering lock.

Universal oil spray (📖 p. 359)

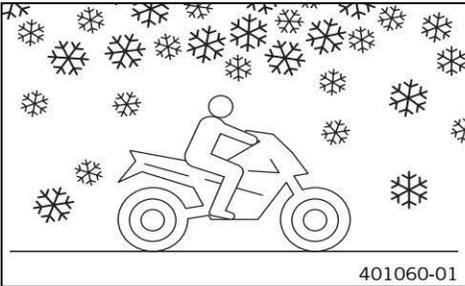
(All US models)

- Grease the ignition switch.

Universal oil spray (📖 p. 359)

27.2 Checks and maintenance steps for winter operation

i Info
 If you use the vehicle in winter, you must expect salt on the roads. You should therefore take precautions against aggressive road salt.
 If the vehicle was operated in road salt, clean it with cold water after riding. Warm water would enhance the corrosive effects of salt.



- Clean the motorcycle. (📖 p. 270)
- Clean the brake system.

i Info
 After **EVERY** trip on salted roads, thoroughly wash the brake calipers and brake linings, in the cooled down and installed state, with cold water and dry carefully.
 After riding on salted roads, thoroughly wash the vehicle with cold water and dry it well.

- Treat the engine, swingarm, and all other bright and zinc-plated parts (except for the brake discs) with a wax-based corrosion inhibitor.

i Info
 Corrosion inhibitor is not permitted to come in contact with the brake discs as this would greatly reduce the braking force.

- Clean the chain. (📖 p. 129)

28.1 Storage



Warning

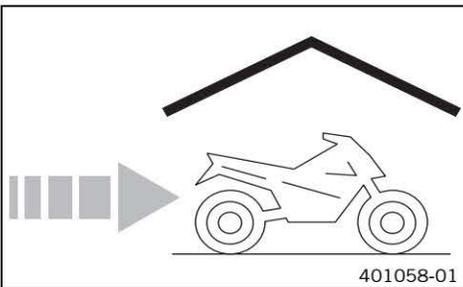
Danger of poisoning Fuel is poisonous and a health hazard.

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



Info

If you want to garage the motorcycle for a longer period, take the following steps. Before storing the motorcycle, check all parts for function and wear. If service, repairs or replacements are necessary, you should do this during the storage period (less workshop overload). In this way, you can avoid long workshop waiting times at the start of the new season.



- When refueling for the last time before taking the motorcycle out of service, add fuel additive.

Fuel additive (📖 p. 358)

- Refuel.
- Clean the motorcycle. (📖 p. 270)
- Change the engine oil and oil filter and clean the oil screens. (📖 p. 248)
- Check the antifreeze and coolant level. (📖 p. 244)
- Check the tire air pressure. (📖 p. 117)
- Remove the battery. (📖 p. 136)
- Recharge the battery.

Guideline

Storage temperature of battery without direct sunlight	0... 35 °C (32... 95 °F)
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- Store the vehicle in a dry location that is not subject to large fluctuations in temperature.



Info

KTM recommends raising the motorcycle.

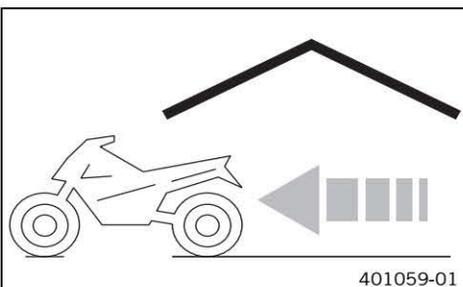
- Raise the motorcycle with the lift stand. (📖 p. 11)
- Preferably cover the vehicle with a tarp or similar cover that is permeable to air. Do not use non-porous materials since they prevent humidity from escaping, thus causing corrosion.



Info

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 exhaust system to rust.

28.2 Preparing for use after storage



- Remove the motorcycle from the lift stand. (📖 p. 11)
- Install the battery. (📖 p. 136)
- Perform checks and maintenance measures when preparing for use.
- Take a test ride.

29.1 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.

29.2 Required work

	Every 45 operating hours	Every 30 operating hours/after every race	Every 15 operating hours	Once after 1 operating hour
Read out the fault memory using the KTM diagnostics tool.	○	●	●	●
Check that the electrical system is functioning properly.	○	●	●	●
Check and charge the battery.		●	●	●
Check the front brake linings. (📖 p. 139)		●	●	●
Check the rear brake linings. (📖 p. 144)		●	●	●
Check the brake discs. (📖 p. 118)		●	●	●
Check the brake lines for damage and leakage.		●	●	●
Check the rear brake fluid level. (📖 p. 147)		●	●	●
Check the free travel of the foot brake lever. (📖 p. 146)		●	●	●
Check the frame and swingarm.		●	●	●
Check the swingarm bearing for backlash. (📖 p. 88)			●	
Check the heim joints at the top and bottom of the shock absorber.		●	●	●
Check the tire condition. (📖 p. 117)	○	●	●	●
Check the tire air pressure. (📖 p. 117)	○	●	●	●
Check the wheel bearing for play. (📖 p. 118)		●	●	●
Check the wheel hubs.		●	●	●
Check the rim run-out. (📖 p. 119)	○	●	●	●
Check the spoke tension. (📖 p. 119)	○	●	●	●
Check the chain, rear sprocket, motor sprocket, and chain guide. (📖 p. 128)		●	●	●
Check the chain tension. (📖 p. 126)	○	●	●	●
Grease all moving parts (e.g. side stand, hand lever, chain, ...) and check for smooth operation.		●	●	●
Check/correct the fluid level of the hydraulic clutch. (📖 p. 234)		●	●	●
Check the brake fluid level of the front brake. (📖 p. 141)		●	●	●
Check the free travel of the hand brake lever. (📖 p. 141)		●	●	●
Check the play of the steering head bearing. (📖 p. 54)	○	●	●	●
Check the valve clearance. (📖 p. 255)	○		●	
Check the clutch. (📖 p. 235)			●	
Change the engine oil and oil filter and clean the oil screens. (📖 p. 248)	○	●	●	●
Check all hoses (e.g. fuel, cooling, bleeder, drainage, etc.) and sleeves for cracking, leaks, and incorrect routing.	○	●	●	●
Check the antifreeze and coolant level. (📖 p. 244)	○	●	●	●
Check the cables for damage and routing without sharp bends.		●	●	●
Check that the throttle cables are undamaged, routed without sharp bends, and set correctly.	○	●	●	●
Clean the air filter and air filter box. (📖 p. 99)		●	●	●
Change glass fiber yarn filling in the main silencer. (📖 p. 95)			●	
Check the screws and nuts for tightness.	○	●	●	●
Check the headlight setting. (📖 p. 151)	○	●	●	●
Change the fuel screen. (📖 p. 105)	○	●	●	●
Check the fuel pressure. (📖 p. 111)		●	●	●
Check idle.	○	●	●	●

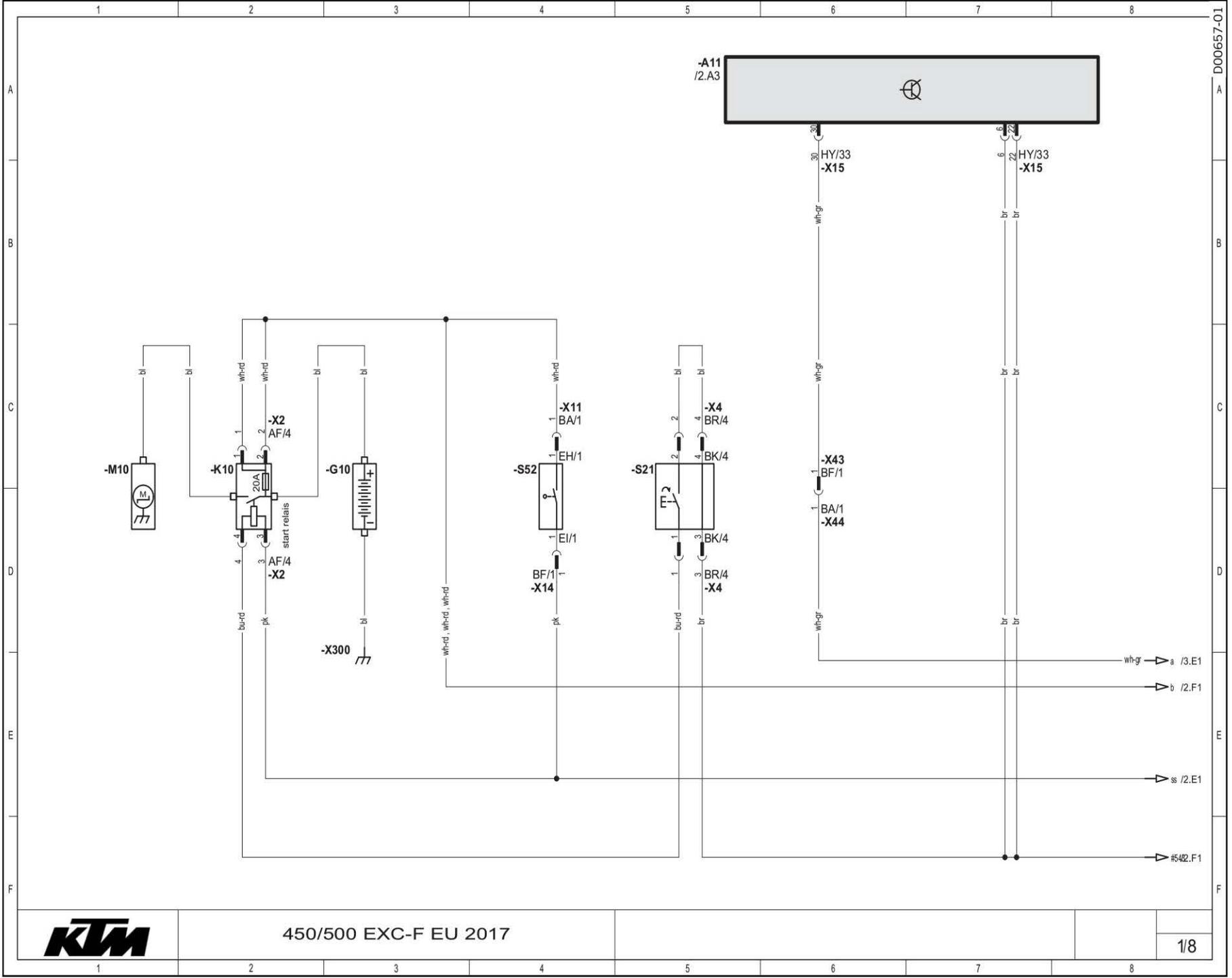
	Every 45 operating hours	Every 30 operating hours/after every race	Every 15 operating hours	Once after 1 operating hour
Check that the radiator fan is functioning properly.	○	●	●	●
Check the inlet membrane. (All US models) (🔧 p. 100)				●
Final check: Check the vehicle is roadworthy and take a test ride.	○	●	●	●
Read out the error memory after the test ride using the KTM diagnostics tool.	○	●	●	●
Make the service entry in the KTM Dealer.net and in the Service and Warranty Booklet.	○	●	●	●

- One-time interval
- Periodic interval

29.3 Recommended work

	Annually	Every 135 operating hours	Every 70 operating hours when used for motorsports	Every 45 operating hours/every 10 operating hours when used for motorsports	Once after 10 operating hours
Change the front brake fluid. (🔧 p. 143)					●
Change the rear brake fluid. (🔧 p. 149)					●
Change the hydraulic clutch fluid. (🔧 p. 234)					●
Lubricate the steering head bearing. (🔧 p. 47)					●
Clean the spark arrestor. (All US models) (🔧 p. 96)					●
Service the fork. (🔧 p. 17)		○	●	●	●
Service the shock absorber. (🔧 p. 69)			●	●	●
Change the fuel filter. (🔧 p. 106)					●
Perform engine service including removing and installing the engine. (Change the spark plug and spark plug connector. Change the piston. Check/measure the cylinder. Check the cylinder head. Change the valves, valve springs, and valve spring seats. Check the camshaft, rocker arm and rocker arm shafts. Change the connecting rod, conrod bearing, and crank pin. Change the shaft seal ring of the water pump. Check the transmission and shift mechanism. Check the oil pressure regulator valve. Change the suction pump. Check the force pump and lubrication system. Check the timing assembly. Change the timing chain. Change all engine bearings. Change the freewheel.)				●	●

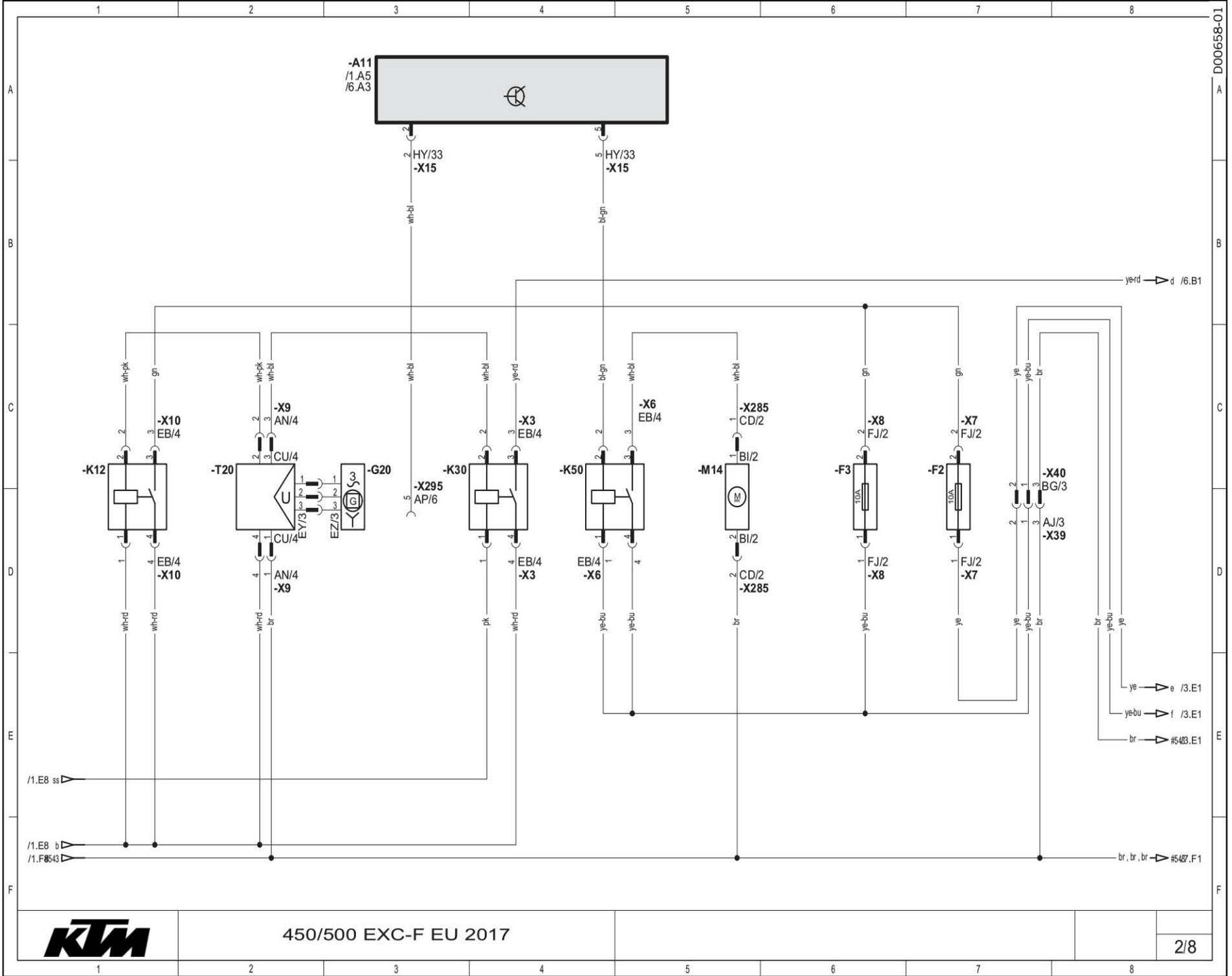
- One-time interval
- Periodic interval



450/500 EXC-F EU 2017

Components:

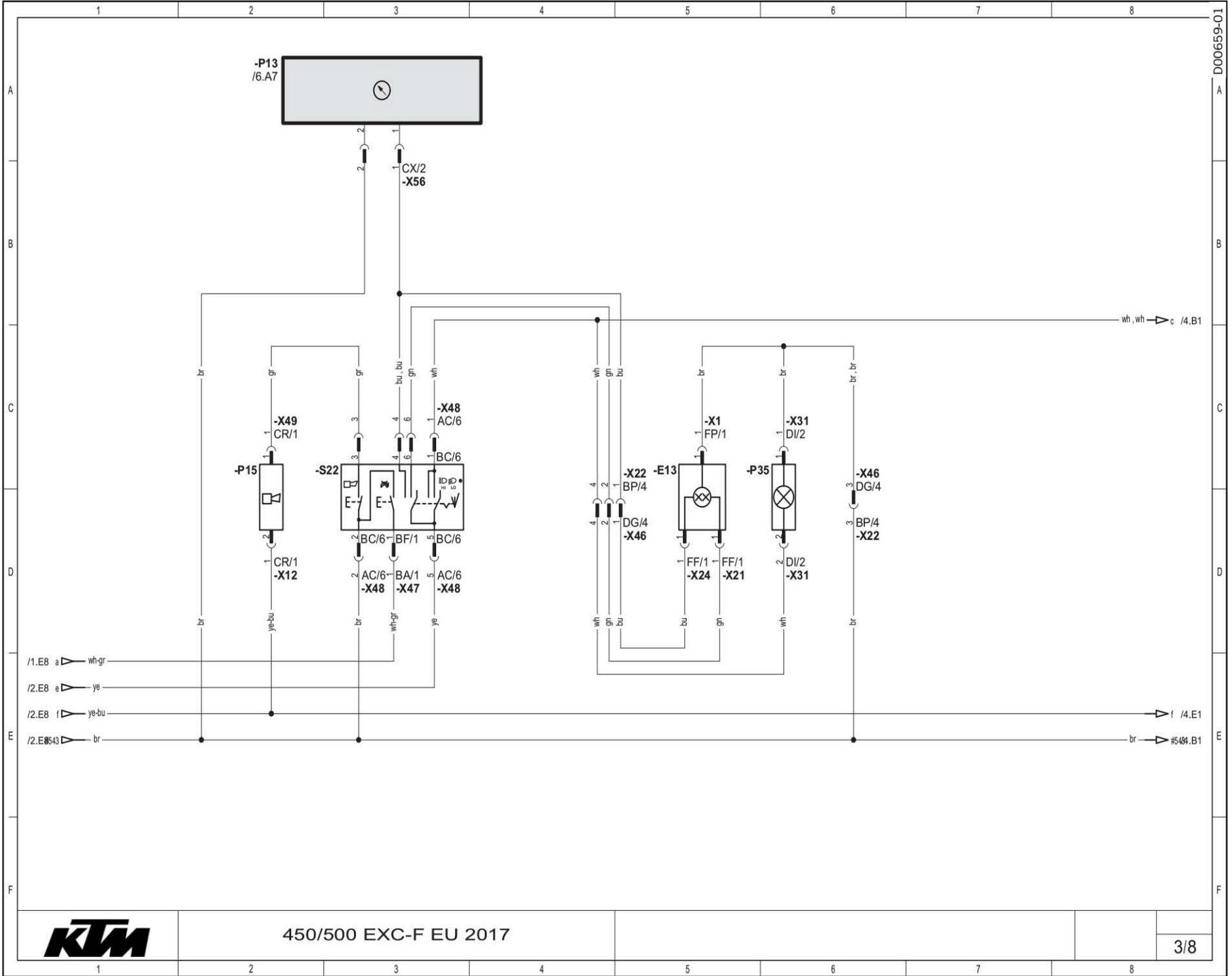
A11	EFI control unit
G10	Battery
K10	Starter relay with main fuse
M10	Starter motor
S21	Electric starter button
S52	Side stand switch



450/500 EXC-F EU 2017

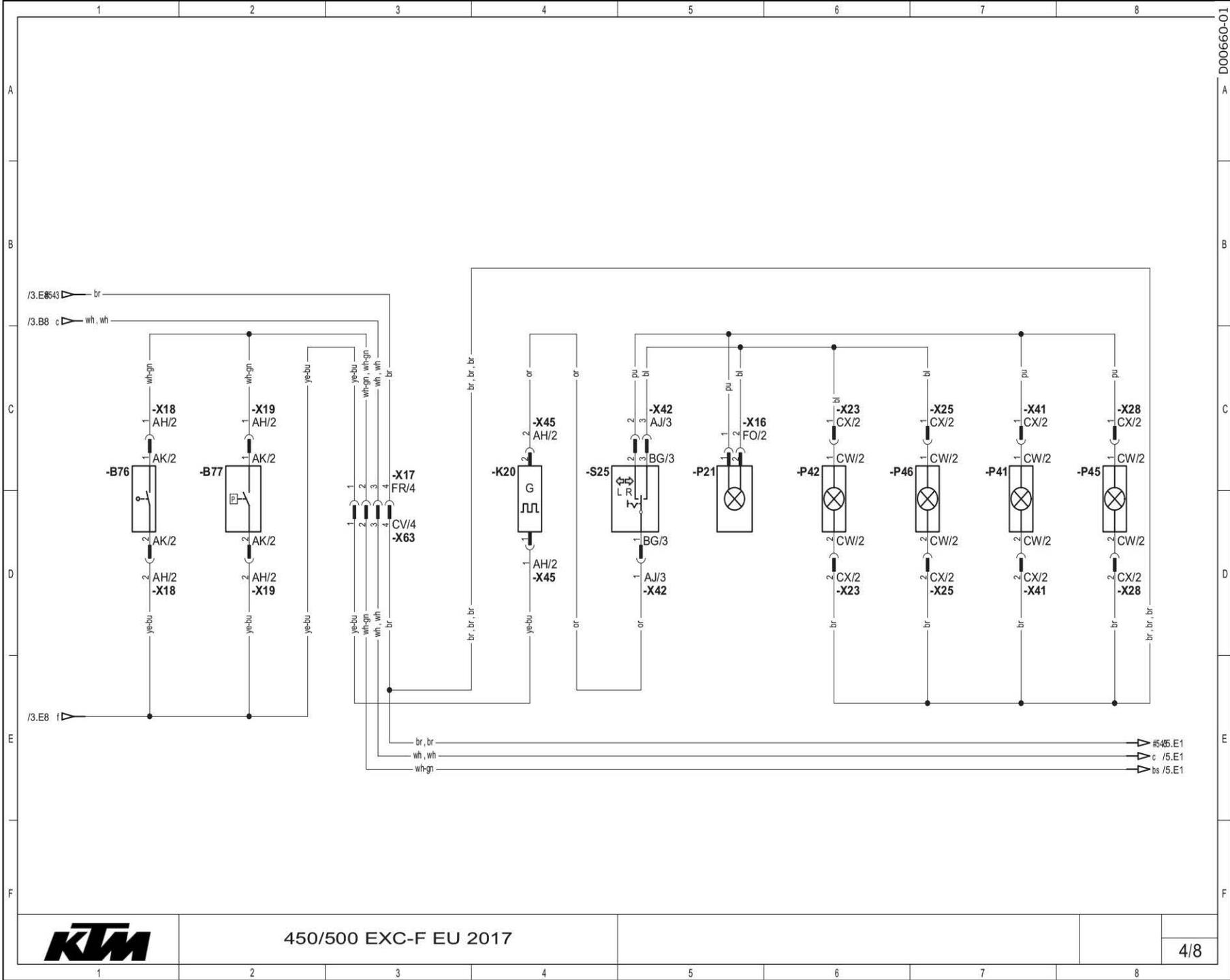
Components:

A11	EFI control unit
F2	Fuse
F3	Fuse
G20	Alternator
K12	Light relay
K30	Power relay
K50	Radiator fan relay
M14	Radiator fan
T20	Voltage regulator
X295	Diagnostics connector



Components:

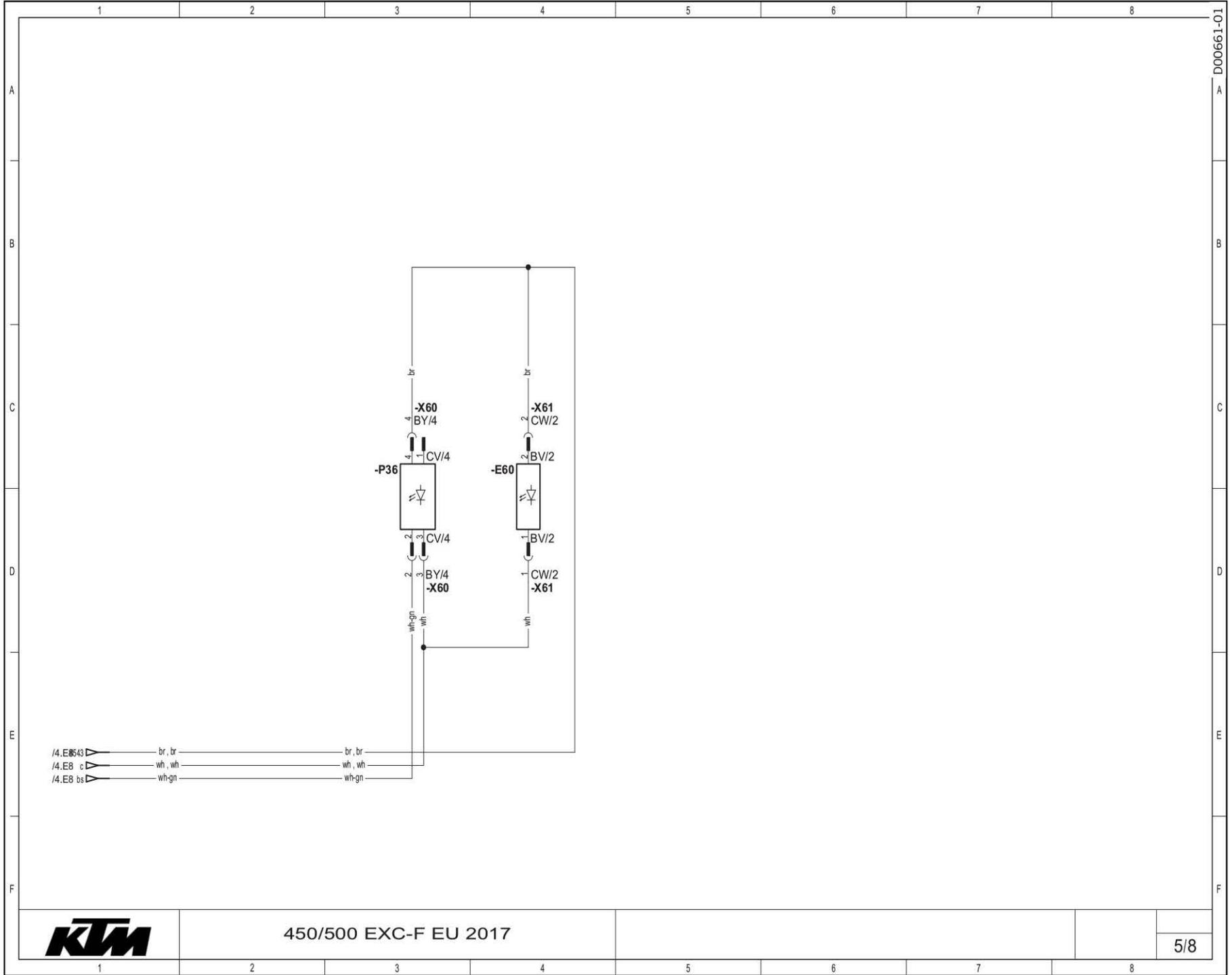
A11	EFI control unit
E13	Low beam, high beam
P15	Horn
P23	High beam indicator lamp
P35	Parking light
S22	Light switch, horn button, kill switch
S23	Emergency OFF switch, electric starter button



450/500 EXC-F EU 2017

Components:

B76	Front brake light switch
B77	Rear brake light switch
K20	Turn signal relay
P21	Turn signal indicator lamp
P41	Front left turn signal
P42	Front right turn signal
P45	Rear left turn signal
P46	Rear right turn signal
S25	Turn signal switch

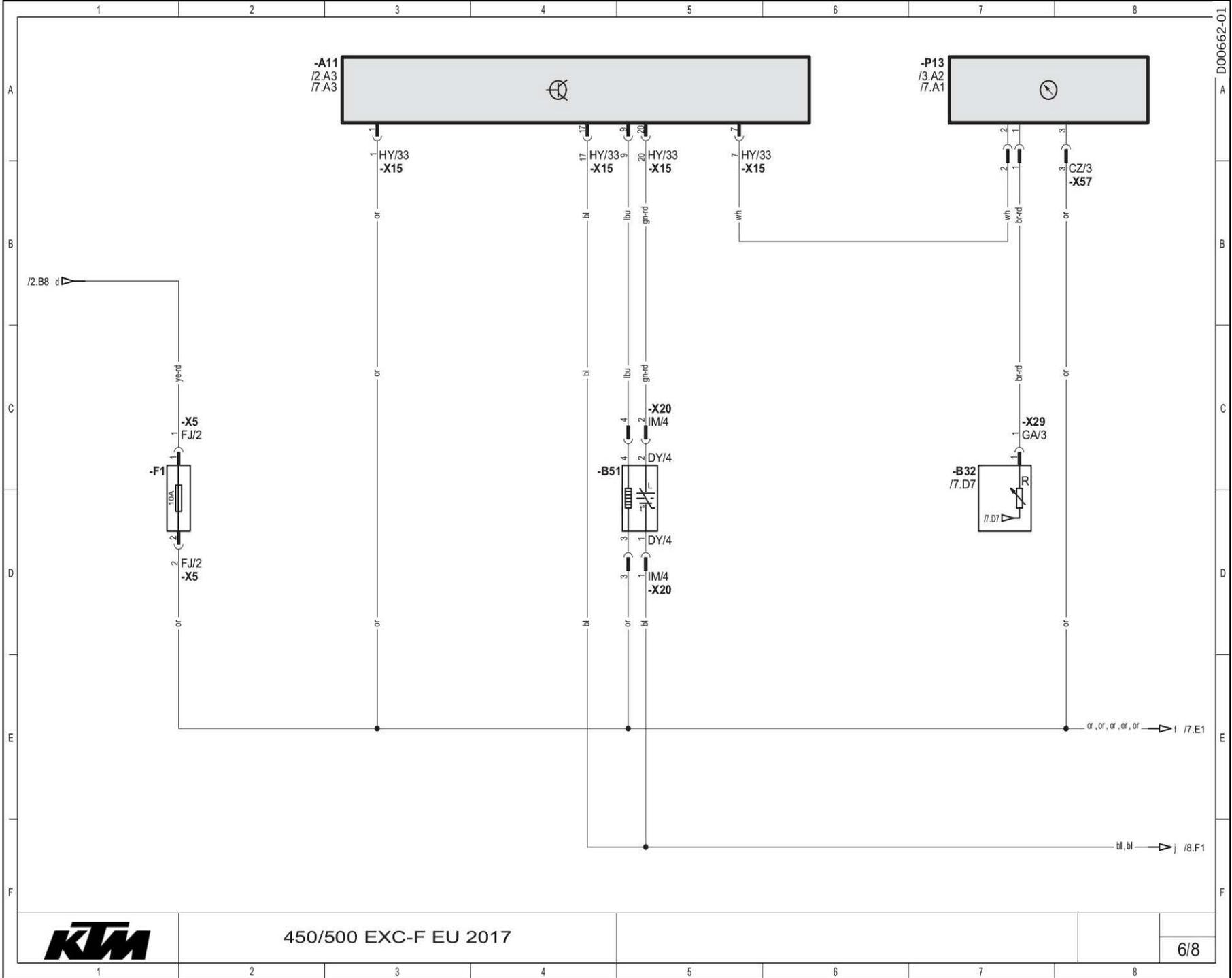


450/500 EXC-F EU 2017

Components:

E60	License plate lamp
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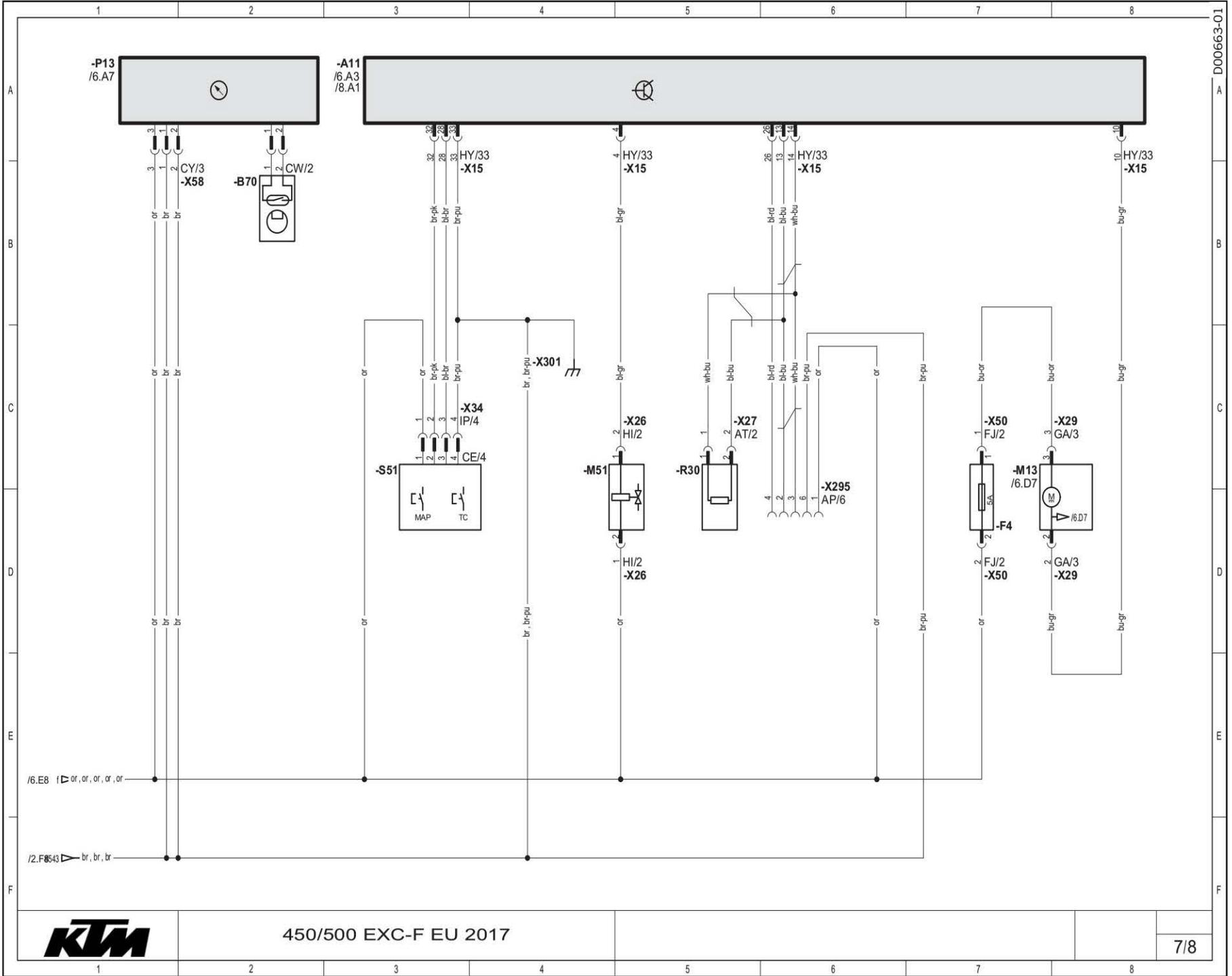
P36	Brake/tail light
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450/500 EXC-F EU 2017

Components:

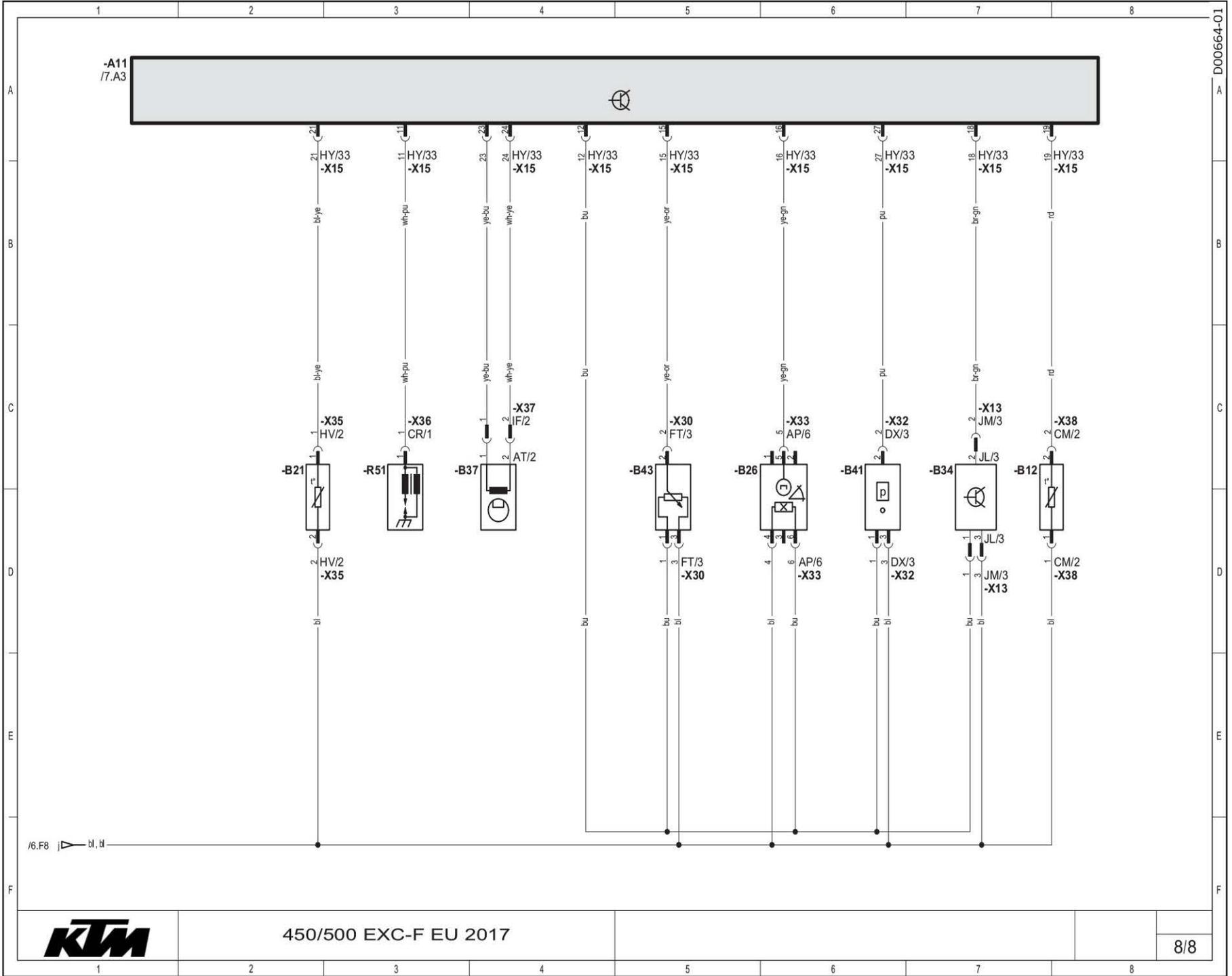
A11	EFI control unit
B32	Fuel tank sensor
B51	Lambda sensor (cylinder 1)
F1	Fuse
P13	Speedometer



450/500 EXC-F EU 2017

Components:

A11	EFI control unit
B70	Front wheel speed sensor
F4	Fuse
M13	Fuel pump
M51	Injection valve (cylinder 1)
P13	Speedometer
R30	CAN-bus terminating resistor 1
S51	Map switch for vehicle operation
X295	Diagnostics connector



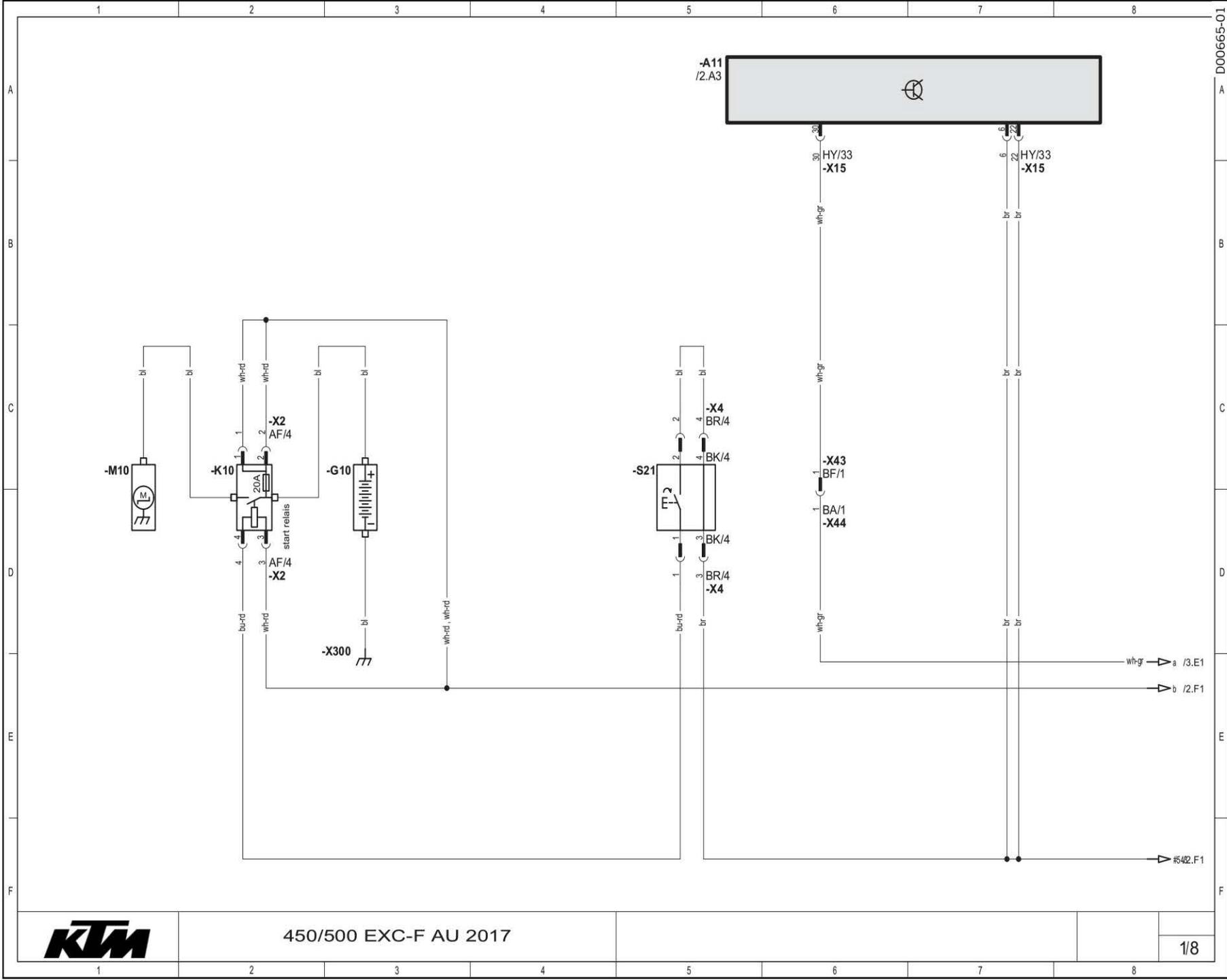
450/500 EXC-F EU 2017

Components:

A11	EFI control unit
B12	Intake air temperature sensor
B21	Coolant temperature sensor (cylinder 1)
B26	Rollover sensor
B34	Gear position sensor
B37	Crankshaft position sensor
B41	Manifold absolute pressure sensor (cylinder 1)
B43	Throttle position sensor
R51	Ignition coil (cylinder 1)

Cable colors:

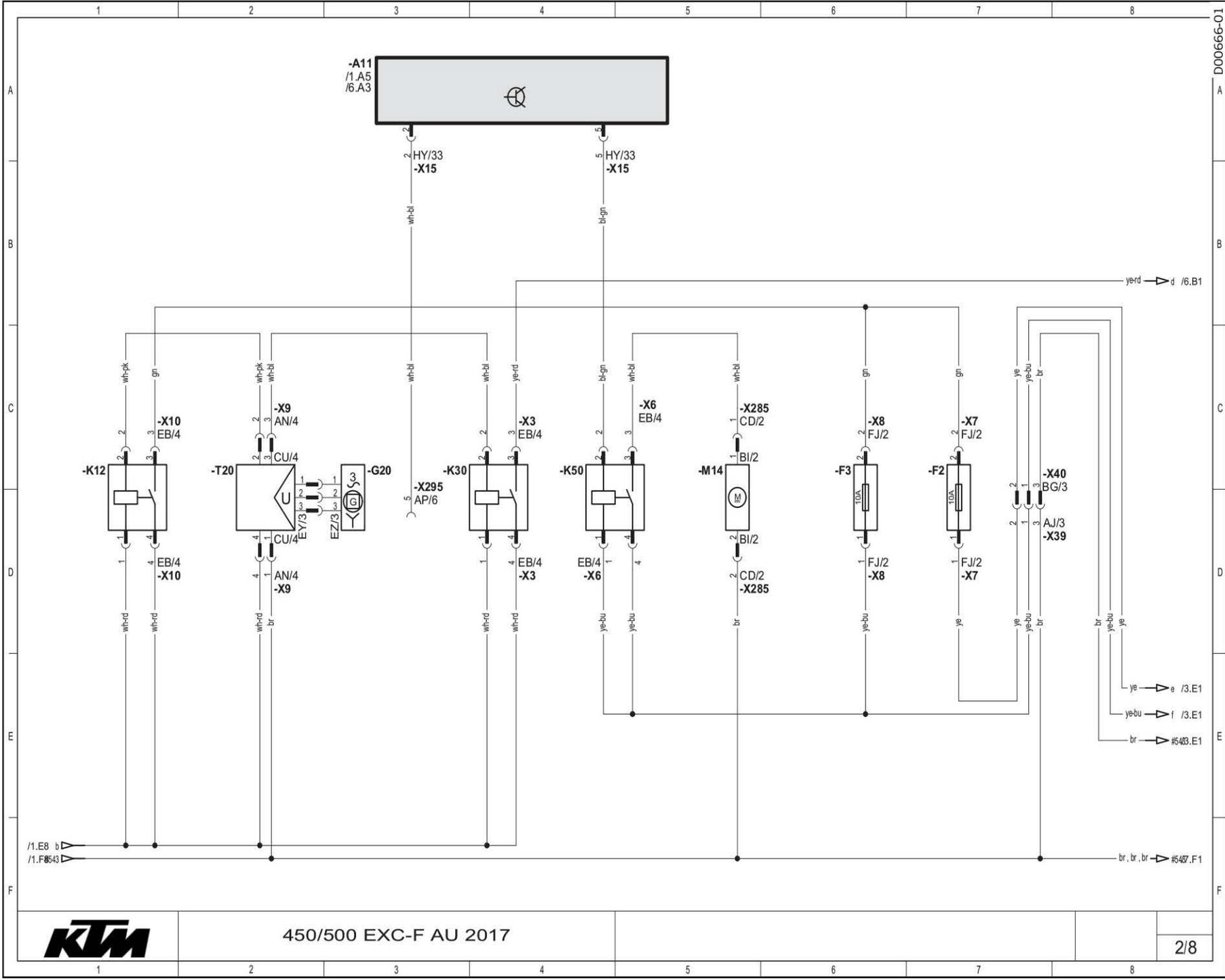
bl	Black
br	Brown
bu	Blue
gn	Green
gr	Gray
lbu	Light blue
or	Orange
pk	Pink
pu	Violet
rd	Red
wh	White
ye	Yellow



450/500 EXC-F AU 2017

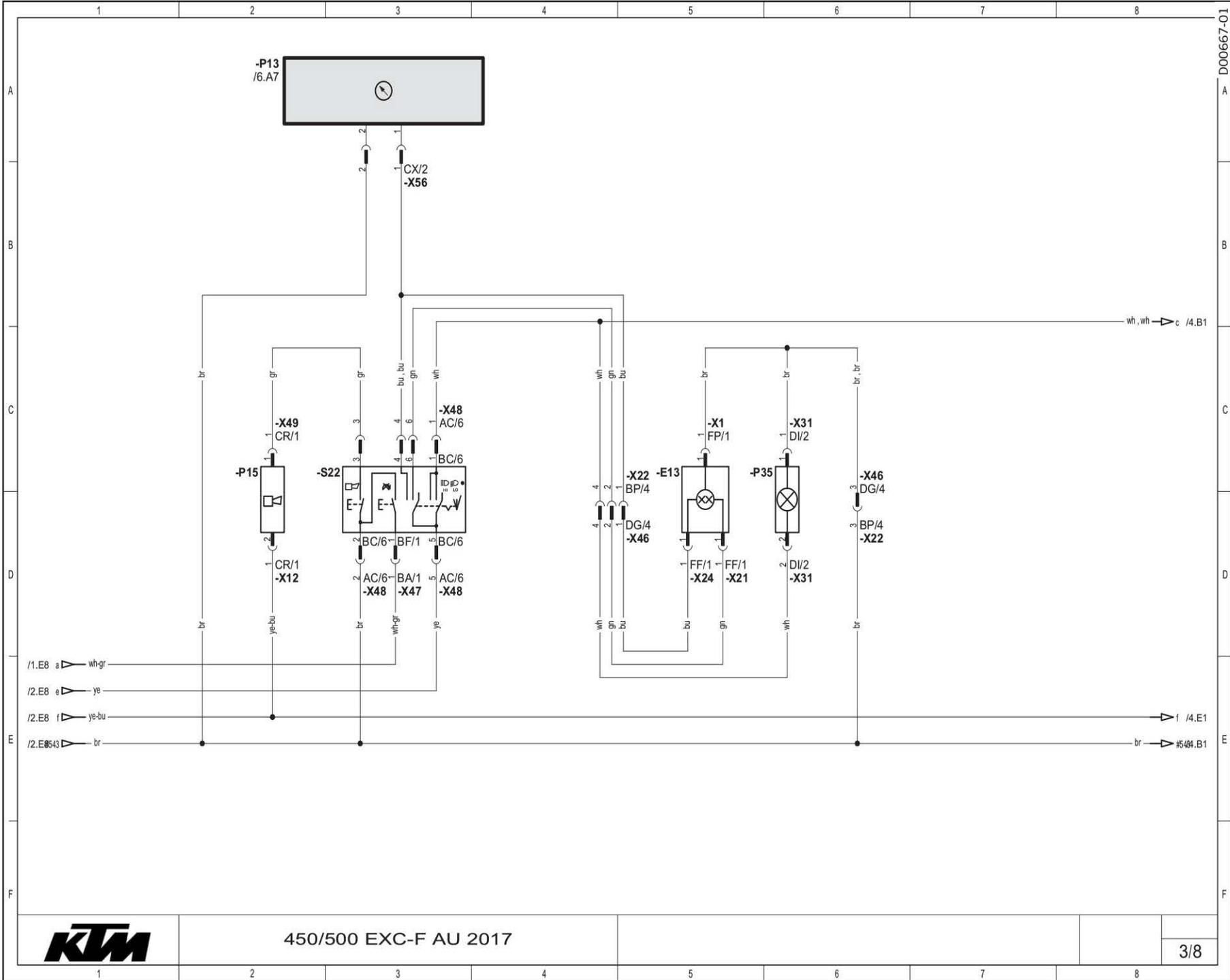
Components:

A11	EFI control unit
G10	Battery
K10	Starter relay with main fuse
M10	Starter motor
S21	Electric starter button



Components:

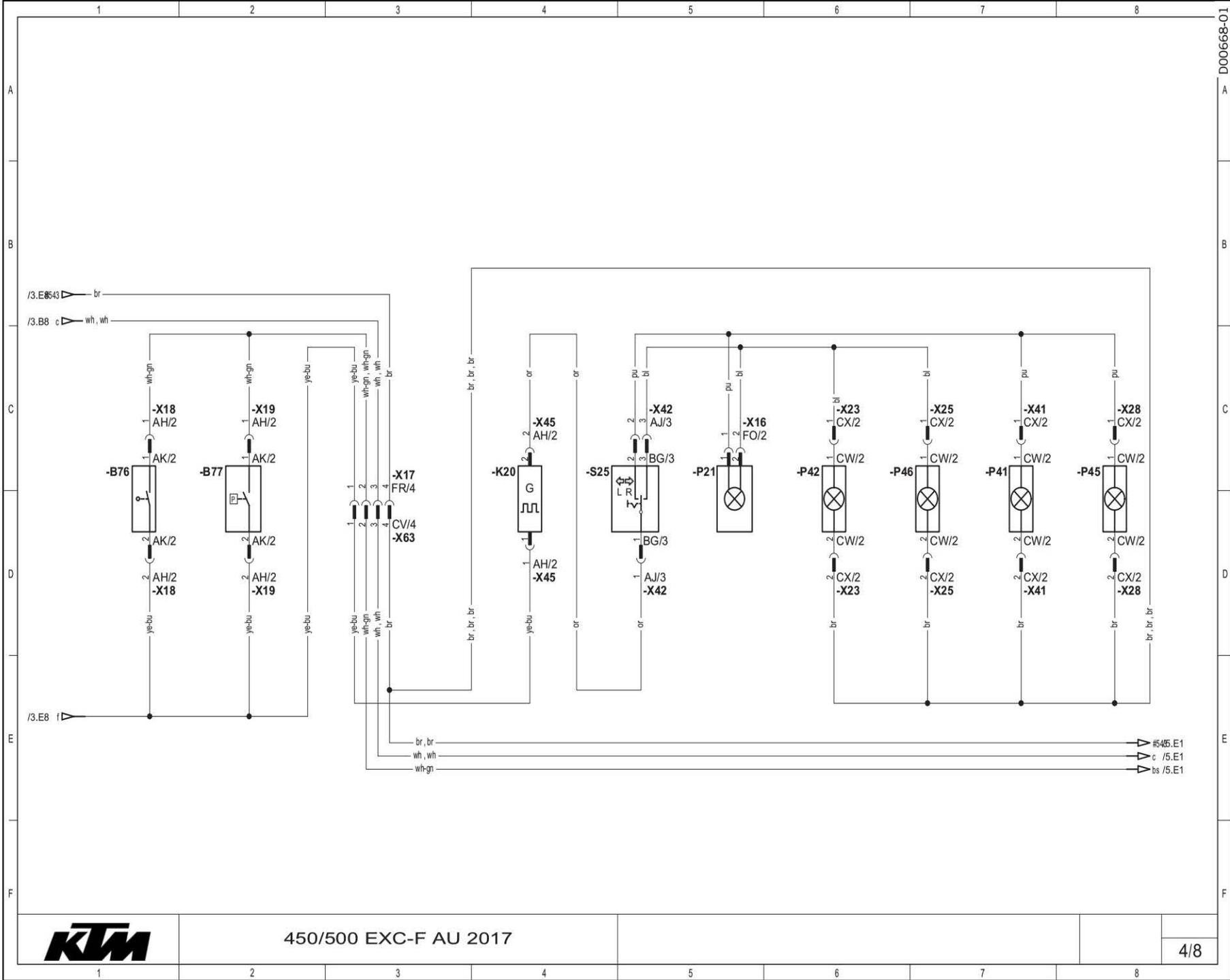
A11	EFI control unit
F2	Fuse
F3	Fuse
G20	Alternator
K12	Light relay
K30	Power relay
K50	Radiator fan relay
M14	Radiator fan
T20	Voltage regulator
X295	Diagnostics connector



450/500 EXC-F AU 2017

Components:

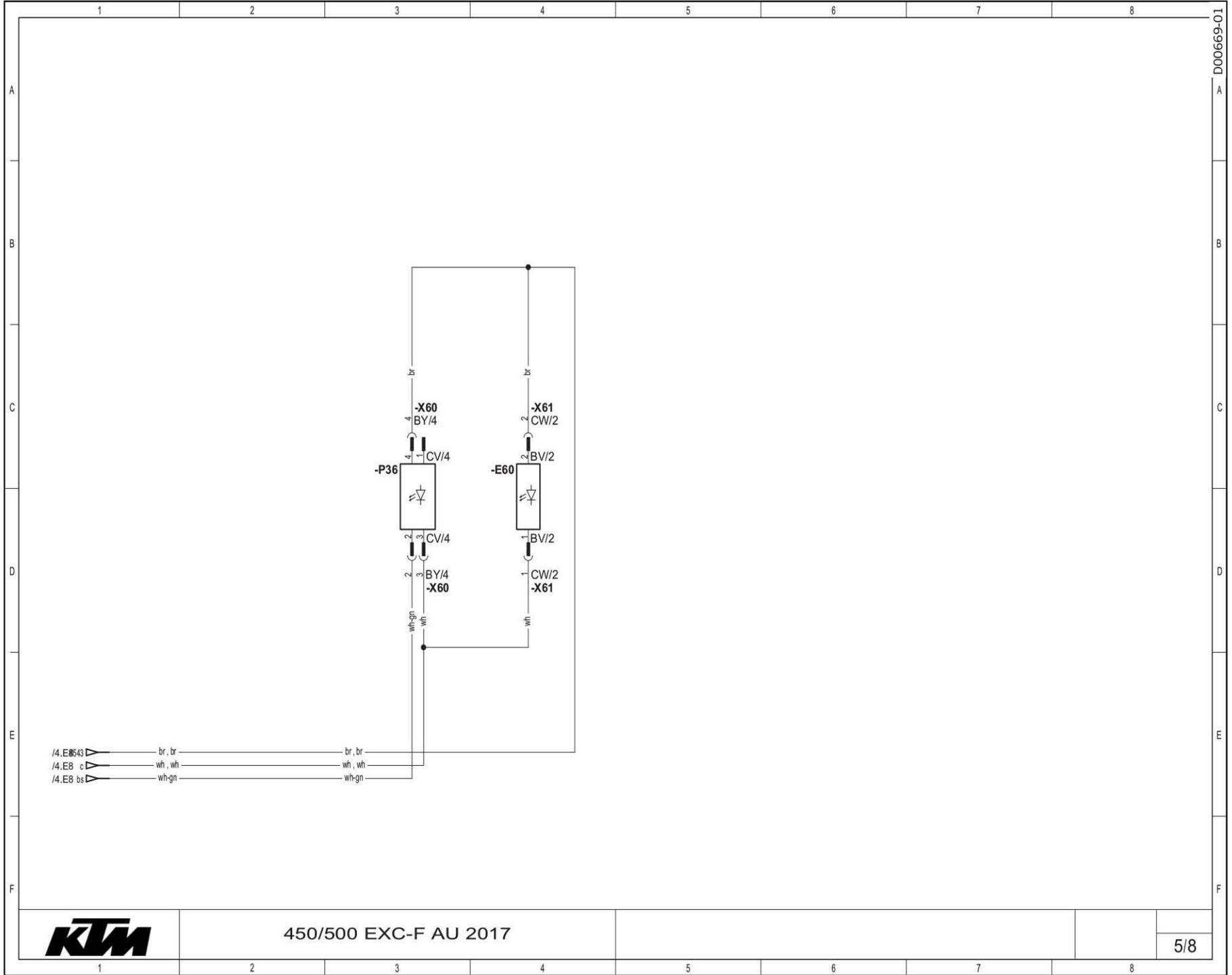
A11	EFI control unit
E13	Low beam, high beam
P15	Horn
P23	High beam indicator lamp
P35	Parking light
S22	Light switch, horn button, kill switch
S23	Emergency OFF switch, electric starter button



450/500 EXC-F AU 2017

Components:

B76	Front brake light switch
B77	Rear brake light switch
K20	Turn signal relay
P21	Turn signal indicator lamp
P41	Left front flasher
P42	Front right turn signal
P45	Rear left turn signal
P46	Rear right turn signal
S25	Turn signal switch

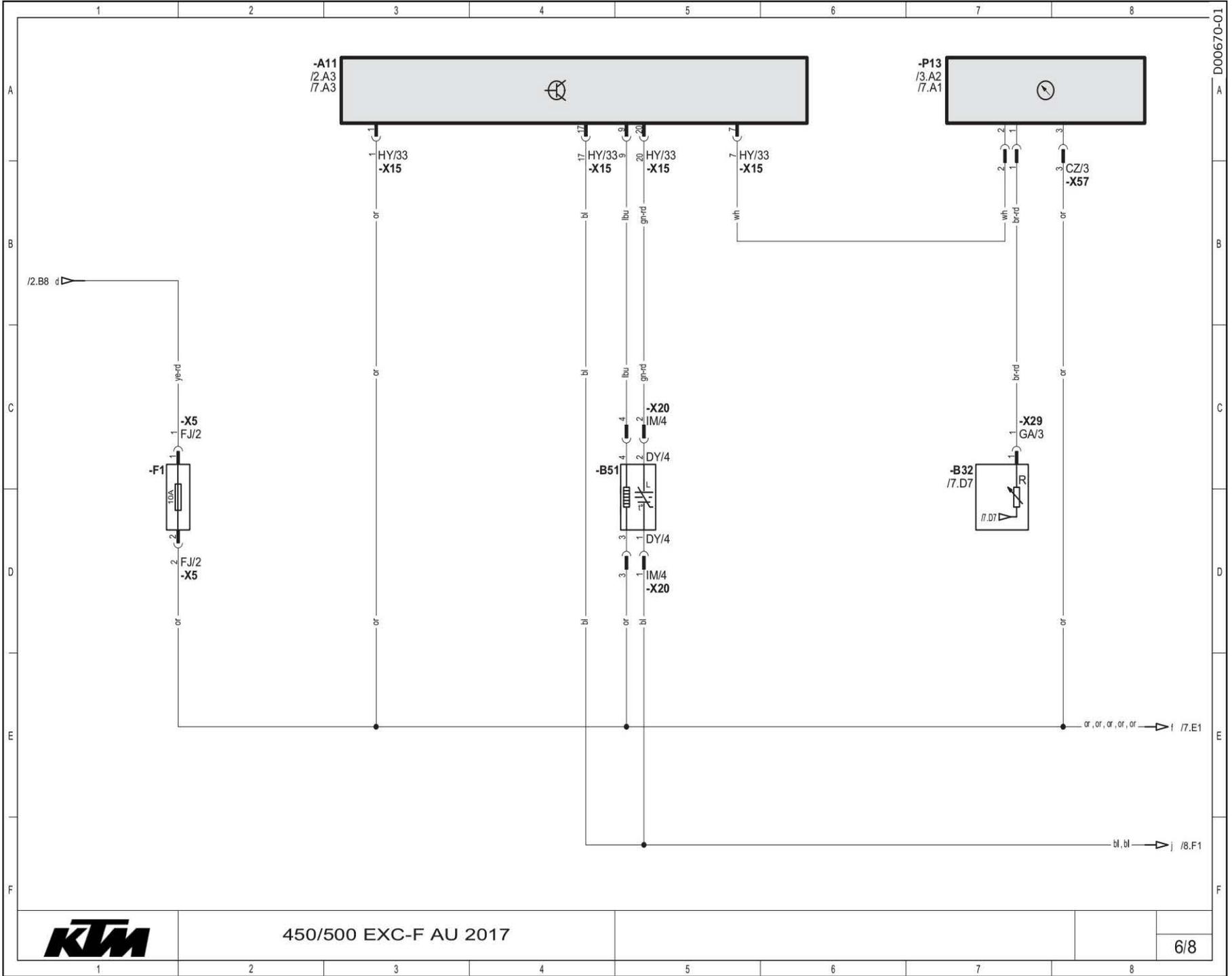


450/500 EXC-F AU 2017

Components:

E60	License plate lamp
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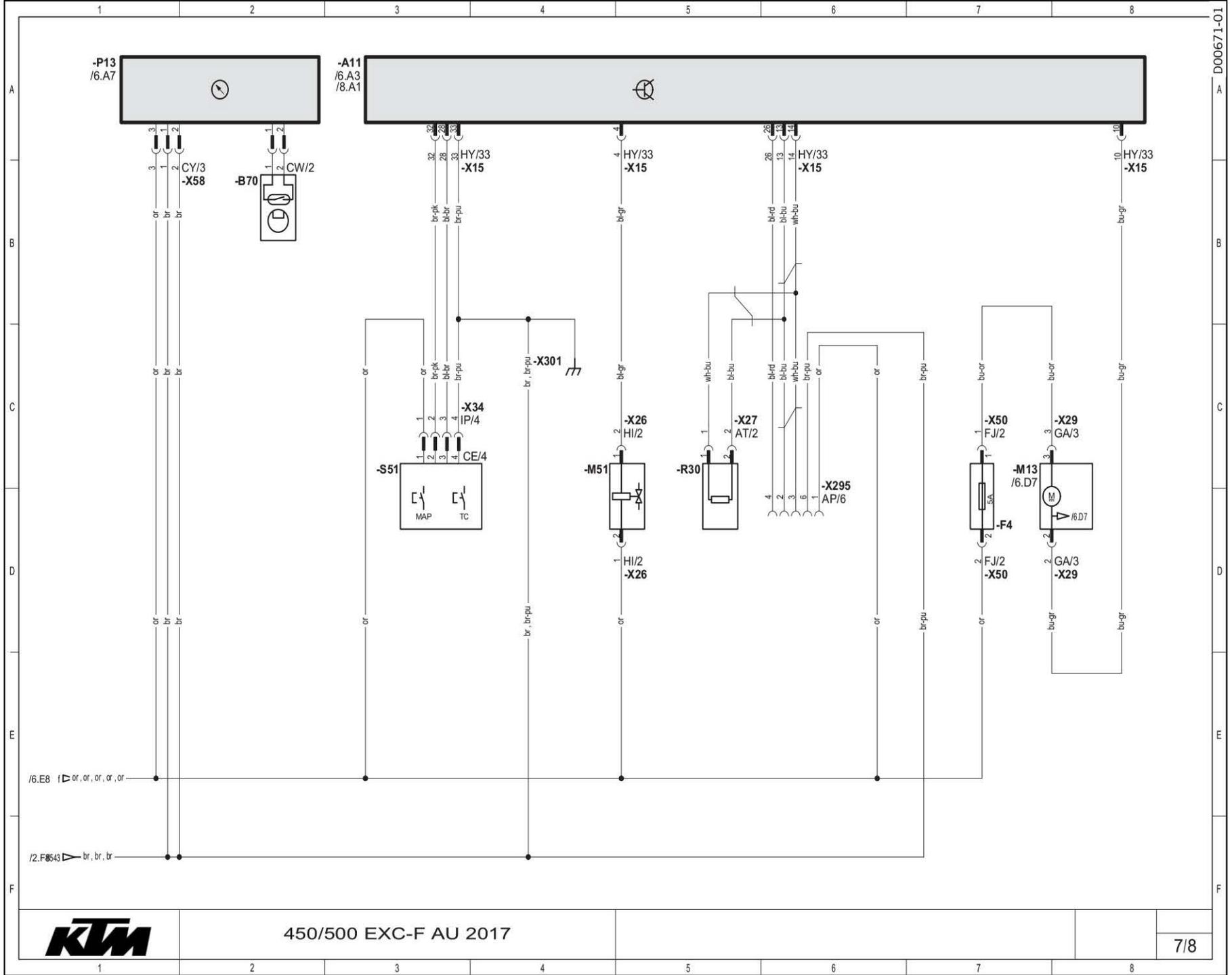
P36	Brake/tail light
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450/500 EXC-F AU 2017

Components:

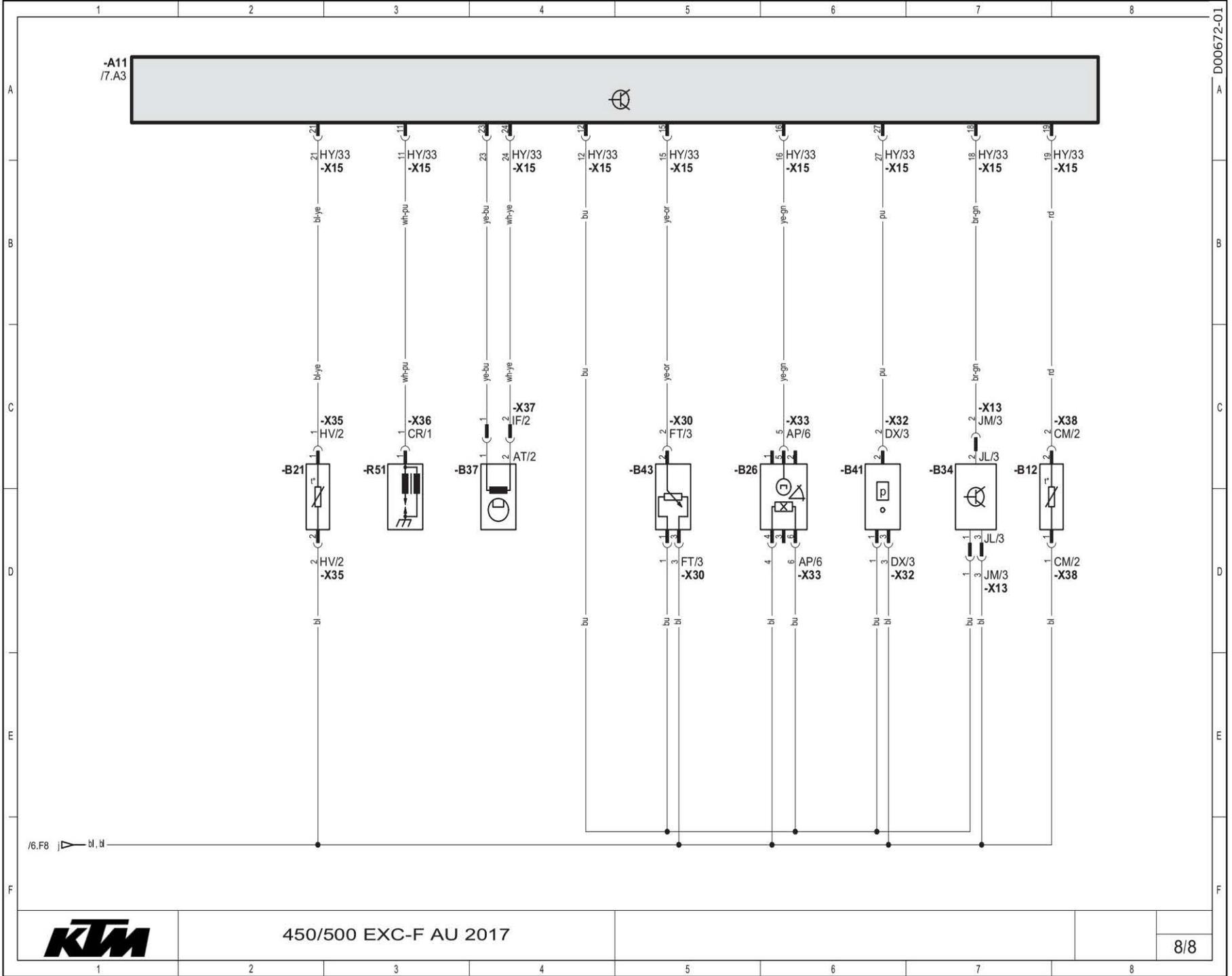
A11	EFI control unit
B32	Fuel level sensor
B51	Lambda sensor (cylinder 1)
F1	Fuse
P13	Speedometer



450/500 EXC-F AU 2017

Components:

A11	EFI control unit
B70	Front wheel speed sensor
F4	Fuse
M13	Fuel pump
M51	Injection valve (cylinder 1)
P13	Speedometer
R30	CAN-bus terminating resistor 1
S51	Map switch for vehicle operation
X295	Diagnostics connector



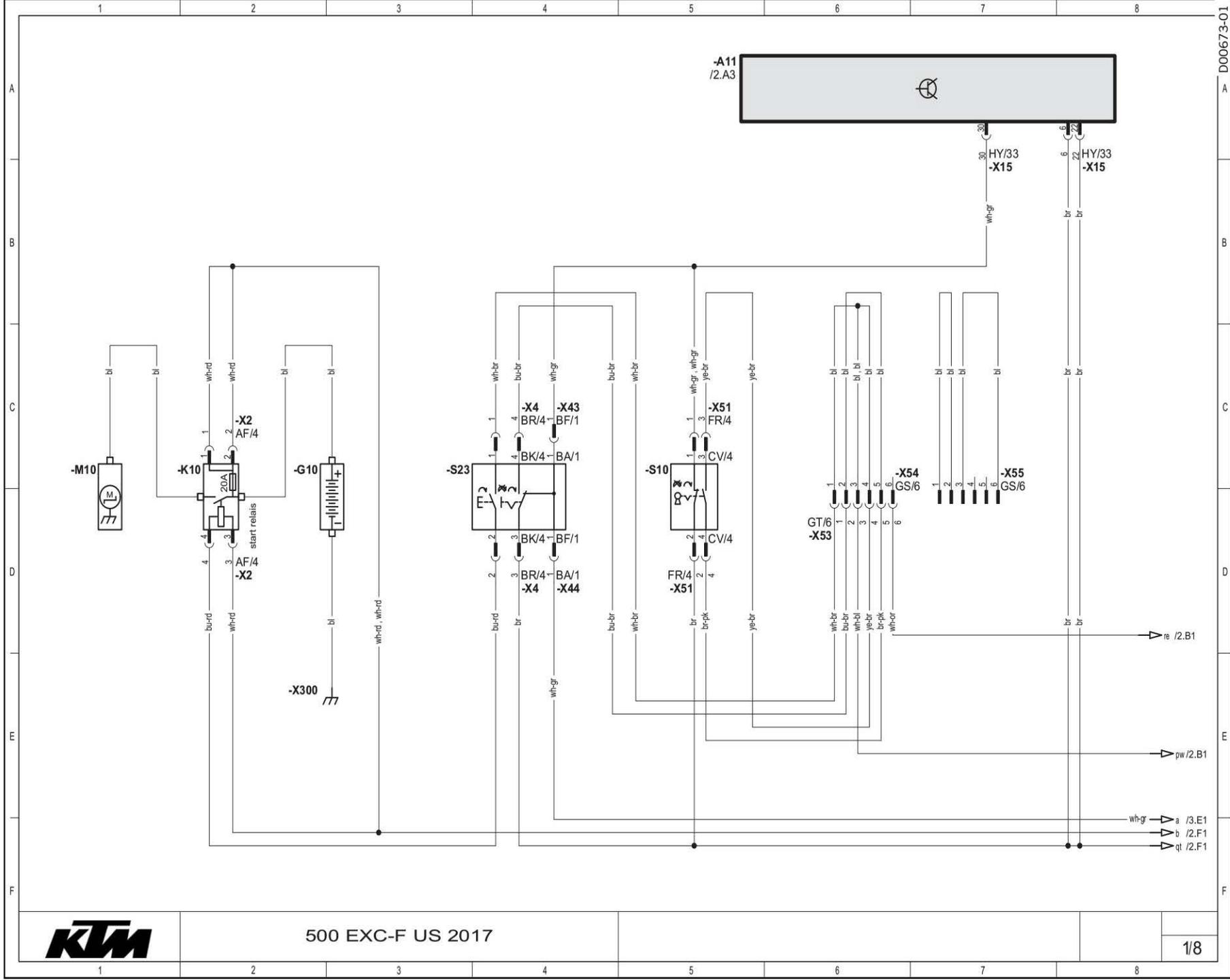
450/500 EXC-F AU 2017

Components:

A11	EFI control unit
B12	Intake air temperature sensor
B21	Coolant temperature sensor (cylinder 1)
B26	Rollover sensor
B34	Gear position sensor
B37	Crankshaft position sensor
B41	Manifold absolute pressure sensor (cylinder 1)
B43	Throttle position sensor
R51	Ignition coil (cylinder 1)

Cable colors:

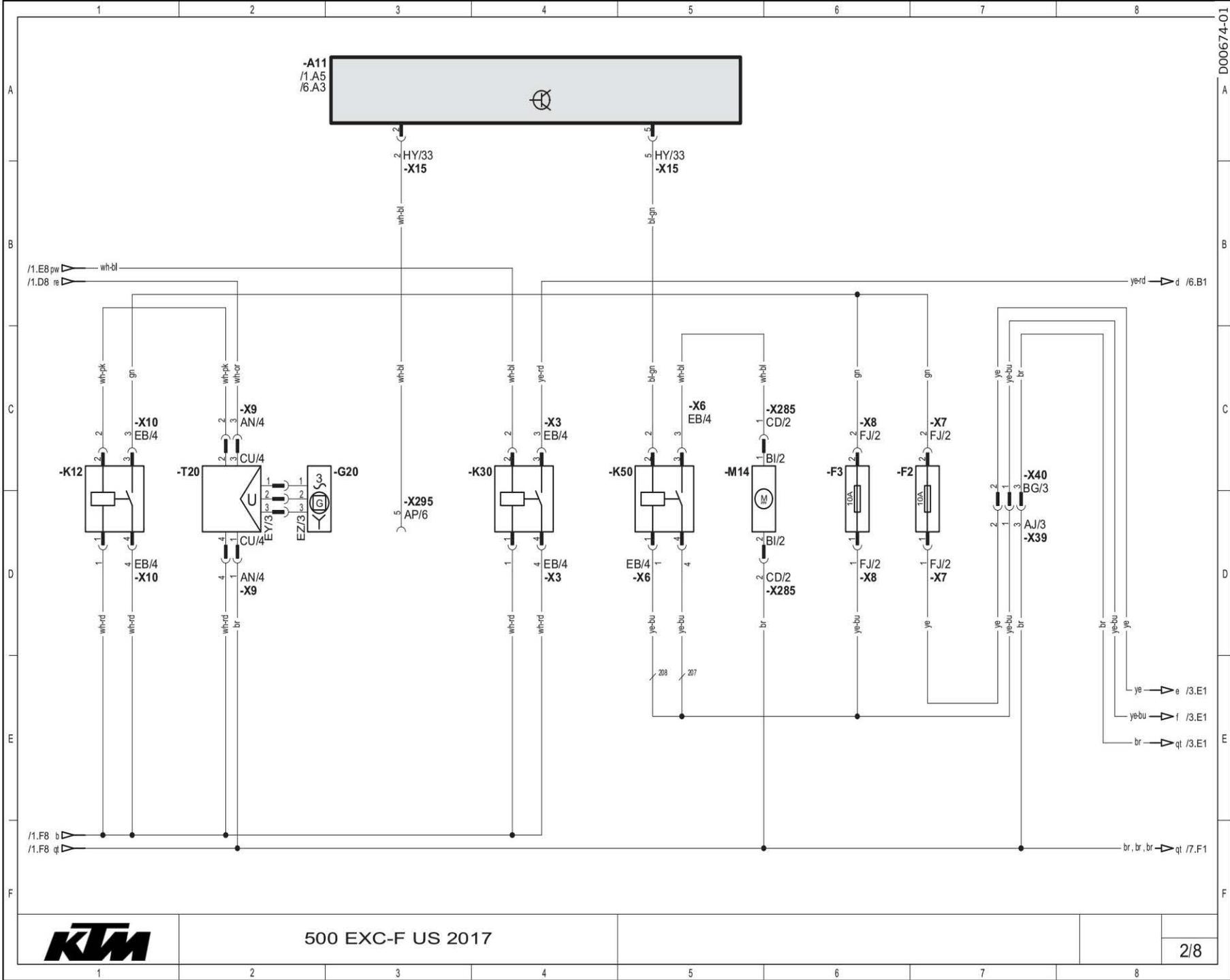
bl	Black
br	Brown
bu	Blue
gn	Green
gr	Gray
lbu	Light blue
or	Orange
pk	Pink
pu	Violet
rd	Red
wh	White
ye	Yellow



500 EXC-F US 2017

Components:

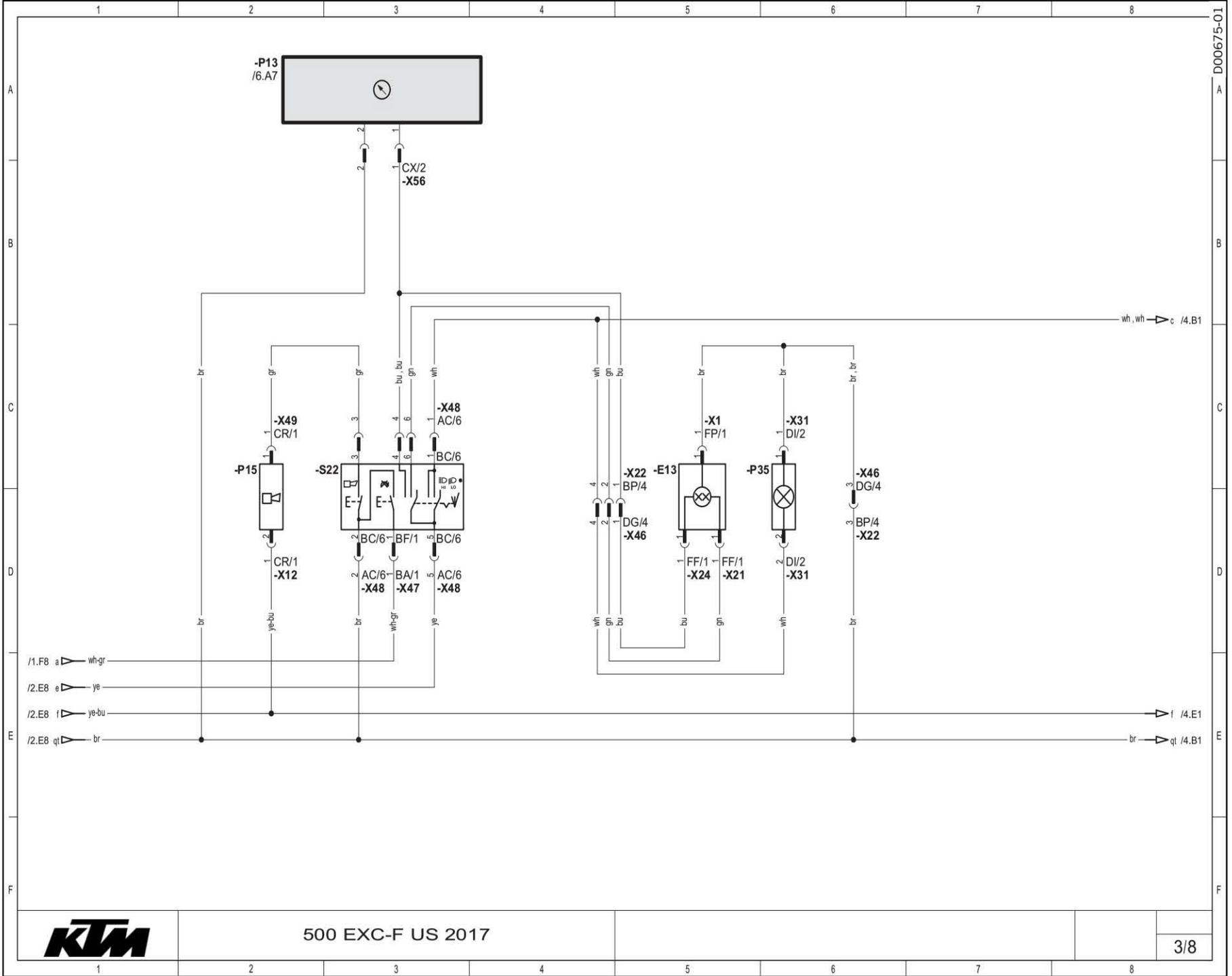
A11	EFI control unit
G10	Battery
K10	Starter relay with main fuse
M10	Starter motor
S10	Ignition lock
S23	Emergency OFF switch, tip switch



500 EXC-F US 2017

Components:

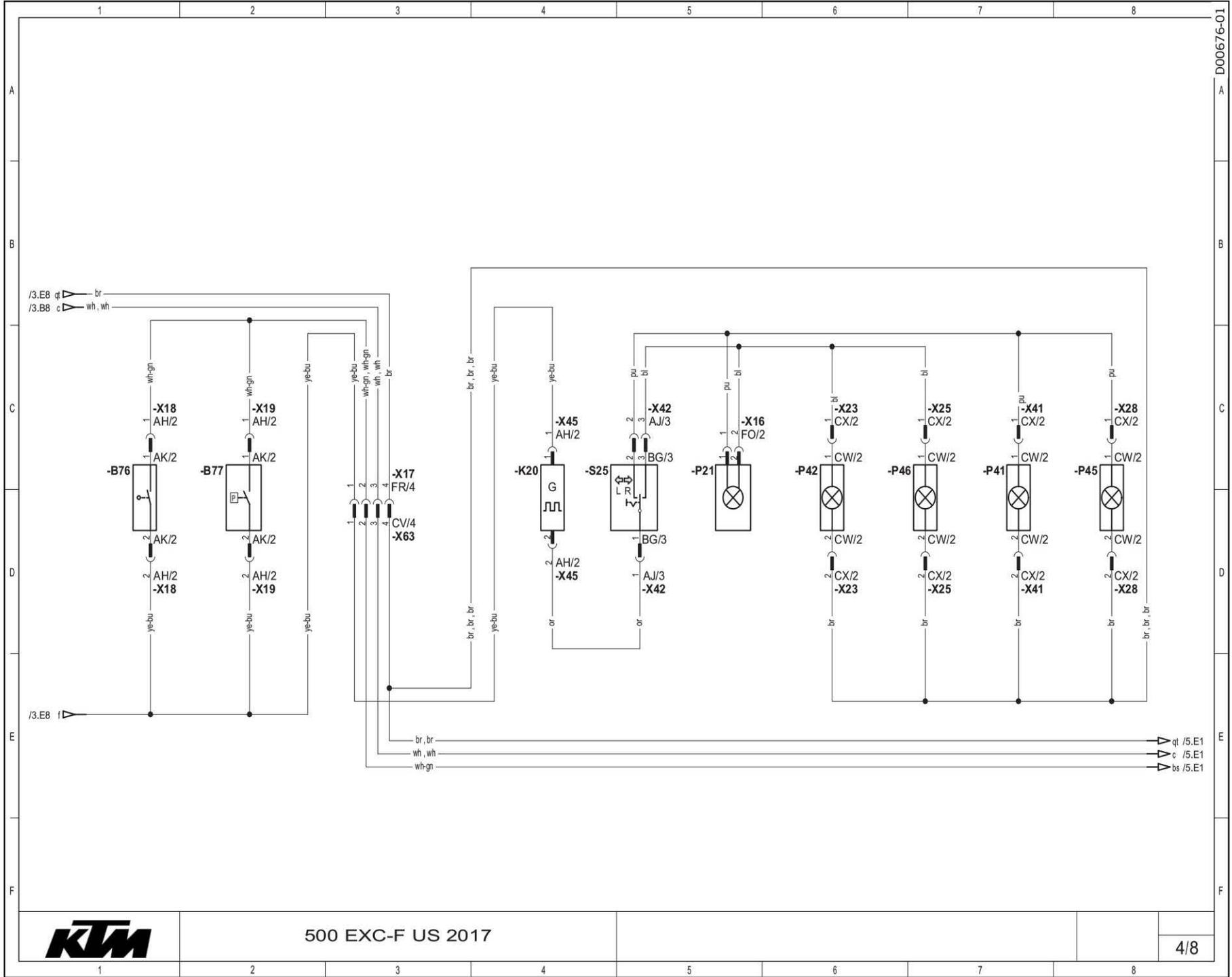
A11	EFI control unit
F2	Fuse
F3	Fuse
G20	Alternator
K12	Light relay
K30	Power relay
K50	Radiator fan relay
M14	Radiator fan
T20	Voltage regulator
X295	Diagnostics connector



500 EXC-F US 2017

Components:

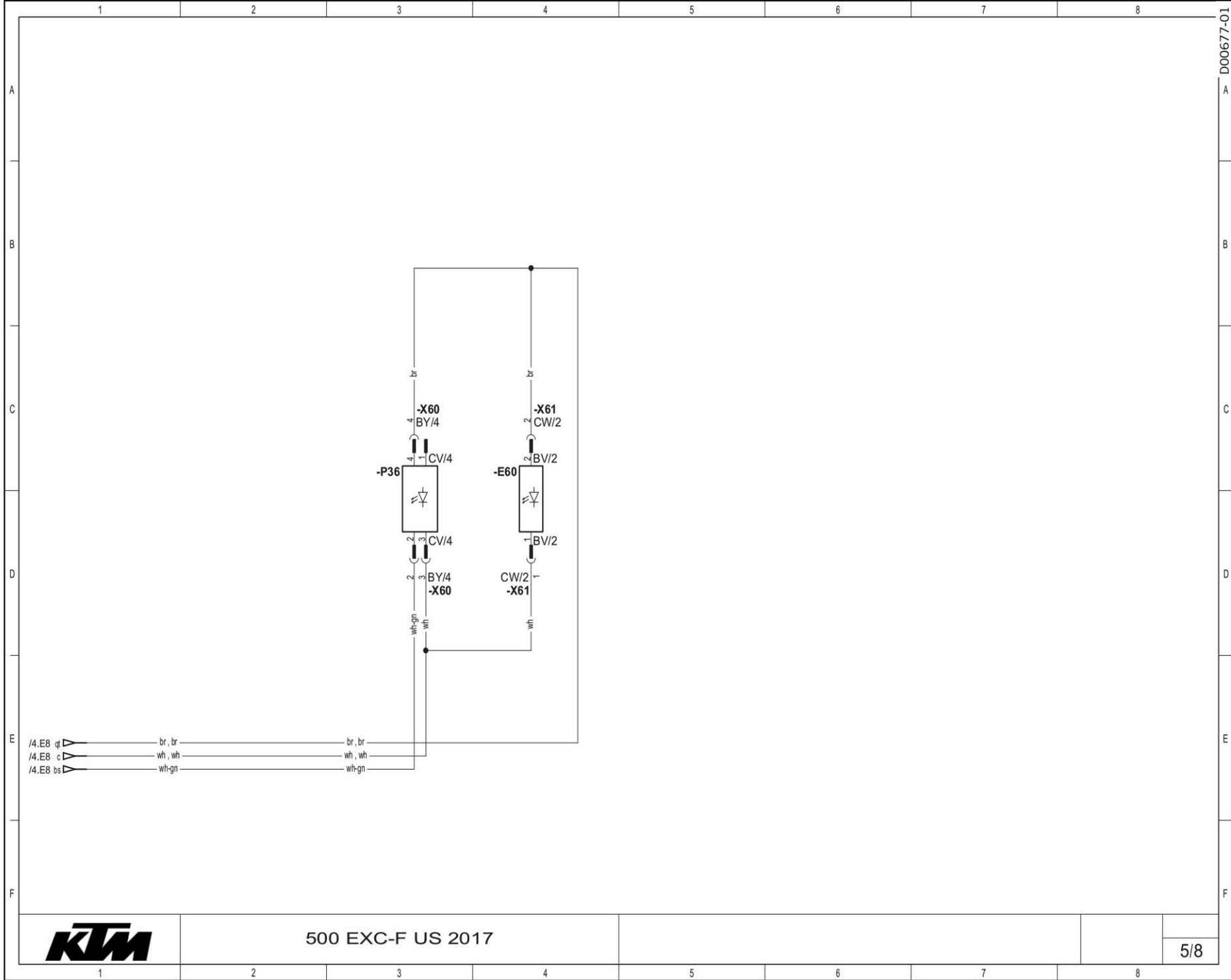
E13	Low beam, high beam
P13	Speedometer
P15	Horn
P35	Parking light
S22	Light switch, horn button, kill switch



500 EXC-F US 2017

Components:

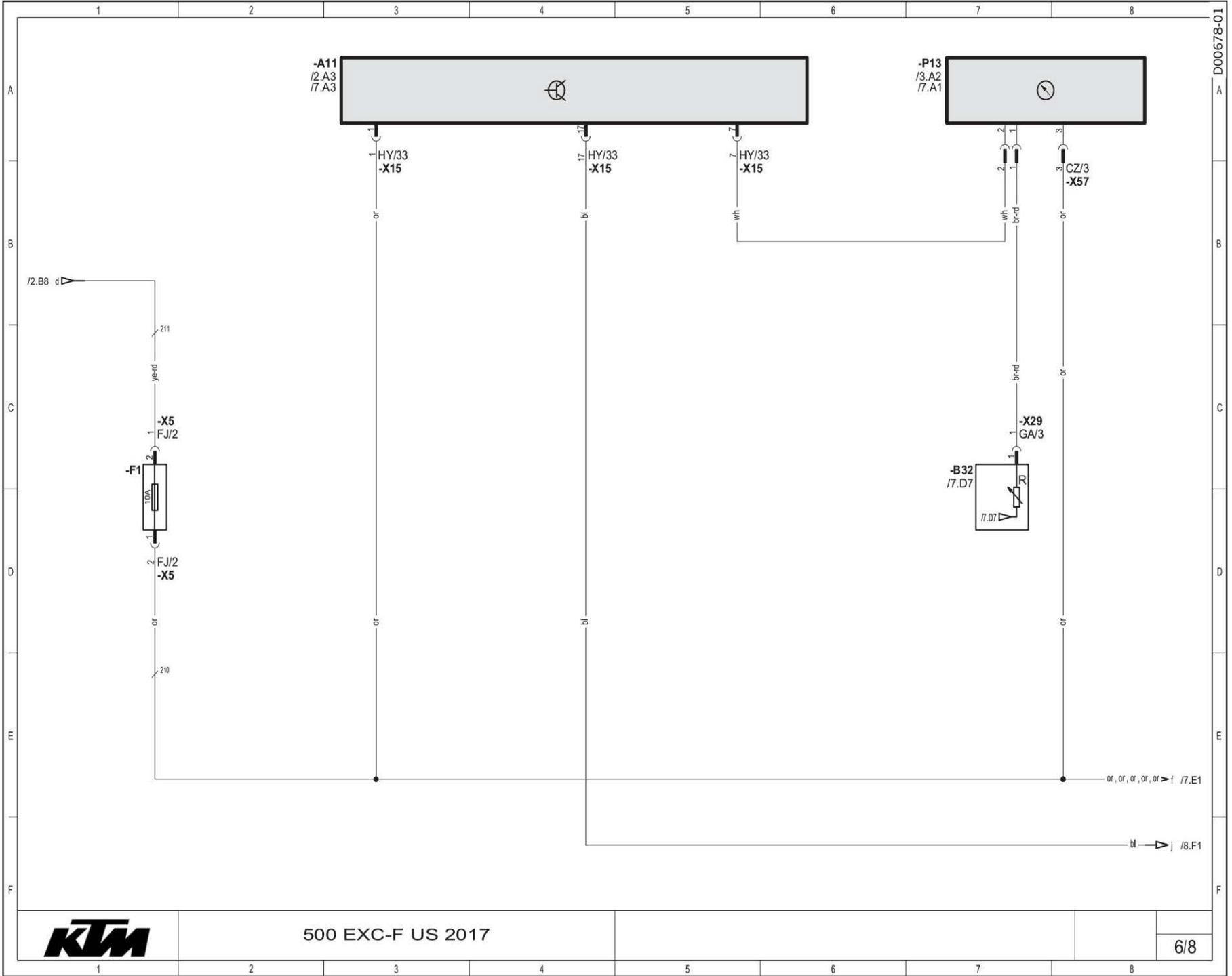
B76	Front brake light switch
B77	Rear brake light switch
K20	Turn signal relay
P21	Turn signal indicator lamp
P41	Front left turn signal
P42	Front right turn signal
P45	Rear left turn signal
P46	Rear right turn signal
S25	Turn signal switch



Components:

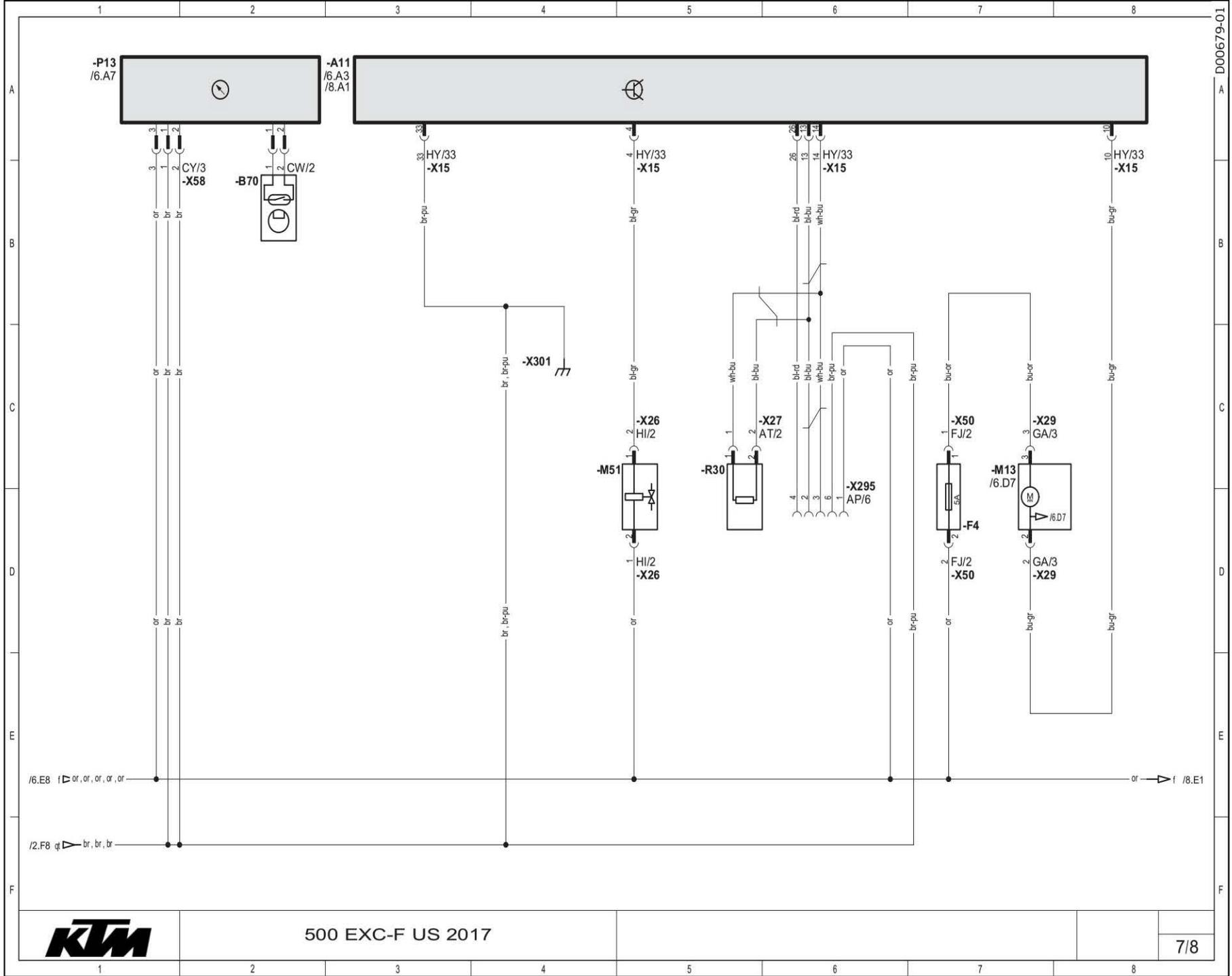
E60	License plate lamp
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P36	Brake/tail light
-----	------------------



Components:

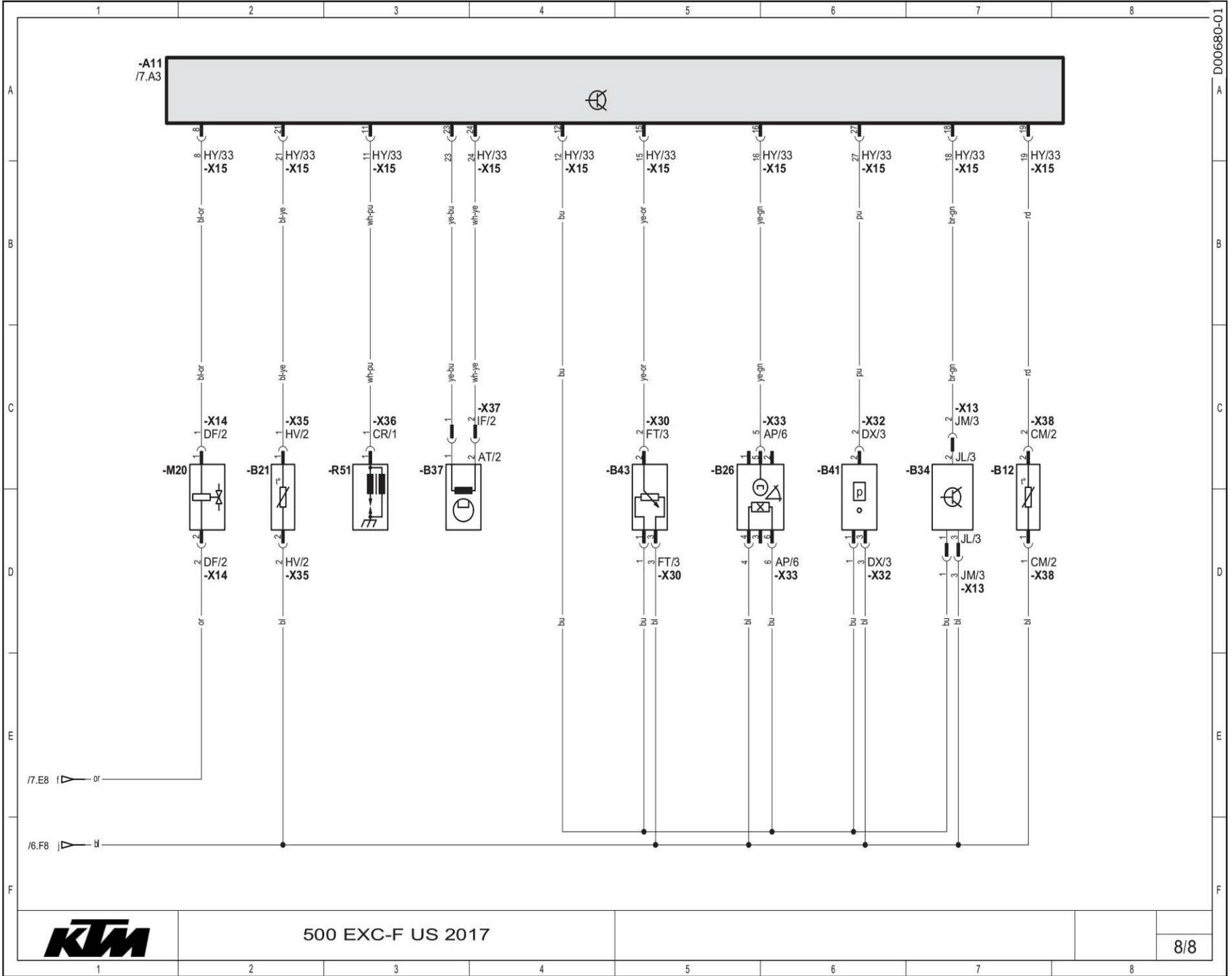
A11	EFI control unit
B32	Fuel level sensor
F1	Fuse
P13	Speedometer



500 EXC-F US 2017

Components:

A11	EFI control unit
B70	Front wheel speed sensor
F4	Fuse
M13	Fuel pump
M51	Injection valve cylinder 1
P13	Speedometer
R30	CAN-bus terminating resistor 1
X295	Diagnostics connector

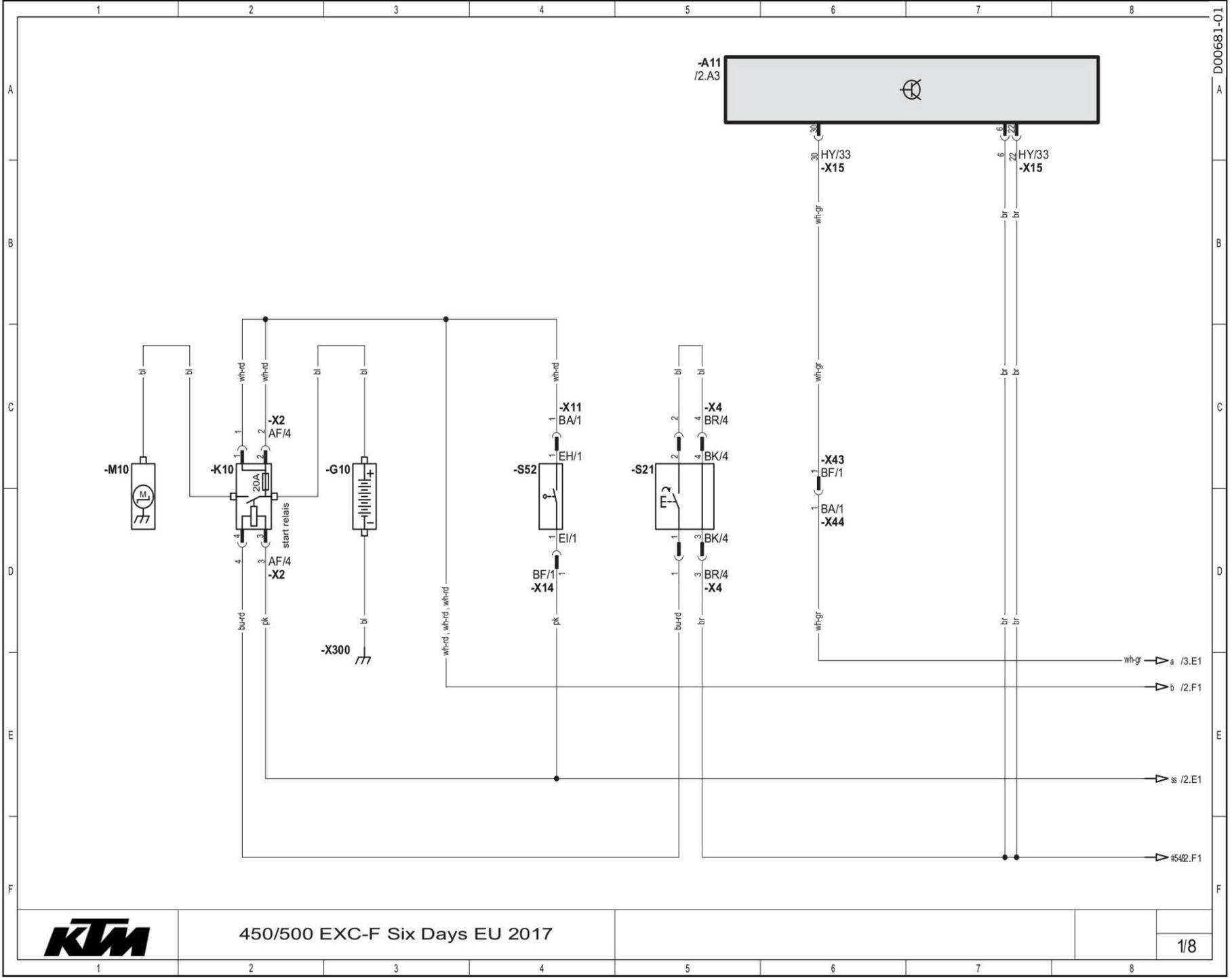


Components:

A11	EFI control unit
B12	Intake air temperature sensor
B21	Coolant temperature sensor (cylinder 1)
B26	Rollover sensor
B34	Gear position sensor
B37	Crankshaft position sensor
B41	Manifold absolute pressure sensor (cylinder 1)
B43	Throttle position sensor
M20	Evaporate emission control valve
R51	Ignition coil (cylinder 1)

Cable colors:

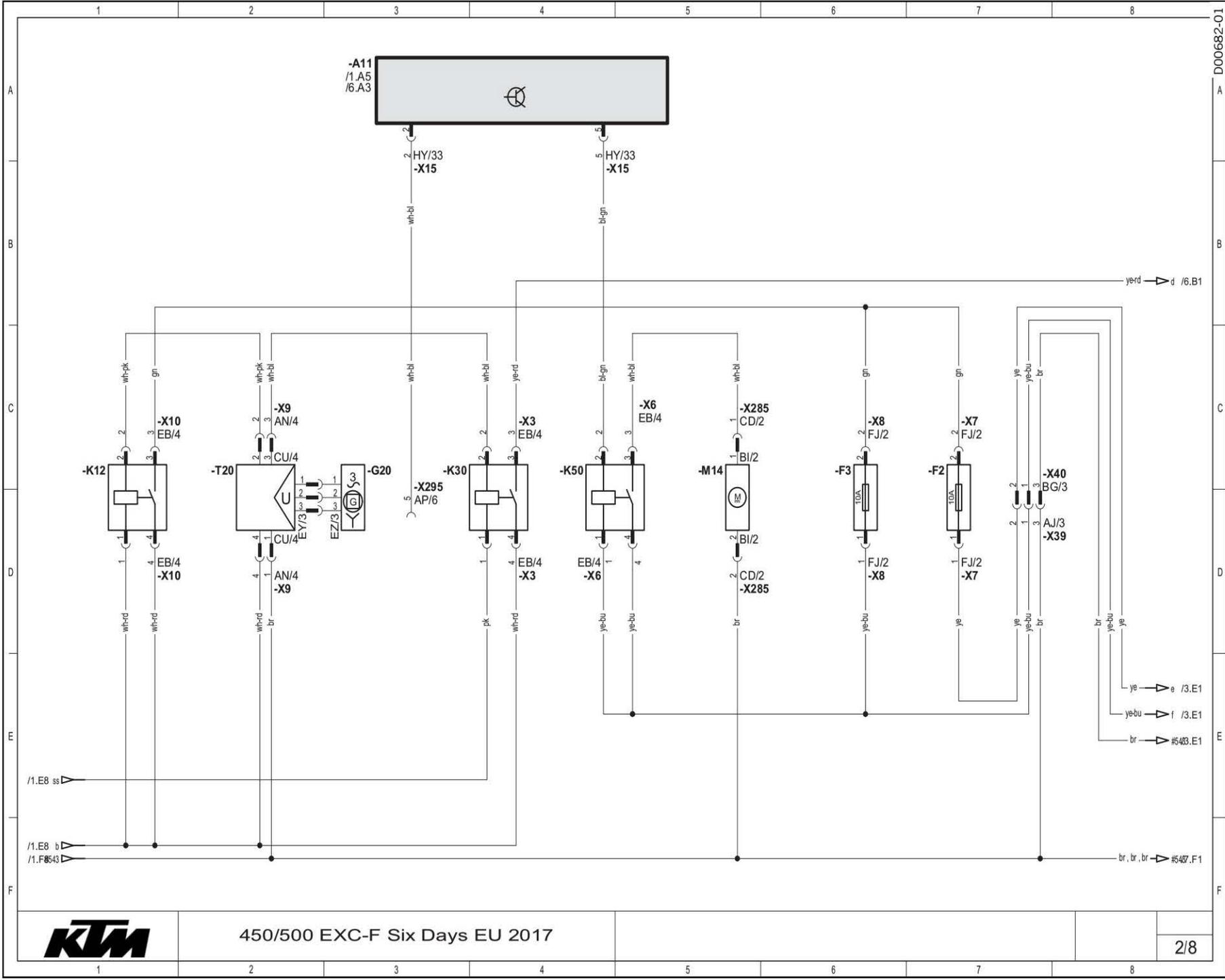
bl	Black
br	Brown
bu	Blue
gn	Green
gr	Gray
lbu	Light blue
or	Orange
pk	Pink
pu	Violet
rd	Red
wh	White
ye	Yellow



450/500 EXC-F Six Days EU 2017

Components:

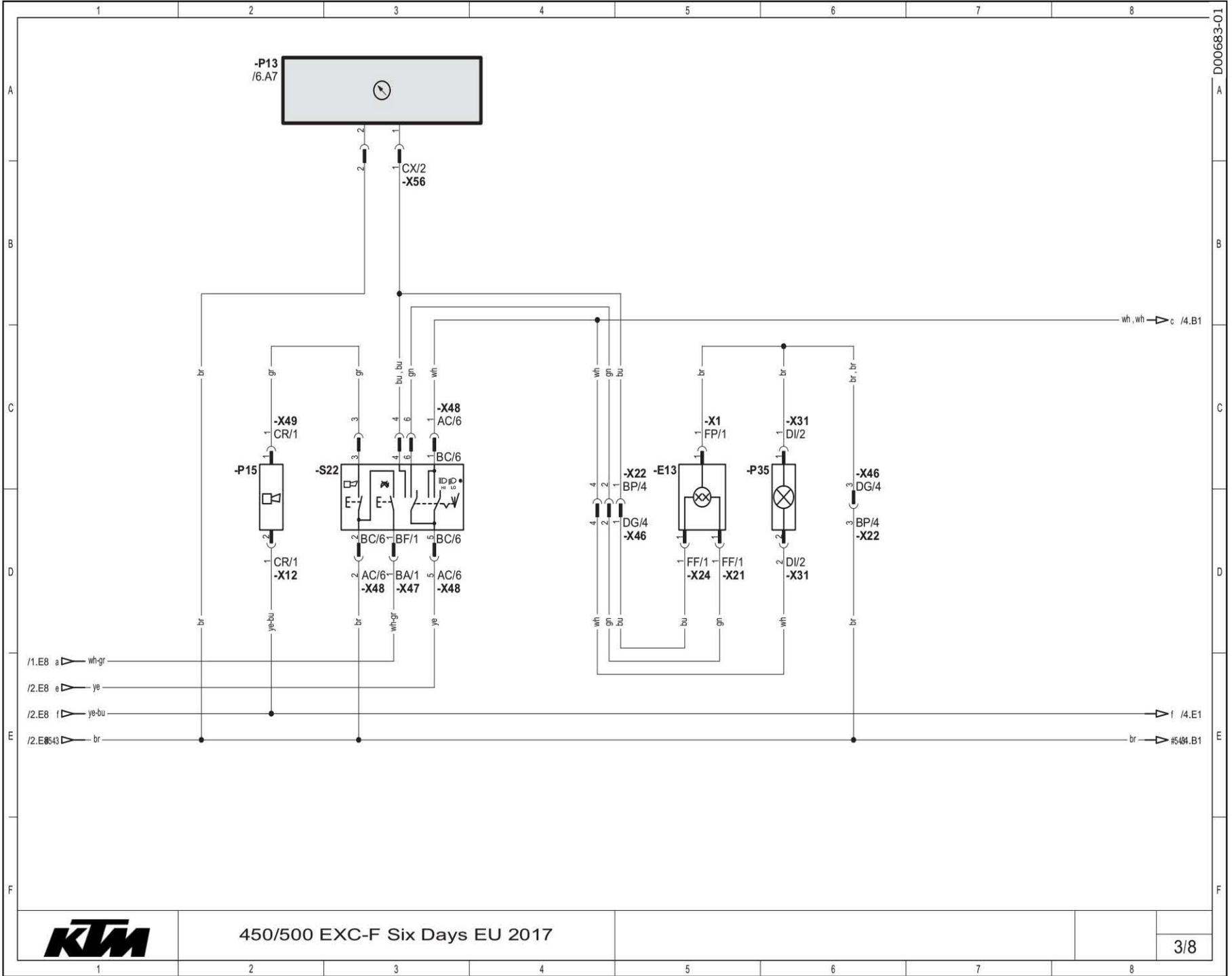
A11	EFI control unit
G10	Battery
K10	Starter relay with main fuse
M10	Electric starter system
S21	E-tip switch
S52	Side stand switch



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Components:

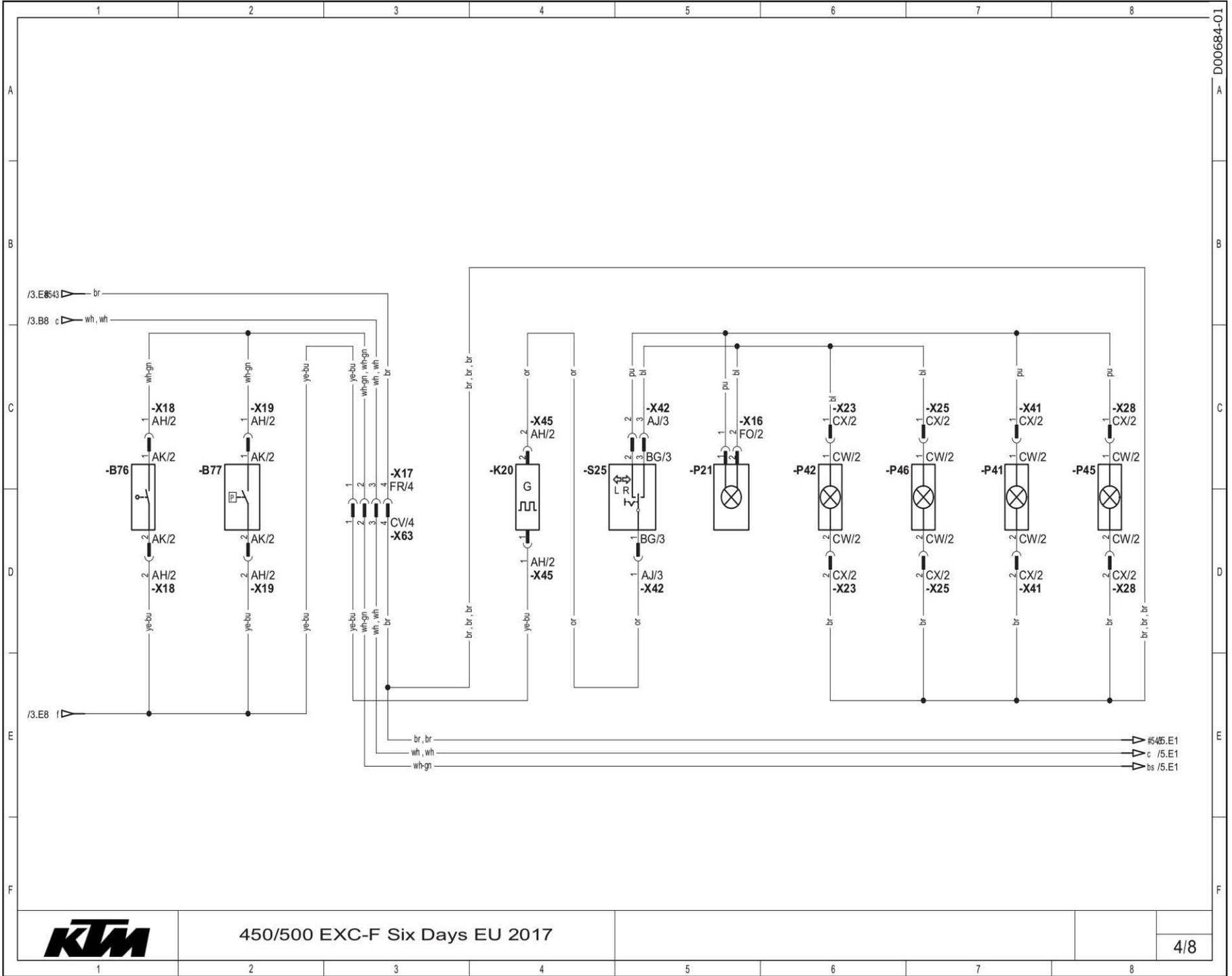
A11	EFI control unit
F2	Fuse
F3	Fuse
G20	Alternator
K12	Light relay
K30	Power relay
K50	Radiator fan relay
M14	Radiator fan
T20	Voltage regulator
X295	Diagnostics connector



450/500 EXC-F Six Days EU 2017

Components:

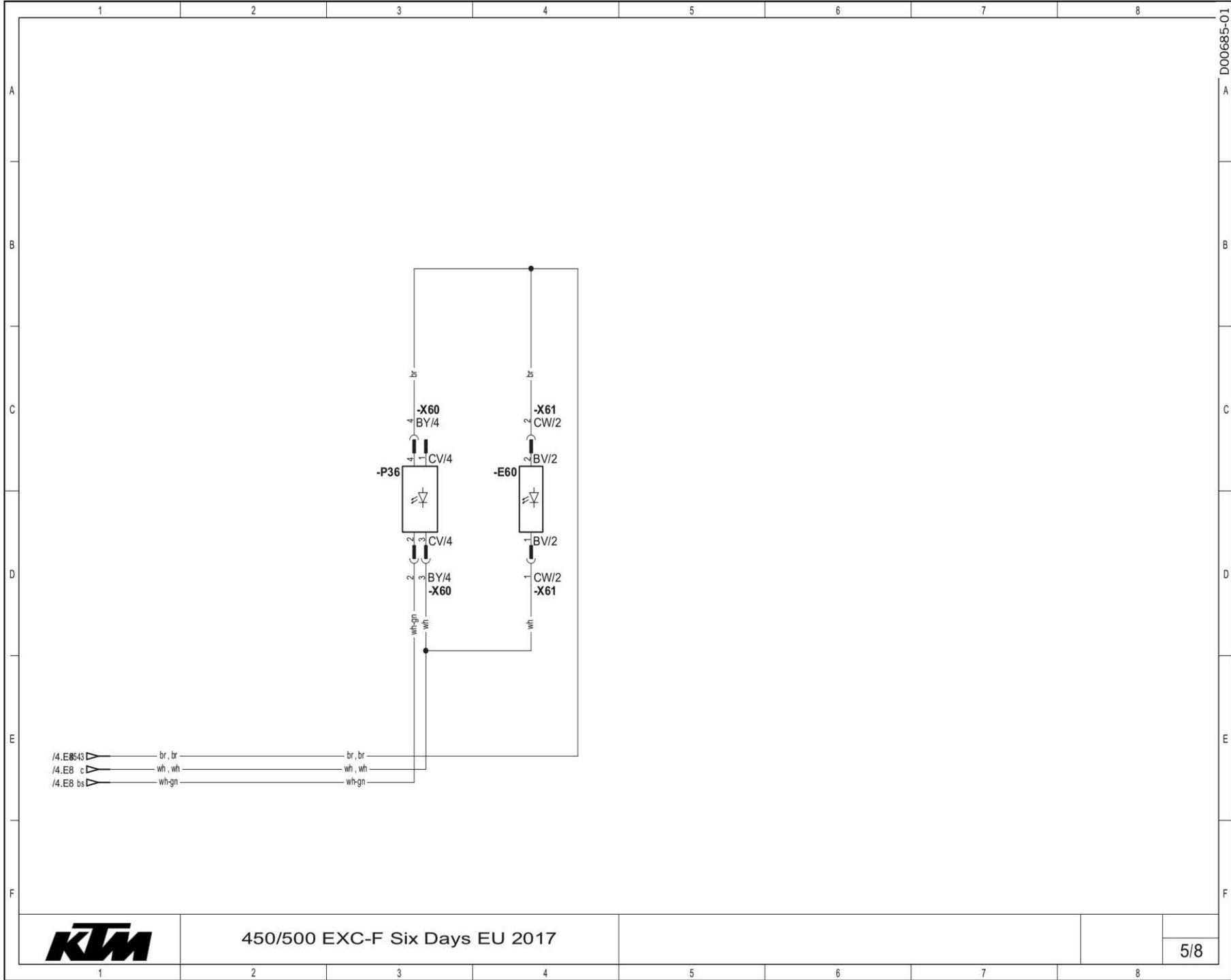
A11	EFI control unit
E13	Low beam, high beam
P13	Speedometer
P15	Horn
P23	High beam indicator lamp
P35	Parking light
S22	Light switch, horn button, kill switch



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Components:

B76	Front brake light switch
B77	Rear brake light switch
K20	Turn signal relay
P21	Turn signal indicator lamp
P41	Front left turn signal
P42	Front right turn signal
P45	Rear left turn signal
P46	Rear right turn signal
S25	Turn signal switch

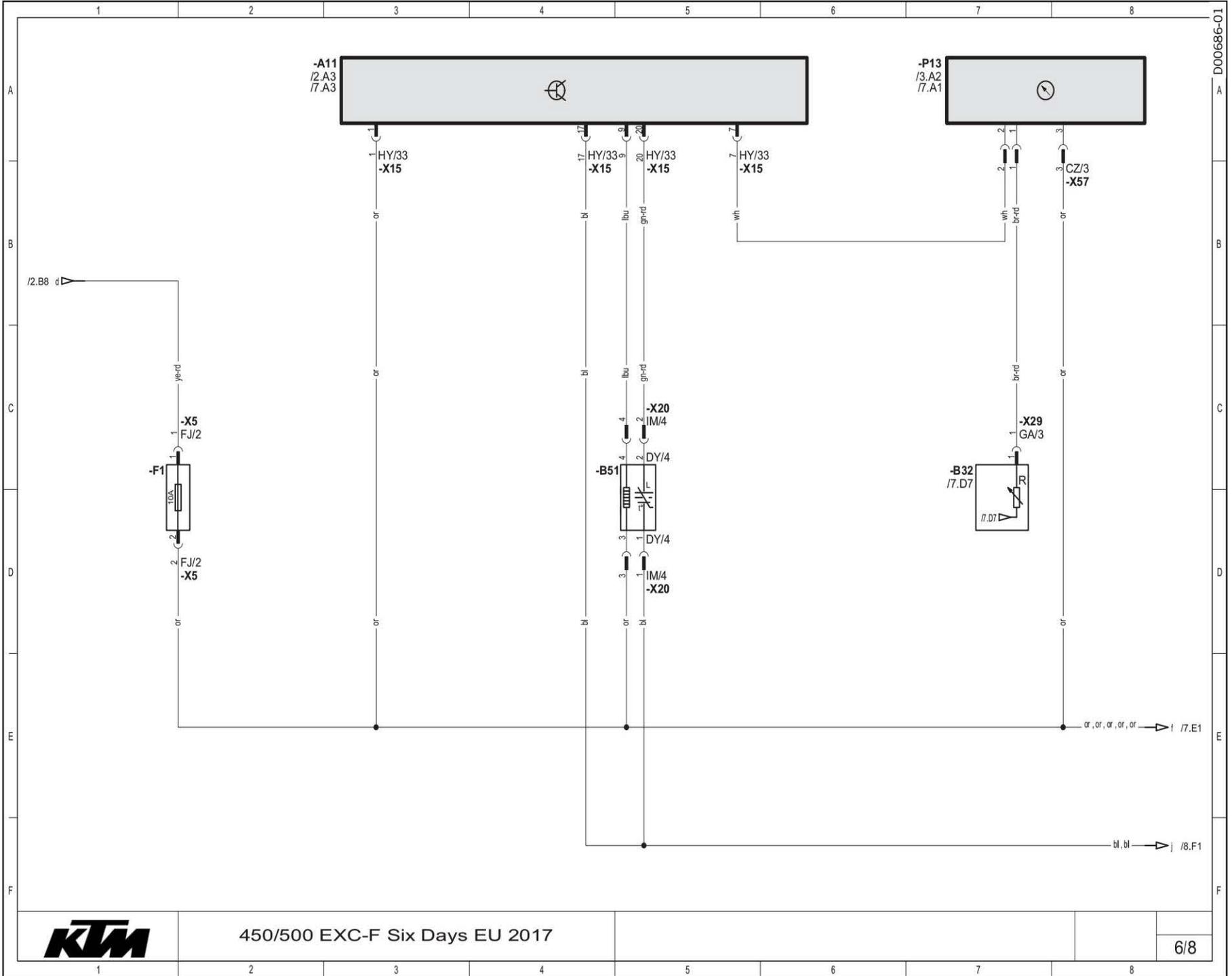


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Components:

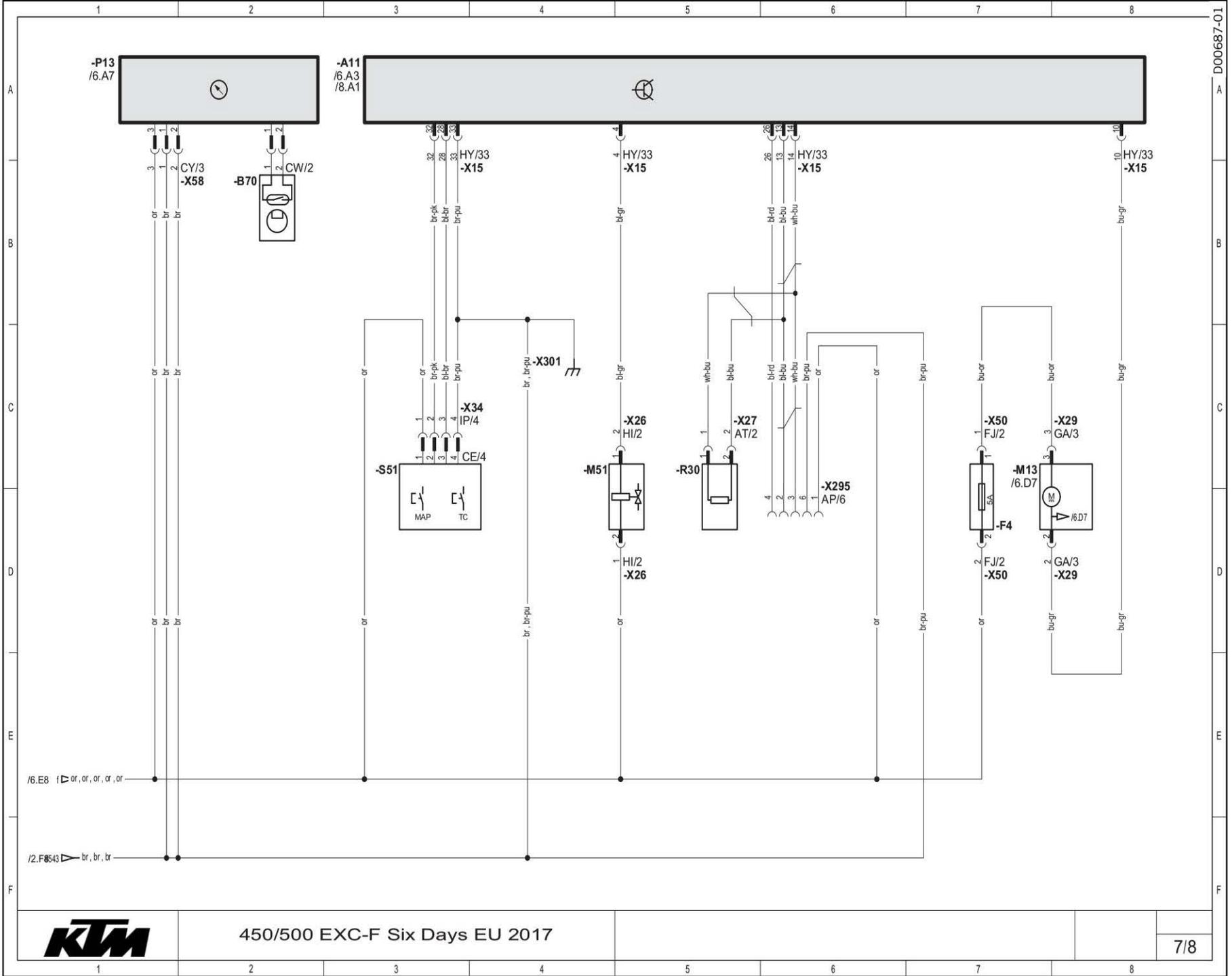
E60	License plate lamp
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P36	Brake/tail light
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Components:

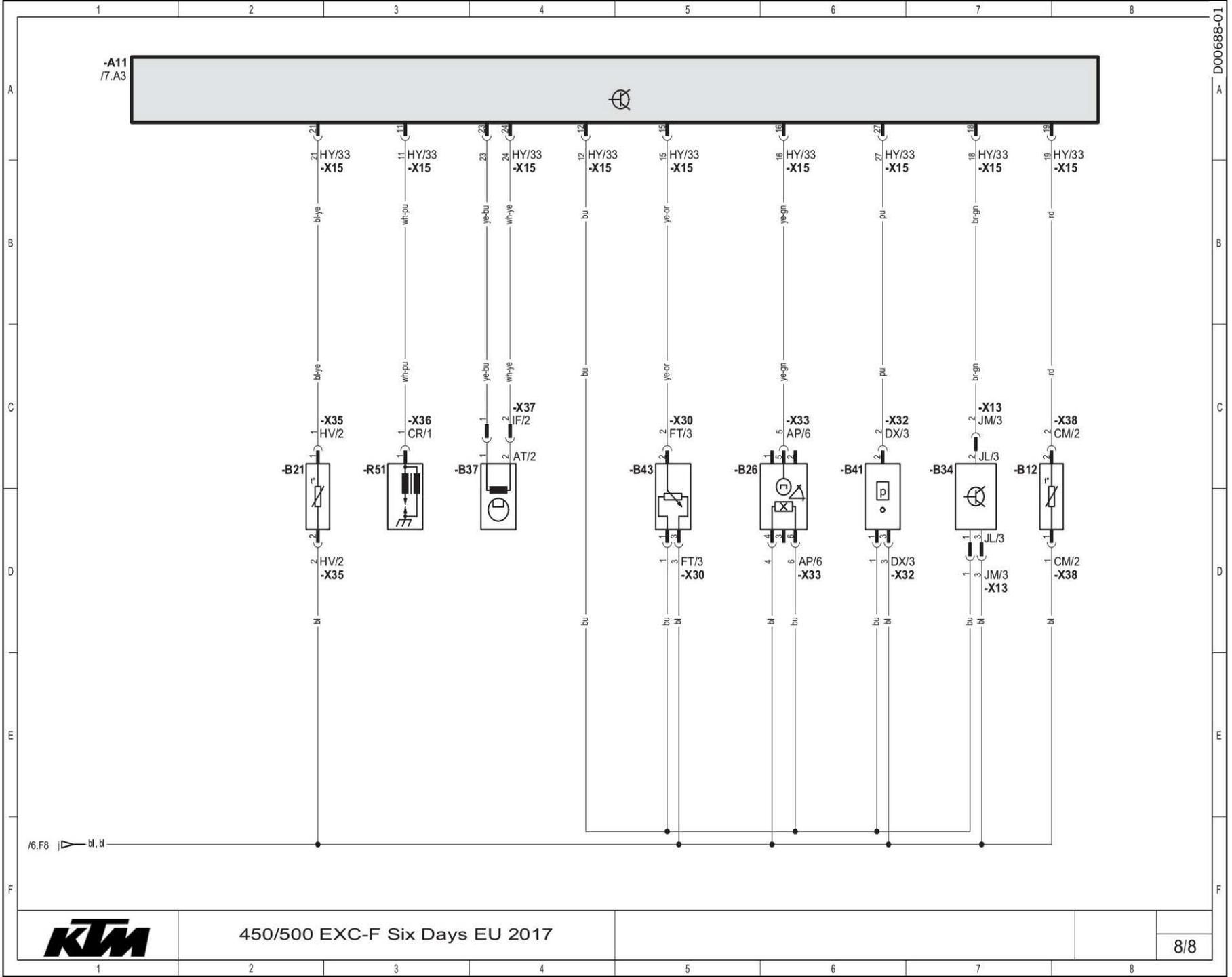
A11	EFI control unit
B32	Fuel level sensor
B51	Lambda sensor (cylinder 1)
F1	Fuse
P13	Speedometer



450/500 EXC-F Six Days EU 2017

Components:

A11	EFI control unit
B70	Front wheel speed sensor
F4	Fuse
M13	Fuel pump
M51	Injection valve (cylinder 1)
R30	CAN-bus terminating resistor 1
P13	Speedometer
S51	Map switch for vehicle operation
X295	Diagnostics connector



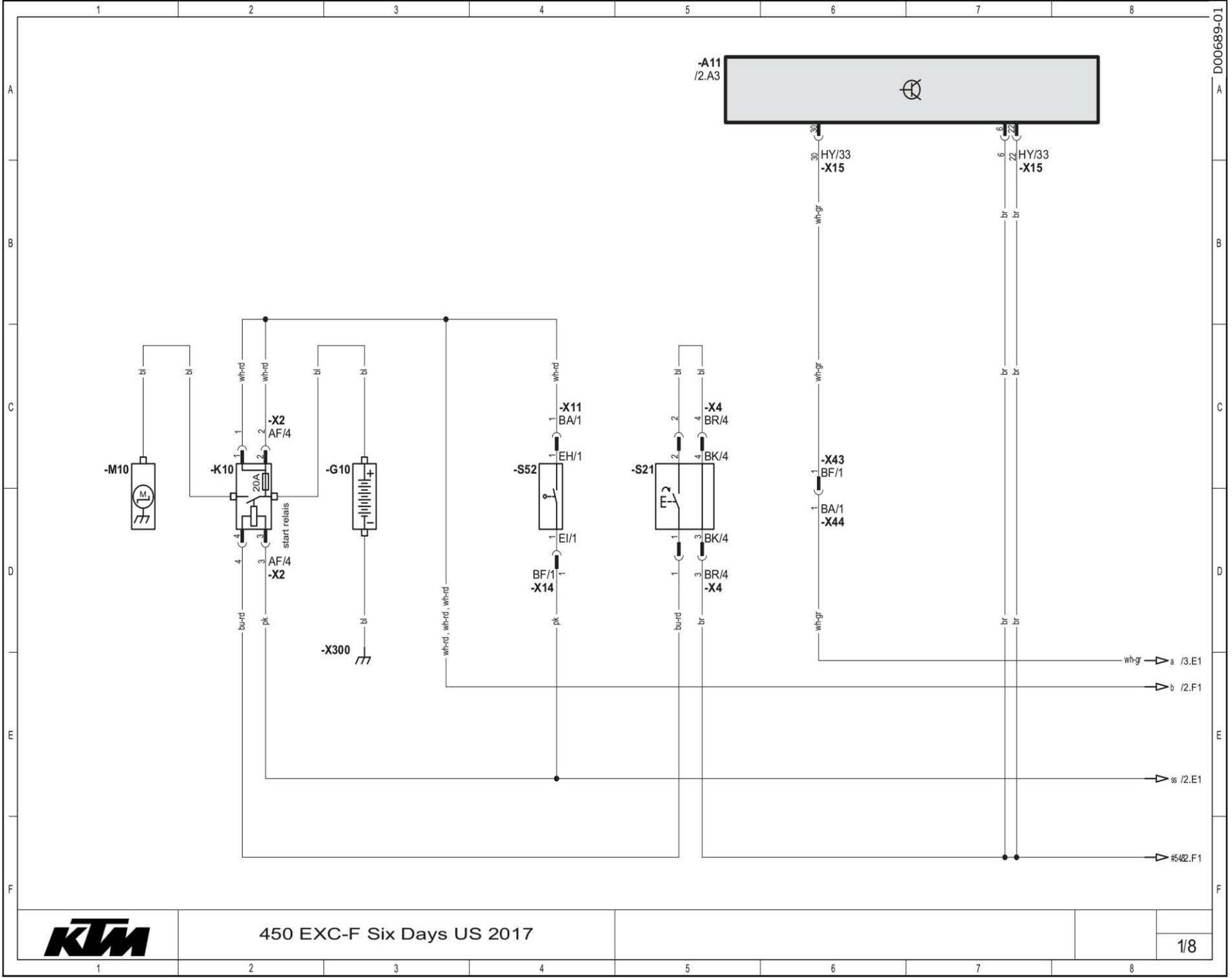
450/500 EXC-F Six Days EU 2017

Components:

A11	EFI control unit
B12	Intake air temperature sensor
B21	Coolant temperature sensor (cylinder 1)
B26	Rollover sensor
B37	Crankshaft position sensor
B41	Manifold absolute pressure sensor (cylinder 1)
B43	Throttle position sensor
R51	Ignition coil (cylinder 1)

Cable colors:

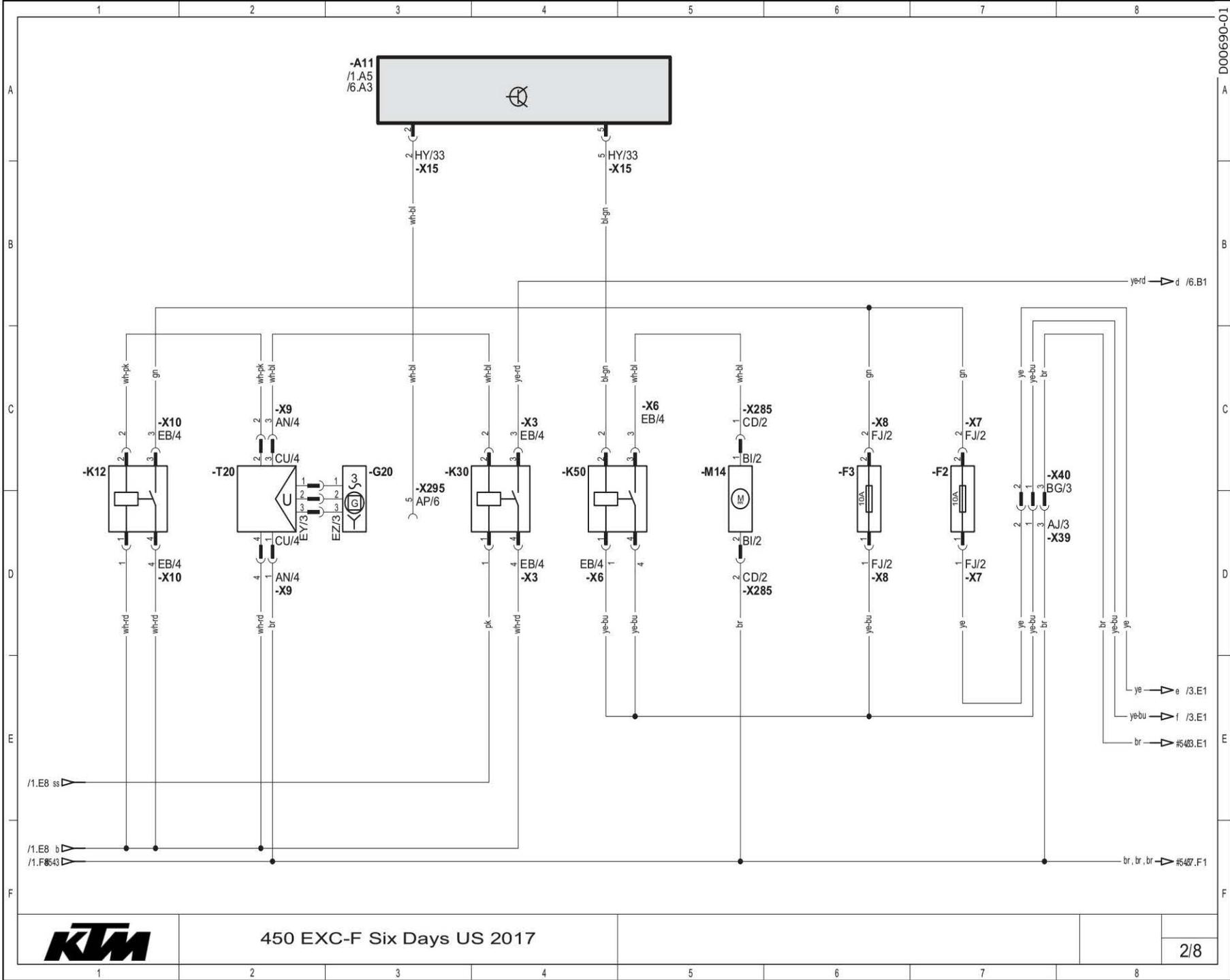
bl	Black
br	Brown
bu	Blue
gn	Green
gr	Gray
lbu	Light blue
or	Orange
pk	Pink
pu	Violet
rd	Red
wh	White
ye	Yellow



D00689-01

Components:

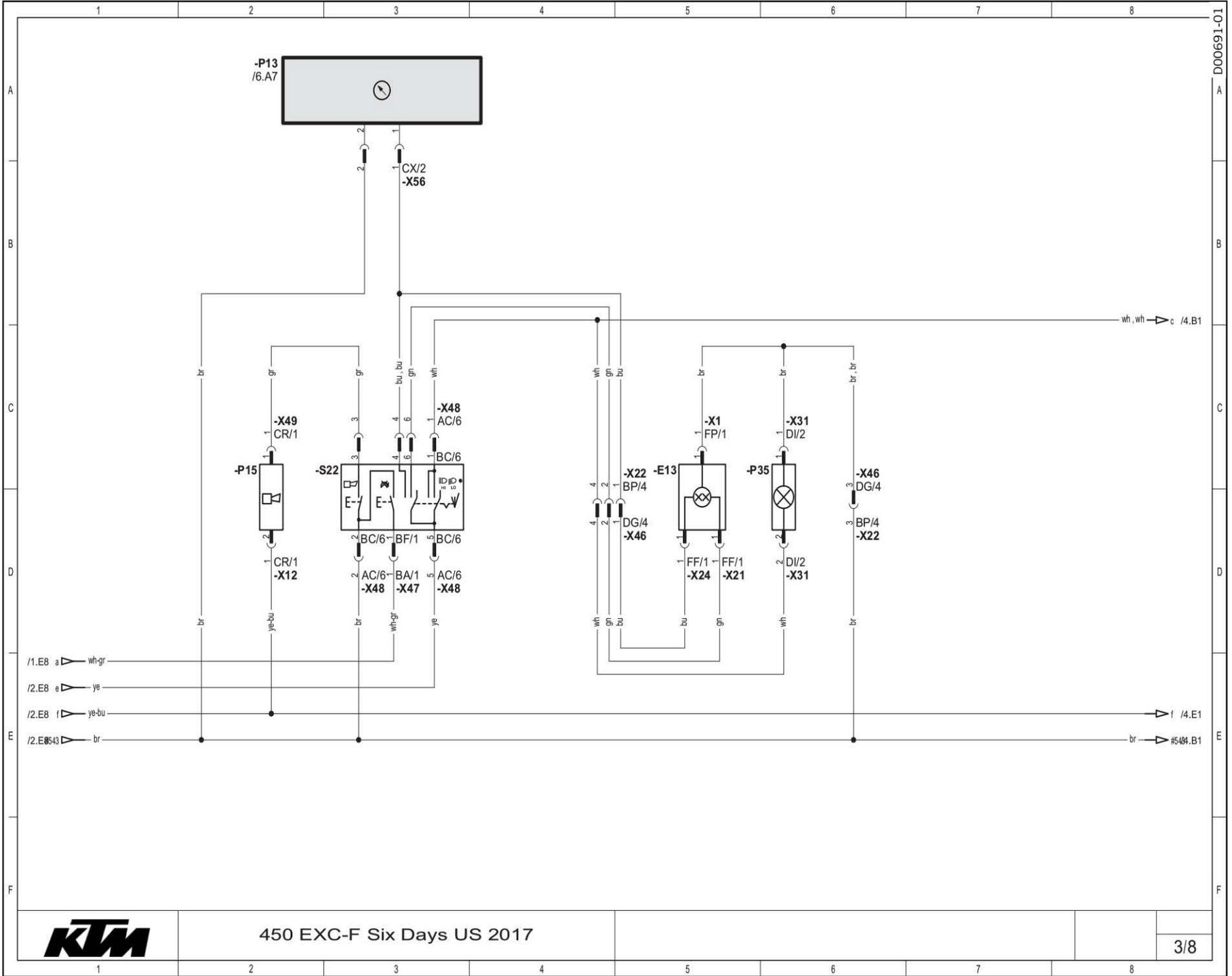
A11	EFI control unit
G10	Battery
K10	Starter relay with main fuse
M10	Electric starter system
S21	E-tip switch
S52	Side stand switch



450 EXC-F Six Days US 2017

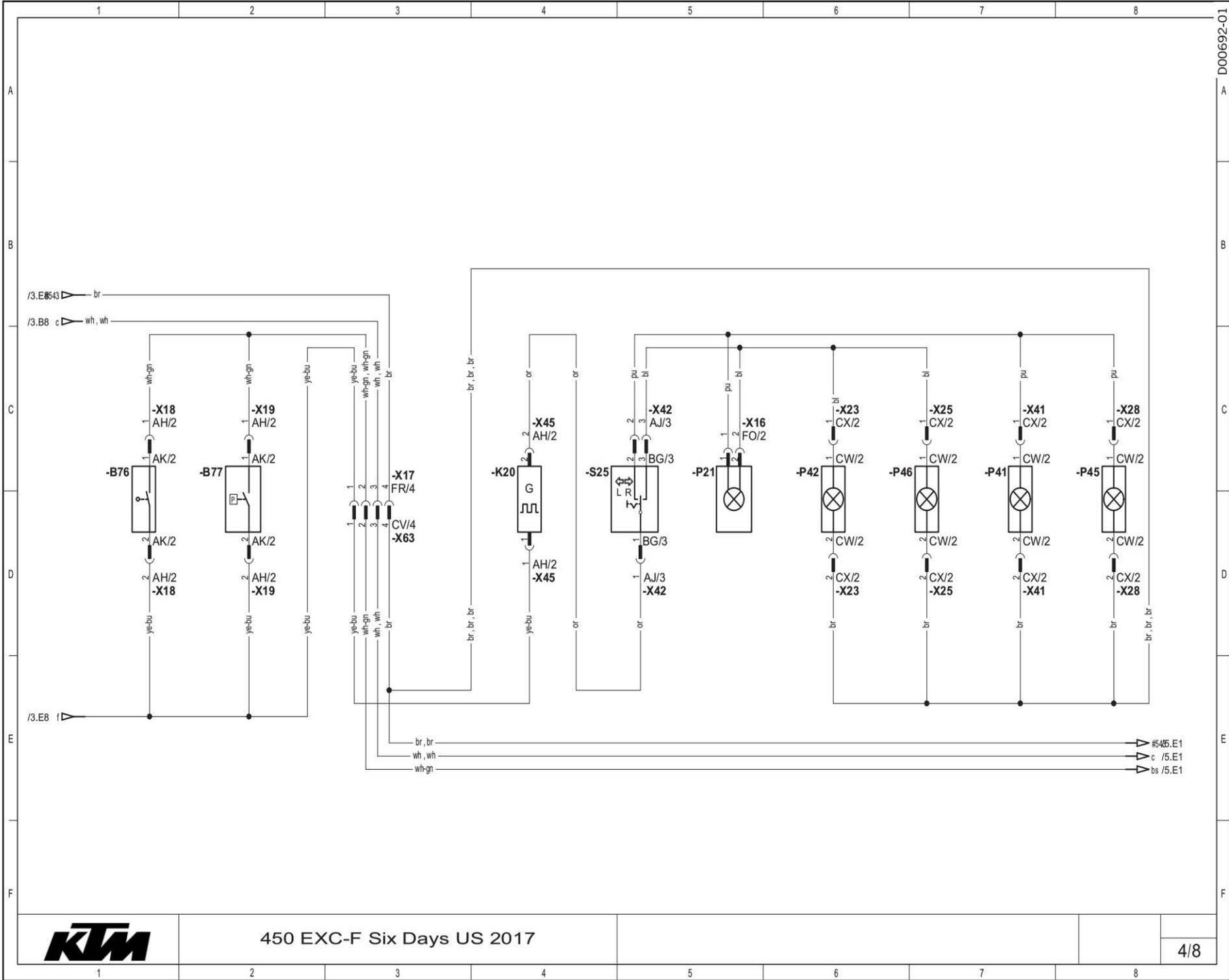
Components:

A11	EFI control unit
F2	Fuse
F3	Fuse
G20	Alternator
K12	Light relay
K30	Power relay
K50	Radiator fan relay
M14	Radiator fan
T20	Voltage regulator
X295	Diagnostics connector



Components:

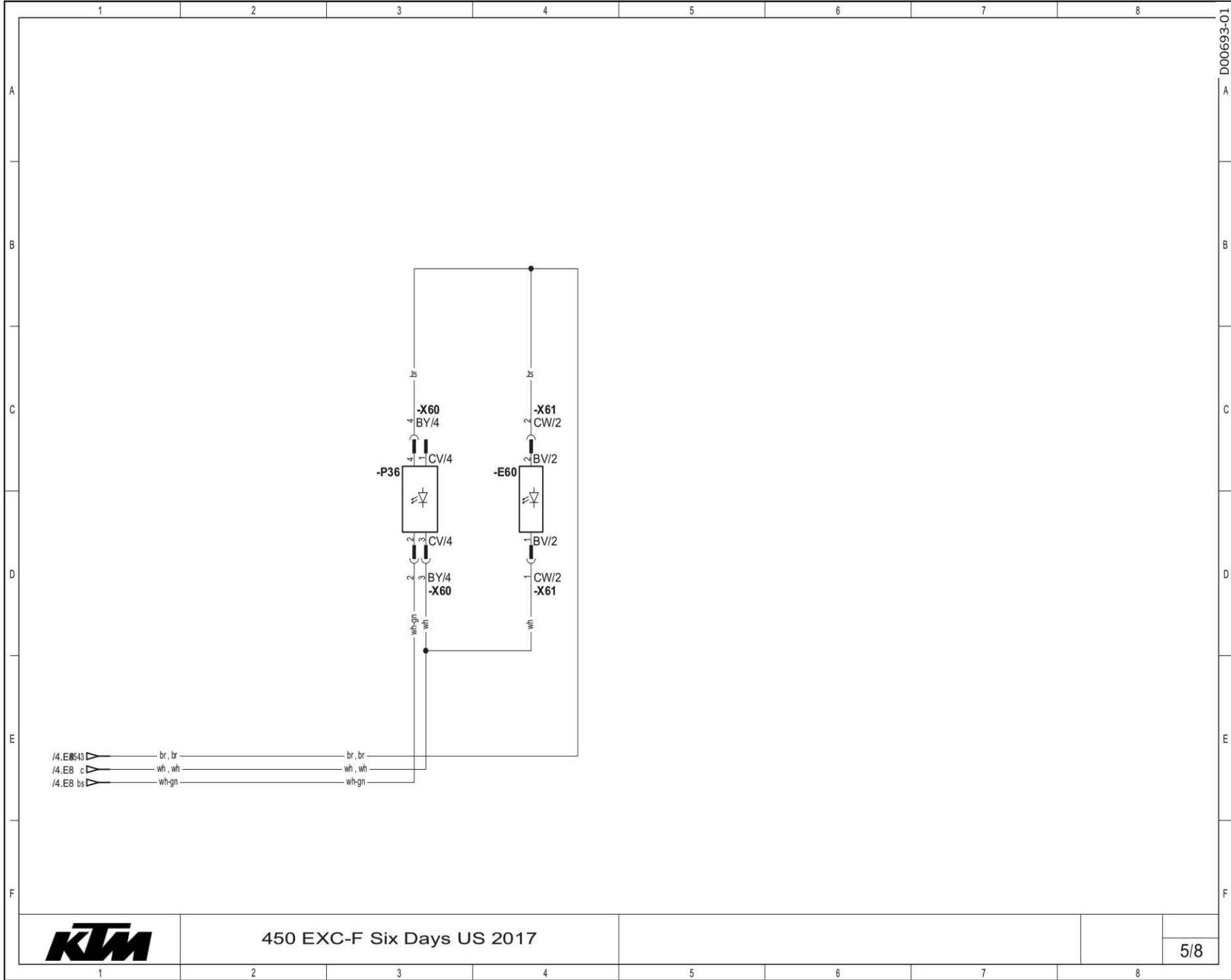
A11	EFI control unit
E13	Low beam, high beam
P13	Speedometer
P15	Horn
P23	High beam indicator lamp
P35	Parking light
S22	Light switch, horn button, kill switch



450 EXC-F Six Days US 2017

Components:

B76	Front brake light switch
B77	Rear brake light switch
K20	Turn signal relay
P21	Turn signal indicator lamp
P41	Front left turn signal
P42	Front right turn signal
P45	Rear left turn signal
P46	Rear right turn signal
S25	Turn signal switch

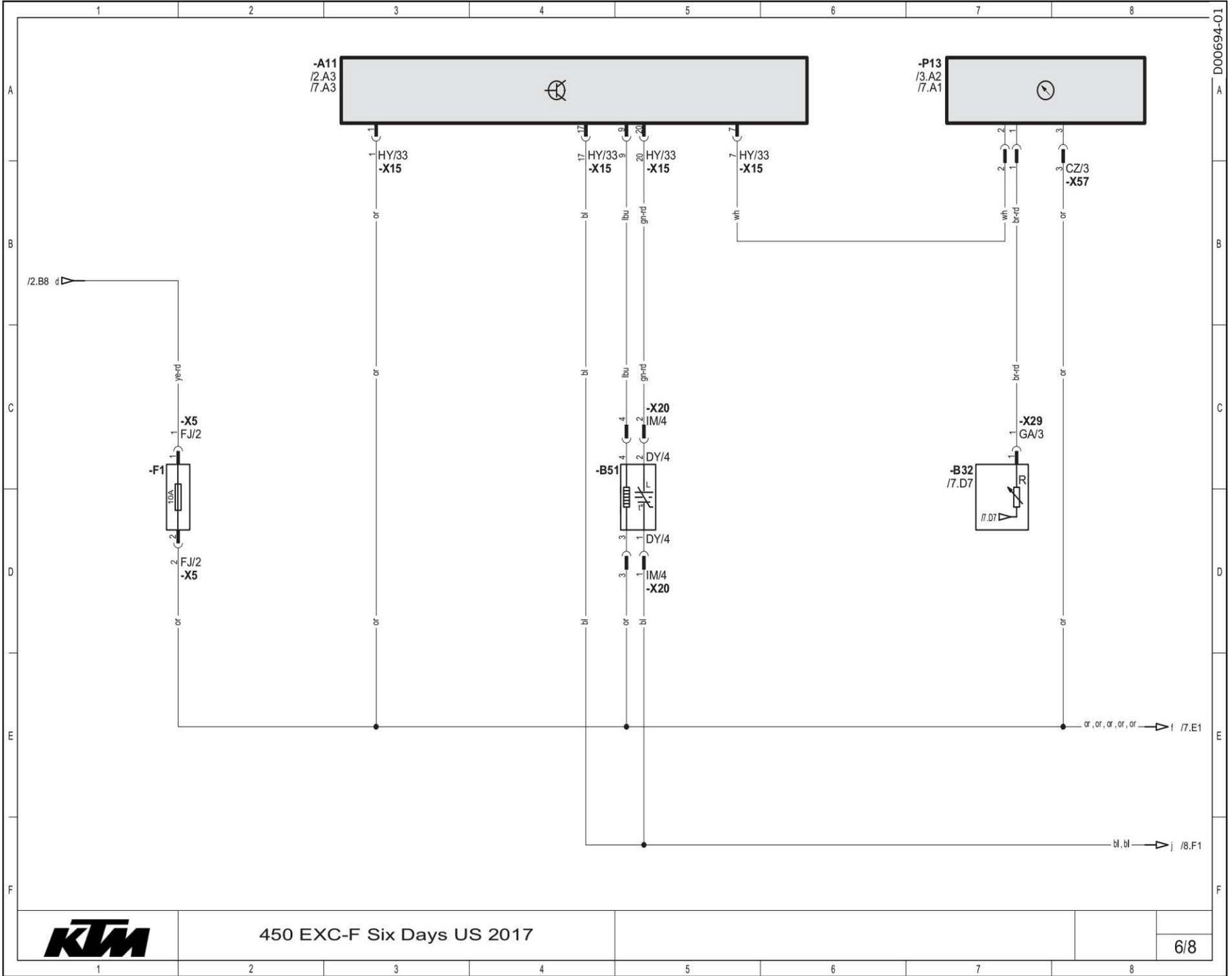


450 EXC-F Six Days US 2017

Components:

E60	License plate lamp
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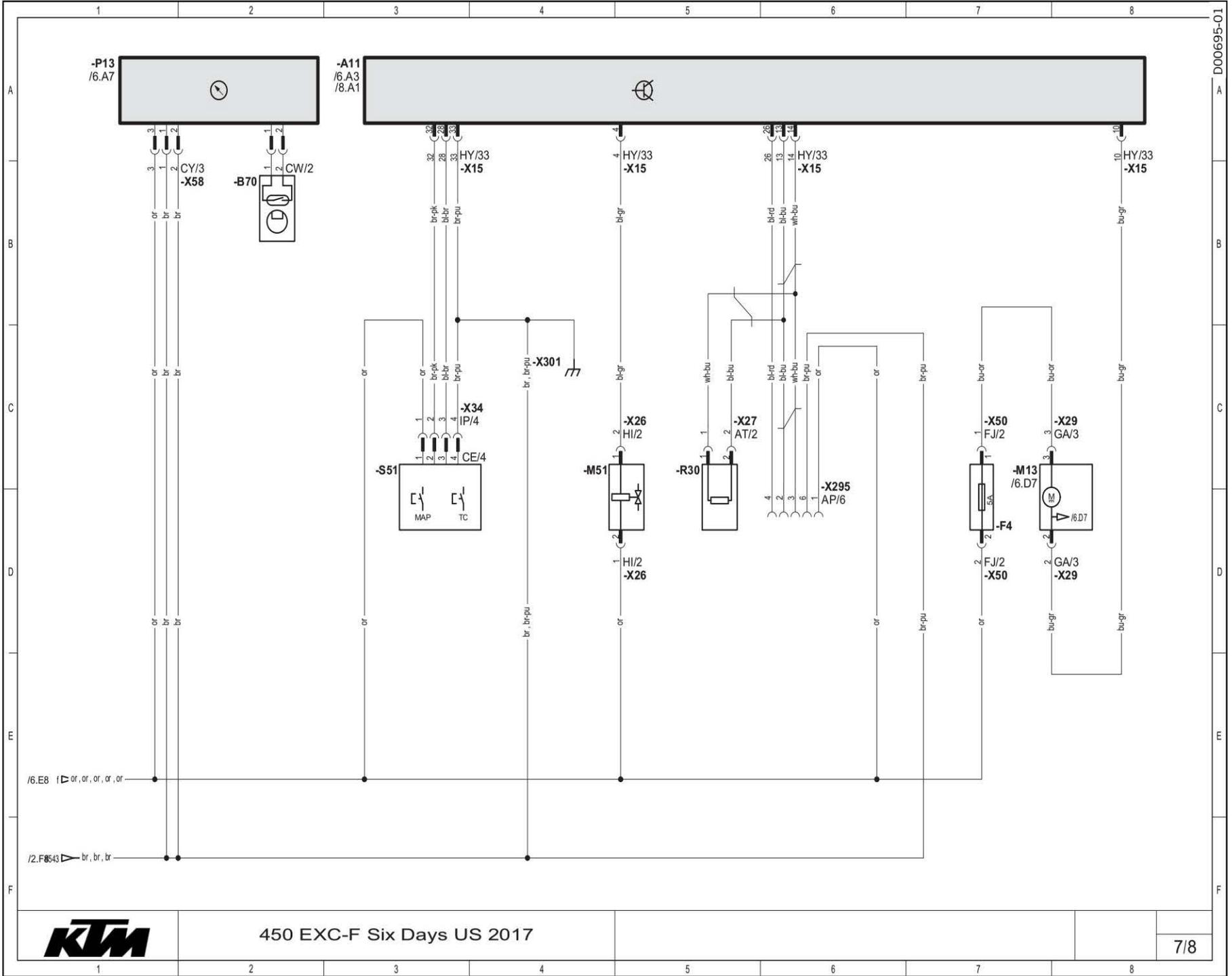
P36	Brake/tail light
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450 EXC-F Six Days US 2017

Components:

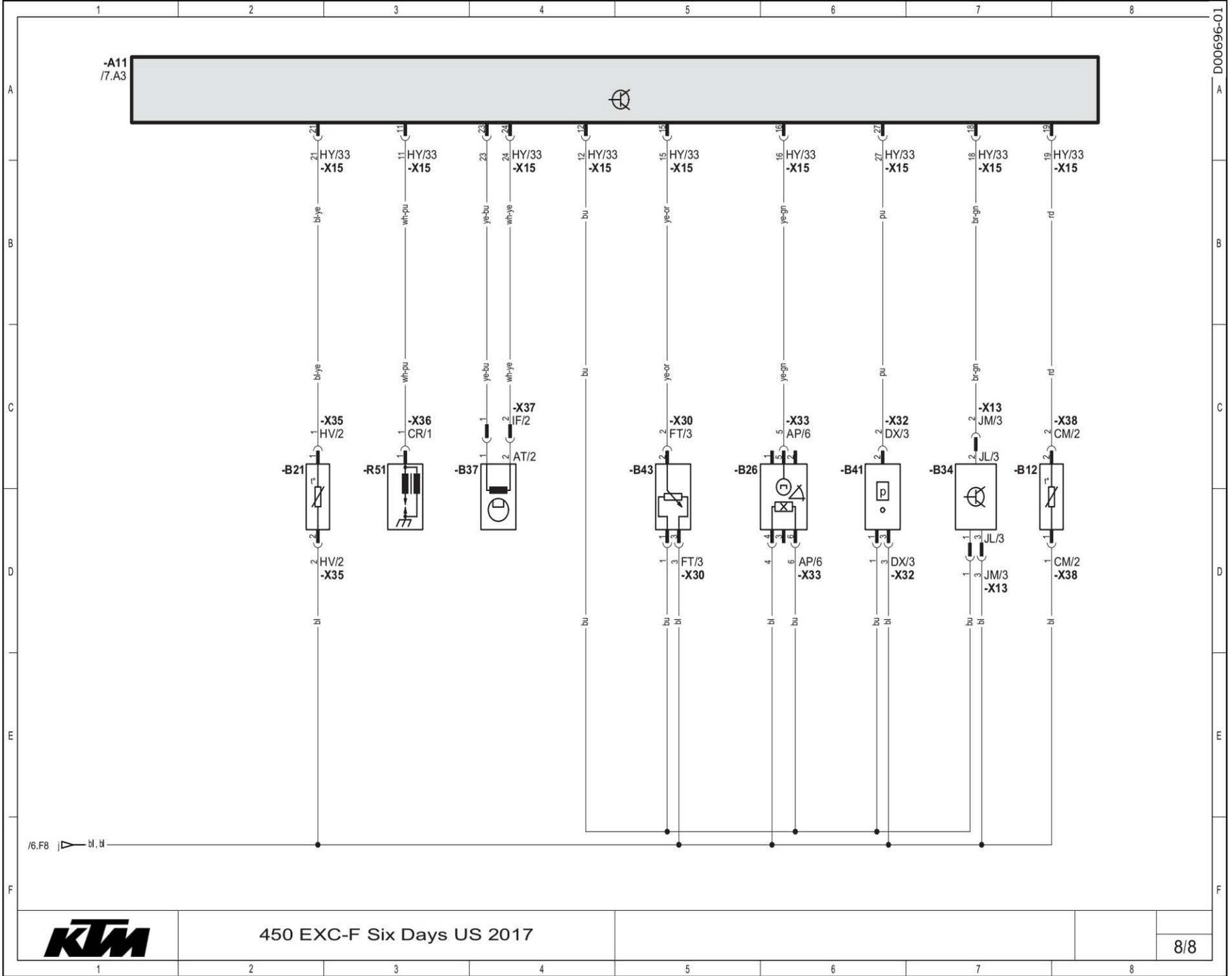
A11	EFI control unit
B32	Fuel level sensor
B51	Lambda sensor (cylinder 1)
F1	Fuse
P13	Speedometer



450 EXC-F Six Days US 2017

Components:

A11	EFI control unit
B70	Front wheel speed sensor
F4	Fuse
M13	Fuel pump
M51	Injection valve (cylinder 1)
R30	CAN-bus terminating resistor 1
P13	Speedometer
S51	Map switch for vehicle operation
X295	Diagnostics connector



450 EXC-F Six Days US 2017

Components:

A11	EFI control unit
B12	Intake air temperature sensor
B21	Coolant temperature sensor (cylinder 1)
B26	Rollover sensor
B37	Crankshaft position sensor
B41	Manifold absolute pressure sensor (cylinder 1)
B43	Throttle position sensor
R51	Ignition coil (cylinder 1)

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

- RESPONSE BRAKE FLUID SUPER DOT 4

Motorex®

- Brake Fluid DOT 5.1

Coolant

Guideline

- Only use high-grade, silicate-free coolant with corrosion inhibitor additive for aluminum motors. Low grade and unsuitable antifreeze causes corrosion, deposits and frothing.
- Do not use pure water as only coolant is able to meet the requirements needed in terms of corrosion protection and lubrication properties.
- Only use coolant that complies with the requirements stated (see specifications on the container) and that has the relevant properties.

Antifreeze protection to at least	-25 °C (-13 °F)
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The mixture ratio must be adjusted to the necessary antifreeze protection. Use distilled water if the coolant needs to be diluted.

The use of premixed coolant is recommended.

Observe the coolant manufacturer specifications for antifreeze protection, dilution and miscibility (compatibility) with other coolants.

Recommended supplier

Motorex®

- COOLANT M3.0

Engine oil (SAE 10W/50)

Standard/classification

- JASO T903 MA (📖 p. 375)
- SAE (📖 p. 375) (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.

Synthetic engine oil

Recommended supplier

Motorex®

- Cross Power 4T

Fork oil (SAE 4) (48601166S1)

Standard/classification

- SAE (📖 p. 375) (SAE 4)

Guideline

- Use only oils that comply with the specified standards (see specifications on the container) and that exhibit the corresponding properties.

Shock absorber fluid (SAE 2.5) (50180751S1)

Standard/classification

- SAE (📖 p. 375) (SAE 2.5)

Guideline

- Use only oils that comply with the specified standards (see specifications on the container) and that exhibit the corresponding properties.

Super unleaded (ROZ 95/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).

Air filter cleaner

Recommended supplier

Motorex®

- Racing Bio Dirt Remover

Chain cleaner

Recommended supplier

Motorex®

- Chain Clean

Fuel additive

Recommended supplier

Motorex®

- Fuel Stabilizer

High viscosity grease

Recommended supplier

SKF®

- LGHB 2

Long-life grease

Recommended supplier

Motorex®

- Bike Grease 2000

Lubricant (T158)

Recommended supplier

Lubcon®

- Turmogrease® PP 300

Lubricant (T511)

Recommended supplier

Lubcon®

- Turmsilon® GTI 300 P

Lubricant (T625)

Recommended supplier

Molykote®

- 33 Medium

Lubricant (T159)

Recommended supplier

Bel-Ray®

- MC-11®

Motorcycle cleaner

Recommended supplier

Motorex®

- Moto Clean

Multi-purpose grease (00062010051)

Recommended supplier

Klüber Lubrication®

- CENTOPLEX 2 EP

Off-road chain spray

Recommended supplier

Motorex®

- Chainlube Offroad

Oil for foam air filter

Recommended supplier

Motorex®

- Racing Bio Liquid Power

Preserving materials for paints, metal and rubber

Recommended supplier

Motorex®

- Moto Protect

Special cleaner for glossy and matte paint finishes, metal and plastic surfaces

Recommended supplier

Motorex®

- Quick Cleaner

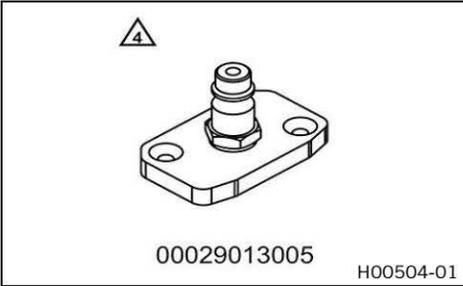
Universal oil spray

Recommended supplier

Motorex®

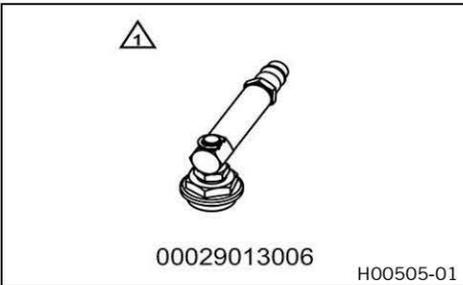
- Joker 440 Synthetic

Bleeder cover



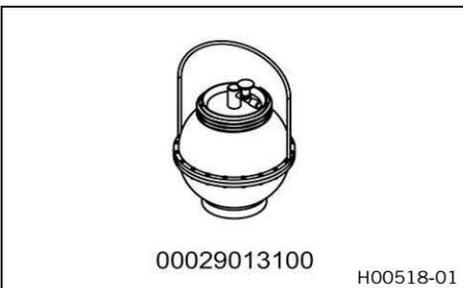
Art. no.: 00029013005

Bleeder cover



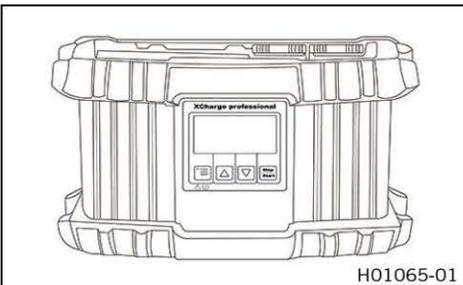
Art. no.: 00029013006

Bleeding device



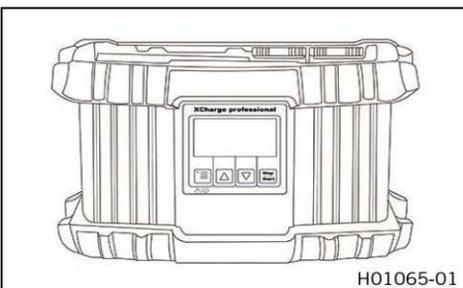
Art. no.: 00029013100

Battery charger XCharge-professional EU



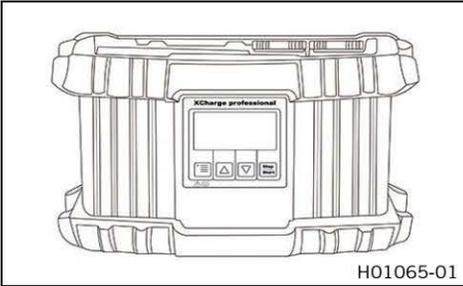
Art. no.: 00029095050

Battery charger XCharge-professional US



Art. no.: 00029095051

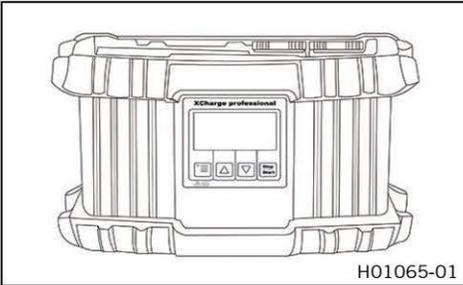
Battery charger XCharge-professional GB



H01065-01

Art. no.: 00029095052

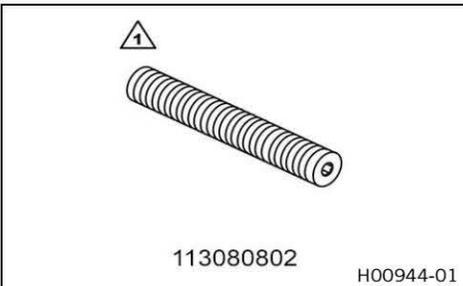
Battery charger XCharge-professional CH



H01065-01

Art. no.: 00029095053

Locking screw

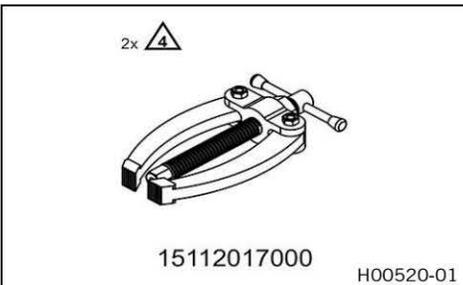


113080802

H00944-01

Art. no.: 113080802

Bearing puller

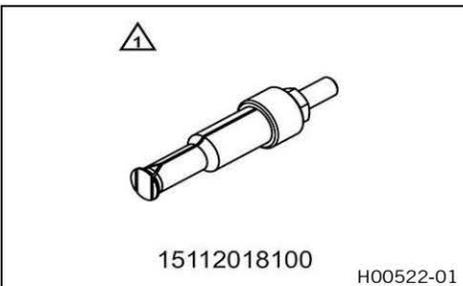


15112017000

H00520-01

Art. no.: 15112017000

Internal bearing puller



15112018100

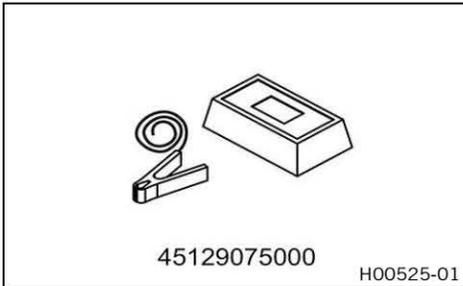
H00522-01

Art. no.: 15112018100

Feature

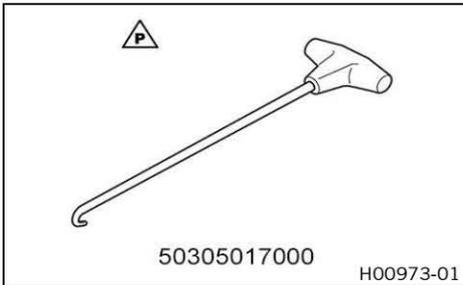
18... 23 mm (0.71... 0.91 in)

Tachometer



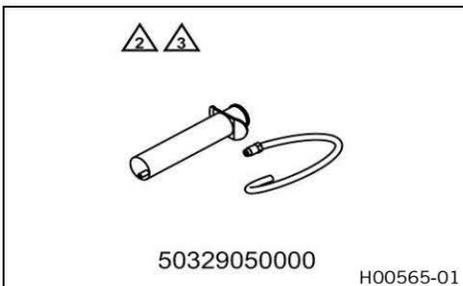
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Spring hook



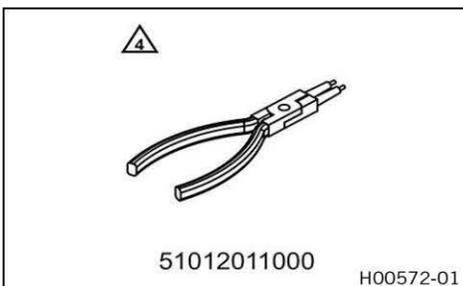
Art. no.: 50305017000

Bleed syringe



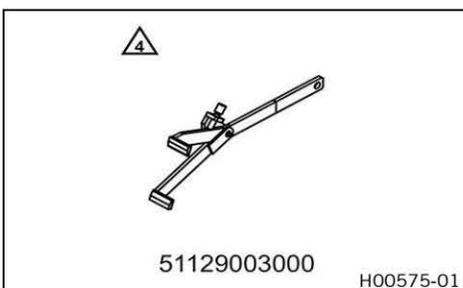
Art. no.: 50329050000

Circlip pliers reverse



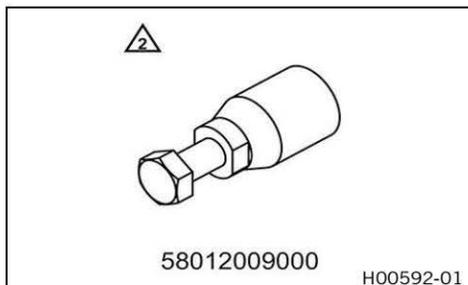
Art. no.: 51012011000

Clutch holder



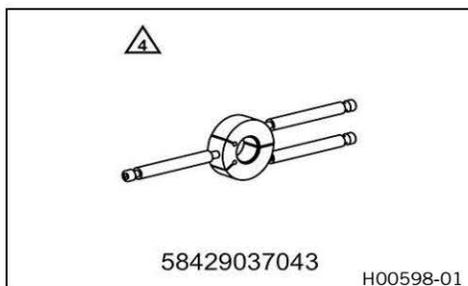
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Extractor



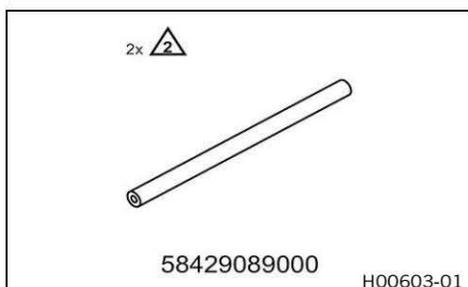
Art. no.: 58012009000

Tool for inner bearing race



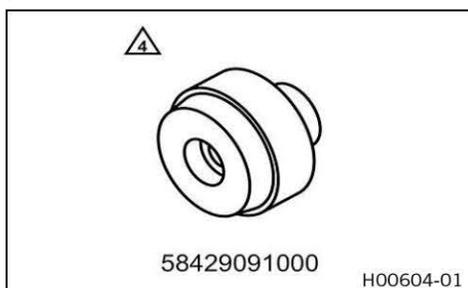
Art. no.: 58429037043

Tool bracket



Art. no.: 58429089000

Press-in tool



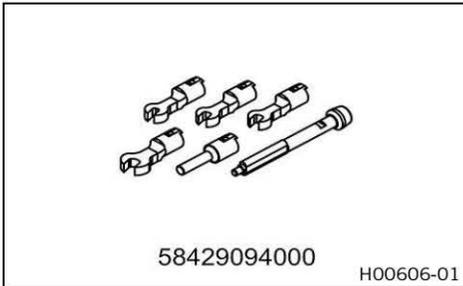
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Press-out tool



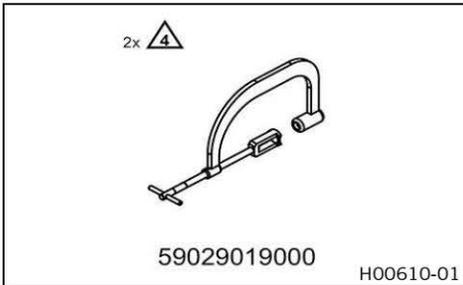
Art. no.: 58429092000

Torque wrench with various accessories in set



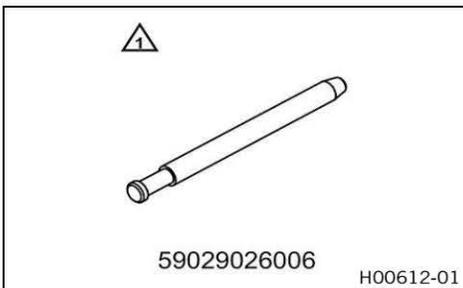
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Valve spring mouter



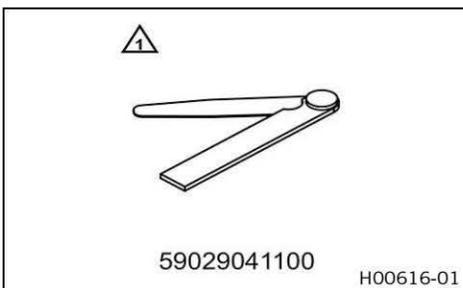
Art. no.: 59029019000

Limit plug gauge



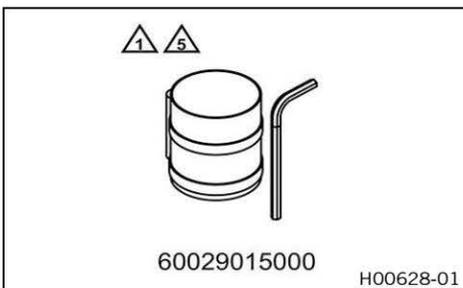
Art. no.: 59029026006

Feeler gauge



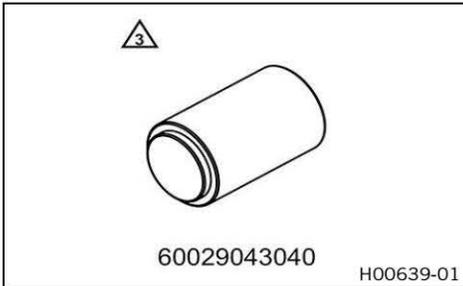
Art. no.: 59029041100

Piston ring mounting tool



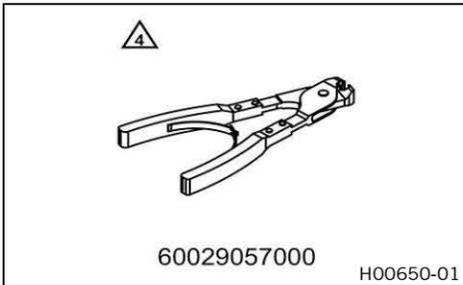
Art. no.: 60029015000

Press drift



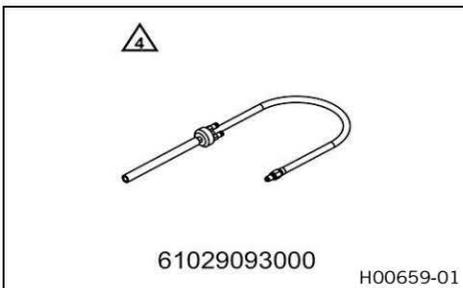
Art. no.: 60029043040

Hose clamp pliers



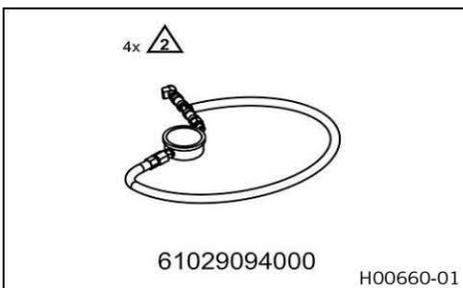
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Testing hose



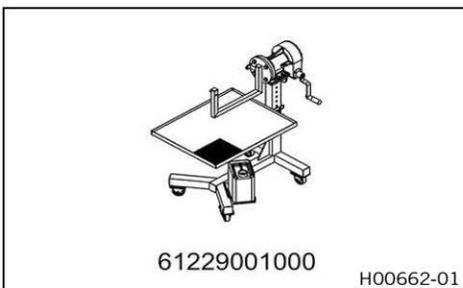
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Pressure tester



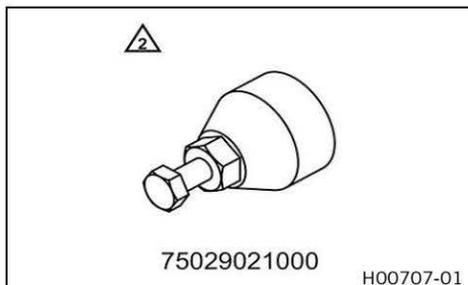
Art. no.: 61029094000

Engine assembly stand



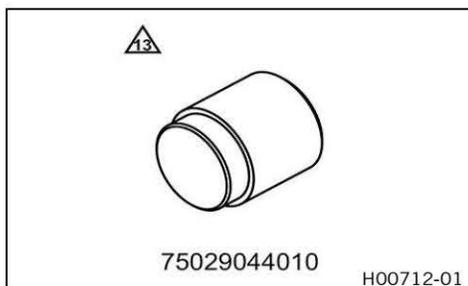
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Extractor



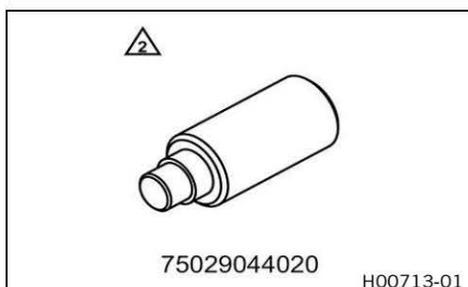
Art. no.: 75029021000

Push-in drift



Art. no.: 75029044010

Push-in drift



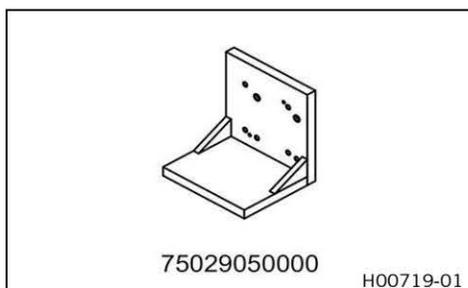
Art. no.: 75029044020

Pressing tool for crankshaft, complete



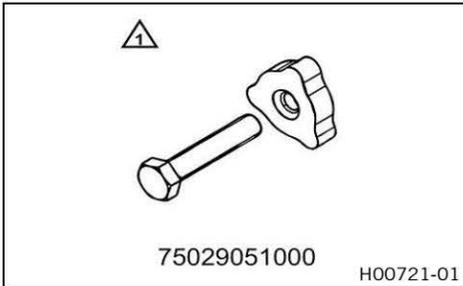
Art. no.: 75029047000

Clamping plate



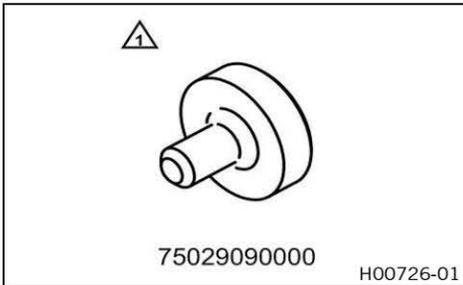
Art. no.: 75029050000

Push-out drift



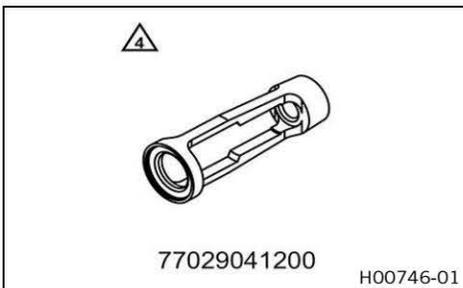
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Protection cap



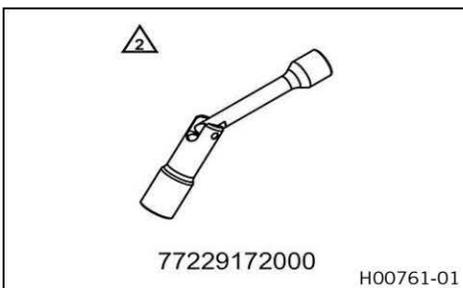
Art. no.: 75029090000

Insert for valve spring lever



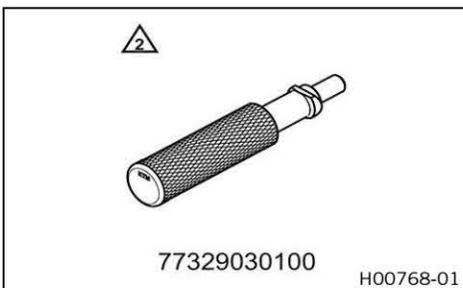
Art. no.: 77029041200

Spark plug wrench



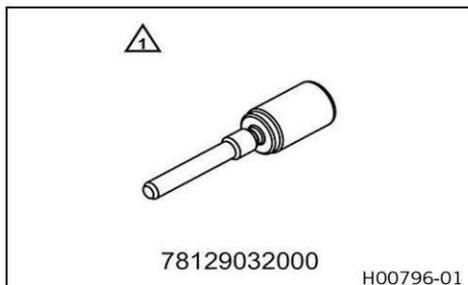
Art. no.: 77229172000

Insertion tool for piston ring lock



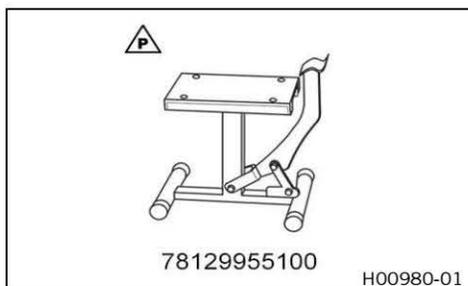
Art. no.: 77329030100

Fixing drift



Art. no.: 78129032000

Lift stand



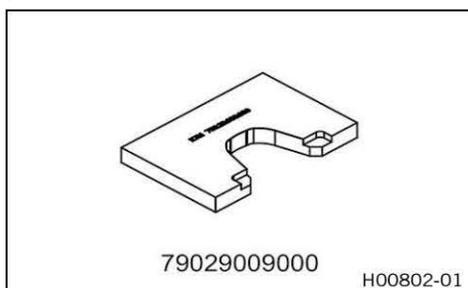
Art. no.: 78129955100

Insert for crankshaft pressing tool



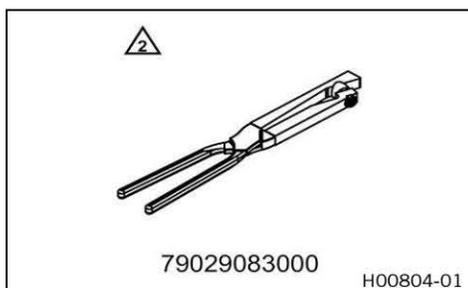
Art. no.: 78929008000

Separator plate



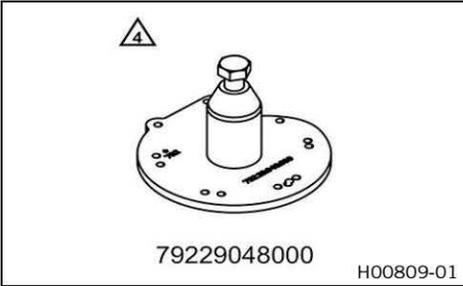
Art. no.: 79029009000

Pliers for footrest spring



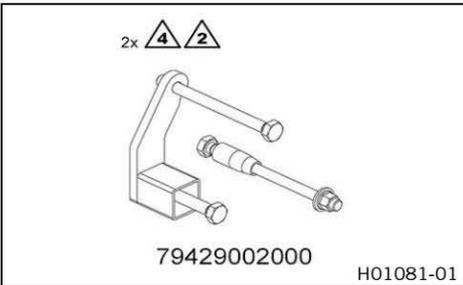
Art. no.: 79029083000

Case separating tool



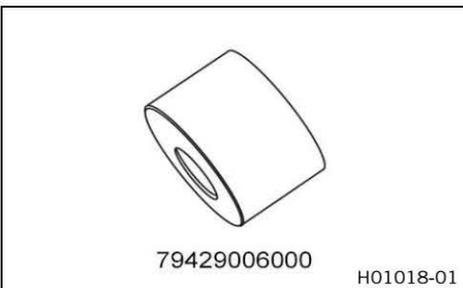
Art. no.: 79229048000

Engine fixing arm



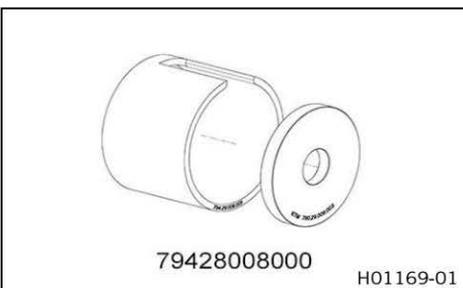
Art. no.: 79429002000

Push-in drift



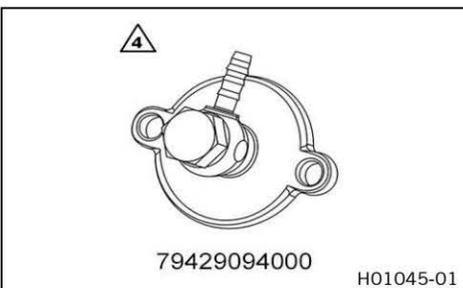
Art. no.: 79429006000

Insert for crankshaft pressing tool



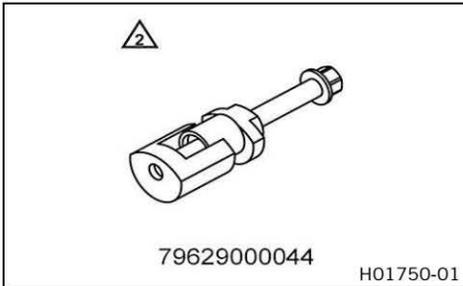
Art. no.: 79429008000

Oil pressure adapter



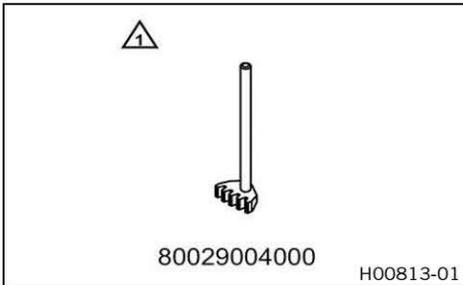
Art. no.: 79429094000

Mounting tool, heim joint



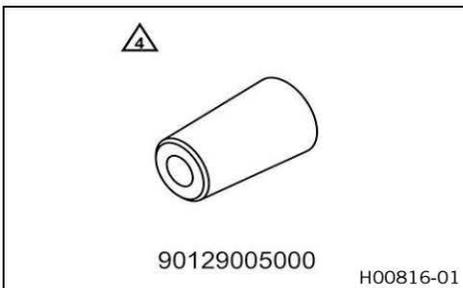
Art. no.: 79629000044

Gear segment



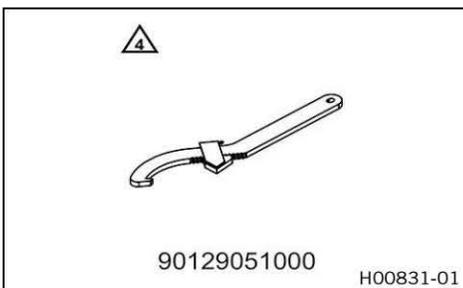
Art. no.: 80029004000

Mounting sleeve



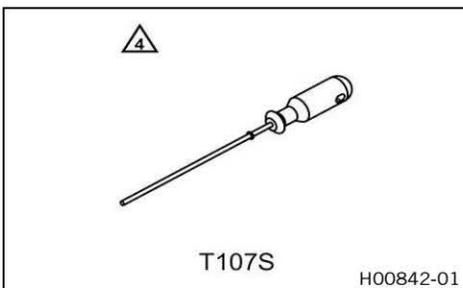
Art. no.: 90129005000

Hook wrench



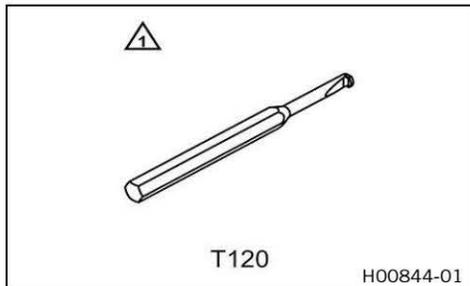
Art. no.: 90129051000

Depth micrometer



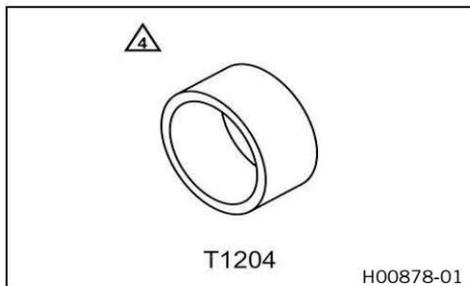
Art. no.: T107S

Pin



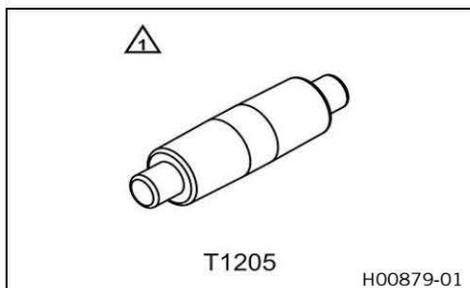
Art. no.: T120

Mounting sleeve



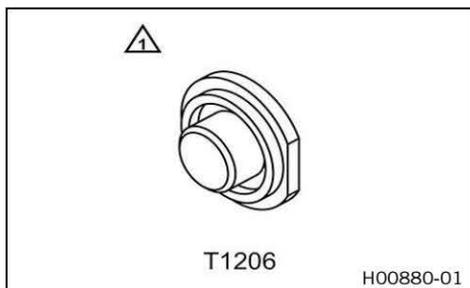
Art. no.: T1204

Calibration pin



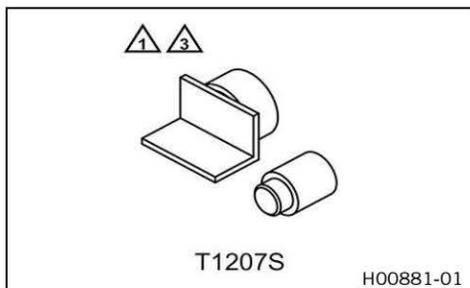
Art. no.: T1205

Pressing tool



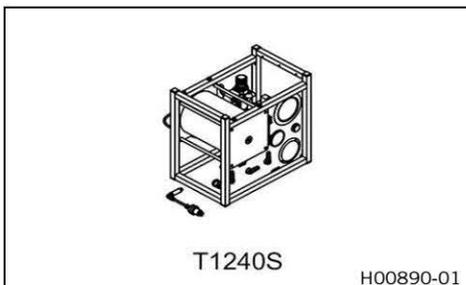
Art. no.: T1206

Pressing tool



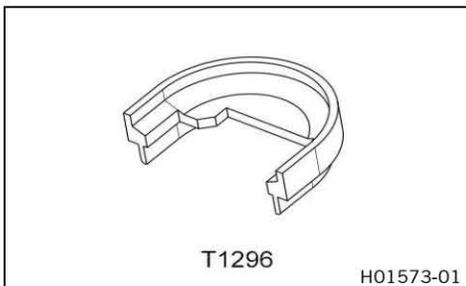
Art. no.: T1207S

Vacuum pump



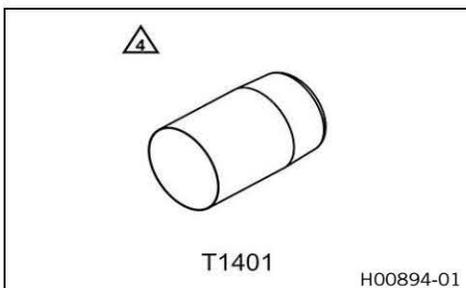
Art. no.: T1240S

Filling adapter



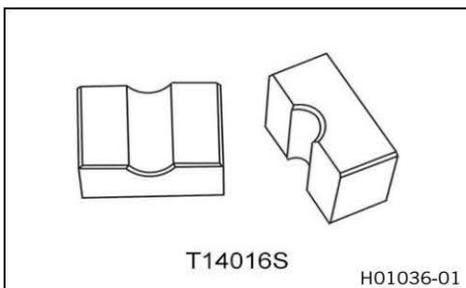
Art. no.: T1296

Protecting sleeve



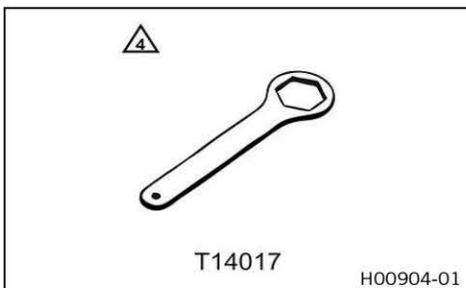
Art. no.: T1401

Clamping stand



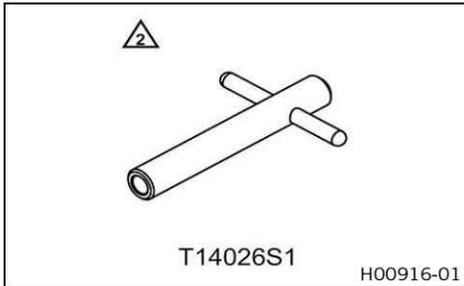
Art. no.: T14016S

Ring wrench



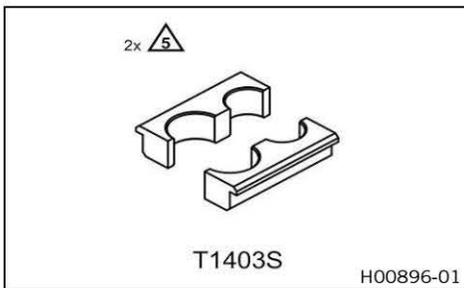
Art. no.: T14017

Gripping tool



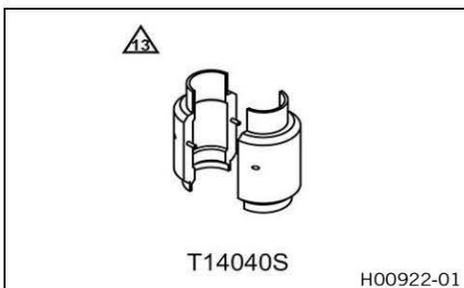
Art. no.: T14026S1

Clamping stand



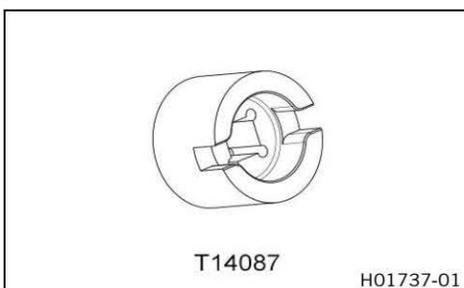
Art. no.: T1403S

Mounting tool



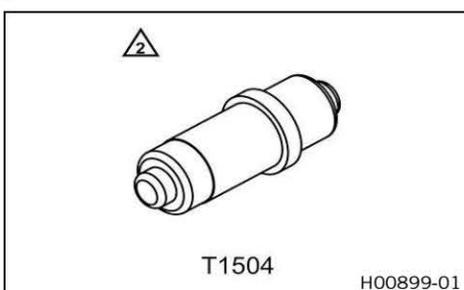
Art. no.: T14040S

Special socket



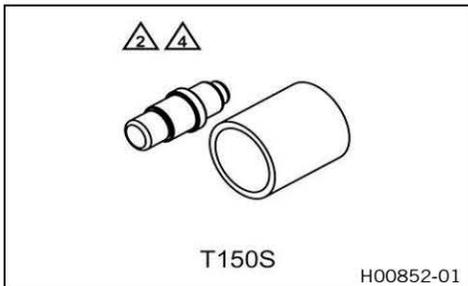
Art. no.: T14087

Press drift



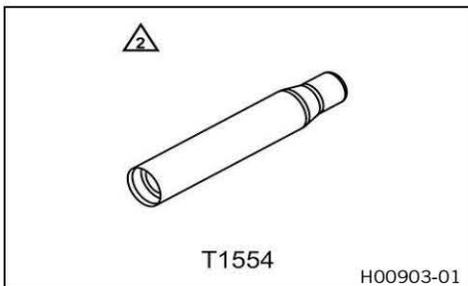
Art. no.: T1504

Assembly tool



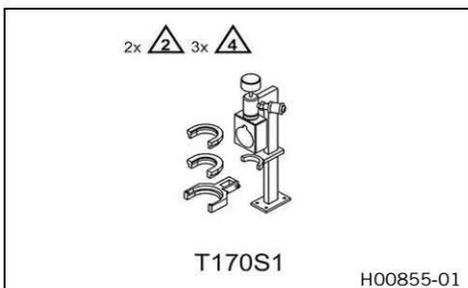
Art. no.: T150S

Mounting sleeve



Art. no.: T1554

Nitrogen filling tool



Art. no.: T170S1

JASO T903 MA

Different technical development directions required a separate specification for 4-stroke motorcycles – the **JASO T903 MA** standard. Earlier, engine oils from the automobile industry were used for 4-stroke 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 the clutch are lubricated with the same oil.

The **JASO MA** 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.

PA	Preload adjuster	Device on the spring elements which enables adjustment of the spring preload
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Art. no.	Article number
ca.	circa
cf.	compare
e.g.	for example
etc.	et cetera
i.a.	inter alia
no.	number
poss.	possibly

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